

Anatomical Robotic Left Trisectionectomy Using Glissonean Pedicle Control: A Minimally Invasive Strategy for Complex Liver Resection

Prof Benedetto Ielpo

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Abstract

(a) Background

Robotic left hepatic trisectionectomy involves the resection of segments 2, 3, 4, 5, 8, and 1 in case of cholangiocarcinoma and is indicated in selected patients with tumors involving both the left liver and right anterior sector.

(b) Hypothesis, materials, and methods

We present a video of a fully robotic anatomical left trisectionectomy using an extrahepatic Glissonian approach.

A 68-year-old woman with multiple comorbidities was diagnosed with a large cholangiocarcinoma involving left pedicle and the right anterior portal branch. Following immunotherapy (Gemcitabine + durvalumab), a partial response was achieved and surgery was planned. The Glissonian approach enabled precise vascular control of both the left and right anterior pedicles.

(c) Results

The procedure lasted 390 minutes with 300 ml of blood loss and no transfusion. The postoperative course was uneventful, with discharge on day 6.

(d) Conclusions

This video demonstrates that robotic left trisectionectomy with Glissonian approach is a safe and reproducible option in selected advanced cholangiocarcinoma cases

Abstract Categories

Liver

Robotic Central Pancreatectomy with Radiofrequency-Assisted Stump Closure: A Novel Parenchyma-Sparing Strategy

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Abstract

(a) Background

Central pancreatectomy is a parenchyma-sparing procedure typically indicated for low-grade neoplasms located in the pancreatic neck or proximal body. Standard reconstruction involves a pancreaticojejunostomy or pancreaticogastrostomy, which can be technically demanding and carry a significant risk of clinically relevant postoperative pancreatic fistula (CR-POPF).

(b) Hypothesis, materials, and methods

In this video, we present a novel anastomosis-free approach to central pancreatectomy, developed from our center's experience with radiofrequency (RF) technology for pancreatic transection. After robotic resection, the distal pancreatic stump is managed by selective ablation of the main pancreatic duct followed by parenchymal coagulation and sealing using a bipolar RF device.

The aim of this strategy is to preserve the endocrine function of the pancreatic remnant while eliminating its exocrine secretion, thereby simplifying the procedure and potentially reducing the risk of POPF.

(c) Results

Surgery last 190 min with 50 cc estimated blood loss. The postoperative course was uneventful, and the patient was discharged on postoperative day 2.

(d) Conclusions

This video demonstrates a safe, effective, and reproducible technique that leverages RF technology to optimize outcomes in minimally invasive pancreatic surgery, particularly for selected patients where maintaining endocrine integrity is a priority

Abstract Categories

Pancreas

Optimizing Robotic Spleen-Preserving Distal Pancreatectomy: Strategies and Innovations from Personal Experience

Prof Benedetto Ielpo

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Abstract

(a) Background

Spleen-preserving distal pancreatectomy by robotic surgery is a safety and feasible surgical technique. Currently, it represents an alternative to the classical distal pancreatectomy with splenectomy, in case of benign and low-grade malignant diseases of the body or pancreas tail. This procedure can be performed by preserving completely the splenic vessels (Kimura technique), just the splenic artery (Kim's technique) or not preserving (Warshaw technique). Robotic approach is a feasible option in this surgery, in terms of postoperative pain, facilitating patient recovery with not increasing pancreatic fistula, hospital readmission, morbidity and mortality.

This surgical technique can be technically demanding; even robotically, therefore, several maneuvers are described to reduce operative difficulty and improve surgical outcomes.

(b) Hypothesis, materials, and methods

The objective of this video is to provide a step-by-step guide to the robotic Spleen-preserving DP surgery, highlighting tips and innovations for improved safety and effectiveness and show an innovative method to transect the pancreas with a radiofrequency device.

(c) Results

During a period of time of 5 years a total of 45 Spleen-preserving distal pancreatectomy by robotic surgery have been performed with a mean clinically significant fistula rate of 17% and conversion of 3 cases (6%).

(d) Conclusions

This video shows some of the strategies and innovation to improve the surgery and its clinical results

Abstract Categories

Pancreas

Mitigation strategies for High Risk Pancreateatoduodenectomy patients

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Abstract

(a) Background

Pancreatoduodenectomy (PD) is performed for the treatment of pancreatic head and periampullary tumors and is associated with relatively high postoperative morbidity and mortality. Traditionally conducted as open surgery, PD has evolved with the advent of minimally invasive techniques, including robotic-assisted approaches.

As reported in the literature, minimally invasive PD is becoming a safe and effective alternative surgical approach. Clinically relevant postoperative pancreatic complications, such as fistulas and hemorrhage, remain among the most challenging issues after PD, particularly in high-risk cases. There are several maneuvers that may reduce their incidence and mitigate their postoperative clinical impact.

(b) Hypothesis, materials, and methods

In this video, we describe strategies implemented at our center for high-risk PD cases, including some key tips and tricks

(c) Results

During a 5 period of time we performed a total of 62 Robotic PD with a clinically relevant pancreatic fistula of 18% and 4.8% of mortality

(d) Conclusions

Mitigation strategy is important to decrease complication rate after PD

Abstract Categories

Pancreas

Exploring Every Route of the Robotic Glissonean Approach in Liver Surgery: A Personal Perspective

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Abstract

(a) Background

The Glissonean approach allows for anatomical, extrahepatic control of segmental inflow, enhancing the safety and precision of liver resections. Robotic surgery, with its enhanced dexterity and visualization, facilitates this dissection, especially in the identification and control of Glissonean gates. Knowledge of these gates and their anatomical landmarks should be part of every liver surgeon's essential armamentarium.

(b) Hypothesis, materials, and methods

This video illustrates a stepwise robotic technique for anatomical liver resections using the Glissonean gate system. Detailed intraoperative videos demonstrate the identification, dissection, and management of Glissonean pedicles of both the left and right liver. The article includes tips and tricks to optimize gate dissection, pedicle control, and parenchymal transection, supported by the use of indocyanine green fluorescence, preoperative 3D reconstruction, and intraoperative ultrasound.

(c) Results

The Glissonean approach, when integrated with robotic technology, offers a reproducible and safe strategy for anatomical liver resection.

(d) Conclusions

This video aims to provide practical, step-by-step guidance for surgeons adopting robotic hepatectomy in their clinical practice.

Abstract Categories

Liver

Surgical Techniques: Robotic versus conventional Laparoscopic cholecystectomy IN benign Gallbladder disease: A randomized controlled, open, parallel, non-inferiority, single-center trial (STaRLING trial)

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Abstract

(a) Background:

Robotic surgery is increasingly being adopted for gallbladder removal, despite the absence of randomized trials comparing its safety and patient outcomes to the current gold standard, laparoscopic cholecystectomy (LC). Existing literature reviews report several case series showing no significant differences in postoperative complications or recovery between robotic cholecystectomy (RC) and LC.

(b) Hypothesis, materials and methods:

When adopting a novel technique, it should be at least as safe as the current standard. We hypothesize that RC is non-inferior to conventional LC in terms of complication rates.

To demonstrate this, a single-center, randomized controlled, parallel, non-inferiority trial is being conducted. All adult patients with benign gallbladder disease with an indication for cholecystectomy will be assessed for eligibility and included after providing informed consent. A total of 276 patients will be randomized to undergo either RC or LC. The primary endpoint will be the incidence and severity of postoperative complications within 30 days after surgery. Secondary endpoints include perioperative outcomes, total health care utilization, health-related quality of life (HR-QoL) as assessed by patient-reported outcome measures, and cost-effectiveness. Follow-up assessments will be conducted at 7 and 30 days postoperatively.

(c) Results:

Recruitment is expected to start in August 2025. Depending on study progress, preliminary results will be made available for presentation at the CRSA 16th Worldwide Congress.

(d) Conclusions:

This will be the first randomized controlled trial comparing RC with LC in the treatment of benign gallbladder disease. The study aims to evaluate the safety and non-inferiority of RC relative to LC and to provide high-quality evidence to guide the progress and broader adoption of robotic surgery in general surgical practice.

Abstract Categories

New Study Proposal

Is microsurgical technique of robotic PJ improving outcomes of postoperative pancreatic fistula (POPF) rates in R-Whipple?

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Abstract

Background: The pancreatic-digestive reconstruction is still a weak point in robotic pancreaticoduodenectomy: failure of the pancreatic anastomosis is the main cause of postoperative pancreatic fistula (POPF), which still has a high incidence (8-26%). In recent years, the rate of difficult pancreas (thin MPD, soft parenchyma) has increased, affecting the reconstruction approach. Multiple techniques exist for pancreatic stump management: cyanoacrylate glue injection, pancreaticogastrostomy (PG), pancreaticojejunostomy (PJ). The ideal reconstruction: end-to-side PJ with mucosa-to-mucosa anastomosis with microsurgical technique.

Hypothesis, materials and methods: Based on a dataset of 198 cases, we conducted a retrospective analysis on 162 R-Whipple performed between September 2007 and July 2025 by a single surgeon at the Division of Minimally Invasive and Robotic Surgery at the University of Illinois at Chicago. Thirty-six cases were excluded, as they were performed at different Institutions and can be considered as part of the surgeon's learning curve. Data including pathology, surgical details, OT, EBL, conversion rate, intraoperative and perioperative complications, type of pancreatic anastomosis, evaluation of resection margins, morbidity, mortality, and LOS were collected. All POPF were classified according to the International Study Group of Pancreatic Fistula (ISGPF) guidelines.

Results: In the last 5 years, end-to-side PJ with mucosa-to-mucosa anastomosis with microsurgical technique has been the most frequently used pancreatic-digestive reconstruction (25 out of 30, ~83% of all anastomosis), while the use of PG steadily decreased (only 5 cases over 5 years). The POPF rate using PJ reconstruction dropped dramatically: only 1 POPF (grade B), a significant lower rate than reported in the literature.

Conclusions: In difficult pancreas, the use of end-to-side PJ with mucosa-to-mucosa anastomosis with microsurgical technique has shown a steep reduction in POPF rates. The addition of a good anchoring technique, as Blumgart-type anchoring stitches for very soft pancreas, helps decrease the risk of mucosa-to-mucosa anastomosis disruption.

Abstract Categories

Pancreas

Esofagectomia completamente robotica di Ivor Lewis: innovazione tecnologica e benefici clinici

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Abstract

(a) The Ivor Lewis esophagectomy is a complex procedure with significant perioperative impact. In recent years, the integration of robotic surgery has introduced new opportunities, offering enhanced precision, three-dimensional visualization, and improved intraoperative control, especially in thoracoabdominal approaches.

(b) The fully robotic approach to Ivor Lewis esophagectomy improves clinical and surgical outcomes compared to conventional or hybrid techniques, without compromising oncological efficacy. A retrospective analysis was conducted in a single center, including patients who underwent fully robotic Ivor Lewis esophagectomy between 2024-2025. Collected data included demographics, operative time, lymphadenectomy, complications, postoperative length of stay, and resection margins.

(c) A total of 25 patients were analyzed. The mean operative time was 390 minutes. The average hospital stay was 9 days. The rate of major complications was 14%, with no cases of anastomotic leak. Oncological radicality was achieved in all patients (R0), with a mean of 28 lymph nodes retrieved.

(d) The fully robotic Ivor Lewis esophagectomy is a safe, effective, and reproducible technique. Technological advantages translate into measurable clinical benefits, supporting wider adoption of this approach in the field of advanced minimally invasive esophageal surgery.

Abstract Categories

Upper GI

Early Discharges for Robotic Colectomies and Similar Readmission Rates Compared to Standard Discharges

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Abstract

Background:

With more interest in reducing postoperative length of stay in colorectal surgeries, many small studies have explored the efficacy and safety of early discharges in minimally invasive colorectal surgeries. Limited data exist on the safety of early discharge for patients undergoing elective robotic left-sided colorectal surgeries.

Methods:

This is a retrospective case control study of patients 18 years and older who underwent elective left sided colon resection, which included sigmoidectomy, left colectomy, or low anterior resection, between January 2014 and August 2024 at a single health maintenance organization (HMO) hospital system. Patients were divided into an early discharge group (postoperative day 0-1) and a standard discharge group (postoperative day ≥ 2). Primary outcome of 30 day readmission rate and secondary outcomes of postoperative complications including ileus, small bowel obstruction, urinary tract infection, acute kidney injury, pulmonary embolism, surgical site infection, and re-operation were compared between the two groups.

Results:

A total of 616 patients met the inclusion criteria. 160 patients underwent early discharge while 456 patients underwent standard discharge. Within the early discharge group, 14 patients (8.8%) were re-admitted within 30 days and within the standard discharge group, 46 patients (10.1%) were re-admitted within 30 days, which was not statistically significant ($p=0.76$.) There was also no statistically significant difference observed in the postoperative complication rates between the two cohorts.

Conclusion:

Early discharge following elective robotic left-sided colorectal resection is safe and not associated with increased risk of readmission or postoperative complications compared to standard discharge.

Abstract Categories

Colo-rectal

Safety and Oncologic Efficacy of Robotic Surgery Compared to Open Surgery After Neoadjuvant Therapy for Pancreatic Cancer

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Abstract

Background: Neoadjuvant therapy (NAT) has become a recommended treatment for borderline resectable or locally advanced pancreatic cancer. However, peripancreatic fibrosis after NAT and the tumor's proximity to major vessels pose technical challenges. The feasibility and safety of robotic approaches remain unclear.

Methods: A retrospective analysis was conducted on patients with pancreatic cancer who received either open pancreatic surgeries (OPS) or robotic pancreatic surgeries (RPS) following NAT between February 2017 and April 2025. Outcomes included R0 resection rate, postoperative complications, disease-free survival (DFS), and overall survival (OS).

Results: The rate of combined vascular resection and reconstruction was significantly lower in the RPS group compared to the OPS group following NAT (0.0% vs. 39.4%, $p < 0.001$). 43 patients undergoing surgeries that did not require vascular segmental resection and reconstruction were ultimately included (20 OPS, 23 RPS). Baseline characteristics were comparable, except for BMI. In the RPS group, one case (4.3%) was converted into laparotomy. The RPS group was associated with longer operative time (340.0 min vs. 254.0 min, $p = 0.015$). The number of harvested lymph nodes was significantly higher in the RPS group (25 vs 18, $p = 0.049$). No significant difference in R0 resection rate was observed. The rate of overall complications was significantly lower in the RPS group (21.7% vs. 55.0%, $p = 0.024$), while the rates of severe complications, clinically relevant pancreatic fistula, and postoperative hemorrhage did not differ. DFS and OS were comparable between the two groups.

Conclusion: In cases where vascular segmental resection and reconstruction are not required, robotic surgery can be safely implemented and significantly reduce postoperative complications, with oncologic outcomes comparable to those of OPS. However, the indications for robotic approach following NAT of pancreatic cancer still require further exploration.

Abstract Categories

Pancreas

ROBOTIC VASCULAR SURGERY

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Abstract

Background: The aim of this retrospective study was to describe and evaluate our single center experience with robotic aortic and non-aortic vascular surgery to treat primarily occlusive disease and aneurysms. The da Vinci system has been used by a variety of disciplines for laparoscopic procedures but the use of robots in vascular surgery is still relatively sporadic.

Materials and Methods: From November 2005 to August 2024, 668 robot-assisted vascular operations were performed. Four hundred nineteen subjects were prospectively evaluated for occlusive disease: 177 subjects for abdominal aortic aneurysm, 1 for descending thoracic aorta-abdominal aortic bypass, 8 for a common iliac artery aneurysm, 13 for a splenic artery aneurysm, 1 for internal mammary artery aneurysm, 26 for median arcuate ligament release, 18 for type II endoleak treatment post endovascular aneurysm repair (EVAR), 2 for renal artery reconstruction, 1 paraaortic biopsy, and 3 cases were inoperable. Eight hybrid procedures in study were performed; 7 subjects underwent combined robotic incisional hernia prosthetic mesh repair with robotic vascular procedure and 1 subject with type B dissection and severe stenosis of the renal artery was treated by robotic ilio-renal bypass and thoracic stent graft implantation.

Results: Six hundred forty-one cases (96%) were successfully completed robotically; surgery was discontinued in 3 subjects (0.45%) due to severe aortic calcification and severe periaortitis. In 24 subjects (3.6%) conversion was necessary. The thirty-day mortality rate was 0.45% (3 subjects), and late prosthetic infection was observed in 6 subjects (0.9%).

Conclusions: Our experience with robot-assisted laparoscopic surgery has demonstrated the feasibility of this technique for occlusive diseases, aneurysms, type II endoleak treatment post EVAR, for median arcuate ligament release and hybrid procedures. Robotic AAA treatment and aorto-femoral bypass represent the standard operations in vascular surgery, and they are not only possible but also safe and successful.

Abstract Categories

Cardio-Thoracic

Impact of body mass index on outcomes of single-port transaxillary robotic thyroidectomy[A1] using the da Vinci SP system

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Abstract

Background: Obesity is considered a potential risk factor for adverse surgical outcomes in robotic transaxillary thyroid surgery, including prolonged operative time, seroma, and transient voice hoarseness. This study aimed to compare surgical and oncologic outcomes between patients with and without obesity undergoing single-port transaxillary robotic thyroidectomy (START) using the da Vinci Single-Port (SP) robotic system.

Methods: This retrospective study included 578 patients with papillary thyroid cancer who underwent START at our institution between January 2020 and June 2022. Patients were categorized into non-obese (BMI < 25 kg/m²) and obese (BMI ≥ 25 kg/m²) groups. Clinicopathological data and surgical outcomes were evaluated and compared.

Results: Of the 578 patients, 452 were classified as non-obese and 126 as obese. Clinicopathological features were similar between groups, except for a higher male-to-female ratio in the obese group ($P < 0.001$). No significant differences were observed in operative time ($P = 0.217$) or postoperative complications ($P = 0.102$). After a median follow-up of 40 months, both groups demonstrated comparable oncological outcomes, including similar TSH-suppressed serum thyroglobulin levels ($P = 0.275$) and recurrence rates ($P = 0.491$).

Conclusions: Obesity did not significantly affect operative, postoperative, or oncological outcomes in patients undergoing START. The two-step retraction method with the da Vinci SP system may provide safe, effective, and cosmetically favorable thyroid surgery for patients with obesity.

Abstract Categories

Endocrine

Totally Intracorporeal Reconstruction in Robotic Total Gastrectomy: A Surgical Technique Video Demonstration

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Abstract

Background

Total robotic gastrectomy for cancer presents unique challenges, especially concerning totally

intracorporeal reconstruction, a controversial yet crucial aspect of minimally invasive approaches.

This reconstructive phase is often the most demanding part of the procedure, executable through

diverse techniques; however, only robotic surgery allows for a truly complete intracorporeal

reconstruction. This video aims to demonstrate a standardized approach for achieving minimally

invasive intracorporeal reconstruction.

Materials and Methods

This video illustrates a total robotic gastrectomy for cancer. Key steps demonstrated include the division of gastroepiploic and pyloric vessels, duodenal division, D2 lymphadenectomy, and left gastric artery dissection. Emphasis is placed on esophageal isolation, division and fixation to the pillars of the diaphragm in order to prevent it from retracting into the thorax.

The reconstructive phase highlights and details the esophagojejunal termino-lateral anastomosis, performed manually, with mucosal-to-muscular layer fixation, posterior external running sutures and internal posterior and anterior interrupted sutures, followed by an anterior external running suture. An omega-shaped jejunal loop is utilized to facilitate the entero-enteric Roux-en-Y anastomosis without camera repositioning.

Results

The demonstrated technique allows for efficient and precise totally intracorporeal reconstruction.

The specific suturing techniques, including mucosal fixation, facilitate secure and complete anastomoses. Utilizing an omega-shaped jejunal loop eliminates the need for camera repositioning for the entero-enteric anastomosis.

Conclusions

Totally intracorporeal reconstruction following robotic gastrectomy is feasible and can be safely and effectively performed using advanced robotic techniques, offering advantages in surgical workflow and precision.

Abstract Categories

Upper GI

Precision Microsurgery to decrease the risk of Pancreatic Leaks after Robotic Pancreaticojejunostomy

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Abstract

Pancreaticojejunostomy is a critical, high-risk step of robotic pancreaticoduodenectomy. A standardized, precise, microsurgical technique is paramount to improving outcomes. This report describes a specific 'How I Do It' approach to a robotic end-to-side, mucosa-to-mucosa PJ, and reports the clinical outcomes from a large, single-surgeon experience.

The pancreatic stump is minimally mobilized to allow posterior anchoring, with division of small splenic branches between 5-0 polipropilene sutures. If the pancreatic duct size is less than 4 mm, a temporary stent is placed inside and fixed with an absorbable 5-0 stitch. The first jejunal loop is brought retromesenterically to the upper quadrant. Before starting the posterior row, a small enterotomy is created where the PJ will be constructed. A 4-0 polipropilene running suture fixes the posterior pancreatic capsule to the jejunal serosa. Some pitfalls include inadvertently incorporating the pancreatic duct in the posterior suture, which increases the risk of pancreatitis and leakage, or placing loose posterior sutures that can cause side-branch leaks. The PJ mucosa-to-mucosa is now performed with microsurgical technique: a short PDS-5/0 running for the posterior wall is followed by interrupted stitches of the same material. Those stitches are momentarily controlled with clips and will be tied all-together at the end of the anastomosis. The precise magnified vision obtained with the scope, moved in the left upper quadrant with swapping of instruments in the robotic cannulas, helps in defining details with perfect approximation of the duct wall with the serosa of the small bowel. A second running suture of polipropilene 4-0 is anchoring the anterior aspect of the pancreatic capsule with the serosa of the bowel. In case of very fragile parenchima, two Blumgart stitches (each on both sides of the anastomosis) are added to improve anchoring of the pancreatic stump to the bowel loop.

Clinical outcomes are reported and commented.

Abstract Categories

Pancreas

Preliminary Outcomes of Remote Surgical Robots in Hepatobiliary and Pancreatic Surgeries

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Abstract

Background/hypothesis:

To evaluate the challenges and advantages of remote surgical robots in hepatobiliary and pancreatic surgeries.

Materials and methods:

We retrospectively analyzed 21 cases of remote robotic hepatobiliary and pancreatic surgeries conducted under the leadership of Sir Run Run Shaw Hospital, Zhejiang University School of Medicine, between June 2023 and July 2025. The surgeries comprised 10 robotic cholecystectomies, 1 robotic spleen-preserving distal pancreatectomy, 1 robotic common bile duct exploration with stone removal, and 9 robotic hepatectomies. Among these, 20 surgeries were performed with the surgeon's console located in Hangzhou, China: 10 cases connected to the robotic operating room in Alai (4,600km away), 5 cases in Jiangshan (266km away), and 5 cases in Shaoxing (71km away). In addition, 1 surgery was conducted with the console located in Strasbourg, France, spanning a distance of over 10,000km to the operating room in Hangzhou, China.

Results:

No significant intraoperative lag occurred, and all patients recovered smoothly postoperatively. Take 9 hepatectomy cases as examples, the operative duration ranged 49~342 minutes (mean 180min), with blood loss ranging 5~800mL (mean 127mL). The mean network latency was 82ms. Three patients developed hypoproteinemia after surgery, and one patient experienced pleural effusion; however, all conditions were within controllable limits and improved after symptomatic treatment. The postoperative hospital stay of the 9 patients ranged 3~15 days (mean 8 days). Postoperative pathological results showed that 7 cases were benign liver diseases (including 4 with hepatic hemangioma, 1 with cirrhotic regenerative nodule, and 2 with hepatolithiasis combined with choledocholithiasis), while 2 cases were malignant liver tumors.

Conclusions:

Preliminary findings suggest that remote surgical robots are feasible and safe for hepatobiliary and pancreatic surgery. They hold significant promise for expanding access to high-quality medical resources, enhancing surgical capacity at grassroots hospitals, and fostering international collaboration in telemedicine.



Zhejiang, China

7月22日 · 🌐

🌐 A medical first! On July 19, Prof Liang Xiao performed the world's first intercontinental robotic liver cancer surgery — operating a Chinese-made surgical robot remotely from France to save a patient 10,000 km away in Hangzhou, all in just 50 minutes.



Abstract Categories

Telesurgery/Remote Surgery

Comparison of short- and long-term outcomes between robotic and laparoscopic operation in hilar cholangiocarcinoma patients: a case control study

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Abstract

Background Robotic surgery (RS) has gained increasing acceptance due to its ability to overcome certain limitations associated with laparoscopic surgery (LS). However, the performance of RS in hilar cholangiocarcinoma (HCCA) patients compared with LS remains unclear. This study aimed to compare the short- and long-term outcomes of RS versus LS in patients with HCCA.

Method The retrospective study included patients who underwent radical resection of HCCA between February 2020 and August 2024. Baseline characteristics, pathological findings, surgical outcomes, and long-term outcomes were analyzed and compared between the RS and LS group.

Results The baseline characteristics and pathologic findings of both groups were comparable. The RS group had less estimated blood loss [300 (175–400) vs 700 (200–750) ml, $p=0.008$], and lower ALT, AST, TBIL, and DBIL compared to LS group, while no significant differences in postoperative complications. Regarding long-term outcomes, the overall survival rates and recurrence-free survival rates were comparable in two groups ($p=0.77$ and $p=0.17$, respectively).

Conclusion This study demonstrated that robotic surgery for HCCA generally achieves satisfactory perioperative outcomes compared to laparoscopic surgery. With continued advancements in surgical techniques and accumulation of experience, robotic radical resection for HCCA could become a routine approach in the future.

Abstract Categories

Liver

Robotic-assisted hepatopancreatoduodenectomy for hilar Cholangiocarcinoma Type IIIb : case report

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Abstract

(a) Background

Hepatopancreatoduodenectomy for hilar cholangiocarcinoma (hiCC) is a highly complex and extensive procedure. Although the Da Vinci robotic system has been widely adopted for its enhanced visualization and maneuverability, its application in robotic-assisted hepatopancreatoduodenectomy for hiCC remains unreported.

(b) Hypothesis, materials, and methods

We present the first case of robotic-assisted hepatopancreatoduodenectomy performed on a 65-year-old male diagnosed with Bismuth-Corlette type IIIb hilar cholangiocarcinoma. Intraoperative frozen section analysis revealed positive margins, necessitated expansion to a combined resection of the left hemiliver, extrahepatic bile duct, duodenum, pancreatic head, and regional lymph nodes, followed by biliary and pancreaticojejunal reconstructions.

(c) Results

The operation was completed in 9 hours and 15 minutes with an estimated blood loss of 400 mL. On postoperative day 8, the patient experienced hemorrhage due to a hepatic artery pseudoaneurysm, which was successfully managed with interventional embolization. Final pathology confirmed moderately differentiated adenocarcinoma with negative margins at the right hepatic duct, liver stump, pancreas, and stomach. The patient recovered well with normalized liver function at 40-day follow-up.

(d) Conclusions

Robotic-assisted hepatopancreatoduodenectomy is a feasible and safe minimally invasive approach for selected patients with advanced hilar cholangiocarcinoma. Intraoperative frozen section guidance and postoperative interventional management are crucial for achieving successful outcomes. This case supports the expanding role of robotic surgery in complex hepatobiliary procedures.

Abstract Categories

Biliary

Robotic TEM for T2N0M0 rectal cancer - Time to move to organ-sparing surgery ?

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Abstract

Background:

T2 cancer in low rectum is difficult to differentiate with T1 cancer. MRI used to over diagnose T1 as T2 cancer. There are different treatment for T1 and T2 in low rectum.- local excision (TEM) or rectal resection / amputation (TME / APR).According to Swedish Colorectal Register only 13 % of T1 cancer is being treated with TEM . Most of them were excised as benign polyps.

Hypothesis, materials, and methods:

We performed 34 robotic TEM of T2N0M0 in low and middle rectum. We used Gel Point Port , 3 robotic arms . All patients obtained antibiotic and antithrombotic prophylaxis. Patients operated in prone position. Full wall excision were performed and defects were sutured with Vloc 3:0. Operative time was between 40 minutes and 105 minutes (median time was 65 minutes.)

It's considered as treatment if pathology shows benign or T1 and as diagnostic procedure if pathology shows T2 and patient is fit to TME or APR.

Results :

2 patients developed fever postoperative and being treated with antibiotic.3 patients got urinary catheter i 2 weeks. Pathology showed 3 high dysplasia polyps .18 T1 (6 -sm1, 8- sm2, 4-sm3) , 11 T2 , 2 T3ab.

8 completed operations were done (6 TME and 2 APR). Outcome was similar like without prior TEM.5 patients were too fragile or refused to be operated.(4 with T2 and 1 with T3ab)...2 patients developed metastasis and died,1 patient developed local recurrence and was operated with TME..

Conclusions:

Robotic full wall TEM is a safe procedure which used to be performed as outpatient mode. It is final treatment if pathology shows benign polyp ,T1 tumor or even T2 in fragile patient.T2 tumor can be completed with TME or APR without risk of worse outcome. TME for T2 cancer can potentially help to recruit more patient to organ sparing surgery in low rectal cancer.

Abstract Categories

Colo-rectal

Short- and long-term outcomes of robot-assisted pancreatectomy among the juveniles

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Abstract

Background: To evaluate the safety, feasibility, and advantages of robot-assisted pancreatectomy versus open pancreatectomy in juvenile patients.

Methods: A total of 72 eligible patients aged below 18 years were enrolled. Propensity-score matching (PSM) was applied to mitigate the random bias. Perioperative outcomes were deemed the primary outcomes, while long-term outcomes were secondary outcomes.

Results: Patients in robot-assisted pancreatic surgery (RPS) group manifested shorter median operative time (135.0 vs. 242.5 [min], $P=0.001$), less EBL (estimated blood loss) (50.0 vs. 125.0 [ml], $P<0.001$), fewer blood transfusion (8.7% vs. 30.8%, $P=0.037$) and fewer overall complications (32.6% vs. 61.5%, $P=0.033$). Additionally, RPS patients reported significantly better subjective scar evaluations (0 vs. 3, $P=0.041$). Post-PSM analyses confirmed these findings, with RPS demonstrating consistent advantages in median operative time (1:2 PSM: 130.0 vs. 215.0 [min], $P=0.016$; 1:1 sensitivity analysis: 120.0 vs. 240.0 [min], $P=0.007$), EBL (1:2 PSM: 50.0 vs. 100.0 [ml], $P<0.001$; 1:1 sensitivity analysis: 50.0 vs. 100.0 [ml], $P=0.008$), overall complications rate (1:2 PSM: 35.0% vs 90.0%, $P=0.001$; 1:1 sensitivity analysis: 36.4% vs. 90.9%, $P=0.027$), and scar evaluation (1:2 PSM: 0 vs. 6, $P=0.002$; 1:1 sensitivity analysis: 0 vs. 5, $P=0.014$).

Conclusion: Among juvenile patients, RPS is a superior alternative to open surgery for juvenile patients, offering improved intraoperative outcomes and reduced scar-related concerns while maintaining comparable complication rates and functional preservation. These results support the broader adoption and development of RPS in pediatric populations.

Abstract Categories

Pancreas

Robotic Roux-en-y reconstruction of the Left hepatic duct: Overcoming complex hepatic ductal obstruction.

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Abstract

This case is that of a 55 year old male with metastatic neuroendocrine tumor of the distal pancreas with single focal liver metastasis in segment 8 of the liver. He underwent distal pancreatectomy and splenectomy and microwave ablation of the segment 8 lesion in 2022 which was complicated with a large liver abscess and bile leak which required extensive percutaneous and endoscopic interventions. Despite multiple interventions over the course of time patient presented with hyperbilirubinemia and jaundice with a completely jailed off Left hepatic duct, that failed endoscopic interventions.

Robotic reconstruction allowed for minimally invasive access and assessment of the complex biliary anatomy. Additional supportive tools like robotic firefly and intra-operative Ultrasound confirmed close associations of the vital hepatic structures and allowed for a precise dissection. After adequate exposure a Roux-en-Y anastomosis was possible.

Use of robotic surgery is becoming increasingly common in complex Hepato-pancreato-biliary surgeries, however, their remains a push towards proceeding with open approach in high complexity cases with prior abdominal surgeries and extensive endoscopic interventions around the porta hepatis. Our video demonstrates safe ability to implement equivalent surgical procedures as open surgery, with better visualization of anatomy.

Abstract Categories

Complex Case

Standardization of a Novel Serosal Patching Technique with Glubran®2 in Robot-Assisted Distal Pancreatectomy: Operative Technique and Initial Outcomes

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Abstract

Background: Clinically relevant postoperative pancreatic fistula (CR-POPF) is a primary cause of morbidity after distal pancreatectomy (DP). Current stump reinforcement techniques yield inconsistent results. We previously reported promising initial results with a novel Glubran®2 serosal patching (GSP) technique. This study aims to report outcomes from an expanded series using a standardized GSP methodology.

Methods: This is a single-center retrospective analysis of 10 consecutive patients who underwent robot-assisted distal pancreatectomy (DP) with standardized GSP for pancreatic stump closure. The primary outcome was the incidence of CR-POPF (Grades B/C) within 90 days, defined according to the International Study Group on Pancreatic Surgery (ISGPS) criteria. Secondary outcomes included overall morbidity and mortality.

Results: Ten patients (mean age 71.6 ± 5.4 years; 60% male) were included. The mean operative time was 4.8 ± 1.1 hours, and all procedures achieved R0 resection. The mean length of stay was 5.1 ± 2.2 days. The incidence of CR-POPF was 0%. One patient (10%) developed a biochemical leak (formerly Grade A) that resolved without intervention. No major complications (Clavien-Dindo Grade $\geq$ IIIa) or 90-day mortality occurred.

Conclusion: The standardized application of the GSP technique for pancreatic stump closure after robot-assisted DP appears to be a safe and reproducible method. In this consecutive series, the technique was associated with a complete absence of clinically relevant pancreatic fistulae. These compelling initial outcomes suggest this novel technique may be highly effective, warranting further investigation in larger, prospective trials.

Abstract Categories

Pancreas

Robotic vs. Open Pancreaticoduodenectomy in the Elderly: A Systematic Review and Meta-Analysis

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Abstract

Background: Pancreaticoduodenectomy (PD) represents the sole curative treatment for periampullary tumors, but it is associated with considerable risks in elderly patients. The potential advantages of robotic PD (RPD) compared to open PD (OPD) in this demographic remain unestablished.

Methods: We performed a systematic review and meta-analysis to compare RPD and OPD outcomes in patients aged 70 years and older. Our primary outcomes of interest included 90-day postoperative mortality, readmission, and reoperation, as well as major complications, length of stay (LOS), operative time, blood transfusion requirements, postoperative pancreatic fistula (POPF), and delayed gastric emptying (DGE). Data were aggregated using a Mantel-Haenszel random-effects model in RevMan 5.4, with heterogeneity assessed using the I^2 statistic.

Results: This analysis included five studies comprising 4,656 patients (4,215 OPD and 441 RPD). Our findings indicated that RPD was associated with a statistically significant lower risk of blood transfusion (RR 0.58; 95% CI 0.39-0.87; $P = 0.009$), a shorter LOS (Mean Difference -2.40; 95% CI -4.32 to -0.49; $P = 0.01$), and a lower risk of major complications (RR 0.70; 95% CI 0.55-0.89; $P = 0.004$). Conversely, the RPD group demonstrated a higher risk of readmission (RR 1.47; 95% CI 1.06-2.03; $P = 0.02$). No significant differences were observed for mortality, operative time, reoperation, DGE, or POPF.

Conclusions: In elderly patients, RPD appears to be linked with a lower risk of blood transfusions, a shorter hospital stay, and fewer major complications compared to OPD. However, RPD may also increase the risk of readmission. The lack of a significant difference in other outcomes is likely due to the limited number of robotic cases studied. More extensive studies and randomized controlled trials are needed to fully understand the role of RPD in this population.

Abstract Categories

Pancreas

Initial Experience of Single-Port Transaxillary Robotic Radical Neck Dissection (STAR-RND) via 3cm

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Yonsei University College of Medicine, Seoul, Korea, Republic of

Abstract

Background

Conventional modified radical neck dissection (MRND) for papillary thyroid carcinoma (PTC) with lateral neck metastasis typically involves a long cervical incision, leading to cosmetic and functional drawbacks. To address these limitations, we developed a refined technique—single-port transaxillary robotic MRND (STAR-RND)—using a 3-cm axillary incision and a hybrid gas-insufflation/gasless approach, aiming to enhance cosmetic outcomes while maintaining oncologic and surgical efficacy.

Materials and Methods

Between April 2023 and April 2025, 24 patients with lateral neck node metastases from PTC underwent robotic total thyroidectomy and unilateral MRND via a 3-cm axillary incision using the da Vinci SP system. A hybrid technique employing initial gas insufflation followed by retractor-based gasless dissection was utilized to optimize working space and exposure. Clinical data, operative metrics, lymph node yield, and perioperative complications were retrospectively analyzed.

Results

The cohort consisted predominantly of female patients (23 of 24; 95.8%) with a mean age of 35.1 ± 8.5 years. The mean operative time was 299.5 ± 34.1 minutes, including 238.4 ± 47.7 minutes for robotic console use. The mean number of lateral and central lymph nodes retrieved was 33.5 ± 6.7 and 7.4 ± 4.3 , respectively. There were no cases of recurrent laryngeal nerve injury or permanent hypoparathyroidism. Minor complications were observed in isolated cases of transient voice change, postoperative bleeding, seroma, and chyle leak (each in 1 patient [4.2%]), and transient hypoparathyroidism (6 patients [25.0%]). The mean postoperative hospital stay was 5.0 ± 0.8 days.

Conclusion

The modified STAR-RND technique via a 3-cm axillary incision is a safe, feasible, and oncologically effective approach for lateral neck dissection in thyroid cancer. This technique offers significant cosmetic and ergonomic advantages without compromising surgical outcomes and may be particularly valuable in high-volume centers with active surgical training programs.

Abstract Categories

Single Port / Single site

Understanding Paraconduit Hernia Following Esophagectomy: Impact of Operative Technique on its Incidence and Recurrence

M.D Agustina Pontecorvo, M.D Jorge Cornejo, M.D Tamar Tsenteradze, M.D Mathew Thomas, M.D Steven Bowers, M.D Enrique Elli

Mayo Clinic, Florida, USA

Abstract

Background: Paraconduit hernia is a significant complication following esophagectomy, with potential compromise of the neo-esophagus and risk of bowel incarceration or strangulation. The aim of this study was to assess the incidence and risk factors of paraconduit hernia development following esophagectomy, and to evaluate its surgical management, recurrence rates, and contributing factors.

Methods: A retrospective cohort study was conducted on patients who underwent esophagectomy between 2008 and 2024. Freedom from paraconduit was estimated using the Kaplan-Meier method, and Cox regression analysis was employed to determine associated risk factors.

Results: Of 349 patients, 27 (7.4%) developed paraconduit hernia. The mean time between esophagectomy and its clinical manifestation was 2.8 years (+2.3). The freedom from paraconduit hernia was 88.1% at the 5-year follow-up. Twenty-one patients were presented with symptoms, including abdominal pain in 51.9%, nausea and vomiting in 59.3%, dysphagia and chest pain in 44.4%. 33.3% required emergency surgical repair due to conduit distension and delayed conduct emptying. Risk factors associated with higher risk of development were hiatal hernia reduction (HR:3.68, CI: 1.27, 10.6, P:0.01) during esophagectomy, and prior history of hiatal hernia repair (HR:3.8, CI: 1.6, 9.0, P:0.01). Extreme BMIs were also associated; lower BMI was associated with higher risk (HR: 4.39, CI: 0.95,20.4, p:0.05), while obesity was associated to be a protective factor (HR:0.26, CI:0.08, 0.84, p:0.024). 37.5% had recurrence of hernia, all of them required reoperation in a median time of 1.25 years from the first event.

Conclusion: Paraconduit hernia is an uncommon but clinically significant complication after esophagectomy, with a 9.3% incidence at 5 years. Its development is influenced by intraoperative factors such as hiatal hernia repair, as well as low BMI and prior hiatal hernia surgery. Prompt surgical intervention with hernia reduction and cruroplasty is essential, as delayed treatment increases morbidity.

Abstract Categories

Upper GI

Double Bubble in the Chest: Morgagni Hernia Repair and Sleeve Herniation converted to RYGB

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Abstract

We present a case of a patient, status post Sleeve gastrectomy, who presented with worsening GERD refractory to antacids.

The preoperative CT scan of the chest and abdomen showed sleeve herniation in the chest and a right Morgagni hernia containing colon and omentum.

The patient was planned for a Robotic-assisted Morgagni, hiatal hernia repair and conversion to Gastric Bypass. Diagnostic laparoscopy demonstrated the diaphragmatic defect and the hernia was reduced. The robot was docked, the hernia sac was excised, and the defect was repaired with a primary closure using non-absorbable sutures and secured with a dual sided mesh. The hiatus was exposed, and esophagus was dissected circumferentially into the mediastinum. The sleeve was herniated into the chest, so after careful dissection it was taken back into the abdomen. Closure of the hiatus was performed with interrupted non-absorbable sutures and conversion to Roux-en-Y Gastric Bypass was completed.

By postoperative day one, the patient was able to ambulate, tolerated liquid diet and progressed appropriately, so the patient was discharged on postoperative day one.

Abstract Categories

Bariatric

Robotic-Assisted Diaphragmatic Hernia Repair Post Ivor-Lewis Esophagectomy

M.D Agustina Pontecorvo, M.D Jorge Cornejo, M.D Tamar Tsenteradze, M.D Enrique Elli

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Abstract

Paraconduit hernias are infrequent but potential complication after esophagectomy.

We present a case of a 65 y.o female, status post Minimally Invasive Ivor-Lewis Esophagectomy indicated for esophageal adenocarcinoma, who consulted for dysphagia and nausea after a complex history of multiple recurrent paraconduit hernia repair and esophago-gastric anastomotic revision. A preoperative CT Chest and abdomen demonstrated herniation of peritoneal fat and colon on the left side of the chest and dilation of the gastric conduit. An upper GI endoscopy showed a moderate stenosis at the esophagogastric anastomosis which was dilated with balloon dilation.

After multiple reinterventions, the patient was planned for a robotic-assisted repair of recurrent paraconduit hernia repair, anastomotic dilation and mechanical and chemical pleurodesis.

The surgery was totally performed in an abdominal approach. The entire colon, cecum and terminal ileum were reduced from the chest into the abdominal cavity. Because of the size of the hernia and the distortion of the hiatus, it was not feasible to perform a primary closure. Therefore, a relaxing incision on the left side of the diaphragm was performed. The chest was accessed through this incision to perform mechanical pleurodesis. Following this, the hiatus was closed horizontally with interrupted non-absorbable sutures. To reinforce the closure and to cover the relaxing incision, a Ovitex Mesh was placed covering both defects. A cecopexy was performed to reduce the risk of recurrence. To conclude the surgery, an intraoperative endoscopic balloon dilation was performed at the anastomosis.

Postoperative recovery was uncomplicated, and the patient was discharged on POD 5

Abstract Categories

Upper GI

Robotic-assisted Reversal of Gastric Bypass in a Patient with Severe Postprandial Hypoglycemia

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Abstract

Reversal of Gastric Bypass is indicated in patients who had late complications after Bypass, such as malnutrition, recalcitrant marginal ulcers, post-prandial hypoglycemia, or incapacitating dumping syndrome. In such cases, this procedure intends to restore the normal anatomy before the Roux-en-Y Gastric Bypass

We present a case of a 54 y.o female, status post Roux-en-Y Gastric Bypass, who consulted for multiple post-prandial episodes of hypoglycemia requiring hospitalizations. She had a complex bariatric history with reoperation for reduction of internal hernia and Petersen defect closure and endoscopic transoral outlet reduction (TORe)

The patient underwent a Robotic-assisted Reversal of Gastric Bypass to restore the normal anatomy of the bowel. For this, first the gastrojejunal (GJ) anastomosis was excised, by transecting both the gastric pouch and the alimentary limb (AL) just before the anastomosis. Then, the Biliopancreatic limb (BP) was transected above the dilated jejunojejunal anastomosis (JJ) and this was anastomosed with the proximal end of the AL. The AL was followed to the JJ anastomosis, which was excised by transection at the level of the lower end of the AL and at the common channel (CC). Then, the distal extreme of the AL and the CC were anastomosed. Finally, a laterolateral anastomosis was created between the gastric pouch and the gastric remnant. This restored the normal bowel continuity.

Postoperative recovery was uncomplicated, and the patient was discharged on POD 5. The hypoglycemic events resolved after the procedure.

Abstract Categories

Bariatric

Surgical Management of Malnutrition after Multiple Bariatric Procedures: Reversal of Distalization of Roux-en-Y Gastric Bypass

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Abstract

Distalization of Roux-en-Y Gastric Bypass is indicated in patients who have not achieved adequate weight loss following the primary surgery. While this malabsorptive technique can enhance weight loss, it carries the risk of malnutrition due to reduced area of nutrients and vitamins reabsorption.

We present a case of a 62 years-old male, status post open Roux-en-Y Gastric Bypass (RYGB), consults for insufficient weight loss management in preparation for heart transplantation, with a BMI of 45.4kg/m². As part of his surgical history, he also underwent incisional and umbilical hernia repair, a right leg amputation and a Roux-en-Y Gastric Bypass.

Therefore, the patient was planned for a robotic assisted distalization of the previous RYGB, with a total alimentary limb length (TALL) of 300 cm. Three months after surgery, the patient developed malnutrition with refeeding of his heart failure and anasarca, with a BMI of 38.8kg/m².

So, decision was made to reverse the anatomy back to the original Roux-en-Y Gastric Bypass, dismantling the distal anastomosis. The patient was planned for a Robotic-assisted Reversal of Distalization of RYGB.

Postoperative recovery was uncomplicated, and the patient was discharged on POD 4

Abstract Categories

Bariatric

Robotic-assisted Pancreaticoduodenectomy for Pancreatic Cancer: From the Ten-Step Technique to the Mesenteric Approach

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Abstract

Background

Robot-assisted pancreaticoduodenectomy (RPD) using the right anterior approach for uncinate process transection represents a well-established technique in robotic surgery for pancreatic head cancer. We have previously outlined a structured "Ten-Step Technique" for this procedure. However, as surgical demands evolve—particularly for complex pancreatic head tumors—further exploration of alternative uncinate process transection approaches during RPD is necessary to accommodate varied clinical scenarios.

Methods

A total of 168 treatment-naïve pancreatic ductal adenocarcinoma (PDAC) patients who underwent robot-assisted pancreaticoduodenectomy (RPD) at Ruijin Hospital between January 2023 and July 2025 were included in this study. Based on review of surgical video recordings, the cases were categorized into two groups according to the approach used for uncinate process transection. Demographic and intraoperative outcomes were collected and comparatively analyzed.

Results

Among the 168 PDAC patients who underwent RPD, 128 patients (76.2%) underwent uncinate process transection via the classic right anterior approach, while 40 patients (23.8%) were treated using the middle (mesenteric) approach. The right anterior approach was associated with a shorter operative time (mean $\pm$ SD: 249.7 $\pm$ 73.7 minutes vs. 293.2 $\pm$ 77.3 minutes; $P = 0.027$) and reduced postoperative hospital stay (12.4 $\pm$ 13.9 days vs. 18.1 $\pm$ 16.3 days; $P = 0.033$). In contrast, the middle approach demonstrated advantages in the number of retrieved lymph nodes (median [IQR]: 13.5 [9.0–20.0] vs. 21.0 [15.0–27.0]; $P = 0.003$) and lower estimated blood loss (mean $\pm$ SD: 193.7 $\pm$ 225.8 mL vs. 317.2 $\pm$ 377.6 mL; $P = 0.002$). No significant differences were observed in R0 resection rates or the incidence of postoperative complications, including postoperative pancreatic fistula, bile leak, delayed gastric emptying, postoperative bleeding, or reoperation.

Conclusions

The middle approach demonstrates both safety and oncological efficacy in patients with PDAC undergoing RPD. Further studies are warranted to compare the long-term outcomes between these two approaches.

Abstract Categories

Pancreas

GASTROENTERIC ROBOTIC ANASTOMOSIS SAFE STUDY – GRASS Trial

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Abstract

BACKGROUND: Radical gastrectomy with adequate lymphadenectomy is the only curative treatment for resectable gastric cancer. Laparoscopic gastrectomy is the earliest and most common application of minimally invasive techniques for treatment of gastric cancer. Laparoscopic gastrectomy is considered a technically challenging procedure especially in difficult surgical steps such as lymph node dissection and anastomosis. Recently, robotic surgery has been introduced to overcome most of these problems. using articulated forceps and tremor-filtering capability, enables various anastomotic techniques. Although robotic gastrectomy has recently become widespread and evidence has shown its feasibility, few multicentric studies comparing laparoscopic and robotic gastrectomy are currently available.

MATERIALS AND METHODS: Multicenter, retrospective study based on a single database of all consecutive patients who underwent elective total and distal gastrectomy for gastric adenocarcinoma with laparoscopic and robotic approach between January 2010 and November 2025. Patients with distant metastases or pre-or intraoperative T4, and patients who had conversion to open surgery will be excluded from the study.

RESULTS: Data will be extracted by a retrospective database. Patients demographics, medical and surgical history, preoperative and intraoperative details, post-operative course and histopathological data will be retrieved. A specific database will be created by the coordinating center (Ospedale San Donato, Arezzo) with the variables of interest.

CONCLUSIONS: The aim of this study is to compare patients who have undergone robotic and laparoscopic gastrectomy in a case-matched analysis using propensity scores. The primary endpoint is the incidence of postoperative surgical complications, including anastomotic leakage, pancreatic fistula, reoperation within 30-days, surgical site infection and intra-abdominal abscess. The study will assess whether there is a relationship between the type of reconstruction and suture and intra-abdominal infectious complications. The secondary endpoint is to identify other patients' characteristics that may influence intra-abdominal infectious complications.

Abstract Categories

Miscellanea

Robotic J-Colpo-Perineo-Rectopexy with titanized polypropylene mesh addressing perineal descent in posterior compartment prolapse

Carlotta La Raja, Francesca Lecchi, Sandro Carino, Chiara Casiraghi, Paola Cellerino, Alberto Giori, Giorgio La Greca, Federica Marazzi, Pietro Dante Augusto Muselli, Pierpaolo Prestianni, Angelo Stuto

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Abstract

Background: Restoring anatomy and function in global perineal descent associated with posterior compartment prolapse can be challenging. Conventional ventral mesh rectopexy addresses rectal prolapse but does not comprehensively support the perineal body and lower vaginal wall. The J-colpo-perineo-rectopexy technique has been developed to provide a unified repair of the rectum, perineum, and lower third of the vagina. Robotic assistance may enhance the precision, ergonomics, and reproducibility of this multi-compartmental approach.

Methods: This video demonstrates a robotic J-colpo-perineo-rectopexy performed using the Versius surgical system. Following standard right sacral promontory dissection, rectovaginal dissection was extended caudally to the perineal body. A titanized Type I polypropylene 21 cm x 3 cm mesh was introduced and tailored in a J-shaped configuration to cover the lower third of the vagina, perineal body, and anterior rectum. Mesh fixation was achieved using a cyanoacrylate-based biodegradable glue delivered via laparoscopic applicator and 2-0 polypropylene sutures. The mesh was anchored to the sacral promontory with fixation staples, and the peritoneum was closed over the mesh to restore the retroperitoneal plane.

Results: The robotic platform facilitated stable exposure, precise dissection, and ergonomic mesh placement. The placement to the mesh in a "J" configuration allowed comprehensive reinforcement of the posterior compartment and perineal body. No intraoperative adverse events were encountered during the presented case.

Conclusions: Robotic J-colpo-perineo-rectopexy with titanized polypropylene mesh represents a feasible and anatomically comprehensive technique for addressing perineal descent in posterior compartment prolapse. By integrating multi-compartmental support into a single procedure, this approach may expand the reconstructive options for complex pelvic floor disorders and serves as a technical reference for future clinical adoption.

Abstract Categories

Colo-rectal

Single center experience: 10 years of robotic approach for primary gastric bypass

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Abstract

Background

Roux-en-Y gastric bypass (RYGB) remains one of the most commonly performed bariatric procedures worldwide. The robotic platform has been increasingly adopted with the aim of improving safety, reproducibility, and patient outcomes. This study reports a 10-year experience with robotic RYGB in a high-volume bariatric center.

Materials and Methods

We conducted a retrospective analysis of all patients who underwent primary robotic RYGB between January 1st, 2014 and January 1st, 2024 at our institution. All revisional cases were excluded. Demographic characteristics, operative data, and postoperative outcomes including complications were reviewed. Complications were described according to the Clavien–Dindo classification.

Results

A total of 473 patients underwent primary robotic RYGB. The mean age was 43 years (range 18–72) with a mean initial BMI of 45.93 kg/m² (range 29.41–83.84). The cohort included 406 females and 67 males; 84 patients had a history of GERD, 226 had type 2 diabetes, and 278 had prior abdominal surgery. Conversion to open surgery was 0%. Mean operative time was 178 minutes, and mean length of stay was 1.4 days (range 1–5). Early complications occurred in 10 patients, including 3 Clavien–Dindo IIIb events (2 internal hernia repairs, 1 jejunojejunostomy revision). There were no leaks. Within the first year, 3 patients required reoperation (1 gastrojejunostomy stenosis, 2 small bowel obstructions from adhesions). Late complications after one year were observed in 13 patients: 9 internal hernias, 2 obstructions due to adhesions, 1 intussusception of the jejunojejunostomy, and 1 umbilical hernia.

Conclusions

Over a decade of experience, robotic approach for primary RYGB has proved to be safe and effective with low perioperative morbidity rates, no conversions, and favorable short- and long-term outcomes. The robotic platform facilitates complex bariatric procedures and may contribute to reproducible results, supporting its role as a valuable tool in bariatric surgery.

Abstract Categories

Bariatric

Completely robotic radical gastrectomy for complicated remnant gastric cancer

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Abstract

Objective: To evaluate the clinical efficacy of robotic surgical systems in performing radical gastrectomy for remnant gastric cancer, offering a minimally invasive alternative for technically challenging reoperative cases.

Methods: We retrospectively analyzed a 68-year-old male patient with a history of open distal gastrectomy + posterior colonic Braun anastomosis for gastric cancer in 2021. The postoperative pathology showed pT2N0M0. In May 2025, he developed progressive epigastric pain and unintentional weight loss (5 kg/3 months). Endoscopic biopsy confirmed a 5×5 cm cardia-adjacent ulcerated lesion as remnant stomach adenocarcinoma. After assessment by a multidisciplinary team, the preoperative staging was T3N2M0. A complete robotic-assisted radical gastrectomy for residual gastric cancer was performed on July 8, 2025. **Results:** Visible during the operation, severe adhesions (transverse colon-abdominal wall/gastric remnant-liver-small bowel) were meticulously dissected using robotic magnification and wristed instrumentation. Key advantages included precise adhesiolysis and intracorporeal anastomosis in confined spaces, with 260 ml estimated blood loss. Final pathology revealed pT4N2M0 disease. The patient achieved uneventful recovery with 7-day postoperative hospitalization.

Conclusion: This case demonstrates that the robotic surgical system is safe and feasible in the second surgery for complex residual gastric cancer. Long-term outcomes warrant prospective multicenter studies.

Abstract Categories

Complex Case

Robotic J-colpo-perineo-rectopexy: short term outcomes of a single-center retrospective study

Dr. Francesca Lecchi, Dr. Carlotta La Raja, Dr. Giorgio La Greca, Dr. Pietro Muselli, Dr. Francesca Aiello, Dr. Sandro Carnio, Dr. Chiara Casiraghi, Dr. Paola Cellerino, Dr. Alberto Giori, Dr. Federica Marazzi, Dr. Pierpaolo Prestianni, Dr. Angelo Stuto

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Abstract

Background: Multi-compartment pelvic organ prolapse (POP) constitutes a complex condition requiring individualized surgical approach. While traditional ventral mesh rectopexy effectively addresses rectal prolapse, it provides limited support to the perineal body and lower vaginal wall. The J-colpo-perineo-rectopexy technique was developed by our team to offer a comprehensive, integrated repair of the rectum, perineum, and distal third of the vagina. The use of the Versius robotic system has brought significant advantages to our technique, allowing for improved ergonomics, enhanced precision of movements, and high-resolution visualization. The aim of this study is to evaluate the safety, feasibility and short-term clinical outcomes of this innovative surgical technique.

Methods: We conducted a retrospective analysis of 25 consecutive patients who underwent robotic J-colpo-perineo-rectopexy at our center between December 2024 and June 2025. All patients were women with symptomatic obstructed defecation syndrome or pelvic disturbances due to perineal descent with a coexisting degree of rectocele or internal rectal prolapse, who had failed conservative treatment. Data collected included demographics, intraoperative details, and postoperative complications.

Results: The patients were women with a mean age of 58.4 years (± 11.6 SD). The mean operative time was 154.8 minutes (± 26.7 SD). In eight cases (8/25, 32%), the procedure was combined with another surgery, such as robotic mono- or bilateral adnexectomy, robotic TAPP inguinal hernia repair, and selective hemorrhoidectomy. All procedures were successfully completed without conversion to open surgery or laparoscopy. There were no intraoperative complications. The mean length of hospital stay was 2.28 days (± 0.55 SD). No cases of 30-day postoperative complications or early recurrence of symptoms were observed at the one-month follow-up.

Conclusions: Robotic J-colpo-perineo-rectopexy appears to be a safe and feasible technique for treating multi-compartment pelvic organ prolapse. Our preliminary short-term results are promising, warranting further investigation with long-term follow-up and functional assessments.

Abstract Categories

Colo-rectal

Advancing Robotic Liver Transplantation: Outcomes of 40 Robotic Donor Hepatectomies and the First Total Robotic Living Donor Liver Transplant in North America

Dr Seung Duk Lee

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Abstract

Background:

Robotic liver transplantation (RLT) remains technically demanding due to anatomic complexity and the need for precise reconstruction. We report outcomes of 40 robotic living donor hepatectomies (RLDH) and North America's first total robotic living donor liver transplant (LDLT).

Methods:

From January 2023 to August 2025, 40 consecutive donors underwent robotic right hepatectomy. Donor perioperative outcomes and graft characteristics were analyzed. In parallel, our institution implemented a stepwise pathway to RLT, progressing from robotic donor nephrectomy to kidney implantation, then RLDH, and ultimately to robotic recipient hepatectomy and implantation.

Results:

Among 40 donors, median age was 37 years and median BMI 24.9. Twelve (30%) had prior upper abdominal surgery. Median liver volume was 898 mL, mean blood loss 234 mL, and operative time 461 minutes. Warm ischemia averaged 9.3 minutes. Two donors (5%) developed postoperative bleeding/hematoma; no bile leaks occurred. Median hospital stay was 6 days. Mean graft weight was 811 g.

The first total robotic LDLT was performed in a 50-year-old woman with autoimmune hepatitis (MELD 36). Robotic hepatectomy and implantation were completed without venovenous bypass. Key anastomosis times were: hepatic vein 17 minutes, portal vein 13 minutes, hepatic artery 42 minutes, and biliary 23 minutes. Total operative time was 683 minutes, warm ischemia 51 minutes, and cold ischemia 138 minutes. Blood loss was 50 mL, with minimal transfusion. The patient recovered uneventfully, was discharged on POD 17, and remains well at 2 months.

Conclusions:

Robotic donor hepatectomy is safe with reproducible outcomes. The first total robotic LDLT demonstrates feasibility and highlights the importance of programmatic training, patient selection, and team expertise.

Abstract Categories

Transplant

Laparoscopic Versus Robotic Hiatal Hernia Repairs: Safety and Efficacy

MD Claire Caplan, MD John Hobbs, MD John Paul Bustamante, DO Veltri John, MD Gregory Crisafulli, MD Sayali Kulkarni, MD Toghrul Talishinskiy

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Abstract

Robotic hiatal hernia repair (RHHR) is becoming a more common alternative to laparoscopic hiatal hernia repair (LHHR); yet, the outcomes have not been fully explored. RHHR may offer safety advantages without compromising symptom control or recurrence-related outcomes.

We conducted a retrospective cohort study of consecutive patients undergoing minimally invasive hiatal hernia repair (HHR) within a single healthcare system (February 2020–October 2024). Exclusions were achalasia, concomitant MAS deployment, and age < 18 years. In total, 181 patients were identified; LHHR (n=116) and RHHR (n=61) comprised the comparative cohorts. Primary outcomes were 90-day readmission and need for revisional repair. Secondary outcomes included postoperative symptoms (reflux, dysphagia) and proton pump inhibitor (PPI) use.

Ninety-day readmissions were lower after RHHR (0/65, 0.0%) than LHHR (7/116, 6.0%; $p=0.043$, 95% CI 0.897–0.984). 4 (6.2%) RHHR and 8 (6.9%) LHHR patients required revision of the HHR ($p=0.847$, CI 95% 0.256–3.061).

Follow-up was available for 155 patients (85%). Postoperative reflux occurred in 3 RHHR patients (9.3%) and 14 LHHR patients (15.1%; $p=0.046$, 95% CI 0.079–1.044). Dysphagia was reported by 11 RHHR patients (17.74%) and 16 LHHR patients (17.2%; $p=0.931$, 95% CI 0.446–2.417). PPI use was similar (RHHR 40/62, 64.5% vs LHHR 64/93, 68.8%; $p=0.577$).

Compared with LHHR, RHHR was associated with fewer 90-day readmissions and similar rates of postoperative symptoms, and PPI use. A nonsignificant trend toward lower postoperative reflux was observed with RHHR. These findings support the safety of a robotic approach to hiatal hernia repair without apparent trade-offs in early efficacy.

Abstract Categories

Upper GI

Robotic set-up for ventral mesh rectopexy with the CMR Versius platform: insights from clinical practice

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Policlinico San Donato, Milan, Italy

Abstract

Background

The Versius CMR platform is a novel robotic system consisting of an open surgical console and independent bedside units (BSU), which confer it an excellent versatility especially in pelvic surgery.

The aim of this paper is to describe our standardized approach to robotic-assisted pelvic floor surgery, based on the experience of a high-volume center, and to introduce novel concepts intended to simplify and optimize surgical workflow.

Materials, and methods

Between September 2024 and May 2025 at the Coloproctology and Pelvic Floor Surgery Department - Policlinico San Donato, Milan (Italy) a total of 70 robotic ventral mesh rectopexy procedures using the CMR Versius platform were performed.

Surgical indications included obstructed defecation syndrome (ODS) in the context of internal rectal prolapse, rectocele, descending perineum, enterocele, and external rectal prolapse.

BSU disposition was determined based on our experience on laparoscopic pelvic floor surgery in order to maximize instrument control and visualization of the surgical field.

Results

A 11 mm optical trocar is inserted under direct vision below the umbilicus, and pneumoperitoneum is inflated with CO₂ at 13 mmHg. The subsequent trocars are placed under visual control: 5 mm in the right iliac fossa, left iliac fossa and left flank. Lastly, an assistant 10 mm trocar is placed at the level of the right flank. Trocars are positioned at least 8.5 cm apart as required by the robotic system and at least two fingertips from the bony structures. Minor variations in BSU positioning were progressively implemented due to clashing, the phenomenon of collision of two robotic arms. No intraoperative conversions were reported, two grade II Clavien–Dindo complication occurred.

Conclusion

Optimization of the robotic setting and dedicated team training have shown a positive impact on clinical outcomes, reducing surgical trauma and improving patient experience. However, ongoing monitoring and long-term evaluation are crucial.

Abstract Categories

Colo-rectal

Robotic surgery for a Todani's type I choledochal cyst

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ASFO, Pordenone, Italy

Abstract

Background: In Western countries extrahepatic bile cysts ducts are rare anomalies often discovered incidentally. However the number of diagnosis has increased in adults due to improved imaging modalities and health check-up. Their potentially complications, like abdominal pain, jaundice, cystolithiasis, cholecystitis, pancreatitis, liver abscess and especially malignant transformation (3-7.5%) make imperative their proper management, which is generally guided by cyst classification. The more common types I and IVb should undergo surgical intervention with complete cyst excision and bilio-enteric reconstruction. Traditionally these complex operations are performed with open surgery, but recently minimal invasive approach has gained wide interest, especially with the use of robotic system, which can facilitate tough dissection and reconstruction.

Materials and methods: Hereby we show a video about robotic total excision of choledochal cyst in a 38-year-old patient who presented to our hospital with epigastric pain for several months. Liver function, oncologic markers and physical examination were negative, instead magnetic resonance cholangiopancreatography revealed a large round cystic mass at the hepatoduodenal ligament (6.3 x 5.2cm in size) suggestive for the type I choledochal cyst, based on the Todani's classification.

According to the literature and our multidisciplinary meeting the operation was performed with robotic approach.

Results: The surgical procedure has been completely performed using Xi-DaVinci-Robotic Platform without intraoperative complications, lasting 258 minutes. The blood loss was less than 130mL.

The young patient had an early and uneventful discharge with cosmetic results. The video highlights the technical complexity of the procedure related to the inflammatory tissue around the bile duct cyst and the robotic advantages during the delicate dissection and the precise Roux-en-y hepaticojejunostomy suture.

Conclusion: Robotic approach could be the best mininvasive technique to manage a potentially malignant disease like the type I bile duct cyst, overcoming the limits related to laparoscopic approach for a complex procedure.

Abstract Categories

Biliary

Robotic-Assisted Repair of Median Arcuate Ligament Syndrome

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¹Athens Medical Center, Athens, Greece. ²Laiko General Hospital, Athens, Greece

Abstract

(a) Background:

Median Arcuate Ligament Syndrome (MALS) is a rare condition caused by external compression of the celiac artery and plexus by the median arcuate ligament. It typically presents with postprandial abdominal pain, nausea, and weight loss, and is often mistaken for other gastrointestinal disorders.

(b) Hypothesis, Materials, and Methods:

We present a case of a young patient with persistent postprandial abdominal pain and significant weight loss. Diagnosis was established with CT angiography, which demonstrated celiac artery compression consistent with MALS. The patient underwent surgical release of the median arcuate ligament.

(c) Results:

The procedure was completed successfully without complications. Postoperatively, the patient reported marked improvement in abdominal pain and tolerated oral intake. Weight stabilization was noted during early follow-up.

(d) Conclusions:

MALS should be considered in patients with unexplained chronic abdominal pain and weight loss. Radiologic imaging is critical for diagnosis. Surgical decompression is effective, offering rapid symptom relief and improved quality of life. Early recognition can prevent prolonged morbidity.

Abstract Categories

Upper GI

Application of the Da Vinci Multi-Port Robotic System in Transanal Total Mesorectal Excision (taTME): A Retrospective Study Evaluating Safety and Efficacy

Dr SHUANGLING LUO, Dr Liang Kang

THE SIXTH AFFILIATED HOSPITAL OF Sun Yat-sen University, Guangzhou, China

Abstract

Background Transanal total mesorectal excision (taTME) offers a novel minimally invasive approach for patients with low rectal cancer. However, its technical complexity and steep learning curve have limited its widespread adoption. Robotic surgical systems have the potential to overcome the technical challenges of conventional laparoscopic taTME. This study aims to evaluate the application of the Da Vinci multi-port robotic platform in taTME and analyze its safety and short-term outcomes.

Methods: This retrospective study analyzed the clinical data of 14 consecutive patients who underwent robot-assisted taTME performed by a single surgical team between Sep 19th 2023 and Jan 21st 2025. All procedures were conducted using the Da Vinci Xi multi-port robotic system via a combined transabdominal and transanal approach. Primary endpoints were perioperative safety indicators, including conversion rate to laparotomy, intraoperative complications (e.g., major bleeding, urethral injury), and postoperative complications (e.g., anastomotic leak, pelvic infection) classified by Clavien-Dindo grade. Secondary endpoints were efficacy indicators, including operative time, intraoperative blood loss, circumferential resection margin (CRM) positivity rate (defined as ≤ 1 mm), TME specimen quality, and postoperative recovery.

Results: All 14 procedures were completed successfully without conversion to laparotomy. No major intraoperative complications occurred. The overall postoperative complication rate was 14.2%, with major complications (Clavien-Dindo grade $\geq$ III) occurring in 1 case. The anastomotic leak rate was 7.1%. Pathological results showed a circumferential resection margin (CRM) positivity rate of 0%, and the TME quality of all specimens was graded as "complete" or "near complete." The mean operative time was 215 ± 45 minutes, and the mean intraoperative blood loss was 85 ± 30 ml.

Conclusion: This study demonstrates that the use of the Da Vinci multi-port robotic system for taTME is safe and effective. The advantages of the robotic system may help reduce the technical barriers and learning curve associated with taTME.

Abstract Categories

Colo-rectal

A Prospective, Randomized, Parallel-Controlled, Superiority Clinical Study Comparing Transanal Total Mesorectal Excision (taTME) and Robot-Assisted Total Mesorectal Excision (RTME) in the Treatment of Low Rectal Cancer.

Dr SHUANGLING LUO, Dr Liang Kang

THE SIXTH AFFILIATED HOSPITAL OF Sun Yat-sen University, Guangzhou, China

Abstract

Background: Both RTME and taTME are innovative surgical techniques with potential advantages in low rectal cancer. High-quality evidence from well-designed randomized controlled trials (RCTs) comparing the conversion and complication rates between taTME and RTME is still needed.

Hypothesis: We propose to conduct a prospective, randomized, parallel-controlled clinical trial comparing taTME with RTME for low rectal cancer, aiming to provide high-level evidence for surgical decision-making and benefit more patients.

Methods: A total of 216 patients with histologically confirmed primary rectal adenocarcinoma (clinical stage I-III, located within 7 cm from the anal verge) will be randomly assigned in a 1:2 ratio to either the robotic-assisted TME surgery group (Robotic group) or the transanal TME surgery group (taTME group). All operations will be performed by certified senior surgeons with extensive experience in both techniques. The primary endpoint is the Intraoperative Conversion Rate. Key secondary endpoints include: 1) pathological outcomes: positive circumferential resection margin (CRM ≤ 1 mm), positive distal margin, and quality of total mesorectal excision (TME); 2) intraoperative outcomes: operation time, blood loss, and conversion rate; 3) postoperative recovery: time to first flatus, postoperative complication rates (within 30 days, graded by Clavien-Dindo classification), and anastomotic leak rate (graded by ISGRS); 4) oncological outcomes: 3-year disease-free survival and 5-year overall survival; 5) postoperative functional outcomes (bowel and urogenital); and 6) quality of life assessments (using EORTC QLQ-C30 and CR29 questionnaires).

Expected Outcomes: It is hypothesized that the robotic group have a higher conversion rate and possibly a similar rate of perioperative complications.

Conclusion: This rigorous multicenter RCT aims to provide high-level evidence on the comparative effectiveness of robotic-assisted versus transanal TME surgery for low rectal cancer, assessing not only short-term surgical quality but also long-term survival and functional outcomes. The results will help inform clinical decision-making and healthcare resource allocation.

Abstract Categories

New Study Proposal

Robotic-assisted Versus Open Pancreatoduodenectomy For Non-pancreatic Periapillary Malignancies: Comparisons of Short- and Long-Term Outcomes Using Inverse Probability of Treatment Weighting

Prof. Xiao-Yu Yin, Dr. Yu-Qing Zhong, Dr. Zun-Long Liu, Dr. Xi-Tai Huang, Dr. Chen-Song Huang, Dr. Wei Chen, Dr. Jia-Ming Lai, Dr. Li-Jian Liang, Dr. Qiong-Cong Xu

Department of Pancreatobiliary Surgery, the First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China

Abstract

Background: The advantages of robotic pancreatoduodenectomy (RPD) versus open pancreatoduodenectomy (OPD) for non-pancreatic periapillary malignancies remain unclear. This study aims to compare the perioperative and long-term outcomes between RPD and OPD for non-pancreatic periapillary malignancies in single center.

Hypothesis, materials, and Methods: The retrospective cohort study was conducted on patients who underwent RPD or OPD between June 2016 and November 2024 for non-pancreatic periapillary malignancies in the First Affiliated Hospital, Sun Yat-sen University. Inverse probability of treatment weighting (IPTW) was adopted to balance demographic and oncologic characteristics, and the perioperative and long-term outcomes were compared between RPD and OPD.

Results: A total of 281 patients were included (97 in RPD and 184 in OPD). After IPTW, RPD group had significantly longer operative time (451 [394, 511] min vs 310 [267, 371] min, $p < 0.001$), but less intraoperative blood loss (50 [50, 76] ml vs 200 [150, 400] ml, $p < 0.001$) and a higher rate of early initiation of adjuvant chemotherapy (47.5% vs 26.6%, $p < 0.001$). Postoperative morbidities, including clinically relevant pancreatic fistula, postoperative hemorrhage, delayed gastric emptying were similar in both groups. The 1-, 3-, and 5-year OS rates were higher in the RPD group (94.2%, 80.9%, and 70.5%, respectively) than in the OPD group (86.0%, 66.8%, and 62.5%, respectively). Similarly, the 1-, 3-, and 5-year RFS rates were also improved with RPD (85.3%, 70.6%, and 60.9%) compared with OPD (77.4%, 59.4%, and 57.1%). Within 36 months postoperatively, the RPD group was associated with better outcomes: superior OS (HR=0.510 [95% CI: 0.280-0.930], $p=0.028$) and improved RFS (HR=0.615 [95% CI: 0.380-0.997], $p=0.049$).

Conclusions: RPD has comparable safety as OPD for non-pancreatic periapillary malignancies, it was associated with reduced intraoperative blood loss, higher postoperative adjuvant chemotherapy and improved survival rates with postoperative 3 years.

Abstract Categories

Pancreas

Anatomical Challenges and Robotic Solutions: A Case of Mixed-Type IPMN With Unusual Vascular Anatomy

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Abstract

Background

Pancreatic intraductal papillary mucinous neoplasms (IPMNs) are mucin-producing epithelial tumors of the pancreatic ductal system. The Kyoto International Consensus Guidelines 2024 classify them as branch-duct, main-duct, or mixed-type, and stratify the risk of high-grade dysplasia (HGD) or invasive carcinoma (IC) according to high-risk stigmata (HRS) and worrisome features (WF). Resection is indicated in the presence of HRS, such as main duct dilation ≥ 10 mm.

Pancreaticoduodenectomy is a technically demanding procedure, and vascular anatomical variants further increase operative complexity. In this context, the robotic platform, with its enhanced three-dimensional visualization and superior instrument dexterity, combined with an artery-first approach allowing early vascular control, provides a rational strategy to optimize safety and feasibility in complex cases

Materials and Methods

A 69-year-old male presented with weight loss and steatorrhea. Imaging and endoscopic work-up confirmed mixed-type IPMN of the uncinate process with main duct dilation >10 mm. Contrast-enhanced CT with vascular reconstruction identified multiple variants: an aberrant right hepatic artery from the superior mesenteric artery (SMA), a hepatogastric trunk ("false tripod"), and a splenic artery arising from the SMA within a splenomesenteric trunk. A robotic pancreaticoduodenectomy with an artery-first strategy was performed.

Results

The robotic platform allowed precise identification and safe dissection of aberrant vascular structures. The artery-first approach enabled early vascular control, mitigating intraoperative risk. The procedure was completed without complications, and the patient was discharged on postoperative day 9. Final pathology confirmed intestinal-type IPMN with high-grade dysplasia and focal colloid carcinoma (pT1bN0, R0).

Conclusions

Robotic pancreaticoduodenectomy, particularly when integrated with an artery-first strategy, is a safe and feasible approach in the presence of challenging vascular anatomy. This case underscores the importance of meticulous preoperative vascular mapping and demonstrates how robotic technology may expand the boundaries of surgical safety and feasibility in complex pancreatic surgery.

Abstract Categories

Pancreas

Robotic splenectomy for massive splenomegaly and hypersplenism in the setting of myelofibrosis

Dr. Ashley Hafer, Dr. Mustafa Raoof

City of Hope, Duarte, CA, USA

Abstract

Background: Myelofibrosis is characterized by progressive fibrosis of the bone marrow, leading to extramedullary hematopoiesis in both the spleen and liver, with the potential for development of both splenomegaly and hepatomegaly over time. Medical treatments, such as JAK inhibitors and hydroxyurea, are used to manage splenomegaly, but splenectomy is sometimes necessary for massive splenomegaly. Robotic splenectomy offers several advantages over open surgery, including decreased pain, smaller incisions, reduced blood loss, and shorter length of stay. Robotic splenectomy also provides several advantages over laparoscopic approaches, such as decreased total operative time and reduced risk of conversion to an open procedure. Hypothesis: Robotic splenectomy is the ideal approach for patients with massive splenomegaly. Materials, Methods, and Results: The DaVinci Xi Robotic System was used to perform a splenectomy for massive splenomegaly due to myelofibrosis. Conclusion: Robotic splenectomy can be safely performed for massive splenomegaly with minimal blood loss.

Abstract Categories

Pancreas

Tumor Distance Drives Operative Demands, Not Complications or Oncologic Adequacy, in Robotic Colorectal Surgery for Rectal Cancer

Dr. Sean Hormozian, Dr. Angel Guan, Dr. Elias Wassel, Dr. So Un Kim, Dr. Michelle Lee, Dr. Ngoc Nguyen, Dr. Robert Yuhan, Dr. Joseph Ruan

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Abstract

Background: Tumor distance from the anal verge is a critical anatomical determinant in rectal cancer surgery, influencing both technical complexity and postoperative outcomes. Robotic platforms offer enhanced dexterity in the confined pelvis, but the relationship between tumor location and operative or clinical outcomes remains incompletely defined in the new era of robotic surgery.

Methods: We analyzed 151 patients undergoing robotic colorectal cancer surgery. Distance from the anal verge was modeled as a continuous predictor, adjusting for age, body mass index (BMI), modified Charlson Comorbidity Index, and neoadjuvant chemoradiation using multivariable regression models. Outcomes included oncologic adequacy (distal and radial margin length, lymph node harvest ≥ 12), functional and operative variables (diversion, port count, robotic portion time, total operative time, estimated blood loss), and perioperative complications (anastomotic leak, ileus, small bowel obstruction, 30-day readmission, and length of stay).

Results: Greater tumor distance from the anal verge was significantly associated with shorter operative time ($p=0.001$) and lower estimated blood loss ($p=0.023$). Distal margin increased going more proximal ($p=0.028$). Radial margin trended toward improvement going more proximal ($p=0.055$), though not statistically significant. No associations were observed between distance and lymph node yield, diversion, or postoperative complications (leak, ileus, SBO, readmission, or length of stay).

Conclusions: In robotic rectal surgery within our institution, tumors located farther from the anal verge are associated with lower intraoperative burden and slightly improved distal margins. Importantly, no difference was observed on postoperative morbidity, lymph node count, or radial margins. These findings support the technical advantages of robotic surgery in addressing low pelvic tumors without compromising oncologic adequacy or clinical outcomes.

Abstract Categories

Colo-rectal

Robotic vs open right living donor hepatectomy: matched cohort comparison of early and long-term outcomes in 2 pioneering North American living donor liver transplantation (LDLT) centers

Dr Yifan Wang, Dr Yee Lee Cheah¹, Dr Ashish Saharia¹, Dr Caroline J Simon¹, Ms M Anne Tellier², Dr Ashton Connor¹, Dr Constance Mobley¹, Dr Osama Gaber¹, Dr Mark Ghobrial¹, Dr Mohamed Akoad²

¹Houston Methodist Hospital, Houston, USA. ²Lahey Hospital & Medical Center, Burlington, USA

Abstract

Background

This is the first comparison of robotic (RDH) vs open (ODH) right donor hepatectomy outcomes in a single surgeon series in 2 centers.

Methods

Consecutive donors who underwent RDH since the initiation of the robotic programs (2018-2025) were analyzed retrospectively. Demographic, graft, post-operative variables were compared to a matched cohort of ODH performed concurrently.

Results

33 RDH vs 30 ODH cases were matched in mean age (40.1 ± 9.6 vs 40.6 ± 10.8 ; $p=0.863$), BMI (27.4 ± 2.5 vs 27.8 ± 2.8 ; $p=0.675$), total liver volume (1507 ± 224 vs 1524 ± 229 mls; $p=0.765$), actual graft weight (841 ± 113 vs 860 ± 127 g; $p=0.517$), single hepatic artery (100vs100%), single portal vein (97.0 vs 96.7 %; $p=0.853$), and single bile duct (63.6 vs 80.0 %; $p=0.341$). Operative (449 ± 70 vs 305 ± 47 min; $p<0.001$) and warm ischemic (11.3 ± 3.0 vs 2.1 ± 0.7 min; $p<0.001$) times were significantly longer in RDH. EBL was lower in RDH (295 ± 158 vs 379 ± 180 mls; $p=0.055$). Similar proportion was transfused in each cohort (RDH vs ODH, 6 vs 10%; $p=0.631$). RDH donors tolerated solid diet earlier (2.4 ± 0.8 vs 3.0 ± 1.0 ; $p=0.025$). They consistently reported lower pain scores (post-operative days 1-5 = 2.7 ± 1.3 , 2.8 ± 1.9 , 2.5 ± 2.1 , 1.9 ± 1.7 , 1.8 ± 1.7 vs 3.0 ± 1.0 , 3.6 ± 1.6 , 3.6 ± 1.5 , 4.2 ± 1.9 , 3.5 ± 1.8), significantly after the 2nd post-operative day ($p<0.05$). These factors led to a shorter length of stay (LOS) in RDH (5.5 ± 1.2 vs 6.1 ± 0.8 days; $p=0.025$). The overall rate of 90-day complications was higher RDH (18.2 vs 13.3%; $p<0.001$) but serious complications higher in ODH (3.3 vs 3.0%; $p<0.001$). One RDH donor required laparoscopic exploration for bleeding and one ODH donor required ERCP for bile leak. 2-year hernia rate was 13.3% (ODH) vs 0% (RDH) ($p<0.001$). There was no difference in the percentage of liver regeneration at 1 -year (RDH vs ODH; 91.9 ± 7.5 vs 90.5 ± 7.2 %; $p=0.51$).

Conclusion

RDH led to faster in-hospital recovery with mostly mild 90-day complications and excellent long-term outcomes.

Abstract Categories

Transplant

Robotic living donor right hepatectomy with type 3 portal vein anatomy and type 3a biliary anatomy

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Abstract

Background

Robotic surgery is emerging as a feasible minimally invasive approach for living donor hepatectomy, with the potential to enhance postoperative recovery. Selecting donors with standard vascular anatomy is prudent at the earlier stages of a robotic program to minimize technical difficulty.

Methods

Once our learning curve was achieved, we expanded our selection criteria to donors with aberrant hilar anatomy. In our single center totally robotic donor hepatectomy experience, 3.0% of right lobe donors had 2 portal vein branches to the right lobe, while 21.2% had aberrant bile duct anatomy.

Results

In this video, we present a robotic right donor hepatectomy in a 29-year-old female with type 3 portal vein anatomy – characterized by an independent takeoff of the right posterior portal vein as the first branch of the main portal vein – and type 3a biliary anatomy. We detail our strategy for safe dissection and isolation of the right anterior and right posterior portal vein branches. We demonstrate the value of indocyanine green to guide transection of the right anterior and right posterior bile ducts.

Conclusion

As surgeon and robotic team experience advances beyond the learning curve, the inclusion of donors with more complex portal venous and biliary anatomy may broaden the pool of eligible donors without compromising safety.

Abstract Categories

Transplant

Robotic Upper Abdominal Cytoreductive Surgery

Dr Daniel Hoffman, Dr Mustafa Raoof

City of Hope, Duarte, USA

Abstract

Cytoreductive surgery plays a key role in the management of patients with peritoneal carcinomatosis from a variety of malignancies. While traditionally requiring large open surgeries with long length of stay, we hypothesize that in appropriately selected patients robotic cytoreductive surgery will allow for an oncologically sound operation while reducing length of stay and morbidity. We demonstrate three such cases and share our outcomes.

Abstract Categories

Complex Case

Comparative Case-Control Study of the First 100 Robotic Pancreatoduodenectomy Cases Versus Conventional Open Surgery in a High-Volume Center

Dr. Annalisa Comandatore, Dr. Niccoló Furbetta, Dr. Simone Guadagni, Dr. Matteo Pezzotti, Dr. Niccoló Ramacciotti, Dr. Chiara Veracini, Dr. Gregorio Di Franco, Prof. Luca Morelli

University of Pisa, Pisa, Italy

Abstract

Background

Pancreatoduodenectomy (PD) remains the standard surgical treatment for a range of diseases affecting the pancreas, duodenum, and distal bile ducts, whether benign or malignant. Over recent years, robotic surgery has emerged as a promising alternative to traditional open procedures, reducing hospital stay, and enhanced surgical accuracy.

Hypothesis, Materials and Methods

This study seeks to compare the outcomes of open versus robotic PD performed in a high-volume center, with a particular focus on safety, effectiveness, and clinicopathological features.

This retrospective analysis involved 500 patients who underwent PD at the General Surgery Department of Pisa University Hospital between October 2008 and May 2024. From 2018, robotic surgeries were carried out using the da Vinci Xi® system. A case-control matching process was used to create two comparable groups of 100 patients each, matched based on sex, age, BMI, ASA score, histological type, and tumor stage. Variables were evaluated using Chi-square and Student's t-tests.

Results

388 patients underwent traditional open PD, while 112 experienced robotic PD. The matched comparison involved two homogeneous groups of 100 patients. Operative duration was similar between the two approaches. Patients undergoing robotic PD showed significantly lower incidences of delayed gastric emptying (23% vs. 38%, $p=0.021$) and pancreatic fistula (15% vs. 32%, $p=0.005$), along with a shorter average hospital stay (18.9 days vs. 23.7 days, $p=0.042$). No differences were observed in tumor staging or major complications. No conversions to open surgery occurred during robotic procedures, all of which were successfully completed completely robotically.

Conclusions

This large series of cases confirms that robotic PD is a safe and viable alternative to open surgery in high-volume centers. The robotic platform provides surgeons with the ability to perform complex procedures minimally invasively, with a low rate of conversion to open surgery. Moreover, this approach may offer improvements in postoperative recovery and outcomes in selected patients.

Abstract Categories

Pancreas

Telesurgery in Urology: 10 Successful Transcontinental Human Procedures with Short-Term Follow-up

Dr Abdulrahman Almazeedi¹, Dr Saad Aldousari^{1,2,3}, Dr Ahmad Almarzouq¹, Dr Abdulkareem Hasan¹, Dr Ahmed Shahin¹, Wang Jiayin⁴, Dr Saud AlHelal¹, Dr Saleh Bubishate^{1,5}, Dr Basma Bahbahani^{1,5}

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⁴MicroPort MedBot (Group) Company, Shanghai, China. ⁵Kuwait Institute for Medical Specializations, Kuwait City, Kuwait

Abstract

Background

Telesurgery has progressed rapidly since the Lindbergh operation carried out by Dr. Marescaux and his team in 2002. Advances in robotic platform networks have enabled their application in real clinical practice. This study reports a series of ten cross-continental robotic telesurgeries conducted between Kuwait and Shanghai (China) and Kuwait and Strasbourg (France).

Hypothesis

The aim was to assess the feasibility and safety of telesurgery and to explore its potential to expand access to advanced robotic surgery through international collaboration.

Materials and Methods

Between December 2024 and July 2025, ten telesurgeries were performed. Patients were located in Kuwait City, while the operating surgeon was remotely operating in Shanghai or Strasbourg. A trained robotic surgeon was present in the operating room in Kuwait as backup. Connectivity relied on a dual-network system using fiberoptic lines, stable 5G, and SD-WAN, supported by regional relay servers in Mumbai, Dubai, Shanghai, and Frankfurt. Ethical approval and informed consent were obtained.

Results

Ten patients underwent robotic telesurgery, eight cases from Shanghai and two cases from Strasbourg. Procedures included five radical prostatectomies, one simple prostatectomy, two partial nephrectomies, one radical nephrectomy, and one nephroureterectomy. The mean latency was 166 ms for Kuwait–Shanghai and 103 ms for Kuwait–Strasbourg. No procedure required conversion or backup intervention. All operations were completed without intraoperative complications. Patients were discharged on average on post-operative day two. Prostate cancer patients had undetectable PSA at 6–8 weeks, while renal cancer patients had negative margins and no recurrence at short-term follow-up.

Conclusions

This series demonstrates that ultra-long-distance telesurgery is both feasible and safe when supported by advanced connectivity and appropriate safety measures. These findings highlight the potential of telesurgery to overcome geographical barriers, expand access to advanced surgical care, and move toward broader clinical adoption worldwide.

Abstract Categories

Telesurgery/Remote Surgery

Delayed Appendiceal Interposition in the Management of Ureteric Injury During Vascular Bypass Surgery

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Abstract

Introduction and Objectives

Robotic appendiceal interposition has emerged as a valuable option for ureteral reconstruction, particularly for mid- to distal-ureter injuries. This video aims to present a detailed, stepwise demonstration of the technique. By utilizing the appendix as a substitute, this method provides a tension-free repair and is especially effective in addressing long-segment ureteral defects.

Methods

We describe the case of a 62-year-old man who sustained an iatrogenic right ureteral transection during an emergency aorto-femoral bypass. Preoperative assessment with CT nephrostogram and renal scintigraphy confirmed a 7 cm ureteric defect with preserved renal function. The surgery was carried out robotically using four robotic ports and one assistant port, strategically arranged for simultaneous access to both upper and lower urinary tract. Intraoperatively, dense adhesions were carefully released, and the appendix was evaluated for length and perfusion with ICG fluorescence before mobilization and ureteral substitution.

Results

The procedure was successful, and recovery was uneventful, with early catheter removal and discharge on postoperative day three. A delayed Clavien-Dindo grade IIIb port-site complication was encountered and appropriately managed. At 12 weeks, CT urography demonstrated unobstructed contrast passage through the reconstructed ureter. Renal scintigraphy confirmed stable right renal function (50% split function), with preserved overall eGFR.

Conclusion

Robotic appendiceal interposition represents a safe and minimally invasive option for managing moderate to long ureteral injuries. The technique provides precise reconstruction, sustained functional outcomes, and low morbidity in complex clinical scenarios.

Abstract Categories

Complex Case

Delayed Buccal Mucosal ureteroplasty Following Iatrogenic transection during Laparoscopic Hemicolectomy

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Abstract

Background

Ureteric injuries are serious complications of abdominal and pelvic surgery that demand prompt recognition and skilled management to prevent long-term morbidity and maintain renal function. The choice of repair—open, laparoscopic, or robotic—depends on the extent and location of injury, as well as patient characteristics and surgeons' expertise. Robotic reconstruction with buccal mucosal grafts (BMG) has emerged as a promising minimally invasive alternative for complex ureteral defects.

Materials and Methods

We present the case of a 27-year-old male who sustained a complete ureteral transection during laparoscopic right hemicolectomy. Preoperative evaluation with CT urography, KUB radiography, and diagnostic ureteroscopy confirmed a 3 cm ureteric defect. Initial management consisted of percutaneous nephrostomy diversion. Definitive repair was later performed using robotic-assisted BMG ureteroplasty. The surgical technique incorporated graft harvesting and tension-free anastomosis.

Results

The procedure was completed in 240 minutes without intraoperative or postoperative complications. The patient was discharged on postoperative day two following drain removal. At six-week follow-up, stent removal was performed. Clinical, biochemical, and radiological evaluations were reassuring: the patient was asymptomatic, wounds had healed well, serum creatinine remained stable, and imaging demonstrated bilateral contrast excretion without hydronephrosis or calculi. MAG3 renography confirmed preserved renal function with split function values of 42% for the right kidney and 58% for the left.

Conclusions

This case illustrates that robotic BMG ureteroplasty is a safe, feasible, and effective minimally invasive approach for managing complete ureteral transections. It offers excellent functional preservation, low morbidity, and rapid recovery, making it a viable option in complex ureteral reconstructive surgery.

Abstract Categories

Complex Case

Port Configuration for Simultaneous Upper and Lower Robotic Urologic Surgery for Patients with Dual Pathologies

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Abstract

Background

The da Vinci robotic platform has revolutionized minimally invasive urologic surgery yet reports of simultaneous upper and lower urinary tract procedures remain limited. Combining two operations in a single session offers the potential to reduce morbidity and improve efficiency by consolidating procedures, provided it is a safe and feasible option for the patient.

Materials and Methods

Three patients with dual pathologies underwent concurrent robotic-assisted upper and lower urinary tract surgeries. A port placement strategy was employed in each case to optimize shared access for both procedures. This approach was designed to minimize the number of additional ports required, maintain ergonomic alignment, and facilitate seamless instrument exchange. Operative planning emphasized efficiency while preserving surgical precision and safety.

Results

All three procedures were completed successfully without intraoperative complications. The port-sharing configuration enabled streamlined workflow and reduced operative time while avoiding the morbidity associated with staged interventions. Postoperative recovery followed standard protocols, with all patients demonstrating uneventful courses and no adverse events. Follow-up confirmed satisfactory functional and oncological outcomes where applicable.

Conclusions

This series demonstrates that, with meticulous preoperative planning and tailored port strategies, simultaneous robotic surgery for combined upper and lower urinary tract pathologies is both safe and feasible. By consolidating interventions into a single session, this approach optimizes surgical efficiency, reduces perioperative burden, and enhances patient-centered outcomes. These findings expand the horizons of robotic urologic surgery and support broader application of combined procedures in carefully selected patients.

Abstract Categories

Miscellanea

Clinical Safety and Effectiveness of the Hugo™ RAS System for Cholecystectomy: Real-World Evidence from Global Post-Market Study

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Abstract

Background: The Hugo™ robotic-assisted surgery (RAS) system is an open console, modular platform to perform robotically-assisted minimally invasive surgery. It received CE marking for general surgery in October 2022 and is commercialized in over 30 countries outside the United States.* The objective of this analysis is to present post market, real-world clinical safety and effectiveness outcomes of the Hugo™RAS system for cholecystectomy procedures.

Methods: The Medtronic-sponsored product surveillance registry (PSR) is a global, post-market, multicenter, prospective, observational study. Patients enrolled in the PSR who underwent cholecystectomy procedure using the Hugo™RAS system and completed their 30-day follow-up, between March 2023 and May 2025, were included in this analysis. Baseline characteristics, procedural details, safety and effectiveness endpoints were collected through the study.

Results: Clinical outcomes of 102 (23 male, 79 female) patients from six study sites across Asia and Europe who underwent cholecystectomy using the Hugo™RAS System were assessed. The median (minimum, maximum) Body Mass Index was 27.7 (18.3, 54.4) kg/m². Total 36% of the patients fell into the obese category (BMI ≥ 30 kg/m²). Median (IQR) total operative time was 75 (57, 100) minutes. There were two unplanned conversions to laparoscopy, one due to device communication issue and the other due to severity of acute cholecystitis. No major post-procedural complications (Clavien-Dindo grade ≥3), reoperations, or mortalities were observed within the 30-day follow-up period. The median (IQR) postoperative length of hospital stay was 1 (0, 1) day. There was one readmission due to abdominal pain on post-operative day 8.

Conclusions: Real-world evidence from this global post-market analysis demonstrates clinical safety and effectiveness of the Hugo™RAS system. Further investigations are necessary to fully establish the Hugo™RAS system in the field of general surgery.

*In the U.S., the Hugo™ RAS system is an investigational device not for sale.

Abstract Categories

Biliary

Robot-Assisted Resection of Gastric GISTs: A Single-Center Experience

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University of Pisa, Pisa, Italy

Abstract

Background:

Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal tumors of the digestive tract, accounting for 1–3% of all gastrointestinal malignancies. While wedge resection is the standard treatment for localized and resectable gastric GISTs, laparoscopic surgery may be limited in tumors >5 cm or in anatomically challenging locations due to the risk of rupture and tumor spillage. Robotic-assisted surgery (RAS), offering enhanced visualization and instrument dexterity, may overcome these limitations, although evidence remains limited.

Hypothesis, materials, methods:

This retrospective study aims to report our experience with robotic-assisted resection of gastric GISTs performed between May 2010 and May 2025 using the Da Vinci Si or Xi systems. Data were collected from a prospective institutional database. Difficult cases were defined as tumors >5 cm and/or located in Privette-Al Thani Type II–IV regions.

Results:

A total of 18 patients underwent robotic wedge resection. Fourteen cases (77.8%) were considered difficult due to size (14.3%), location (50%), or both (35.7%). The Si system was used in 10 patients (7 difficult cases), and the Xi in 8 (7 difficult cases). Mean tumor size was 4.6 ± 1.5 cm (Si) and 3.1 ± 1.5 cm (Xi). All procedures were completed without conversion to open surgery or need for gastrectomy. No tumor rupture, spillage, or intraoperative complications occurred. Mean operative time was 144.4 ± 54.0 minutes (Si: 166; Xi: 117.5). All patients achieved R0 resection. Average hospital stay was 4.4 ± 1.3 days. After a mean follow-up of 109.2 ± 46.7 months, no recurrences were reported.

Conclusion:

Our findings confirm the feasibility and safety of robotic-assisted surgery for gastric GISTs. The Da Vinci system enables precise dissection and intracorporeal suturing even in complex cases, potentially expanding the indications for minimally invasive surgery.

Abstract Categories

Upper GI

Title: Robot-Assisted Surgery for Pancreatic Neuroendocrine Tumors: A Video-Based Experience with the Da Vinci System

Dr. Annalisa Comandatore, Dr. Niccoló Furbetta, Dr. Simone Guadagni, Dr. Ornela Ujka, Dr. Niccoló Ramacciotti, Dr. Matteo Pezzotti, Dr. Chiara Veracini, Dr. Gregorio Di Franco, Prof. Luca Morelli

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Abstract

Background:

The role of robotic-assisted surgery in the treatment of pancreatic neuroendocrine tumors (pNETs) remains not clearly established. Despite increasing interest in minimally invasive approaches, evidence supporting the use of the Da Vinci system for these tumors is still limited.

Methods:

We collected and analyzed intraoperative videos of selected robotic-assisted procedures for pNETs performed at our center. These included primarily tumor enucleations, as well as cases requiring distal pancreatectomy or pancreaticoduodenectomy. Surgical strategies, technical details, and intraoperative findings are presented to illustrate the potential advantages of the robotic approach.

Results:

The video series highlights the feasibility and safety of robotic enucleoresection in various anatomical locations of the pancreas. In addition, robotic assistance was successfully applied in more complex resections, such as distal pancreatectomy and pancreaticoduodenectomy. The system's enhanced visualization and instrument articulation facilitated precise dissection, even in challenging cases.

Conclusion:

Although the role of robotic surgery in the management of pNETs is not yet fully defined, our experience supports its use as a valuable tool, particularly for complex or technically demanding procedures. The Da Vinci system may help broaden the indications for minimally invasive surgery in patients with pancreatic neuroendocrine tumors.

Abstract Categories

Pancreas

Automatic Recognition of Anatomy and Surgical Phases in Robot-Assisted Minimally Invasive Esophagectomy (RAMIE) using Deep Learning: a Retrospective Cohort Study

Drs. Romy van Jaarsveld¹, MSc Yiping Li², MSc Ronald de Jong², Drs. Gino Kuipers¹, BSc Jasper Bongers², MSc Tim Jaspers², Prof. dr. Marcel Breeuwer², Assoc. prof. dr. Fons van der Sommen², Dr. Yasmina Al Khalil², Prof. dr. Richard van Hillegersberg¹, Prof. dr. Jelle Ruurda¹

¹University Medical Center Utrecht, Utrecht, Netherlands. ²Eindhoven University of Technology, Eindhoven, Netherlands

Abstract

BACKGROUND: Robot-Assisted Minimally Invasive Esophagectomy (RAMIE) is challenging to master due to the complex chest anatomy, semi-prone patient positioning and zoomed-in view. Computer-aided anatomy and surgical phase recognition holds promise for improving intraoperative navigation. This study aims to develop two real-time recognition algorithms of the thoracic part of RAMIE using deep learning, and to understand the challenges and limitations of current state-of-the-art algorithms.

MATERIALS AND METHODS: A retrospective single-center cohort study was conducted at University Medical Centre Utrecht, The Netherlands. RAMIE videos from January 2018 to July 2021 were collected to create an anatomy segmentation dataset (D1) and a labeled surgical phase dataset (D2), by PhD-candidates supervised by an expert surgeon. D1 included 879 frames segmented with eight anatomical structures and four surgical instruments. D2 labeled 27 RAMIE videos into thirteen phases. Different machine learning models were trained separately on the datasets, the predictions were evaluated using the testsets.

RESULTS: For D1, eight models were evaluated using Dice score (measuring overlap from 0 to 1) and Average Symmetric Surface Distance (ASSD, margin accuracy in pixel distance). A model called “Mask2Former” showed the best accuracy (overall Dice 0.71, ASSD 11 pixels). All models performed highest for the aorta and lowest for thoracic duct recognition.

On D2, we benchmarked our own model for surgical phase recognition against four state-of-the-art models. Ours performed best by assessing accuracy (78%), precision (77%), recall (76%), and the Jaccard index (61.94). Misclassification occurred between phases aorto-pulmonary window and subcarinal lymph node dissection.

CONCLUSIONS: We introduce two comprehensive anatomy and surgical phase recognition datasets for RAMIE, along with an extensive model performance analysis. We identified key features for improving automatic anatomy and surgical phase recognition in RAMIE. By increasing representation of less distinct structures and phases we foresee further improvement of the models’ performance.

Abstract Categories

Artificial Intelligence

Bridging Algorithmic Accuracy and Clinical Relevance: Surgeon Perspectives on AI Anatomy Overlays in Robotic-Assisted Minimally-Invasive Esophagectomy (RAMIE)

Drs. Romy van Jaarsveld¹, Dr. Yasmina Al Khalil², MSc Ronald de Jong², Drs. Gino Kuiper¹, MSc Yiping Li², Prof. dr. Richard van Hillegersberg¹, Prof. dr. Marcel Breeuwer², Prof. dr. Jelle Ruurda¹

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Abstract

BACKGROUND: Artificial intelligence (AI)-driven anatomical overlays are increasingly used to support intraoperative visualization in surgery, yet their clinical value remains underexplored. This study evaluated the perceived utility, accuracy and clinical relevance of AI-generated overlays in Robot-Assisted Minimally Invasive Esophagectomy (RAMIE).

MATERIALS AND METHODS: A survey was performed in which participants assessed twelve annotated video clips using Likert-scale ratings and open-ended feedback. Each clip displayed overlays of key anatomical structures in RAMIE, including the aorta, azygos system, pericardium, thoracic duct, right lung, esophagus, airways and vagus nerves. Participants were stratified by experience level for subgroup analysis.

RESULTS: In total, 26 upper-gastrointestinal surgeons with varying levels of experience participated: seven experts (>100 (RA)MIE's performed), eleven intermediates (10-100 (RA)MIE's performed) and eight novices (<10 (RA)MIE's performed or assisted). Overall, overlays were rated as moderately to highly useful, especially by novice surgeons, who consistently reported improved anatomical recognition and spatial orientation. Experts provided more critical feedback, emphasizing the need for precision, visual clarity, and selective display of high-risk structures such as the recurrent laryngeal nerves and thoracic duct. Overlay accuracy ratings varied by structure, with the aorta receiving the highest scores and vagal nerves among the lowest. Importantly, a positive correlation was observed between perceived usefulness and the models' segmentation accuracy. Qualitative feedback highlighted key improvement areas: sharper boundaries, greater temporal stability, and customizable display options.

CONCLUSIONS: We used surgical feedback to evaluate the accuracy of AI-generated anatomical overlays in RAMIE, aiming to bridge the gap between technical innovation and clinical applicability. The current models performance for the included anatomical classes were rated "Acceptable" to "Good". This study supports the potential of AI-driven overlays to enhance both surgical training and intraoperative orientation, while emphasizing the importance of a user-centered design for broader clinical adoption.

Abstract Categories

Artificial Intelligence

Robotic Extended Left Hepatectomy for Recurrent Colon Cancer with Liver Metastasis

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Abstract

This video depicts a complex robotic extended left hepatic lobectomy for colon cancer with recurrent liver metastasis in a 63-year-old man. The patient initially presented for robotic left hemicolectomy for colon cancer in August 2022 and was placed on adjuvant chemotherapy for positive lymph nodes, initial staging pT3N1M0. He subsequently developed metachronous liver metastases in March 2023 which were treated with systemic chemotherapy and, after a good response, robotic partial hepatectomy of a lesion straddling segments 6 and 7, and laparoscopic/robotic assisted microwave ablation of two additional lesions in segment 2 and segment 7 in January 2024. He showed no evidence of disease until October 2024 when MRI of the liver showed a small increase in size of the segment 2 ablation site up to 3.9cm in maximum diameter with diffusion restriction, in conjunction with positive circulating tumor DNA. This lesion appeared to abut the retro-hepatic inferior vena cava and the middle hepatic vein. He received several additional cycles of systemic chemotherapy which showed decrease in the size of the lesion and regression of the inferior vena cava margin. At this point he was taken to the operating room for a robotic extended left hepatic lobectomy to remove this segment 2 lesion. Both the left and middle hepatic veins were ligated, the final margin abutting the inferior vena cava was negative. This video depicts safe completion of a complex hepatectomy with pathology in close proximity to major vascular structures in a patient who had prior liver surgery, all of which are factors which would most commonly lead to completing this surgery in an open fashion. The patient recovered well and was discharged home on post operative day three after major hepatectomy, experiencing the full benefit of minimally invasive, robotic surgery.

Abstract Categories

Complex Case

Jumping into a Totally Robotic Practice: From Laparoscopy to High-Volume Robotic Surgery in 15 Months

Mr Sasindran Ramar¹, Mr Kyriakos Bananis¹, Mr Pushpak Chaudhari¹, Mr Emmanuel Obale¹, Ms Pooja Jageer²

¹King's College Hospital, London, United Kingdom. ²Aintree Hospital, Liverpool, United Kingdom

Abstract

Purpose: The transition from advanced laparoscopic to robotic surgery necessitates structured training, robust team coordination, and innovative operational strategies. This presentation outlines my 15-month journey as a robotic surgeon, leveraging laparoscopic expertise and institutional support to establish a high-volume robotic practice.

Materials and Methods: Training commenced in March 2024, encompassing 80 hours of simulation console time (achieving 100% proficiency across modules) and 100 hours of self-directed study analyzing robotic procedure videos. A dedicated robotic team was formed to optimize workflow, with “Tiger Sundays” (weekend surgical lists) implemented to increase case volume. Initial proctored cases included three cholecystectomies, two sleeve gastrectomies, and one additional cholecystectomy, followed by independent complex procedures.

Results: Over 15 months, 317 robotic cases were performed. Bariatric procedures comprised 50% (160 cases: 85 sleeve gastrectomies, 53 Roux-en-Y gastric bypass, 16 revision RYGB, 6 band removals), 27% were cholecystectomies (86 cases), and 12% were inguinal hernias (38 cases: 24 unilateral, 14 bilateral). The remaining 10% (33 cases) included hiatal and epigastric hernias. Laparoscopic expertise facilitated rapid skill acquisition, while the dedicated team and Tiger Sundays ensured operational efficiency and high throughput.

Conclusions: Structured training, prior laparoscopic proficiency, and a cohesive team with innovative scheduling were critical to building a high-volume robotic practice. These findings highlight the effectiveness of simulation-based training, mentorship, and team-driven strategies, providing a scalable model for surgeons adopting robotic techniques

Abstract Categories

Bariatric

Outcomes of Robotic Bariatric & Metabolic Surgery: A Single Surgeon Experience of 138 Cases

Mr Sasindran Ramar, Mr Kyriakos Bananis, Mr Pushpak Chaudhari, Mr Emmanuel Obale
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Abstract

Background: Robotic bariatric surgery offers precision, yet single-surgeon outcomes for large cohorts, particularly regarding BMI and comorbidities, are underexplored. This study evaluates efficiency and safety in 138 robotic procedures, focusing on correlations between BMI, comorbidities, and surgical outcomes.

Methods: Retrospective analysis of 138 robotic bariatric procedures (85 sleeve gastrectomies, 53 RYGB) performed by a single surgeon from March 2024 to August 2025. Outcomes included console time, length of stay (LOS), complications, and readmissions. Subgroup analyses examined correlations of BMI and comorbidities with outcomes using Spearman's rank correlation and logistic regression, with secondary comparisons for hiatal hernia repair (HH) cases (10 sleeve, 8 RYGB) vs. non-HH (75 sleeve, 45 RYGB) using t-tests and chi-square tests. Analyses were conducted in SPSS v28.

Results: Sleeve console time was 76.2 ± 29.0 min, LOS 2.3 ± 1.2 days; RYGB console time 141.5 ± 37.5 min, LOS 2.0 ± 1.2 days. Complications (1.2% sleeves, 0% RYGB) and readmissions (2.4% sleeves, 0% RYGB) were rare. BMI showed no significant correlations ($p \geq 0.35$); comorbidities weakly correlated with RYGB LOS ($r=0.29$, $p=0.04$). HH comparisons showed no significant differences ($p \geq 0.10$), with sleeve HH console time 106.1 ± 38.6 min, LOS 2.7 ± 1.8 days.

Conclusion: Robotic bariatric surgery is safe and efficient across 138 cases, with minimal BMI impact and slight comorbidity influence on RYGB LOS. Long-term outcomes warrant further study.

Abstract Categories

Bariatric

Climbing the Curve: Leveraging the Intuitive App in Robotic Bariatric and Metabolic Surgery – A Single-Surgeon Perspective

Mr Sasindran Ramar¹, Mr Kyriakos Bananis¹, Mr Pushpak Chaudhari¹, Mr Emmanuel Obale¹, Ms Pooja Jageer²

¹King's College Hospital, London, United Kingdom. ²Aintree Hospital, Liverpool, United Kingdom

Abstract

Introduction: This study explores the Intuitive App's role in tracking a single-surgeon's learning curve in robotic bariatric surgery.

Methods: Data from 79 Sleeve Gastrectomies and 53 Roux-en-Y Gastric Bypasses (RYGB), performed March 2024 to August 2025, were extracted using the app's timeline. Cohort-based learning curve analysis excluded 10 hiatal hernia repair cases from Sleeves (leaving 69 cases, grouped into 20-20-20-9 cohorts: cases 1-20, 21-40, 41-60, 61-69) and 7 from RYGB (leaving 41 cases pending 12 additional cases to reach 53, grouped into 15-15-11 cohorts: cases 1-15, 16-30, 31-41). Averages were calculated in Excel.

Results: Sleeve console time improved from 92.5 minutes (cases 1-20) to 59.8 minutes (cases 61-69), a 35.4% reduction. RYGB console time decreased from 167.5 minutes (cases 1-15) to 128.9 minutes (cases 31-41), with pouch time from 32.1 to 24.5 minutes, gastrojejunostomy from 47.9 to 34.9 minutes, and jejunojejunostomy from 34.5 to 27.6 minutes.

Conclusion: The Intuitive App's real-time analytics facilitated cohort analysis, driving efficiency gains and supporting surgical training innovations.

Abstract Categories

New Tools

Kite Stitch: A Simple Way to Create an Efficient and Effective Jejunojejunal Anastomosis in Robotic RYGB

Mr Sasindran Ramar, Mr Kyriakos Bananis

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Abstract

Purpose: Jejunojejunostomy (JJ) anastomosis in robotic-assisted Roux-en-Y gastric bypass (RYGB) is a critical step prone to complications such as afferent limb obstruction. The Kite Stitch, a novel two-layered closure technique, was developed to enhance the efficiency, reliability, and safety of JJ anastomosis by leveraging robotic precision.

Materials and Methods: The Kite Stitch employs a two-layered enterotomy closure with a strategically placed anti-obstruction stitch to optimize anatomical alignment and minimize tension asymmetry. The technique's kite-like configuration promotes symmetrical tissue approximation, enhancing mechanical stability. Executed using the robotic platform's articulation, the method ensures consistent and reproducible outcomes.

Results: Implemented in over 50 robotic RYGB procedures at our center, the Kite Stitch demonstrated simplicity, reproducibility, and functional safety. The anti-obstruction stitch and kite-shaped closure provide robust mechanical and anatomical integrity, potentially reducing obstruction risks. Surgeons reported intuitive adoption due to the technique's structured approach and visual clarity.

Conclusions: The Kite Stitch offers a simple, efficient, and effective enhancement to JJ anastomosis in robotic RYGB. By reducing postoperative complications and aligning with robotic precision, it strengthens the bariatric surgery toolkit. This technique holds promise for broader adoption, with ongoing evaluation to confirm long-term outcomes

Abstract Categories

Bariatric

POSTER : Achieving the Critical View of Safety in Robotic Cholecystectomy: A Consecutive Single-Surgeon Series of 81 Cases

Mr Sasindran Ramar¹, Mr Kyriakos Bananis¹, Ms Pooja Jageer²

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Abstract

Background The Critical View of Safety (CVS) is fundamental to preventing bile duct injury in cholecystectomy. Robotic platforms may enhance exposure and standardization, but single-surgeon consecutive series are limited.

Methods We retrospectively reviewed 81 consecutive robotic cholecystectomies performed by a single surgeon between March 2024 and August 2025. Demographic variables, ASA class, indication, and preoperative severity (Modified Parkland Grading Scale) were recorded. Our primary endpoint is successful CVS documentation during surgery; this abstract focuses on patient and disease characteristics, with outcome adjudication underway

Results Mean age 49.3 ± 14.6 years ($n=78$); 57 female, 24 male. ASA: I 13 (16.9%), II 44 (57.1%), III 19 (24.7%), IV 1 (1.3%). Indications: gallstones (unspecified) 29 (35.8%), symptomatic gallstones 21 (25.9%), cholecystitis—unspecified/chronic 12 (14.8%), acute cholecystitis 10 (12.3%), choledocholithiasis 2 (2.5%), gallstone pancreatitis 2 (2.5%), gallbladder polyp 1 (1.2%), other 4 (4.9%). Parkland grades: 1—40 (49.4%), 2—19 (23.5%), 3—17 (21.0%), 4—4 (4.9%), 5—1 (1.2%).

Conclusion A structured CVS-first robotic technique was applied by a single surgeon across 81 consecutive cases, covering the full spectrum of Parkland grades. This consecutive series highlights the feasibility and safety of consistently pursuing CVS in robotic cholecystectomy, and establishes the foundation for reporting CVS documentation and perioperative outcomes.

Abstract Categories

Biliary

POSTER : Outcomes of Robotic Cholecystectomy Across Parkland Grades in Urgent and Elective Settings

Mr Sasindran Ramar, Mr Kyriakos Bananis, Mr Pushpak Chaudhari, Ms Kasthoory Kandiah, Mr Emmanuel Obale

King's College Hospital, London, United Kingdom

Abstract

Background: Robotic cholecystectomy leverages advanced visualization, yet its performance across preoperative severity and urgency is underexplored. This study evaluates its efficacy using the Modified Parkland Grading Scale (PGS).

Materials and Methods: Retrospective cohort study of 81 robotic cholecystectomies (Da Vinci Xi) from March 2024 to August 2025 at a single center. Data included PGS (Grades 1–5), urgency (elective: 71.6%, urgent: 28.4%), console time, length of stay (LOS), conversions, complications, and readmissions. Analyses used Kruskal-Wallis, Mann-Whitney U, and Fisher's exact tests ($p < 0.05$).

Results: Among 81 patients (76.5% female, mean age 49 ± 15.4 years), PGS distribution was: Grade 1 (45.7%), Grade 2 (19.8%), Grade 3 (28.4%), Grade 4 (4.9%), Grade 5 (1.2%). Console times increased with PGS (Grade 1: median 53 min [IQR 33–64] vs. Grade 5: 179 min, $p < 0.001$) and urgency (urgent: 68 min [IQR 53–109] vs. elective: 53 min [IQR 33–64], $p < 0.001$). No conversions occurred; complications were 1.2% (1 bile leak, Grade 4 urgent); readmissions were 1.2%. Median LOS was 1 day [IQR 1–2], longer in urgent cases (2 days, $p < 0.001$) and sickle cell patients (2 days, $p = 0.03$). Console times decreased over time ($p = 0.01$).

Conclusions: Robotic cholecystectomy achieved no conversions and minimal complications across PGS severities, outperforming laparoscopic benchmarks (2–15% conversions). It excels in complex (Grades 3–5) and urgent cases, supporting targeted NHS adoption. Multicenter trials are needed to confirm findings and assess cost-effectiveness.

Abstract Categories

Biliary

POSTER : Robotic Repair of Bilateral Inguinal Hernia in a Patient with Extensive Pelvic Collateral Veins and Prior Deep Vein Thrombosis

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Abstract

Background Inguinal hernia repair in patients with extensive collateral venous circulation poses significant technical challenges and increases the risk of intraoperative bleeding. The use of minimally invasive robotic-assisted surgery may offer enhanced visualization and precision, allowing safe dissection and mesh placement in anatomically complex situations.

Case Presentation A 45-year-old man with a history of left deep vein thrombosis presented with symptomatic right inguinal hernia. Clinical evaluation and MRI demonstrated bilateral inguinal hernias with extensive collateral varicosities across the inguinal and suprapubic regions, extending into the pubic bone. After multidisciplinary discussion with vascular surgery, robotic-assisted transabdominal preperitoneal repair was undertaken. Intraoperatively, bilateral inguinal hernias were identified. Peritoneal flaps were raised, hernia contents reduced, and large lightweight 3D mesh prostheses were placed bilaterally (12.2 × 17.0 cm left, 10.8 × 16.0 cm right). Meshes were secured with interrupted sutures, and hemostasis was meticulously achieved without vascular injury. The patient's postoperative course was uneventful.

Discussion This case demonstrates the utility of robotic-assisted hernia repair in patients with extensive pelvic venous collateralization. The three-dimensional visualization and instrument dexterity provided by the robotic platform enabled safe dissection and mesh placement, mitigating bleeding risk in a highly vascular operative field.

Conclusion Robotic inguinal hernia repair can be performed safely in patients with extensive pelvic collateral veins and prior deep vein thrombosis, offering a viable option in anatomically challenging cases where open repair may carry increased morbidity

Abstract Categories

Hernia

Patient-Reported Outcomes in Robotic-Assisted Bariatric Surgery: Insights from a Cohort of Sleeve Gastrectomy and Gastric Bypass Patients

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King's college hospital, London, United Kingdom

Abstract

Background: Robotic-assisted bariatric surgery has emerged as a precise tool in managing obesity, offering potential benefits in recovery and patient satisfaction. However, patient-reported outcomes (PROs) are crucial for evaluating its role in holistic care. This study assesses PROs in robotic sleeve gastrectomy and gastric bypass patients, exploring the clinical and operative advancements in obesity through robotic-assisted bariatric surgery.

Methods: A cross-sectional survey was conducted among 115 patients undergoing robotic bariatric procedures (78 sleeve gastrectomy, 34 gastric bypass, 3 other) at SRS Strasbourg from March 2024 to May 2025. A 17-item questionnaire evaluated satisfaction, recovery time, complications, trust in robotic technology, and qualitative perceptions. Descriptive statistics, chi-square tests, and multivariable ordinal logistic regression analyzed associations with demographics and procedure type.

Results: High satisfaction was reported by 87.8% (101/115) of patients, with 81.7% (94/115) noting clear preoperative explanations. Rapid recovery was evident, with 47.8% (55/115) resuming daily activities within one week. Complications (self-describing) occurred in 13.9% (16/115), mainly gastrointestinal (e.g., vomiting), with no significant difference between procedures ($\chi^2=0.68$, $p=0.41$). Trust in robotic technology was strong (83.5% strongly agreed), and 86.1% would recommend it. Ordinal logistic regression revealed younger age (<40 years) increased odds of higher satisfaction levels (OR=2.5, 95% CI: 1.5–4.2, $p<0.001$). Qualitative feedback emphasized minimal scarring, quick recovery, and weight loss benefits, supporting improved diabetes management through enhanced surgical precision.

Conclusion: Robotic bariatric surgery yields excellent PROs, facilitating faster recovery and high patient trust, which are vital for effective obesity and diabetes management. These findings advocate for integrating robotic technologies into multidisciplinary approaches, to optimize patient-centered outcomes.

Abstract Categories

Bariatric

poster : Robotic Revision Sleeve Gastrectomy Following Failed Endoscopic Sleeve in a Patient with Crohn's Disease

Mr Sasindran Ramar, Mr Kyriakos Bananis, Ms Kasthoory Kandiah, Mr Emmanuel Obale, Mr Pushpak Chaudhari

King's College Hospital, London, United Kingdom

Abstract

Background Endoscopic sleeve gastropasty (ESG) is increasingly used for weight management in obesity, but long-term durability and weight loss maintenance remain variable. Surgical revision following failed ESG is uncommon and technically challenging due to altered anatomy and adhesions. Robotic platforms may provide enhanced precision and ergonomics in complex revisional bariatric procedures.

Case Presentation A 41-year-old woman with obesity, Crohn's disease, and fecal incontinence presented with weight regain after a previous ESG. Her history included multiple abdominal and anorectal interventions. She underwent robotic sleeve gastrectomy as a revisional procedure. Intraoperative findings included mild fatty liver and previous ESG sutures. A sleeve was fashioned over a 38 Fr bougie using a robotic stapler, starting 4 cm from the pylorus to the angle of His. The staple line was reinforced, hemostasis was secured, and leak testing with indocyanine green was negative.

Discussion This case illustrates the feasibility of robotic revision sleeve gastrectomy in a patient with significant comorbidities and prior ESG. The robotic approach facilitated meticulous dissection around the gastroesophageal junction and safe creation of a smooth gastric sleeve. Revisional surgery following ESG is rare but may become increasingly relevant as more ESG patients present with weight recurrence.

Conclusion Robotic revision sleeve gastrectomy is a safe and technically viable option after failed ESG, offering precision and safety in anatomically complex reoperations.

Abstract Categories

Bariatric

STARK-Sovato platforms for evaluation of remote surgery and its workflow: A porcine model study of technical and non-technical factors

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¹City of Hope, Duarte, USA. ²LIVSMED, San Diego, USA. ³Sovato, Santa Barbara, USA.

⁴LIVSMED, Seongnam-si, Korea, Republic of

Abstract

Background

Telerobotic surgery leverages advanced robotics and high-fidelity telecommunications to enable surgeons to operate on patients across geographic distances. While technical feasibility has been demonstrated since the early 2000s, standardized perioperative workflow and optimized communication strategies remain underexplored.

Methods

We evaluated *STARK*, a novel robotic platform with proprietary 90-degree articulating instruments with a nascent remote capability built-in to the system. A remote *STARK* robotic console in Santa Barbara, CA was connected using the Sovato low-latency telecommunications network to the *STARK* robotic rams/instruments in Chicago, IL.

Simulating operative workflows, each site had a full team, one remote and one bedside who communicated throughout each procedure. Three telesurgeries - cholecystectomy, gastrojejunostomy, and duodenojejunostomy were performed in a porcine model. Outcomes were assessed and included perioperative timeouts with the Orchestration App, network performance, procedure length, intraoperative complications, cognitive load, and surgeon-reported usability.

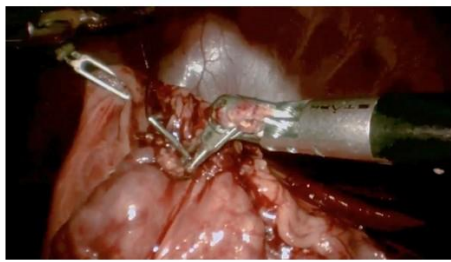
Results

Presurgical timeout averaged 3.38 minutes (range 1.33 - 5.43); postoperative surgical signout averaged 1.2 minutes (range 1.0 - 1.3). Mean operative time was 63.6 minutes (range 52.7 - 82.0). Network performance was stable with mean latency of 51.23 ms (range 51.21 - 51.28), jitter of 0.03 ms (range 0.02 - 0.12), and no packet loss. The SURG-TLX scores were low to moderate across all domains including mental, physical, temporal demands, task complexity, situational stress, or distractions. Surgeons rated remote communication with the bedside team during trocar placement and throughout the procedure, checklist integration, and team collaboration as excellent. Identified workflow gaps included limited access to patient monitor audio, bedside camera optimization, and full-room visualization. No intraoperative complications occurred.

Conclusions

This study demonstrates the feasibility and safety of complex telesurgical procedures using a next-generation robotic platform, an ultra-reliable telecommunications system, and structured perioperative workflows. Beyond confirming technical viability, our findings highlight key workflow considerations critical for safe adoption and scaling of remote surgery.

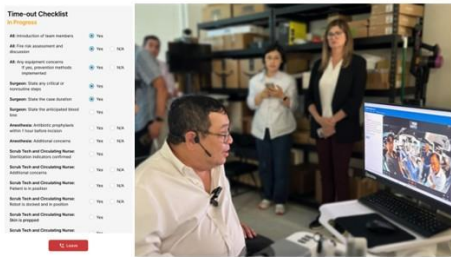
Figure 1. STARK-Sovato Platforms for Remote Surgery.



(A) STARK 90-degree robotic instrument



(B) Telerobotic intraoperative communication



(C) Orchestration App – Presurgical timeout



(D) Remote surgical procedure

Abstract Categories

Telesurgery/Remote Surgery

Leveraging the CHA2DS2-VASc Score for Cardiovascular and Renal Risk Stratification in Robotic-Assisted Pulmonary Lobectomy

Mr. Austin Erickson¹, Mr. Atif Islam¹, Mr. Brandon Dyer¹, Ms. Carla Moodie², Mr. Joseph Garrett², Ms. Diana De La Cruz², Ms. Lindsay Power², Ms. Jenna Tew², Dr. Jobelle Joyce-Anne Baldonado^{2,1}, Dr. Jacques Fontaine^{2,1}, Dr. Samuel Freyaldenhoven^{2,1}, Dr. Eric Toloza^{2,1}

¹University of South Florida Health Morsani College of Medicine, Tampa, FL, USA. ²Moffitt Cancer Center, Tampa, FL, USA

Abstract

Background: The CHA2DS2-VASc score is a commonly used predictive tool for estimating thromboembolic risk in patients with atrial fibrillation (AFib), yet its broader utility in non-cardiac surgical settings remains unclear. Robotic-assisted pulmonary lobectomy (RAPL) is commonly performed for early-stage lung cancer; however, postoperative cardiovascular and renal complications remain clinically significant.

Hypothesis, Materials, and Methods: A retrospective review of 842 consecutive patients who underwent RAPL between September 2010 and April 2025 was conducted to evaluate whether the preoperative CHA2DS2-VASc score was able to predict cardiovascular and renal complications following RAPL in patients without pre-existing AFib. Patients with preoperative AFib were excluded. Using eight preoperative variables, CHA2DS2-VASc scores were created for each patient. Univariable logistic regression assessed associations between CHA2DS2-VASc scores and incidence of hypotension, new-onset postoperative AFib, acute kidney injury (AKI), deep vein thrombosis (DVT), pulmonary embolism (PE), myocardial infarction (MI), and cerebrovascular accident (CVA),

Results: Of 725 study patients, 425 patients (58.6%) were female, median age was 69 [Inter-Quartile Range (IQR): 62-75] years, and median body mass index (BMI) was 27 [23.8-31.0] kg/m². Univariate analysis revealed the CHA2DS2-VASc score to be significantly associated with several postoperative events including hypotension, (OR=1.47, 95% CI: [1.06-2.03], p=0.02), AKI (OR=1.23, 95% CI: [1.02-1.49], p=0.03), new-onset AFib (OR=1.38, 95% CI: [1.17-1.63], p<0.01), and CVA (OR=3.76, 95% CI: [1.73-8.16], p<0.01). There was no significant association between the CHA2DS2-VASc score and postoperative incidence of DVT, PE, or MI.

Conclusion: The CHA2DS2-VASc score shows promise as a predictive tool for postoperative cardiovascular and renal complications in patients undergoing RAPL, despite a lack of pre-existing AFib. Given the simplicity and familiarity of this tool to clinicians, there is potential in using CHA2DS2-VASc scores to determine cardiovascular and renal risks of non-cardiac thoracic surgery. Further multivariable validation and studies regarding clinical integration are warranted.

Abstract Categories

Cardio-Thoracic

Early Deficit Accumulation Survival Index Predicts Unfavorable Discharge Disposition Following Robotic-Assisted Pulmonary Lobectomy

Mr. Atif Islam¹, Mr. Brandon Dyer¹, Mr. [Austin Erickson](#)¹, Dr. Timothy Hembree², Dr. Richard Reich², Ms. Carla Moodie², Mr. Joseph Garrett², Ms. Diana De La Cruz², Ms. Lindsay Power², Ms. Jenna Tew², Dr. Jobelle Joyce-Anne Baldonado^{2,1}, Dr. Jacques Fontaine^{2,1}, Dr. Samuel Freyaldenhoven^{2,1}, Dr. Eric Toloza^{2,1}

¹University of South Florida Health Morsani College of Medicine, Tampa, FL, USA. ²Moffitt Cancer Center, Tampa, FL, USA

Abstract

Background [\[A11\]](#) : Several clinical factors, such as malnutrition and inflammatory markers, have been shown to independently predict survival outcomes in cancer patients. However, individually, these factors often fall short in giving the clinician a comprehensive picture of a patient's preoperative vulnerability and survival after treatment. The Deficit Accumulation Survival Index (DASI) has been previously shown to offer a more holistic picture of patient frailty. However, whether increases in DASI scores are associated with unfavorable discharge dispositions remains unclear.

Hypothesis, Materials, and Methods: This retrospective cohort study included 798 consecutive patients who underwent robotic-assisted pulmonary lobectomy (RAPL) from March 2015 to January 2025 to investigate whether increases in DASI scores predict unfavorable discharge dispositions. Twenty-five clinical variables were abstracted from the electronic medical records and then used to calculate Preoperative and Discharge DASI scores for each patient. Discharge dispositions were recorded and classified as Favorable or Unfavorable, with Unfavorable defined as any setting providing a greater level of care than baseline. Descriptive statistics and Mann-Whitney U tests were used to analyze the relationship between DASI scores at the two time points and discharge disposition.

Results: Of 798 patients, 87.7% (668 patients) had Favorable discharge dispositions. Patients with Unfavorable discharge dispositions had higher median Preoperative DASI scores (5.0 vs. 4.0, $p < 0.01$). Similarly, patients with Unfavorable discharge dispositions had higher median Discharge DASI scores (6.0 vs 5.0, $p < 0.01$). Interestingly, Preoperative DASI scores outperformed Discharge scores as a predictor of Unfavorable discharge disposition (Cliff's δ : -0.366 vs. -0.260, Odds Ratio: 1.729 vs 1.457).

Conclusions: Higher Preoperative and Discharge DASI scores are both significantly associated with Unfavorable discharge dispositions. However, the Preoperative score is more strongly associated with Unfavorable dispositions than Discharge scores. These results suggest that Discharge scores may reflect transient alterations to frailty, while Preoperative scores may better reflect long-term global health status.

Abstract Categories

Cardio-Thoracic

Lymph Node Metastatic Pattern Following Robotic-Assisted Lobectomy and Systematic Lymph Node Dissection in Non-Small Cell Lung Cancer

Dr. Aihab Aboukheir Aboukheir¹, Dr. Samuel Freyaldenhoven^{1,2}, Mr. Joseph Garrett¹, Ms. Carla Moodie¹, Ms. Jenna Tew¹, Dr. Jobelle Joyce-Anne Baldonado^{1,2}, Dr. Jacques Fontaine^{1,2}, Dr. Eric Toloza^{1,2}

¹Moffitt Cancer Center, Tampa, FL, USA. ²University of South Florida Health Morsani College of Medicine, Tampa, FL, USA

Abstract

Background: The prognosis and treatment strategies in non-small cell lung cancer (NSCLC) is predominately influenced by the extent of lymph node (LN) involvement. The extent and necessity of mediastinal LN dissection is often debated. Evaluation of the expected LN mapping will help surgical planning.

Hypothesis, Materials, and Methods: Treatment naïve patients undergoing robotic lobectomy with systematic LN dissection for NSCLC between September 2010 and April 2022 were reviewed in order to investigate LN metastatic patterns following lobectomy for NSCLC. Clinical and pathologic characteristics were analyzed.

Mediastinal LN involvement was determined according to primary tumor location. LN stations were classified into mediastinal regions: upper (stations 2-6), central (station 7), and lower (stations 8 and 9).

Results: Of 1044 study patients, 277 (26.5%) were found to have metastatic LN disease, including 237 (22.7%) with N1 and 154 (14.5%) with N2 disease. The right upper lobe had the lowest rate of N1 involvement (21%, $p=0.02$), with no difference in rates of N2 disease among the different lobes ($p=0.09$). In patients with N2 disease, upper and central stations were more involved across all lobes. Upper stations were more commonly involved with right upper lobectomies (94%) and left upper lobectomies (91%), while the central station was more likely to be involved with right lower (76%) and left lower (62%) cases. Skip metastases (SN2) involving only N2 stations without N1 involvement were found in 40 (3.8%) patients. Most SN2 were single-station (78%, $p<0.001$) and followed similar distribution patterns as non-skip metastases.

Conclusion: After systematic LN dissection, mediastinal lymphatic drainage largely follows an anatomic pattern, with majority of cases of N2 cases involving upper and central LN stations regardless of primary tumor location. The overall rate of skip metastasis is low, with the majority involving single N2 stations and a similar geographic pattern.

Abstract Categories

Cardio-Thoracic

When robots talk, lung cancer patients win: Single-setting robotic bronchoscopy and resection for early lung cancer

Dr Shady Eldaif

City of Hope, Atlanta, USA

Abstract**Background**

Early detection offers the best chance for cure in lung cancer, yet sub-centimeter pulmonary nodules remain difficult to diagnose and treat. Robotic technology may allow both diagnosis and resection in a single setting, reducing delays and risks.

Hypothesis, Materials, and Methods

We hypothesized that combining robotic bronchoscopy with robotic surgical resection during one anesthetic event would improve diagnostic accuracy, accelerate treatment, and limit complications. Twelve patients with pulmonary nodules ≤ 8 mm were prospectively enrolled based on risk factors such as smoking history, radiographic growth, and suspicious imaging findings. All underwent robotic navigational bronchoscopy followed, when indicated, by immediate robotic resection.

Results

Of 12 patients, 11 (92%) were diagnosed with malignancy and 1 (8%) with a benign lesion. Among malignant cases, 9/11 (82%) were primary lung cancers (adenocarcinoma and neuroendocrine tumors), while 2/11 (18%) were metastatic lesions (melanoma and breast carcinoma). Robotic bronchoscopy localized 100% of nodules, and same-setting resections enabled parenchymal-sparing surgery in most patients (75%). No major perioperative complications occurred. Diagnostic and therapeutic management were completed during a single anesthesia, eliminating the traditional delay between biopsy and resection.

Conclusions

A single-setting robotic pathway combining bronchoscopy and surgery is safe, accurate, and efficient for high-risk patients with small pulmonary nodules. This approach shortens time to diagnosis, supports lung-sparing resections, and reduces procedural risk. Adoption of this strategy may redefine early-stage lung cancer management by aligning precision diagnostics with immediate, curative treatment.

Abstract Categories

Cardio-Thoracic

Robotic Whipple with Trans-Mesenteric Resection and Superior Mesenteric Vein/Portal Vein Reconstruction

Dr Aaron Lewis, Dr. Fairouz Chibane, Dr Jae Kim, Dr Laleh Melstrom

City of Hope, Duarte, USA

Abstract

Background:

Robotic platform has been successfully used for minimally invasive Whipple operations while robotic-assisted vascular surgery is a burgeoning field. Traditionally, Whipple procedures requiring reconstruction of major blood vessels have used open or non-robotic techniques.

Methods:

A 37 year old female patient with a history of Li-Fraumeni was diagnosed with a 3.9 by 2.5 cm pancreatic head adenocarcinoma with marked narrowing of the Superior Mesenteric Vein (SMV) at the porto-splenic confluence. The patient was offered robotic Whipple surgery with portal vein reconstruction after completion of neoadjuvant chemotherapy. The robot (da Vinci Xi) was docked from the patient's left. For the procedure: four 8 mm robotic ports, one 12 mm assist port and one 5 mm assist port were used.

Results:

The operative time was 480 minutes. The estimated blood loss was 450 ml. Operative findings included a pancreatic mass involving two areas of the Portal Vein (PV) and SMV. A 6 by 1 cm section of proximal vein beginning at the confluence of the two branches of SMV required a vein patch. There was an additional more distal 2 by 1 cm section that was resected and closed primarily. Final pathologic stage was pT3N2. Follow up period of 6 weeks has been uneventful.

Conclusion:

We have demonstrated feasibility of using robotic technology for Whipple procedure with increased complexity due to PV and SMV involvement.

Abstract Categories

Pancreas

Prospective Evaluation of Da Vinci SP Robotic Surgery in Gynecologic Procedures

Dr. Vinita Popat, Dr. Ernest Han, Dr. Mihae Song, Dr. Thanh Dellinger, Dr. Mehdi Kebria

City of Hope National Medical Center, Duarte, USA

Abstract

Background: Currently, the Da Vinci Single-Port (SP) robotic system is FDA approved for use in urology, otolaryngology, thoracoscopic, and colorectal procedures.

Prospective data in gynecologic surgery is lacking. We hypothesized that gynecologic surgery performed with the Da Vinci SP platform is feasible and safe.

Methods: We conducted a prospective IRB approved study at a single academic center to evaluate the Da Vinci SP robotic system in gynecologic surgery. Eligible patients undergoing robotic gynecologic procedures were enrolled. The primary endpoint was feasibility, defined as the rate of conversion to multi-port robotic, laparoscopic, or open surgery. Secondary endpoints included intraoperative and postoperative complication rates and total operative time. Patients were evaluated preoperatively, intraoperatively, and for 30 days postoperatively.

Results: Eighteen patients were enrolled over a 1.5-year period. Procedures performed included total hysterectomy with bilateral salpingo-oophorectomy (BSO) (n=13), BSO alone (n=4), and ovarian cystectomy (n=1). Surgical indications were predominantly benign, though four patients underwent surgery for cervical dysplasia. Only one patient had a history of prior abdominal surgery. All procedures (18/18; 100%) were successfully completed using the Da Vinci SP system without conversion to an alternative surgical approach. One case required the placement of an additional port to facilitate initial adhesiolysis. No intraoperative or postoperative complications occurred. Median operative time was 164 minutes (range, 65–395), and median blood loss was 12.5 mL (range, 0–40). Most patients (14/18; 77%) were discharged same day; the remainder went home on postoperative day 1.

Conclusions: Preliminary results from this prospective study demonstrate that gynecologic surgery with the Da Vinci SP system is feasible and safe, with no conversions or perioperative complications in this initial cohort. Operative times were comparable to those reported for standard multi-port robotic surgery. Further studies with larger patient populations are warranted.

Abstract Categories

Single Port / Single site

Single-port transthoracic lobectomy on the da Vinci SP platform: early clinical experience.

Dr. Alberto Antonicelli^{1,2,3,4}, Dr. Pierluigi Novellis¹, Dr. Piergiorgio Muriana¹, Dr. Stefano Viscardi¹, Dr. Carlo Di Giovannantonio^{1,4}, Dr. Francesca Misceo^{1,4}, Karesly Corona⁵, Prof. Giulia Veronesi^{1,4}

¹Ospedale San Raffaele, Milan, Italy. ²David Geffen School of Medicine at UCLA, Los Angeles, USA. ³UCLA Jonsson Comprehensive Cancer Center, Los Angeles, USA. ⁴Vita-Salute San Raffaele University, Milan, Italy. ⁵University of California Los Angeles, Los Angeles, USA

Abstract

Background: Minimally invasive thoracic surgery continues to evolve, spanning multiport and uniport video-assisted approaches to computer-assisted (robotic) platforms. The da Vinci Single-Port system enables single-incision access with multi-jointed instruments. Fully 'wristed' and elbowed arms provide near-360° range of motion within the operative field, enhancing technical dexterity and surgeon ergonomics. An articulated scope provides a specialized "cobra" mode, expanding three-dimensional, high-definition visualization. Leveraging these capabilities, we sought to implement our robotic surgery program and recently performed our first single-port right upper lobectomy for early-stage lung cancer (video).

Methods (Surgical Technique): Paravertebral block at the T8 level was administered for perioperative analgesia. Trans-thoracic access was obtained via a 6th intercostal space incision along the anterior axillary line. One access port kit accommodated all robotic instruments as well as handheld manual staplers. An anterior fissure-less approach was followed for lobar dissection.

Results: Total operative time was 207 minutes, including wedge resection and frozen section for diagnosis. No intraoperative complications occurred. The operative field moved cohesively as a single unit, with internal elbow deployment allowing the instruments to assume a diamond configuration that eliminated external collisions. Holographic guidance provided real-time feedback on instrument positioning within the working space, enhancing procedural precision. The patient's length of stay was four days. There was no change in EORTC QLC-C30 and LC13 scores postoperatively. Final histopathology confirmed a stage IA2 lung adenocarcinoma.

Conclusions: Compared with our experience using the da Vinci Xi multi-port system (four-port approach), single-port transthoracic lobectomy with the da Vinci SP system demonstrates technical feasibility and safety. Reduced incision-related morbidity is anticipated. The recent introduction of wristed robotic staplers may further streamline this approach. Stepwise adaptation of established robotic workflows can facilitate widespread adoption. Prospective data collection is underway to characterize clinical benefits, learning curves, and long-term functional outcomes.

Abstract Categories

Single Port / Single site

Idle Console Time as a Marker of Teaching and Workflow in Robotic Acute Care Surgery

Dr Jeffrey Glaser, Dr Audra York, Dr Michael Mazzei, Dr Rovinder Sandhu

Lehigh Valley Health Network, Allentown, USA

Abstract

Background

The introduction of robotics into acute care surgery has provided new opportunities for both surgeons and trainees. While resident console time has been studied as a measure of engagement, idle console time—periods during which instruments are docked but not actively manipulated—may provide additional insights into teaching and workflow dynamics. We sought to quantify idle console time in robotic acute care surgery and determine its relationship with trainee involvement and surgeon experience.

Methods

A retrospective review of robotic acute care surgery procedures performed from January 2024 to August 2025 was conducted. Data were extracted from the Intuitive Surgical analytics platform and included total console time, active instrument time, and idle console time. Cases were stratified by resident participation (>75% resident active console time vs <75%) and by quartile of program implementation to assess temporal trends. Idle console time was expressed as a proportion of total console time.

Results

A total of 278 robotic cases were analyzed. Overall, mean idle console time was 6.9 minutes (11.7% of total console time). Cases with high resident involvement had significantly greater idle time compared to low-involvement cases (8.3 vs 5.1 minutes, $p<0.01$). Idle time decreased over sequential quartiles of program maturity, from 14.2% of console time in early cases to 9.1% in later cases. This trend was consistent across surgeons, though the magnitude of reduction varied.

Conclusion

Idle console time is a measurable and meaningful marker of teaching and workflow in robotic acute care surgery. Resident-led cases predictably demonstrate higher idle time, consistent with intraoperative teaching and skill transfer. Over time, idle time decreases, reflecting both surgeon and trainee adaptation to the robotic platform. Tracking idle console time may provide a novel, objective metric for balancing education and efficiency as robotic training expands in acute care settings.

Abstract Categories

Surgical Simulation, Training and Credentialing

Robotic IVC leiomyosarcoma resection

Dr. Jiping Wang, Dr. Mohamad Hussain

Brigham and Women's Hospital, Boston, USA

Abstract

Background: This is a 46 year old patient experienced recurrent IVC leiomyosarcoma 2 years after initial open resection.

Hypothesis: We believe using novel retroperitoneal approach provide unique advantage to avoid previous surgical field and significantly reduce the difficulties and risk of surgery.

Result: Patient underwent IVC resection via Transabdominal Inferior Retroperitoneal Approach (TIRA) without complications. Start PO intake 1 day after surgery and went home 4 days after surgery.

Conclusion: IVC resection via TIRA is feasible and safe.

Abstract Categories

Complex Case

Fluorescence guided robotic retroperitoneal sarcoma resection

Dr. Jiping Wang

Brigham and Women's Hospital, Boston, USA

Abstract

This video illustrated a novel method to resect retroperitoneal tumor. Sorry that the voice annotated version is too large to be uploaded.

Abstract Categories

Technological Innovation

Complex Robot-Assisted Repair of a Giant Recurrent Incisional Hernia in a Post-Kidney Transplant Patient

MD Andrea Gianmario Di Santo Albini, MD Jessica Cassiani, MD Alvaro Ducas, MD Valentina Valle, MD PhD(Hon) FACS Pier Cristoforo Giulianotti

University of Illinois Chicago, Chicago, USA

Abstract

Background: Recurrent incisional hernias in renal transplant patients represent a surgical challenge due to previous mesh repair, adhesions, muscle atrophy and retraction with proximity to the transplanted organ. This is a case report of a robot-assisted repair.

Material and Methods: A 45-year-old male with history of renal transplant (2020), prior laparoscopic incisional hernia repair with mesh (2021) and laparoscopic sleeve gastrectomy (January 2025) presented with a giant (>30 cm bulge) recurrent ventral hernia containing bowel loops, some of which were incarcerated. The patient underwent robot-assisted laparoscopic ventral/lateral hernia repair with segmental small bowel resection due to chronic enteral adhesions with the previous mesh. A biological long-term absorbable mesh was placed intra-peritoneally after posterior fascia release, to facilitate the approximation of the fascial defect.

Results: The operation was completed with minimal blood loss (50 mL). Operative time was 170 minutes. Postoperative course included transient serous drainage without infection. The patient tolerated diet advancement and had regular bowel movements at discharge (POD 4). The post-operative course was uneventful.

Conclusions: Robot-assisted repair of giant recurrent ventral/lateral hernias in renal transplant patients may be an option in the hands of experienced surgeons, allowing precise adhesiolysis and mesh placement. Multidisciplinary perioperative management is crucial for optimizing outcomes.

Abstract Categories

Complex Case

Robotic Hepatic Artery Infusion Pump Placement

Dr. Ryan Lamm, Dr. Laleh Melstrom

City of Hope, Duarte, USA

Abstract

Case: An 81-year-old man diagnosed with moderately differentiated rectosigmoid adenocarcinoma metastatic to liver and lung s/p multiple lines of neoadjuvant chemotherapy with mixed response (stability in the primary and lung metastases; progression in the liver metastases) after two years presents for consideration of hepatic artery infusion pump placement. Given his age, co-morbidities, and stage of disease, robotic approach to hepatic artery infusion pump (HAIP) is offered balancing the perioperative risks and recovery with the benefit of being able to deliver intra-catheter, liver-directed chemotherapy. This video highlights the key steps to safely selecting the correct patient as well as implanting a HAIP using robotic technique.

Abstract Categories

Liver

From Multiport to Single-Port: What Changes for Pain?

Dr Nikolaos Pachos, Dr Costas Bizakis, Dr Robert Cerfolio, Dr Michael Zervos

NYU Langone Health, New York City, USA

Abstract

Background

Postoperative pain remains a major determinant of recovery after thoracic surgery. By reducing intercostal access trauma, the da Vinci Single-Port (SP) platform seems to decrease pain compared with the multiport (MP) robotic approach. Comparative clinical data are limited, but we present our early results that confirm our hypothesis.

Methods

We conducted a retrospective, matched cohort study of patients undergoing robotic thymectomy or anatomic lung resection between 2023 and 2025. SP patients (n=50) were matched 1:2 to MP patients (n=100) by procedure type and calendar quarter. Multivariable adjustment included age, BMI, ASA class, ethnicity, operative time, regional block use, and analgesia orders. Pain was assessed using the Numeric Rating Scale (0-10) in the post-anesthesia care unit (PACU), on postoperative day (POD) 1, and on POD14. In addition, we compared rescue opioid use, length of stay (LOS), and postoperative complications.

Results

Baseline demographics and operative variables were comparable between groups. Adjusted analyses showed significantly lower NRS pain scores in the SP group compared with MP: PACU (median 3 vs 5, $p<0.01$), POD1 (2 vs 3, $p<0.01$), and POD14 (1 vs 2, $p<0.05$). Rescue opioid use was also reduced in SP patients (28% vs 45%, $p<0.05$). The total number of lymph nodes removed and nodal station counts were similar across approaches, indicating comparable lymphadenectomy. LOS and complication rates did not differ significantly between groups.

Conclusions

We strongly believe that SP robotic thoracic surgery can provide a less painful recovery for patients and reduce opioid requirements, while maintaining comparable safety and perioperative outcomes. With standardized matching and multivariable adjustment, our early results suggest that SP represents an important step forward in patient-centered outcomes for robotic thoracic surgery.

Abstract Categories

Cardio-Thoracic

Quantifying the Financial Impact of Complication-Related Readmissions After Minimally Invasive Cholecystectomy

Cezanne Kooij, Jennifer Straatman, Gijs van Boxel

Department of Upper GI Surgery, Queen Alexandra Hospital, Portsmouth, United Kingdom

Abstract

(a) Background:

Cholecystectomy is one of the most frequently performed surgical procedures in Western countries, yet data on the economic burden of postoperative complications and related readmissions are limited. This study evaluates the direct hospital costs of 30-day readmissions and examines the influence of complication severity on these expenditures.

(b) Hypothesis, materials and methods:

A single-center retrospective observational cohort study was performed, including all patients who underwent elective minimally invasive cholecystectomy in 2024 and were readmitted within 30 days due to a postoperative complication. The primary endpoint was the mean total readmission cost, stratified by complication severity according to the Clavien-Dindo classification (highest grade per patient). Cost data were obtained from the hospital's financial department, based on resource utilization and billing records, and comprised expenses related to hospital stay, imaging, medication, and reoperation(s).

(c) Results:

In 2024, a total of 677 patients underwent elective minimally invasive cholecystectomy at our center, of whom 17 (2.5%) required readmission within 30 days due to postoperative complications. Mean readmission costs increased with complication severity: £2,667 (\$3,618) for Clavien-Dindo grade 2; £8,360 (\$11,341) for grade 3a; £9,673 (\$13,122) for grade 3b, and £10,985 (\$14,902) for grade 4. No readmissions occurred in patients with grade 1 complications.

(d) Conclusions:

To our knowledge, this is the first study to quantify readmission costs following minimally invasive cholecystectomy, revealing that even a relatively low-cost procedure can lead to substantial expenses when complications occur. These findings underscore the critical importance of preventing postoperative complications to optimize both patient outcomes and healthcare resource utilization.

Abstract Categories

Biliary

Anastomotic Outcomes of a Reinforced Hand-Sewn Technique in Robotic Ivor-Lewis Esophagectomy: Consecutive Series Analysis

Dr Nikolaos Pachos, Dr Michael Zervos, Dr Camille Yongue, Dr Costas Bizakis

NYU Langone Health, New York City, USA

Abstract

Background

Robotic Ivor-Lewis esophagectomy is increasingly adopted due to its minimally invasive approach and favorable outcomes. A secure and reliable anastomosis remains critical to the success of the procedure. When surgical objectives can be achieved this way, patients often experience faster recovery and better outcomes. We describe a reinforced, stapled, single-layer, thoracic anastomosis. These are our institutional outcomes using this technique.

Materials and Methods

We reviewed a consecutive series of adults undergoing robotic Ivor-Lewis esophagectomy by a two-surgeon team (January 2022-June 2025). Key steps of the procedure include: 1) Proper orientation of the gastric conduit with mediastinal pleural tacking medially and laterally. 2) Proper positioning and securing of the esophagus onto the anterior wall of the gastric conduit. 3) Robotic stapling and sewing. 4) Circumferential omental wrap, and placement of a posterior drain for daily amylase measurements. Esophagram is obtained on POD3. Variables include demographics, histology, neoadjuvant therapy, operative time, blood loss, conversions, lymph node yield, length of stay (LOS), anastomotic leak and mortality.

Results

A total of 41 patients were included with a median age of 70 years. Indications were cancer in 37 patients (31 adenocarcinoma, 6 squamous cell carcinoma) and 4 benign. 80% of the esophageal patients received neoadjuvant chemoradiotherapy. Median operative time was 242 minutes, median blood loss was 50 mL, and average lymph nodes were 22. There were no conversions, and median LOS was 4 days. No anastomotic leaks were detected by drain amylase on POD3 esophagram, and there was no 30- or 90-day mortality. Complete pathologic response was observed in 29% of cancer cases.

Conclusions

To conclude, we believe that this anastomosis is not only reproducible but can be safely performed with no leaks and no morbidity. This technique, when properly executed, is oncologically equivalent and associated with excellent short-term outcomes.

Abstract Categories

Cardio-Thoracic

Introduction of robotic SP to HPB surgery - initial experience

Professor Long R Jiao, [Joseph Davids](#)

The Royal Marsden and Cromwell Hospitals, London, United Kingdom. Imperial College, London, United Kingdom

Abstract

Background: Robotic SP has been adopted in urology over the last 12 months offering even more non-invasive operation through single incision. However, its use in general and hpb surgery remains unclear.

Methods: The first few SP hepatobiliary and pancreatic cases, surgeon's training pathway and docking time were reported. "Docking" spanned patient-cart entry to cannula engagement; "Incision" covered skin incision through port fixation. Combined and individual phase times were summarized as medians (IQR). Learning-curves were assessed with OLS slopes and CUSUM plots.

Results: A total of 25 patient underwent operation with da Vinci SP in a West London hospital in London, UK, including HPB (n=15), OG (n=5) and urology (n=2). Fifteen HPB cases were cholecystectomy (n=12), liver resection (n=2) and distal pancreatectomy with splenectomy (n=1). Median docking and incision times were 17 min (IQR 13–21) and 6 min (5–7), respectively. Docking showed a pronounced learning-curve ($\beta = -0.89$ min/case, $p = 0.004$), reaching a 7 min plateau by case 20.

The training time for hpb surgery was 21.26 hours consisting of simulator training (n=260 mins), online course and assessment (n=76 mins), wet lab (n=600 mins) and case observation (n=360 mins).

The mean console time and operative time for cholecystectomy was 26.8+/-10.4 mins and 38.9+/-16.7 mins respectively, liver resection of non anatomical resection of segments 2 and 3 (n=2) 105+/- 19.7 min and 124.5+/-6.2 mins, and distal pancreatectomy with splenectomy 130 mins and 182 mins.

There was no conversion to open without perioperative complications. The median length of stay for cholecystectomy was 1 day, liver resection 3 days and distal pancreatectomy with splenectomy 5 days.

Conclusion: The first few hepatobiliary and pancreatic resections were performed safely with Da Vinci SP after a short period of training in an experienced robotic xi operator.

Abstract Categories

Biliary

One Day, One Team, One Cure: Robotic Bronchoscopy and Same-Day Resection of a Pulmonary Nodule

Andres Fontaine Nicola, Emiliano Gabriel Manuelli Laos, Mario A. Masrur, Khaled Abdelhady

University of Illinois Chicago, Chicago, USA

Abstract

Background

Pulmonary nodules are a frequent incidental finding, and conventional diagnostic pathways often involve multiple referrals, staged biopsies, and delayed surgical treatment. This fragmented model leads to prolonged time-to-treatment, duplication of procedures, increased patient anxiety, and higher healthcare costs. Advances in robotic bronchoscopy and thoracic surgery now enable an integrated “short pathway” approach where diagnosis and resection occur in a single encounter.

Hypothesis, materials and methods

We hypothesized that the short pathway (same-day diagnosis and resection) is feasible and safe compared with the traditional long pathway (fragmented, multi-step care). In the traditional model, patients undergo sequential evaluation: referral to pulmonology, diagnostic biopsy by interventional radiology or pulmonology, pathology confirmation, and only then referral for surgery. In contrast, the short pathway integrates robotic ion bronchoscopy for diagnosis with immediate robotic resection. We present a patient with a fluorodeoxyglucose (FDG)-avid 1.4 cm lingular nodule. Ion robotic bronchoscopy with indocyanine green (ICG) marking localized the lesion, followed by robotic pulmonary resection with stapled division of the feeding artery, bronchus, and draining vein.

Results

The segment was retrieved via the assistant port and sent for frozen section pathology, which confirmed non-small cell lung cancer. Total operative time was 89 minutes with 50 ml blood loss. No intraoperative complications occurred. The patient’s hospital stay was three days, with uneventful postoperative recovery. At 18 months follow-up, the patient remained disease-free with no evidence of recurrence.

Conclusions

This case illustrates the feasibility and safety of the short pathway, integrating robotic bronchoscopy and same-day resection. Compared with the long pathway, this streamlined approach reduces delays, minimizes patient burden, and optimizes healthcare efficiency. Larger series are warranted to confirm oncologic outcomes and validate its broader applicability.

Abstract Categories

Cardio-Thoracic

Robotic Distal Splenopancreatectomy with spleno-portal confluence resection for Pancreatic Ductal Adenocarcinoma: A Case Report

Dr. Francesco Matarazzo, Dr. Giuseppe Giuliani, Dr. Francesco Guerra, Dr. Lorenzo Giacinto DeFranco, Dr.ssa MariaPia Dorma, Dr. Andrea Coratti

Misericordia Hospital, Grosseto, Italy

Abstract

Background:

Pancreatic ductal adenocarcinoma (PDAC) located in the body of the pancreas presents a surgical challenge, particularly when adjacent vascular structures are involved. Minimally invasive approaches, including robotic-assisted surgery, have emerged as feasible and safe options in selected cases.

Materials and Methods:

We report the case of a 47-year-old woman with a diagnosis of PDAC involving the pancreatic body, identified in December 2024 following an episode of epigastric pain. Imaging and endoscopic ultrasound revealed a 3 cm lesion infiltrating the splenic vein just proximal to the spleno-portal confluence, while sparing the major arterial vessels. Histology confirmed pancreatic ductal adenocarcinoma. The patient underwent neoadjuvant chemotherapy with 6 cycles of FOLFIRINOX from January to April 2025. Post-chemotherapy imaging showed stable disease with no distant metastases or significant tumor regression.

Results:

A robotic distal pancreatectomy with en bloc splenectomy was performed. The procedure included vascular resection of the involved spleno-portal confluence. No intraoperative complications were encountered, and blood loss was minimal. The patient had an uneventful postoperative course and was discharged on postoperative day 4. Histopathological examination confirmed a poorly differentiated ductal adenocarcinoma (ypT2N1), with negative resection margins (R0) with lymphovascular and perineural invasion. A total of 48 lymph nodes were harvested, 2 positive for metastasis.

Conclusions:

Robotic distal splenopancreatectomy can be a safe and effective approach in selected patients with localized pancreatic body adenocarcinoma, even in the presence of limited vascular involvement. Neoadjuvant chemotherapy allowed for disease stabilization and optimal surgical timing. Robotic assistance enabled precise dissection and vascular control, contributing to favorable oncological and postoperative outcomes.

Abstract Categories

Pancreas

Robotic Ultrasound-Guided Stapler-Free Resection of Gastric GISTs: Safety and Long-Term Outcomes

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Abstract

Background

Atypical resection without stapling devices for gastrointestinal stromal tumors (GISTs) of the stomach may maximize organ preservation without compromising oncological safety and is particularly advantageous in anatomically unfavorable sites, where. This report illustrates our technique of ultrasound-guided, organ-sparing robotic resection of gastric GISTs.

Methods

We retrospectively reviewed all consecutive patients undergoing robotic gastric GIST resection by a dedicated surgical team over a 10-year period. Perioperative outcomes and oncological results were assessed.

Results

Forty-eight patients were included. In 65% of cases, tumors arose in technically challenging locations such as the antropyloric region, posterior wall, fundus, or close to the gastroesophageal junction. All procedures were completed successfully with an organ-preserving, stapler-free technique. Median operative time was 150 minutes (range 80–260). No intraoperative complications or conversions occurred. Postoperative morbidity was <5%, with a mean hospital stay of 4 days. All patients achieved R0 resection; median tumor size was 4.7 cm (range 1–12). At a median follow-up of 36 months, disease-free survival reached 98%.

Conclusions

Robotic, ultrasound-guided, stapler-free resection of gastric GISTs is feasible, safe, and oncologically effective. The technique enables organ preservation even in anatomically unfavorable sites, while ensuring minimal morbidity and excellent long-term outcomes.

Abstract Categories

Upper GI

Robotic Approach in Recurrent Functional Pelvic Floor Disorders

Dr. Alfredo Genovese, Dr.ssa Lucia Salvischiani, Dr. Francesco Matarazzo, Dr. Giuseppe Giuliani, Dr. Francesco Guerra, Dr. Simone Berardi, Dr. Andrea Coratti

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Abstract

Background:

Recurrence of functional pelvic floor disorders following initial surgical repair remains a challenging clinical scenario, often requiring complex reoperations. Robotic-assisted surgery offers enhanced visualization and precision, facilitating safe dissection and mesh placement even in anatomically altered fields.

Materials and Methods:

We report two cases of women with recurrent pelvic floor disorders successfully managed with robotic surgery.

Case 1: A 59-year-old woman presented with a symptomatic anterior bladder prolapse and bilateral incisional hernias following previous colposacropexy and multiple minimally invasive reoperations for recurrent Pfannenstiel incisional hernias. CT imaging confirmed bilateral hernias (largest defect: 5.8 × 3.6 cm) with anterior bladder displacement and vaginal bulging. She underwent robotic repair of bilateral recurrent incisional hernias with transversus abdominis release (TAR) and anterior-lateral bladder suspension.

Case 2: A 68-year-old woman underwent robotic-assisted POP suspension and bilateral adnexectomy in April 2022 for stage III cystocele. She presented with anterior vaginal bulging without urinary or defecatory symptoms. Examination confirmed recurrent stage III cystocele with mild anterior rectocele. She was scheduled for robotic lateral suspension of pelvic organs according to the Dubuisson technique.

Results:

Both patients underwent successful robotic procedures with no intraoperative complications. The robotic approach enabled precise adhesiolysis and effective placement of mesh and suspension sutures. Postoperative courses were uneventful, with hospital discharge within 2–3 days. At follow-up, both patients reported resolution of bulging and improvement in quality of life, with no signs of recurrence or mesh-related complications.

Conclusions:

Robotic-assisted surgery is a valuable tool in the management of recurrent functional pelvic floor disorders. It allows for meticulous dissection and secure anatomical reconstruction in complex reoperative fields. These cases demonstrate the feasibility, safety, and effectiveness of robotic techniques in addressing both anatomical defects and associated pelvic organ prolapse.

Abstract Categories

Complex Case

Single-Port versus Multi-port Robotic Cholecystectomy in HPB Surgery: A Patient-Level Cohort with Repeated-Measures Pain Outcomes and Adjusted Marginal Inference

Dr Joseph Davids^{1,2}, Mr Bradley Russell^{2,1}, Prof Long Jiao^{3,2,4}

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Abstract

Background

The Da Vinci single port robotics programme in the UK recently commenced in December 2024, following regulatory approval. Single-port (SP) robotic platforms promise smaller incisions and potentially less pain than multi-port (MP) robotic approaches in hepatopancreatobiliary (HPB) surgery, but comparative patient-reported outcomes remain uncertain.

Methods

We conducted the first single-center, patient-level audit of robotic HPB cases and analyzed the **cholecystectomy subset** (n=15; SP=11, MP=4). Pain scores (0–10) were captured at 4 h, 8 h, Day 1, Day 3, and Day 7 post-op. We profiled distributional assumptions (Shapiro–Wilk, QQ, skewness/kurtosis), summarized descriptives, and used **repeated-measures** models: (i) subject fixed-effects ANOVA-style model (for global approach/time effects) and (ii) **GEE** (Gaussian, independence) for **population-averaged** adjusted marginal means and **Holm-adjusted** SP–MP contrasts. Normality was frequently violated (5/10 SP cells at different time-points, Shapiro $p < 0.05$), supporting robust/marginal inference. Methods adhered to SAMPL guidance.

Results

Average overall age was 55.2 years (SP: 55.6 years and MP: 54.4 years; n = 25 patients). Repeated-measures ANOVA (subject FE) showed a **main effect of approach** (SP vs MP, $p = 0.019$) and **time** ($p = 0.0018$), with **no approach-time interaction** ($p = 0.718$) in favor of SP. Pairwise SP–MP at each time-point did **not** remain significant after Holm adjustment, but **Cliff's δ** favored **lower pain with SP** at every time-point ($\delta \approx 0.18$ – 0.50).

Conclusions

In this pilot cholecystectomy cohort, SP robotic approach showed **consistently lower pain trends** than MP across the early post-operative period, while time-specific contrasts were underpowered after multiplicity control. Larger, multicenter studies are needed to define the clinical magnitude and durability of SP benefits in HPB practice.

Abstract Categories

Biliary

Living Donor Liver Transplantation: a case of robotic right lobe implantation in a cirrhotic patient with history of recurrent cholangitis and cholecystogastrostomy

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Abstract

Objectives. Nowadays robotic surgery has entered nearly all surgical disciplines and fully robotic liver transplants (FRLTs) represent the latest innovation in this field.

Methods. A 37-years-old female patient (BMI 25.5) donates to her 28-years-old cousin (BMI 24.6) affected by CLD secondary to Autosomal Dominant Polycystic Kidney/Liver Disease (MELD 18). She had history of recurrent cholangitis and a previous cholecystogastrostomy with LAMS stent positioning was performed.

Right lobe was chosen: GRWR was 1.21% and GW was 626 gr.

The recipient liver appeared stiff and difficult to mobilize. Recipient hepatectomy was done with Vessel Sealer device and double Maryland. The metal stent was carefully extracted and the stomach was closed with a two-layers interrupted suture. Right and left hepatic veins were divided using robotic Sureform 45mm.

Cirrhotic liver was retrieved through Pfanniessiel and the graft introduced through GelPort. The graft RHV was anastomosed end to end to recipient RHV with extension cavotomy using 5-0 GoreTex suture. Single PV was anastomosed to main PV with 6-0 GoreTex suture. Single HA was anastomosed to left HA end-to-end with 8-0 Prolene suture. Main gastric collaterals were ligated using 2-0 Vicryl and Hem-o-Lok. Single BD was anastomosed to left BD end-to-end with 7-0 PDS suture in a continuous fashion.

IOUS and flowmeter showed satisfactory graft perfusion (HA 187ml/min; PV 700ml/min).

Results. FRLTs showed encouraging results with a markedly reduced hospital stay.

Conclusion. Recipient operation lasted 680min about. The postoperative course was uneventful and the patient was discharged on postoperative day 8.

Abstract Categories

Transplant

Fully robotic assisted sVII segmentectomy for liver metastasis: importance of intraoperative us and advanced energy devices

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Abstract

Background

We present the case of a 68-year-old male who was diagnosed with S7 metastasis from low rectal adenocarcinoma in December 2021. Following neoadjuvant therapy, he achieved a complete response to the primary cancer. In June 2025, the patient was referred to our center for treatment of a 6.5×5 cm hepatic lesion (segment VII). Following a multidisciplinary evaluation, the patient was scheduled for surgical resection.

Materials and Methods

The patient underwent robotic-assisted resection of segment VII of the liver using the Da Vinci Xi system. He was positioned at a 45° tilt on his left flank. Four 8 mm robotic trocars and two 12 mm trocars were used: one for assistance and one for the Pringle manoeuvre. Table motion was used to optimize the patient's position during the procedure. Following an ultrasound scan to exclude the presence of other lesions, a transparenchymal approach was adopted on S7. Parenchymal transection was facilitated by SynchroSeal with ultrasound guidance, enabling effective and safe tissue dissection. This instrument is especially useful in complex segment resections, as it allows anatomical dissection and is also effective for hemostasis. This reduces the number of clips or sutures required and saves time. Two Pringle manoeuvres, each lasting 15 minutes, were performed.

Results

The postoperative course was uneventful and the patient was discharged on day 5 without complications. Histological result confirmed the presence of intestinal adenocarcinoma nodules with complete R0.

Conclusions

This case study demonstrates the effectiveness of a robotic approach to anatomical resection of large liver metastases in the posterior segments, made possible by the use of intraoperative ultrasound and advanced energy devices, ensuring safe and precise anatomical resection.

Abstract Categories

Liver

“Robotic Kimura spleen-preserving distal pancreatectomy for RCC metastasis: technical feasibility with a low-cost instrument strategy”

MD Nicol Ferioli, MD Ubaldo Marra, MD Lucia Salvischiani, MD Lorenzo De Franco, MD Maria Pia Federica Dorma, MD Giuseppe Giuliani, MD Francesco Guerra, MD Andrea Coratti

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Abstract

Background

Spleen-preserving distal pancreatectomy (SPDP) is indicated in cases of benign or low-grade malignant pancreatic lesions, as well as selected metastatic lesions. Spleen preservation reduces possible infective sequelae and hematologic complications. Two main techniques are described: Warshaw procedure, sacrificing splenic vessels, and Kimura procedure, preserving both splenic artery and vein. The advantages of robotic platforms support the execution of these technically demanding procedures making them feasible even without the use of expensive devices.

Material and Methods

We report the case of a 63-year-old female patient with a history of open right nephroadrenalectomy for RCC. Contrast-enhanced CT scan showed a 19 mm lesion at the pancreatic tail. Endoscopic fine-needle biopsy highlighted metastasis from RCC. After multidisciplinary discussion, the patient was scheduled for robotic SPDP with the da Vinci Xi platform. Two assistant trocars and four standard robotic ports were placed. An intraoperative ultrasonography evaluation was performed to detect the lesion. The procedure was carried out exclusively with bipolar Maryland forceps and monopolar scissors, without employing staplers or advanced energy devices.

Results

Total operative time was 210 minutes with negligible blood loss. No intraoperative complications occurred. The postoperative course was uneventful and the patient was discharged on postoperative day 4.

Conclusion

The use of the robotic platform may support safe and effective Kimura SPDP, also in a cost-effective way.

Abstract Categories

Pancreas

Robotic Bottom-up Approach with Suprapubic Access for Right and Transverse Colectomy: A Versatile Setup for Any Resection

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Abstract

Background: Accurate preoperative localization of transverse colon lesions is challenging, with the highest reported rates of discordance between endoscopic and intraoperative findings among all colonic sites. This uncertainty, combined with the wide variability of potential resections, necessitates an operative strategy adaptable to multiple scenarios without compromising efficiency or ergonomics.

Methods: We describe a systematic, fully robotic, bottom-up approach to right and transverse colon using suprapubic access and caudal-to-cranial dissection. This configuration supports seamless execution of any required resection—from formal right colectomy to extended right, transverse, splenic flexure, or subtotal colectomy—without altering patient positioning or port configuration.

Results: The technique facilitates central vascular ligation, tension-free mobilization of both flexures, and safe intracorporeal reconstruction.

Conclusions: This technique offers a versatile, oncologically sound solution for managing transverse colon lesions within a minimally invasive framework, particularly in anatomically or procedurally uncertain scenarios.

Abstract Categories

Colo-rectal

Robotic Bottom-Up p-TEP Repair of Umbilical Hernia with Rectus Diastasis Using the New Hugo™ RAS Surgical System: A Case Report

Riccardo Caruso, Emilio Vicente, Yolanda Quijano, Valentina Ferri, Eduardo Diaz Reques, Hipolito Duran, Isabel Fabra, Luis Malave, Pablo Ruiz Quijano, Alessandro Sirotti, Alessandro Broglio, Gabriel Garabote, Gianvito Varvaro, Sara Martinez Falero, Clara Briand

HM Sanchinarro, Madrid, Spain

Abstract

a) Background

Umbilical hernias associated with rectus muscle diastasis represent a challenging abdominal wall pathology. Robotic preperitoneal transabdominal endoscopic (p-TEP) repair has recently emerged as a minimally invasive option offering precise dissection and optimal mesh positioning.

(b) Hypothesis, Materials, and Methods

We hypothesized that a robotic bottom-up p-TEP approach performed with the Hugo™ RAS platform could provide safe and effective repair with enhanced recovery. A female patient with an umbilical hernia and rectus diastasis underwent robotic p-TEP. After preperitoneal dissection and hernia sac reduction, a 28 × 15 cm PVDF mesh was placed to cover the defect and the diastatic area. Operative time was 90 minutes.

(c) Results

The procedure was completed without intraoperative complications. Postoperative recovery was uneventful, and the patient was discharged 24 hours after surgery in good condition.

(d) Conclusions

Robotic bottom-up p-TEP repair using the Hugo™ RAS system proved feasible, safe, and effective. This platform enabled accurate mesh placement, minimal invasiveness, and rapid recovery, supporting its potential role in the management of complex abdominal wall defects.

Abstract Categories

Hernia

'Robotic management of cholecystitis and biliary duct stones complicated by Mirizzi's syndrome type II in a patient with patent foramen ovale (PFO).'

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Abstract

Background:

Mirizzi syndrome is considered a challenging condition to treat with a minimally invasive approach. The anatomical structure of the bile duct can be difficult to detect, which can result in injury to the common hepatic duct, leading to significant post-operative morbidity and mortality. Although laparoscopic procedures are generally considered safe for patients with PFO, there is a theoretical risk of paradoxical gas embolism. The robotic approach can be considered useful for patients who require a low level of pneumoperitoneum or a gasless procedure, as the robotic arms provide adequate traction at the abdominal wall.

Material and methods

We present the case of a 44-year-old male patient with a history of biliary colic and a patent foramen oval (PFO). Contrast-enhanced CT and MRI revealed gallbladder and main biliary duct lithiasis. Following a multidisciplinary discussion involving a cardiologist and an anesthetist, the patient was scheduled for a robotic cholecystectomy involving exploration of the biliary duct using the da Vinci Xi platform and a gasless procedure. One assistant trocar and four standard robotic ports were placed. During the dissection of the Calot triangle, a Mirizzi type II was diagnosed. A cholecystectomy with exploration of the biliary tract was then performed using a Fogarty catheter and with the aid of intraoperative ultrasonography, indocyanine green and cholangioscopy. The pneumoperitoneum was established at 5 mmHg for a brief moment only during the procedure. A Kehr catheter was left in the main biliary tract.

Results

Total operative time was 230 minutes with negligible blood loss. No intraoperative complications occurred. The postoperative course was uneventful, and the patient was discharged on the third postoperative day.

Conclusions

The robotic platform can support these complex procedures in a gasless manner, allowing minimally invasive procedures in cases of Mirizzi syndrome associated with choledocolithiasis.

Abstract Categories

Biliary

EMERGENT SPLENIC FLEXURE RESECTION FOR LOCALLY ADVANCED COLONIC CANCER WITH SEALED-OFF ABDOMINAL WALL PERFORATION

Doctor Laura Benuzzi, Professor Giampaolo Formisano, Doctor Bianca Colangelo, Doctor Riccardo Masserano, Doctor Simona Giuratrabocchetta, Doctor Ada Salaj, Professor Paolo Pietro Bianchi

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Abstract

Background

The role of robotic-assisted surgery in urgent abdominal conditions remains limited compared to its established use in elective colorectal procedures. Robotic technology offers advantages of precision, visualization, and minimally invasive access, which may prove beneficial in complex urgent cases. This video presents the case of robotic colon resection for transverse colon perforation with fistulization to the anterior abdominal wall.

Materials and Methods

A 55-year-old female with no significant past medical history presented to the emergency department with constipation, abdominal pain, a palpable mass in the left flank, and high inflammatory laboratory tests. Contrast-enhanced computed tomography revealed transverse colon wall thickening and a 35 × 60 × 50 mm collection within the left rectus abdominis muscle, suggestive of fistulization. Antibiotic therapy was initiated, followed by urgent robotic-assisted colon resection.

Results Intraoperatively, a transverse colon perforation with fistulization to the left rectus abdominis muscle was confirmed. The abscess cavity was drained and sampled for microbiological culture. The diseased colonic segment was resected, with vascular pedicles sectioned at their origin. An intracorporeal side-to-side anisoperistaltic colo-colic anastomosis was performed using robotic stapling and reinforced with a double-layer braided absorbable suture. The specimen was extracted through a Pfannenstiel suprapubic incision. Two drains were positioned: one peri-anastomotic and one within the abdominal wall. Postoperatively, recovery was uneventful, with resumption of bowel function and discharge on postoperative day six. Histopathology revealed moderately differentiated adenocarcinoma (G2) with free resection margins, 0/30 lymph nodes involved, and MSI-high status. According to AJCC 8th edition, the stage was pT3N0M0. The multidisciplinary tumor board recommended oncological follow-up without adjuvant treatment.

Conclusions This case demonstrates the feasibility of robotic-assisted colon resection in an urgent setting, achieving precise dissection, safe resection, and favorable recovery. Robotic surgery may represent a valuable option for selected urgent colorectal cases while ensuring adherence to oncological principles.

Abstract Categories

Colo-rectal

Robotic Total Gastrectomy with “π”- shaped Esophago-jejunal Anastomosis

Dr. Ryan Lamm, Dr. Aaron Lewis

City of Hope, Duarte, USA

Abstract

This video shows the case of a 60 year old male with biopsy-confirmed cT3N2M0 gastric adenocarcinoma along the lesser curvature near the GE junction. He received neoadjuvant chemotherapy and was taken to the operating room for a robotic total gastrectomy with a “π”- shaped esophago-jejunal anastomosis.

Abstract Categories

Upper GI

Advanced Tele-robotic surgery for combat casualty care

MD, FACS Francesco Bianco, MD Alvaro Ducas, MD Andrea Gianmario Di Santo Albini, MD, PhD (Hon), FACS Pier Cristoforo Giulianotti, MD, FACS Enrico Benedetti, MD, FACS Steve Bartlett

University of Illinois at Chicago, Chicago, USA

Abstract

Background: Remote surgery was initially envisioned to support battlefield medicine by bridging distance and expertise. With advances in robotics and secure networks, the feasibility of conducting complex procedures from remote sites is being re-evaluated for combat casualty care.

Materials and Methods: A remote robotic-assisted surgical procedure was conducted between the University of Illinois at Chicago (UIC) and Walter Reed National Military Medical Center. The study assessed network performance (latency, jitter, packet loss) alongside surgeon workload using the SURG-TLX instrument.

Results: The procedure was completed successfully, demonstrating the capability of tele-robotic surgery under controlled conditions. Network performance remained within thresholds considered acceptable for safe surgical manipulation. SURG-TLX scores indicated [placeholder: e.g., moderate workload with minimal impact from network variability].

Conclusions: This pilot experiment demonstrates the feasibility of advanced tele-robotic surgery across military and civilian institutions. The findings establish baseline performance data for future experiments that aim to extend surgical telepresence to high-demand environments, including naval aircraft carriers. This represents an important step toward enabling combat casualty care where timely surgical intervention is critical.

Abstract Categories

Telesurgery/Remote Surgery

Single-Port Robotic Surgery in Acute Care: Early Experience with the da Vinci SP Platform

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Abstract

Background: Single-port robotic platforms are emerging as valuable tools in minimally invasive surgery, providing enhanced dexterity and precision while reducing surgical trauma. Although widely adopted in elective procedures, evidence regarding their application in acute care settings remains limited. We report our initial institutional experience using the da Vinci SP system for urgent and emergent general surgical procedures, focusing on feasibility, safety, and perioperative outcomes.

Materials and Methods: A retrospective analysis was conducted on 53 consecutive patients who underwent single-port robotic acute care surgery between July 2019 and June 2025. Procedures included cholecystectomy (n=49), inguinal hernia repair (n=1), and appendectomy (n=3). Of these, 48 operations were performed in the main OR and 5 in the Specialty Care Building outpatient facility of UI Health. Patient demographics included 22 males and 31 females. Clinical endpoints were conversion rate, perioperative complications, readmission, length of stay (LOS), incisional hernia occurrence, and follow-up outcomes.

Results: All 53 cases were completed robotically using the da Vinci SP system, with a conversion rate of 0%. Average LOS was 1.4 days (range 0–6). One patient (1.9%) required readmission after robotic cholecystectomy due to choledocholithiasis, successfully managed with ERCP and sphincterotomy. There were no significant intraoperative or perioperative complications across the series. No postoperative incisional hernias were observed during a mean follow-up of 339 days.

Conclusions: Our early experience demonstrates that single-port robotic surgery with the da Vinci SP system is not only a feasible option for acute care conditions, but also a forward-looking approach that expands the boundaries of minimally invasive surgery in urgent contexts. Broader adoption and larger studies will be crucial to establish its long-term role in emergency general surgery.

Abstract Categories

Single Port / Single site

Robotic Recipient Liver Transplantation: A Systematic Review and Individual Data Meta-Analysis of Techniques, Outcomes, Perceptions, and Future Directions

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Abstract

Background: Liver transplantation, though lifesaving, is associated with high morbidity and mortality. Robotic surgery, established in other organ transplants, has emerged in liver transplantation to address these challenges. With enhanced precision, dexterity, and minimally invasive access, robotic liver transplantation (RLT) aims to reduce surgical trauma and improve recovery. This systematic review evaluates the feasibility, outcomes, and future direction of RLT in both deceased donor (DDLT) and living donor liver transplantation (LDLT).

Methods: A literature search was conducted using PubMed, Google Scholar, and Cochrane Library up to March 2025. Studies reporting on robotic RLT in humans were included, while animal, cadaver, and simulation studies were excluded. Outcomes included perioperative characteristics, complications, graft, recipient survival, compared with open approaches.

Results: Ten studies (64 unique cases) were included, with 89.1% involving LDLT. RLT had longer operation and warm ischemia times but significantly reduced blood loss, transfusion requirements, and infection rates compared to open. Major complications occurred in 20.3% of cases, primarily bile leaks and bleeding. Challenges included prolonged ischemia times, high costs, and a steep learning curve. RLT demonstrated feasibility, with no in-hospital mortality and 100% 6-month recipient survival. Graft survival was 96.9%, with two failures due to vascular complications.

Conclusion: Robotic liver transplantation is feasible and associated with reduced surgical trauma and favorable short-term outcomes. Its adoption is limited by technical challenges, costs, and the need for long-term data. Future research should focus on standardized protocols, cost reduction, and integration with emerging technologies to optimize outcomes and expand accessibility.

Abstract Categories

Transplant

Global Outcomes of Open versus Laparoscopic versus Robotic Donor Hepatectomy: A Prospective Study from the International LDLT Registry (LDLTregistry.org)

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Abstract

Background: Living Donor Liver Transplantation (LDLT) is a critical solution to the global organ shortage. Comparisons of donor short-term outcomes according to the surgical approach are limited to few single-center retrospective studies. This study aimed to evaluate the short-term outcomes of open, laparoscopic, and robotic surgical approaches to living donor hepatectomy using data from the prospective International Living Donor Liver Transplantation Registry (LDLTregistry.org).

Methods: Data from 2,600 living donors undergoing hepatectomy were prospectively collected from September 2023 to February 2025. Donors were grouped into open (1,726, 66.4%), laparoscopic (242, 9.3%), and robotic (632, 24.3%) approaches.

Results: The mean donor age was 33 (SD 9.4) years, with 45% female and a mean BMI of 24.7 kg/m² (SD 6.5). Conversion rates were 15.3% for laparoscopic and 5.1% for robotic approaches (OR 0.30, 95% CI 0.17-0.50, $p < 0.001$). Robotic hepatectomy was associated with the lowest intraoperative blood loss (70 ml, IQR 50-100), lowest pain scores on postoperative day 1 (VAS 2.3, SD 1.9), and shortest hospital stay (4 days, IQR 3-5). Robotic hepatectomy was associated with the lowest overall (Grade $\geq$ 1) (4.6%) and major (Grade $\geq$ 3a) (0.3%) complication rates compared to laparoscopic (16.5% overall, 3.7% major) and open (10.4% overall, 1.9% major) approaches ($p < 0.001$).

Conclusion: This is the first global study to show evidence that robotic living donor hepatectomy offers superior short-term outcomes compared to laparoscopic and open approaches. While open surgery remains the most common approach, robotic techniques show promise for improving donor safety and recovery.

Abstract Categories

Transplant

First Spanish Experience of Inguinoscrotal Hernia Repair Using the Da Vinci Single Port Robotic System

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Abstract

Background

The Da Vinci Single Port (SP) robotic platform represents the latest advance in minimally invasive surgery, allowing complex procedures to be performed entirely through a single incision. Its application in inguinal hernia repair, particularly in challenging inguinoscrotal cases, remains limited and scarcely reported in Europe.

Hypothesis, Materials, and Methods

We hypothesized that the Da Vinci SP system is a safe and feasible approach for complex inguinal hernia repair, combining the benefits of robotic precision with the advantages of single-incision surgery. We present the first case in Spain of a unilateral left transabdominal preperitoneal (TAPP) repair for a large inguinoscrotal hernia (S1) in a 67-year-old patient without comorbidities, who also presented with a concomitant umbilical hernia. The procedure was carried out entirely through a single transperitoneal incision using the Da Vinci SP robotic system.

Results

The surgery was successfully completed without intraoperative complications. The single-port system enabled precise dissection and mesh placement with optimal three-dimensional visualization and ergonomics, while minimizing abdominal wall trauma. Postoperative recovery was uneventful, with early mobilization, minimal pain, and satisfactory cosmetic outcomes.

Conclusions

This case demonstrates the feasibility and safety of single-incision robotic TAPP repair with the Da Vinci SP platform for complex inguinal hernias. The system offers potential advantages in terms of reduced invasiveness, faster recovery, and improved cosmesis. Further studies and larger case series are required to validate its role in the management of inguinal and inguinoscrotal hernias

Abstract Categories

Hernia

First 100 General Surgery Cases with the Hugo™ Robotic-Assisted Surgery (RAS) System: A Single-Center Experience in Spain

MD Riccardo Caruso, MD Yolanda Quijano, MD Hipolito Duran, MD Eduardo Diaz, MD Isabel Fabra, MD Luis Malave, MD Pablo Ruiz, MD Valentina Ferri, MD Alessandro Broglio, MD Emilio Vicente

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Abstract

Abstract

Introduction

Robotic-assisted surgery (RAS) has transformed modern surgical practice by enhancing precision, dexterity, and visualization. The Hugo™ RAS system represents a new generation of modular robotic platforms designed to improve flexibility and accessibility. This study presents the first Spanish experience with Hugo™, evaluating its implementation, safety, and effectiveness across 100 general surgery interventions in a single center.

Methods

We conducted a prospective observational study of the first 100 consecutive general surgery cases performed using the Hugo™ RAS system between January 2023 and February 2025. Procedures included cholecystectomies, hernioplasties, funduplications, colectomies, and others. We collected demographic data, operative times, complications, and hospital stay lengths. All surgeries were performed by trained surgeons and informed consent was obtained from all patients.

Results

Among 100 patients, most common were hernioplasties (65%), cholecystectomies (22%), and abdominal wall repairs (14%). Average operative times: hernioplasty 120 min, cholecystectomy 132 min, colectomy up to 360 min. Morbidity was mostly minor; no major complication occurred. No mortality. Mean hospital stays: 2 days (hernioplasty), 2 days (cholecystectomy). Oncologic margins were negative in all cancer cases.

Conclusion

This first Spanish series using the Hugo™ RAS system shows it is a safe, effective and flexible platform for general surgery. Despite early-stage use, the system achieved low complication rates and acceptable operative times. Its modularity and digital integration support precise surgery and educational development. Hugo™ offers a viable option for expanding robotic surgery beyond urology and gynecology, though further comparative studies are needed to assess long-term benefits and cost-effectiveness.

Abstract Categories

Miscellanea

Launch of the International Robotic Transplant Registry – IRRegistry.org

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Abstract

Background: Robotic transplantation is growing rapidly, but much of the evidence remains single-center and variably reported. The International Robotic Transplant Registry (IRRegistry.org) is a prospective, multicenter platform to generate real-world evidence, standardize outcomes reporting, and enable global benchmarking. The registry will launch with robotic recipient liver transplantation (living and deceased donor) and expand in phases to kidney, pancreas, and other solid organs.

Methods: International, observational registry capturing consecutive eligible cases via a standardized electronic case report form (CRF). Core domains include center characteristics, recipient baseline, donor/graft characteristics, operative strategy, ischemia and phase times, and postoperative outcomes. The primary endpoint is 90-day morbidity and mortality. Secondary endpoints include in-hospital metrics, 12-month graft and patient survival, complication/rescue profiles, learning-curve analyses, and technology utilization. Each site designates a Local PI and an independent auditor for data verification. Data are de-identified and handled under GDPR/HIPAA-aligned safeguards with encrypted transfer and role-based access.

Results: Planned outputs include global feasibility and baseline characteristics for robotic recipient liver transplantation, standardized complication and rescue profiles, program-level benchmarking dashboards, and learning-curve/technology reports to inform training and adoption. Publications will follow a collaborative authorship model (registry-wide group authorship and member-led studies per ICMJE criteria).

Conclusion: IRRegistry.org provides the first comprehensive, prospective framework to evaluate robotic transplantation across organs. Beginning with liver and expanding to other solid organs (e.g., kidney, pancreas, lung, uterus, and heart), the registry aims to accelerate safe adoption, improve best practices and outcomes worldwide. Launch date: TBA soon.

Abstract Categories

New Study Proposal

Preliminary Experience with the Da Vinci Single Port (SP) Robotic System in General Surgery: First Report from Spain

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Abstract

Background

The Da Vinci Single Port (SP) robotic platform represents the most recent technological advancement in minimally invasive surgery, enabling complex procedures to be performed entirely through a single incision. While its application has been consolidated in urology, evidence in general and abdominal wall surgery is scarce, particularly in Europe.

Hypothesis, Materials, and Methods

A prospective database was maintained including all patients undergoing robotic surgery with the SP system since its implementation in February 2025 at a tertiary referral center in Spain. Demographic variables, surgical indications, intraoperative parameters, and postoperative outcomes were prospectively recorded and analyzed.

Results

Twenty patients (mean age 57.9 years; mean BMI 25.5 kg/m²; ASA I–II) underwent SP robotic procedures. Surgical indications comprised inguinal and inguinoscrotal hernia repairs, cholecystectomies, and colorectal resections. All procedures were completed through a single transperitoneal incision without conversion. Postoperative morbidity occurred in three patients (15%), none of whom required reoperation. One patient developed a postoperative incisional hernia during follow-up. No perioperative mortality was observed.

Conclusions

This study reports the first Spanish experience with the Da Vinci SP robotic system applied to general and abdominal wall surgery. Our findings confirm the technical feasibility and safety of the single-port robotic approach, even in complex surgical scenarios, with encouraging short-term clinical outcomes. Larger multicentric studies with extended follow-up are warranted to establish its definitive role in minimally invasive hernia and general surgery.

Abstract Categories

Single Port / Single site

Distal Pancreatectomy with the Da Vinci Single Port (SP) Robotic System

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Abstract

Background

The aim of this work is to present a video demonstrating the first case of distal pancreatectomy performed in Spain using the Da Vinci SP robotic system, highlighting the technical aspects and perioperative outcomes of this innovative approach.

Materials and Methods

A patient with an indication for distal pancreatectomy underwent robotic surgery with the Da Vinci SP system. A single transumbilical incision was used for port placement, and the entire dissection, vascular control, and parenchymal transection were achieved without auxiliary trocars.

Results

The procedure was completed successfully without conversion. Operative time was 185 minutes, with minimal intraoperative blood loss. The postoperative course was uneventful, with early recovery and discharge on postoperative day 5. Pathological evaluation confirmed complete resection with negative margins.

Conclusions

This case illustrates the feasibility and safety of distal pancreatectomy with the Da Vinci SP system. The single-port robotic approach may offer advantages in reducing surgical invasiveness while maintaining precision and oncological safety. The video presentation aims to contribute to the dissemination of technical knowledge regarding the application of SP technology in complex pancreatic surgery.

Abstract Categories

Single Port / Single site

Robot-assisted Nissen fundoplication using the Da Vinci® Single Port system to treat gastroesophageal reflux: first report in Spain

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Abstract

Background: Gastroesophageal reflux disease is a benign clinical condition that impacts the life of many patients. Anti-reflux surgery is the preferred option for patients in whom medical treatments prove ineffective. Laparoscopic surgery represents the standard treatment paradigm, however, with the advent of robotic assisted surgery we are witnessing a paradigm shift. The recent introduction of the Da Vinci® Single Port (SP) system (Intuitive Surgical Inc.) represents an innovative evolution, offering enhanced ergonomics and access through a single incision.

Methods: We aim to describe the first Nissen fundoplication performed with the Da Vinci® SP System in our centre. A detailed description of the platform, docking configuration, and surgical steps is provided, along with an accompanying procedural video.

Results: The procedure was performed without conversion with a single midline incision and an assistant trochanter. No intraoperative complications occurred, and the robotic system functioned optimally throughout. Docking time was 2 minutes and total operative time was 95 minutes. The patient resumed oral intake on the first postoperative day and was discharged on postoperative day three.

Conclusions: This case confirms the safety and feasibility of robot-assisted Nissen fundoplication using the Da Vinci® SP System. The ergonomics and single-port access of the platform offer specific advantages in upper gastrointestinal surgery, potentially expanding the applications of robotic-assisted surgery in general surgery.

Abstract Categories

Single Port / Single site

Single-port subxiphoid radical thymectomy on the da Vinci SP platform: early clinical experience.

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Abstract

Background: Minimally invasive thoracic surgery continues to evolve, spanning multiport and uniport video-assisted approaches to computer-assisted (robotic) platforms. The da Vinci Single-Port system enables single-incision access with multi-jointed instruments. Fully 'wristed' and elbowed arms provide near-360° range of motion within the patient, enhancing dexterity and surgeon ergonomics. An articulated scope provides a specialized "cobra" mode, potentially expanding 3DHD visualization. Leveraging these capabilities, we sought to implement our robotic surgery program and recently performed our first single-port subxiphoid radical thymectomy for a well-defined anterior mediastinal lesion (video).

Methods (Surgical Technique): A xiphoid-sparing, vertical incision was made below the xiphoid process. A floating, docked access port kit accommodated all instruments. Carbon dioxide insufflation was maintained at 8-10 mmHg. Adequate retrosternal working space was developed, gaining full instrument articulation and eventual use of all three robotic arms. Complete phrenic-to-phrenic en bloc thymectomy was performed using bipolar energy. The incision was infiltrated with short- and long-acting anesthetics for perioperative analgesia.

Results: Total operative time was 143 minutes. No intraoperative complications occurred. The operative field moved cohesively as a single unit, with internal elbow deployment enabling a diamond configuration that prevented external collisions. Creation of the retrosternal tunnel required sequential adjustments and initial use of only two arms. The camera was maintained in linear mode. Holographic guidance provided real-time feedback on instrument positioning, enhancing precision. The patient was discharged on postoperative day two. Pain was minimal at discharge and at 30 days (NRS 1-2).

Conclusions: Compared with our experience using the da Vinci-Xi multi-port system (three-port), subxiphoid thymectomy with the da Vinci-SP demonstrates technical feasibility and safety. This approach provides an optimal central view of the mediastinum and easy control of both phrenic nerves, thereby enhancing radical dissection. Reduced incision-related morbidity is anticipated. Prospective data collection is underway to characterize learning curves and clinical outcomes.

Abstract Categories

Single Port / Single site

Robotic Lymphadenectomy for Staging of Perihilar Cholangiocarcinoma Prior to Living Donor Liver Transplantation: A Video Case

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Abstract

Background: Perihilar cholangiocarcinoma (pCCA) represents ~50% of all cholangiocarcinomas and is the second most common primary hepatic malignancy. Accurate staging, including lymphadenectomy, is critical to identify candidates for liver transplantation (LT) following the Mayo protocol of neoadjuvant chemoradiation. Traditionally performed via open surgery, minimally invasive approaches may reduce morbidity while maintaining oncologic accuracy.

Methods: We present a case of a 32-year-old male with pCCA following neoadjuvant chemoradiation. Preoperative workup included MRCP, ERCP with brush cytology, and CT imaging. Robotic hepatic lymphadenectomy of the hepatic hilum was performed for staging prior to living donor liver transplantation (LDLT). Operative technique emphasized high-definition magnification for precise lymphadenectomy.

Results: The patient underwent robotic staging with excision of periportal lymph nodes, discharged on postoperative day 2 without complications. Pathology revealed no invasive adenocarcinoma. Two weeks later, the patient was listed for LT and underwent LDLT combined with pancreatoduodenectomy within 30 days. At 6 months follow-up, the patient remains disease-free. This minimally invasive approach enabled accurate staging, reduced perioperative morbidity, and optimized timing of transplantation.

Conclusion: Robotic hepatic lymphadenectomy is a safe and effective method for staging pCCA prior to LDLT, allowing precise lymph node assessment, expedited recovery, and excellent short-term outcomes. Coordination with the oncology team is essential, and in carefully selected patients meeting Mayo criteria, LT offers favorable long-term survival (1-, 3-, and 5-year survival rates: 82%, 81%, and 74%, respectively).

Abstract Categories

Transplant

HUGO™ System robotic eTEP technique for ventral hernia repair. A step by step medial bottom–up approach

MD Valentina Ferri, MD Emilio Vicente, MD Yolanda Quijano, MD Hipolito Duran, MD Eduardo Diaz, MD Isabel Fabra, MD Luis Malave, MD Pablo Ruiz, MD Gabriel Garabote, MD Sara Martinez Falero, MD Riccardo Caruso

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Abstract

Background

The extended totally extraperitoneal (eTEP) approach has gained increasing acceptance for ventral hernia repair, offering reduced morbidity and improved functional outcomes compared with intraperitoneal techniques. The introduction of the HUGO™ robotic-assisted surgery (RAS) system, with its modular and flexible design, provides new opportunities to refine abdominal wall reconstruction.

Objective

We present a video case describing a novel robotic eTEP repair for ventral hernia using the HUGO™ system through a medial bottom–up approach, with emphasis on the technical steps and docking configuration.

Case and Methods

A 78-year-old male with an incisional umbilical hernia associated with rectus diastasis underwent robotic eTEP repair using the HUGO™ system. Robotic trocars were placed in the hypogastric region following a medial bottom–up strategy. The modular design of the HUGO™ system enabled customized positioning, and single docking was sufficient.

Results

The operation lasted 180 minutes and was completed without intraoperative complications. The postoperative course was uneventful. The patient resumed oral intake on postoperative day one and was discharged after 7 days. At follow-up, satisfactory outcomes were confirmed without complications.

Conclusions

This case illustrates the feasibility of a novel robotic eTEP medial bottom–up approach for ventral hernia repair using the HUGO™ RAS system. The innovative trocar placement and docking configuration may broaden the application of robotic retromuscular hernia repair. Further studies are required to assess reproducibility, long-term outcomes, and applicability among surgeons experienced in abdominal wall reconstruction.

Abstract Categories

Hernia

Robotic Management of Lower abdominal Metastases in Recurrent Colorectal Cancer: A Video-based Case Series

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Abstract

This video-based case series presents four representative examples of the possibilities of robotic management of lower abdominal metastases in patients with recurrent colorectal cancer. Across the four cases different techniques are portrayed with progressively extensive disease, highlighting the ability to manage peritoneal and mesenteric in a minimally invasive fashion. Also shown in the video is the rationale for patient selection and select perioperative outcomes arguing for the feasibility of treating patients in this way.

Abstract Categories

Oncology

Pancreaticoduodenectomy for Mucinous Cystic Neoplasm with SMA and SMV Abutment

Dr. Yi Du, Dr. Frances McCarron

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Abstract

Background:

Pancreatic mucinous cyst neoplasms (MCNs) are benign neoplastic cystic lesions that have a 15-30% chance of malignant transformation often found incidentally on imaging. Surgical resection is recommended for treatment.

Case Report:

This patient is a 42-year-old female with no significant past medical history who presented to a community-based emergency department with abdominal pain that worsened with her menstrual cycle. She underwent computed tomography imaging showing a possible hepatic artery aneurysm. She underwent an abdominal angiogram with vascular surgery that showed no vascular abnormalities. CTA triphasic liver protocol was obtained showing a large 4cm calcified pancreatic uncinata process cystic lesion with abutment to the celiac axis, SMA, SMV/portal vein confluence. She underwent endoscope ultrasound with FNA and FNB. Her body fluid CEA was >5000 and pathology showing low grade mucinous cystic neoplasm. She underwent robotic assisted laparoscopic pancreaticoduodenectomy. Due to the abutment of the MCN to critical vascular structures this video highlights the dissection along the SMA and SMV.

The patient was admitted to the surgical intensive care unit post operatively and did well postoperatively on post-operative day 5.

Conclusion:

Robotic assisted laparoscopic pancreaticoduodenectomy can be safely performed at community-based hospitals for mucinous cystic neoplasms, even with vascular abutment.

Abstract Categories

Pancreas

Augmented Intelligence in the OR: The Clinical applications of The Intelligent Surgical Unit™ (ISU™) by Asensus

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Abstract

Background: The Intelligent Surgical Unit™ (ISU™) by Asensus represents an advancement in robotic surgery, integrating real-time Augmented Intelligence to enhance surgical performance.

Materials and Methods: The ISU™ incorporates tools like surgeon-controlled camera positioning, which include camera control based on eye-tracking or following the instruments or going to specific areas. Smart Zoom features that compensate for the variation of angles in the 30-degree scopes. 3D precise intracorporeal measurement based on Point to point and tissue contour measurements. Advanced image analytics and annotation like digital tagging, continuously collecting data from the surgical field and allowing to identify and follow anatomical landmarks.

Results: The ISU™ enables surgeons to perform procedures with enhanced accuracy, leveraging real-time data to optimize outcomes.

Conclusions: The ISU™ offers the potential for a significant step forward in surgical robotics, providing tools that could improve surgical precision and patient outcomes while helping standardize procedures with objective interpretation of the surgical field.

Abstract Categories

Technological Innovation

Complex Foregut and Bariatric Revision: Management of Failed Childhood Nissen with Hiatal Hernia and Obesity via Gastric Bypass

MD Alvaro Ducas, MD Patricia Ruiz Cota, MD, FACS, FRCS Chandra Hassan, MD, FACS
Francesco Bianco, MD, FASMBS Yevhen Pavelko

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Abstract

Background

Nissen fundoplication is performed in childhood for severe gastroesophageal reflux disease. Long-term follow-up studies have shown that a significant proportion of these patients experience recurrence of reflux, wrap failure, or hiatal hernia in adulthood. Concurrently, the increasing prevalence of obesity further complicates management, as obesity is a recognized risk factor for failure of antireflux procedures and recurrence of hiatal hernia. In such cases, Roux-en-Y gastric bypass (RYGB) is the our preferred surgical option, offering durable reflux control, hernia repair, and effective weight loss.

Materials and Methods

We present the case of a 42-year-old female with a BMI of 47.7 kg/m² and a past surgical history of childhood Nissen fundoplication. Preoperative upper gastrointestinal imaging revealed a moderate-sized sliding hiatal hernia. The patient underwent a robotic-assisted Roux-en-Y gastric bypass, which included adhesiolysis, takedown of the prior fundoplication, esophageal mobilization, hiatal hernia repair with cruroplasty, and creation of a gastric pouch with Roux-en-Y reconstruction.

Results

The described approach allowed safe reversal of the prior fundoplication, successful hernia repair, and completion of RYGB without intraoperative complications. The patient was discharged on postoperative day one. Follow-up demonstrated no complications or evidence of hernia recurrence.

Conclusions

Robotic RYGB is an effective strategy for patients with history of childhood fundoplication associated with hiatal hernia and obesity. This technique improves both symptoms and long-term outcomes. The presented case highlights key steps in managing these challenging revision scenarios.

Abstract Categories

Bariatric

Robotic Transection of Caudate Nodule and Robotic Cholecystectomy

Dr. Elif Kortan, Dr. Jimena Alaniz, Luke Atia, Dr. Jorge Almario Alvarez, Dr. Pierpaolo Di Cocco, Dr. Ivo G. Tzvetanov, Dr. Enrico Benedetti, Dr. Mario Spaggiari

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Abstract

Caudate lobe resections are among the most technically demanding liver operations due to the lobe's deep location and intimate relationship with the inferior vena cava, portal triad, and hepatic venous confluence. Variable inflow and complex venous/biliary drainage necessitate meticulous vascular control. Open caudate resections typically require large incisions, whereas minimally invasive approaches remain uncommon. Robotic surgery provides enhanced three-dimensional vision, wristed instruments, and stable retraction, facilitating precise dissections in this challenging location.

We report the case of a 65-year-old male with hepatitis C–related cirrhosis (SVR achieved, MELD 9, stage II fibrosis, moderate steatosis) and a history of peripheral vascular disease. A 2.3 cm LR-5 caudate hepatocellular carcinoma was identified after incomplete response to multiple TACE attempts. Gallbladder sludge was also noted. After multidisciplinary review, robotic caudate resection with concomitant cholecystectomy was performed.

Following port placement, an extracorporeal tourniquet was positioned for potential Pringle maneuver. Mobilization included division of falciform, round, right coronary, and triangular ligaments. The hepatocaval ligament was divided, and short hepatic veins to the IVC were controlled. A retrograde robotic cholecystectomy was performed. Robotic intraoperative ultrasound confirmed the lesion and guided transection. The caudate lobe was retracted with the fourth arm, and parenchymal transection was carried out in a layer-by-layer fashion using monopolar and bipolar energy, alternating between superior and inferior planes.

The operation was completed entirely robotically with no conversion. Estimated blood loss was 200 mL. The patient was extubated in the operating room, tolerated diet promptly, and was discharged home on postoperative day two without complications.

This case highlights the feasibility of robotic caudate resection in a cirrhotic patient. The robotic platform enabled meticulous dissection around the IVC and portal pedicle, stable long-term retraction, and precise parenchymal transection.

Abstract Categories

Liver

Robotic Repair of Iatrogenic Biliary Duct Injury with Roux-en-Y Reconstruction of the Right Duct Stump

Dr. Elif Kortan, Dr. Jimena Alaniz, Luke Atia, Dr. Jorge Almario-Alvarez, Dr. Pierpaolo Di Cocco, Dr. Ivo G. Tzvetanov, Dr. Enrico Benedetti, Dr. Mario Spaggiari

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Abstract

Bile duct injury (BDI) is a serious complication of laparoscopic cholecystectomy. While most involve the common bile duct, isolated right hepatic duct injuries are rare, difficult to diagnose, and often refractory to endoscopic or percutaneous management. Definitive bilioenteric reconstruction is required, and robotic surgery provides enhanced visualization, precise microsuturing, and the integration of indocyanine green (ICG) fluorescence for intraoperative anatomical mapping and leak detection.

We present the case of a 42-year-old female with morbid obesity (BMI 50.48 kg/m²) who underwent laparoscopic cholecystectomy for chronic cholecystitis at an outside hospital. She developed recurrent biloma and sepsis. She underwent multiple ERCP stent placements, exchanges, and percutaneous drain insertions across several admissions, but persistent intrahepatic collection and bilious drainage continued. She was ultimately referred to our center as a third opinion, nearly three years following laparoscopic cholecystectomy with an indwelling drain producing 300–400 cc/day of bile. Definitive robotic Roux-en-Y hepaticojejunostomy to the right duct stump was planned.

Robotic exploration allowed extensive adhesiolysis and identification of the right hepatic duct stump. ICG fluorescence facilitated real-time delineation of biliary anatomy and meticulous detection of the leak site, while also confirming jejunal limb perfusion. A Roux-en-Y limb was prepared and a tension-free mucosa-to-mucosa hepaticojejunostomy was completed robotically. The patient's postoperative course was uneventful: a POD4 HIDA scan showed no bile leak, and she was discharged on POD5. At one-week and six-month follow-up, she remained asymptomatic with normal liver function tests.

This case highlights the role of robotic reconstruction in isolated right hepatic duct injuries after failed nonoperative management. The use of ICG fluorescence was critical for leak localization and safe reconstruction. Robotic Roux-en-Y hepaticojejunostomy represents a valuable minimally invasive approach for complex bile duct injuries requiring definitive repair.

Abstract Categories

Biliary

Novel Minimally Invasive Hybrid Approach for Simultaneous Pancreas-Kidney Transplantation

Dr. Elif Kortan, Dr. Jimena Alaniz, Luke Atia, Dr. Jorge Almario-Alvarez, Dr. Pierpaolo Di Cocco, Dr. Ivo G. Tzvetanov, Dr. Enrico Benedetti, Dr. Mario Spaggiari

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Abstract

Robotic pancreas transplantation offers advantages of enhanced visualization, precise vascular suturing, and reduced wound morbidity. However, its role in simultaneous pancreas–kidney (SPK) transplantation is limited by technical complexity and prolonged operative times. We report the first case of a novel minimally invasive hybrid SPK technique, integrating robotic pancreas implantation with open kidney transplantation to combine the benefits of both approaches.

A 42-year-old male with type 2 diabetes mellitus, diabetic nephropathy, and stage G4 chronic kidney disease (not on dialysis) underwent hybrid SPK transplantation. Bench preparation of the pancreas included iliac Y-graft reconstruction with repair of a procurement-related laceration. The pancreas was implanted robotically through a GelPort-assisted approach. End-to-side anastomoses were created between the portal vein and external iliac vein, and between the arterial Y-graft and external iliac artery, using running 5-0 PTFE sutures. Perfusion was confirmed with indocyanine green (ICG) fluorescence and Doppler. Enteric drainage was performed with a stapled and reinforced duodenoileostomy. Following robotic undocking, the kidney was implanted through an extended hockey-stick incision in the retroperitoneal right iliac fossa using standard techniques.

Both grafts reperfused promptly with excellent flow. A small pancreatic branch required ligation, but no other intraoperative complications occurred. The patient demonstrated minimal drain output and rapid return of bowel function, facilitating early recovery. Importantly, placing the pancreas intraperitoneally and the kidney extraperitoneally created separate compartments, potentially reducing cross-complications and enabling easier graft monitoring. The patient was extubated in the operating room and transferred to the transplant ICU in stable condition.

This first description of a hybrid SPK demonstrates technical feasibility, excellent early outcomes, and potential advantages including enhanced recovery and protective compartmentalization. Hybrid SPK may represent a safe and efficient alternative for complex multi-organ transplantation, warranting further study.

Abstract Categories

Transplant

Single-Port Robotic Management of an Intraoperatively Detected Cholecystoduodenal Fistula: A Case Report

MD Yolanda Quijano, MD Eduardo Diaz, MD Hipolito Duran, MD Isabel Fabra, MD Hipolito Duran, MD Riccardo Caruso, MD Valentina Ferri, MD Luis Malave, MD Pablo Ruiz, MD Gabriel Garabote, MD Alessandro Sirotti, MD Emilio Vicente

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Abstract

Background

Cholecystoduodenal fistulas are an uncommon complication of cholelithiasis, representing 0.15–8% of cases, and are typically associated with recurrent episodes of acute cholecystitis. Clinical presentation is often nonspecific, including intermittent abdominal pain, nausea, or weight loss, and up to 10–15% may remain asymptomatic and be diagnosed incidentally. Reported complications include gastrointestinal bleeding, intestinal perforation, or cholangitis, with perioperative mortality rates as high as 13% in historical series.

Objective

We present a video case demonstrating the robotic single-port (Da Vinci SP) management of an unsuspected cholecystoduodenal fistula identified intraoperatively.

Case and Methods

A patient with a history of acute cholecystitis and a sclerotic-atrophic gallbladder was scheduled for elective robotic cholecystectomy. Intraoperatively, a cholecystoduodenal fistula not previously diagnosed was identified. Using the Da Vinci SP platform, meticulous dissection was performed, followed by complete gallbladder resection and primary closure of the duodenal defect.

Results

The procedure was completed without intraoperative complications. Postoperative recovery was uneventful, with early resumption of oral intake and discharge according to the standard pathway.

Conclusions

This case illustrates the feasibility and safety of single-port robotic surgery in the management of complex hepatobiliary conditions. The Da Vinci SP system provides enhanced precision, ergonomics, and access in restricted anatomical spaces, mitigating the risks associated with distorted anatomy and chronic inflammatory changes. Single-port robotic surgery represents a valuable tool in the treatment of rare and technically demanding scenarios such as cholecystoduodenal fistulas.

Abstract Categories

Single Port / Single site

Robotic Distal Pancreatectomy with Celiac Trunk Resection for Locally Advanced Pancreatic Adenocarcinoma

MD Emilio Vicente, MD Pablo Ruiz, MD Valentina Ferri, MD Hipolito Duran, MD Eduardo Diaz, MD Isabel Fabra, MD Luis Malave, MD Riccardo Caruso, MD Gabriel Garabote, MD Yolanda Quijano

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Abstract

Background

Pancreatic adenocarcinoma with celiac axis involvement is a technically demanding condition, often requiring vascular resection and complex dissection. Robotic surgery offers enhanced visualization and precision, potentially expanding indications in advanced pancreatic cancer.

To present a video case of robotic distal pancreatectomy with celiac axis resection following neoadjuvant therapy.

Case and Methods

A 70-year-old woman with pancreatic adenocarcinoma involving the celiac axis, treated with chemotherapy and radiotherapy, underwent robotic surgery with the Da Vinci system. Intraoperatively, tumor infiltration of the celiac trunk was confirmed and en bloc resection of the distal pancreas and celiac trunk was performed.

Results

The procedure was completed without intraoperative complications. Blood loss was minimal, and no vascular reconstruction was required. Recovery was uneventful, with early diet resumption and discharge according to an enhanced recovery protocol. Pathology confirmed pancreatic adenocarcinoma with negative margins.

Conclusions

Robotic distal pancreatectomy with celiac axis resection is feasible in selected patients after neoadjuvant therapy. The robotic platform facilitates precise vascular dissection, offering a promising approach for complex pancreatic oncologic surgery.

Abstract Categories

Pancreas

From Technique to Training: Defining US Hernia Repair Standards with the Hugo™ RAS System

MD, FACS Francesco Bianco¹, MD David Chen², MD Flavio Malcher³, MD Jacob Greenberg⁴

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Abstract

Background:

The Medtronic Hugo™ RAS system has not yet received FDA approval in the U.S. However, abundant evidence has been generated through international experience, demonstrating its feasibility and safety across a variety of procedures. In preparation for entry into the U.S. market, an effort has been undertaken to standardize surgical techniques for inguinal and ventral hernia repair and to define structured training and proctoring pathways. This initiative was conducted as part of the Enable Hernia Repair IDE study and was designed to establish reproducible operative workflows and support the safe and effective adoption of the Hugo™ RAS system for abdominal wall surgery.

Materials and Methods:

Standardized surgical techniques for inguinal and ventral hernia repair using the Hugo™ RAS system were developed across multiple centers. Key elements include defining trocar placement strategies and robotic cart setup to ensure reproducibility and efficiency. A structured training pathway was implemented, beginning with dry- and wet-lab simulation to achieve specific proficiency objectives, followed by supervised clinical exposure. Proctoring during the initial series of live inguinal and ventral hernia procedures supported safe adoption and adherence to standardized workflows, with data collected under the IDE study framework.

Results:

All procedures were completed successfully without conversion to another modality and with no intraoperative complications. The standardized techniques proved reproducible across participating centers. The structured training pathway was positively received by surgeons and facilitated safe and efficient platform adoption. Operative times suggested a fast learning curve, reflecting progressive efficiency and confidence with the system.

Conclusions:

This is the first U.S. experience standardizing hernia repair with the Hugo™ RAS system from technique to training. The IDE study results support its feasibility and safety while providing a framework for structured adoption. Standardization will be essential to broaden safe system implementation and to support the future growth of robotic surgery.

Abstract Categories

Hernia

A Prospective, Multi-center Study of the Medtronic Hugo™ Robotic-assisted Surgery System in Inguinal and Ventral Hernia Repair: Enable Hernia Repair

MD Francesco Bianco¹, MD Ajay Panchal², MD David Chen³, MD Flavio Malcher⁴, MD Clayton Petro⁵, MD Steven Hopson⁶, MD Salvatore Docimo⁷, MD Erik Wilson⁸, MD Pier Cristoforo Giulianotti¹, MD Michael Rosen⁹, MD Jeffrey Berndtson³, MD Lucas Beffa⁵, MD Chris Irwin¹⁰, MD Ruben Larue¹⁰, MD Jacob Greenberg¹¹

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Abstract

Background

Robotic-assisted surgery (RAS) is used for hernia repairs, yet competitive options for RAS systems are limited. The Enable Hernia Repair study (findings initially presented at the 2025 American Hernia Society meeting) is the first investigational device exemption (IDE) study of robotic-assisted hernia repair in the US to evaluate the safety and effectiveness of the Hugo™ RAS system.

Methods and Materials

This prospective, multicenter, single-arm, FDA-monitored IDE study examined the Hugo™ RAS system for use in inguinal and ventral hernia repair across seven US sites. The primary safety endpoint was the rate of procedure- and/or device-related surgical-site events (SSEs) through 30 days post procedure. SSEs include the following: bleeding requiring transfusion, bowel injury, bowel obstruction, cellulitis, epigastric vessel injury, hematoma or seroma requiring procedural intervention, and surgical-site infection. The primary effectiveness endpoint was the surgical success rate, defined as the procedure not being converted from the Hugo RAS system to an open or laparoscopic procedure or to another RAS system. Thirty-day overall and major complication rates (Clavien–Dindo grades ≥I and ≥III, respectively); operative time; and 30-day readmission, reoperation, and recurrence rates were also assessed. Participants will be followed for two years post procedure.

Results

From April 2024 to February 2025, 97 participants underwent inguinal hernia repair and 96 underwent ventral hernia repair. The mean (standard deviation) age and body-mass index were 57.4 (13.6) years and 28.4 (4.8) kg/m², respectively, and 78.8% (152/193) of patients were male. The surgical success rate was 100% (193/193), with no conversions. The SSE rates for the inguinal and ventral cohorts were 0% (0/97) and 2.1% (2/96), respectively.

Conclusions

This study demonstrates the safety and effectiveness of the Hugo™ RAS system for inguinal and ventral hernia repair, with all procedures successfully performed using the Hugo™ RAS system and a low rate of post-operative complications.

Abstract Categories

Hernia

Robotic vs. Laparoscopic Approaches for Pancreatic Resection After Neoadjuvant Treatment: proposal of a an International Multicenter Retrospective Study

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Abstract

Background: While minimally invasive surgery for pancreatic cancer has shown advantages, the role of the robotic platform, and particularly its potential added value compared to the standard laparoscopic approach, is not yet well-defined. This is especially true in the context of patients treated with neoadjuvant therapy, where anatomical changes induced by the treatment make the surgical intervention particularly complex. This international multicenter retrospective study aims to bridge this knowledge gap.

Hypothesis, materials, and methods: This is a comparative and retrospective study that will analyze data from multiple international centers. The primary composite outcome is a combination of postoperative morbidity (Clavien-Dindo ≥ 3), postoperative pancreatic fistula (POPF grade B/C), length of hospital stay, and 30-day mortality. Secondary outcomes include intraoperative variables (time, blood loss), pathological results (surgical margins, number of lymph nodes), and long-term survival. Propensity score matching will be applied to mitigate selection bias.

Results and conclusions: The results of this study will provide crucial evidence regarding the safety, feasibility, and oncological efficacy of robotic pancreatic resections compared to laparoscopic ones in the post-neoadjuvant setting. The data may help inform clinical practice and guide the choice of surgical approach, with the ultimate goal of optimizing patient care.

Abstract Categories

New Study Proposal

Robotic Single-Port Cholecystectomy: How I do it

MD, FASMBS Yevhen Pavelko, [MD Alvaro Ducas](#), MD Andrea Gianmario Di Santo Albini, MD, FACS Chandra Hassan, MD, FACS Francesco Bianco

University of Illinois at Chicago, Chicago, USA

Abstract

Background

Minimally invasive cholecystectomy has evolved from multiport laparoscopy to single-incision and robotic approaches. Robotic single-port cholecystectomy (SPC) offers improved dexterity compared to multiport robotic technique, better visualization, and ergonomics compared to conventional laparoscopy, while enhancing cosmetic outcomes. This presentation outlines a standardized technique for performing SPC using the robotic platform.

Materials and Methods

A 2.2 cm periumbilical incision is performed, and a single site port is placed. After docking the robot, the instruments consisting in the camera, bipolar forceps in the left arm, monopolar hook in the right arm and cadere forceps in the remaining arm are advanced through the single port. The patient is placed in the supine, reverse Trendelenburg position with a mild tilt on the left side. The gallbladder is retracted cephalad with the cadere forceps, and dissection of Calot's triangle is carried out to achieve the critical view of safety. The cystic duct and artery are divided after secure clipping, and the gallbladder is detached from the liver bed and retrieved through the umbilical incision. Technical pearls and troubleshooting strategies are emphasized.

Results

This technique provides improved exposure of Calot's triangle and allows safe dissection with enhanced precision. In our experience, single umbilical incision results in excellent cosmetic outcomes and high patient satisfaction.

Conclusions

Robotic SPC is a safe and reproducible alternative to conventional approaches, combining the cosmetic benefits of single-incision surgery with the technical advantages of robotics. The described technique offers efficiency, safety, and ergonomics that make it suitable for both routine practice and training with the ongoing development of a suprapubic incision technique.

Abstract Categories

Single Port / Single site

From chronic medication to surgical cure: Nissen fundoplication for long-standing refractory gastroesophageal reflux disease

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University of Illinois Chicago, Chicago, USA

Abstract

Background

Gastroesophageal reflux disease (GERD) that persists despite proton pump inhibitor (PPI) therapy remains a surgical challenge, particularly when diagnostic studies do not show a hiatal hernia. While Nissen fundoplication has long been the gold standard, recent literature notes a trend toward partial fundoplication, which may provide similar reflux control with lower rates of dysphagia and gas-bloat. This case highlights the continued relevance of a complete fundoplication in selected patients.

Materials and Methods

We present the case of a 47-year-old female with class III obesity (BMI 45.2 kg/m²), hypertension, and 15 years of medically refractory GERD, manifested by daily cough and reflux despite PPI use. Preoperative evaluation included upper endoscopy, which showed a normal esophagus with a Hill grade I gastroesophageal flap valve; a 96-hour Bravo pH study with a DeMeester score of 14.2, acid exposure of 2.8%, and symptom association probability of 99.5%; and an upper GI study that revealed no hiatal hernia. Given persistent symptoms with physiologic correlation, she underwent robotic Nissen fundoplication.

Results

Operative exploration confirmed absence of hiatal hernia but revealed a short intra-abdominal esophagus. Robotic dissection enabled safe mobilization of the GEJ, crural reapproximation, and creation of a 360° floppy wrap over a 52 Fr bougie. Estimated blood loss was 10 mL, operative time 113 minutes, and length of stay 2 days. There were no intraoperative complications. At 3-month follow-up, she reported resolution of nocturnal regurgitation, choking episodes, and chronic cough, and tolerated solids with only occasional transient dysphagia when eating quickly.

Conclusions

Although trends favor partial wraps due to lower dysphagia rates, this case demonstrates that Nissen fundoplication remains a highly effective option when symptoms and physiologic testing are concordant. Robotic assistance facilitated precise dissection and wrap creation, resulting in durable symptom resolution and underscoring the value of complete fundoplication in foregut surgery.

Abstract Categories

Upper GI

Management of bile duct injuries: single center perioperative and long-term outcomes

MD Alvaro Ducas, MD Jessica Cassiani, MD Valentina Valle, MD Andrea Gianmario Di Santo Albini, MD, FACS Pier Cristoforo Giulianotti

University of Illinois at Chicago, Chicago, USA

Abstract

Background:

Bile duct injury (BDI) remains a serious complication following cholecystectomy, often requiring complex management. Early referral to specialized centers and advances in minimally invasive approaches, particularly robotic surgery, may improve patient outcomes. This study describes our experience in the surgical repair of BDIs, focusing on perioperative outcomes and long-term results.

Material and Methods:

The dataset consists of 29 patients undergoing BDI repair between 2008 and 2025 for bile duct injury following cholecystectomy. Patients with associated vascular and small bowel injuries were excluded from this study. Demographics, comorbidities, injury classification, perioperative outcomes, and long-term follow-up were analyzed.

Results:

The cohort had a mean age of 48 years (75.8% female, mean BMI 30.7 kg/m²), with 86% referred from external institutions. Most injuries occurred after laparoscopic (83%) or open cholecystectomies (17%), and 75.8% underwent early repair. Strasberg E injuries accounted for 82.7% of cases. Hepaticojejunostomy (HJ) was performed in 93% (85.2% robotic, 11.1% open, 3.7% laparoscopic). Median operative time was 212 minutes, and mean hospital stay was 7 days. One patient developed deep venous thrombosis in the early postoperative period, managed successfully with anticoagulation.

At a median follow-up of 17 months, no reoperations were required. Late complications occurred in 5 patients (17%). Four experienced recurrent cholangitis due to anastomotic stricture: three were managed with endoscopic dilation via ERCP; while the fourth required biliary stenting through percutaneous transhepatic cholangiography (PTC). The additional complication included one perihepatic abscess treated with percutaneous drainage.

Conclusions:

Robot-assisted repair following bile duct injury is an emerging technique that seems to be effective in specialized centers. The microsurgical capability of the platform allows optimal reconstruction minimizing the perioperative and long-term complications. This approach allows also an early treatment of these lesions, speeding up convalescence and mitigating litigation rate.

Abstract Categories

Biliary

Single-Port Robotic Extended Totally Extraperitoneal (eTEP) Repair for Ventral and Umbilical Hernia with Rectus Diastasis: Preliminary Experience

MD Yevhen Pavelko, MD Andrea Gianmario Di Santo Albini, MD Alvaro Ducas,
MD FACS Francesco Maria Bianco

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Abstract

Extended totally extraperitoneal (eTEP) repair has emerged as a valuable minimally invasive approach for ventral and umbilical hernia repair, allowing wide retrorectus mesh placement while preserving the peritoneum. The robotic platform offers enhanced dexterity, magnified visualization, and superior ergonomics, and its single-port (SP) evolution further reduces the invasiveness of the procedure.

The patient is positioned supine with legs abducted to optimize ergonomic access. A 2.5 cm transverse suprapubic incision is made, exposing the anterior rectus sheath, followed by a small vertical opening lateral to the midline. The rectus muscle is gently retracted laterally, and the retrorectus and preperitoneal planes are developed cephalad and bilaterally. A robotic SP port is introduced and docked to the robotic system, and the working space is expanded under direct vision. The robotic camera was maintained in a central superior position, providing stable panoramic visualization. Instrument configuration included a grasper on the left and a monopolar hook on the right, while the inferior quadrant of the port was intentionally left unused to optimize ergonomics and avoid instrument collision. After complete reduction of the umbilical and ventral hernia sacs, the rectus diastasis is clearly delineated. Midline integrity is restored with a continuous non-absorbable barbed suture, reconstructing the linea alba. A lightweight, large-pore polypropylene mesh was prepared extracorporeally with marked cardinal points. After being tightly rolled, the mesh was introduced by the bedside assistant through the lateral access of the balloon port and subsequently unrolled in the retrorectus pocket, ensuring wide overlap beyond the defect margins. The implant is carefully oriented and laid without folds or tension. Following hemostasis, instruments are withdrawn, the fascia is closed with absorbable sutures, and the skin is sealed with an intradermal suture and surgical glue.

Clinical outcomes are reported and commented.

Abstract Categories

Single Port / Single site

The Robotic Console of the Future: From Telesurgery to Integrated Cockpit

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Abstract

Background

While clinical robotic surgery has advanced significantly, the ergonomic design of surgical consoles has not kept pace. Current setups, often involving basic stools, offer limited support for surgeons during long, precision-based procedures. By comparison, modern car and aircraft cockpits provide superior ergonomic environments for sustained high-concentration tasks.

Hypothesis

We propose that transforming the robotic console into an integrated, systemic working station—combining telesurgery, data processing, and mobility—can enhance ergonomics, surgeon comfort, and workflow efficiency, while laying the foundation for an eco-system of remote telesurgery.

Materials and Methods

A novel electrically driven cart was designed to function both as a robotic console and a mobile surgical cockpit. It incorporates robotic manipulators, a fold-down visor, and multiple monitors, all arranged within an ergonomically optimized, cockpit-like environment. The fully adjustable seat includes heating, massage, and customizable positioning, enabling surgeons to maintain dynamic postures. The cart can tilt to counterbalance gravity and blood flow effects, while features such as ventilation, cup holders, and fold-down armrests improve comfort. Its electric car-like drive system allows mobility within the hospital, facilitating flexible deployment. Beyond ergonomics, the platform integrates systemic functions: telesurgery, intraoperative data processing, and secure connectivity for AI support and future telesurgery applications. A full-size demonstrator was constructed to evaluate the design's potential.

Results

Preliminary evaluations suggest that the cockpit substantially improves surgeon comfort, posture, and focus. Integration of telesurgery, data handling, and mobility in a single system shows promise for cleaner workflows and enhanced adaptability.

Conclusions

The CELSUS console redefines robotic surgery as a systemic, mobile working station. By merging ergonomic optimization with integrated data and connectivity, it establishes a path toward AI-driven digital surgery and an eco-system enabling remote telesurgery.

Keywords

Robotic Surgery Console, Ergonomics, Systemic Working Station, Mobility, Telesurgery

Abstract Categories

Technological Innovation

Robotic Transit bipartition (Single anastomosis sleeve jejunostomy-SASJ)- technique & early metabolic outcomes

Dr. Jaydeep Palep

Dr. Palep's Weight Loss & Gastro Clinic &

Jaslok-Breach Candy-PD Hinduja Hospitals, Mumbai

India

Abstract

(a) Background

The robotic single-anastomosis sleeve jejunostomy (SASJ), also referred to as a transit bipartition variant or modified SAS-J bypass, is a hybrid metabolic–restrictive procedure designed to optimize weight loss and metabolic outcomes while preserving gastrointestinal continuity. It is derived conceptually from Santoro's sleeve + bipartition approach and the single-anastomosis sleeve ileal (SASI) bypass, but with a shorter biliopancreatic limb to mitigate malabsorptive complications.

(b) Hypothesis, materials, and methods

In this video, we present our technique of a robotic SASJ (daVinci™ X & Xi) with 4 arms +/- assistant port with single docking to perform both, the supracolic & infracolic compartments with a hand sewn G-J. In India, we avoid performing ileal based anastomosis to mitigate the nutritional complications (short & long term) and prefer the jejunum instead.

(c) Results

The surgical outcomes of 25 patients were analyzed up to 1 year with respect to technique, total body weight loss (TBWL), resolution of co-morbidities like Type II Diabetes Mellitus, HTN, dyslipidemia, etc and micronutrient levels were monitored.

(d) Conclusions

This technique is technically safe, replicable and has a short learning curve giving good metabolic outcomes without causing nutritional complications.

Abstract Categories

Bariatric

Robotic large splenic cyst excision

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India

Abstract

(a) Background

The robotic technique for excision of two very large splenic cysts is shown here. This was a case of a recurrent post traumatic splenic cyst formation.

(b) Hypothesis, materials, and methods

In this video, we present our technique of a robotic excision of a two very large splenic cysts (daVinci tm). 25/M with a h/o undergoing a Sleeve gastrectomy (SG) for morbid (Class 2 obesity). Following this he was involved in a road traffic accident and had a splenic contusion which was successfully treated conservatively. The patient then developed splenic cysts and he presented with acute abdomen to the ER, 8M post Sleeve Gastrectomy. On Ct scan a 9 cm x 10 cm x 6 cm postero-superior cyst and another antero- inferior cyst 6 cm x 4 cm x 4 cm were documented. The patient underwent a laparoscopic surgery for the same in his country. He remained asymptomatic for a year but returned back to the ER with the same symptoms, repeat scan showed a recurrence of the two cysts (possibly incomplete excision), patient came to our unit and was offered a robotic excision for the same.

(c) Results

Meticulous dissection, splenic mobilization and excision of the cysts was performed using the da Vinci (4 arms + 1 Asst port). Patient was discharged POD3 and on a 2 year follow up is totally asymptomatic and disease free. Total operative time was 150 min, estimated blood loss- 40 ml,

(d) Conclusions

This was a challenging case considering that it was a recurrence. The robotic technique gives a very stable operative field with a very miniscule chance of iatrogenic splenic injuries leading to minimal blood loss and early return to work.

Abstract Categories

Upper GI

Robotic Nissen fundoplication for a large paraesophageal hernia presenting with recurrent pneumonia

Dr. Jaydeep Palep

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India

Abstract

(a) Background

The robotic technique for treatment of hiatus hernias is very routine for at least 2 decades globally. The challenge is when the hernia is very large and para-esophageal. The robotic platform in this gives us an advantage.

(b) Hypothesis, materials, and methods

In this video, we present our technique of a robotic Nissen (360°) fundoplication (daVinci™). A 71 yr old lady presented with repeated hospitalizations due to pneumonias and s/s/o GERD (for 8-10 years) being managed conservatively. On extended investigations for the pneumonia, the HRCT

(thorax) and HRM showed a large Gr4 para-esophageal hernia.

(c) Results

The video demonstrates the difficulty in mediastinal dissection in such a case and how the robotic platform allows precise identification and dissection of various structures in an overcrowded mediastinum. Total operative time- 65 mins, blood loss- 35-40 ml. 4-arms + 1 asst port. No adverse events throughout the surgery.

(d) Conclusions: Robotic Nissen fundoplication especially for Gr3 and Gr4 hiatal hernias is one of the best indications for the da Vinci technology in upper GI surgeries. The wrap in an edematous stomach wall of a long standing hiatus hernia tends to go back to its original position. Mobilization of adequate intra-abdominal length of the esophagus is one of the keys to success of this procedure and the robotic technique enhances and make easy this technique.

Abstract Categories

Upper GI

Surgical Outcomes of Robotic Thyroidectomies for Thyroid Tumours: A Single Surgeon's Experience with over 100 Robotic Procedures in India

Gyan Chand¹, Kumari Madhu², Aakriti Yadav³

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2. Dr. Kumari Madhu, Assistant Professor, Department of Endocrine Surgery, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, India.
3. Dr. Aakriti Yadav, Senior Resident, Department of Endocrine Surgery, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, India.

Abstract

Introduction: Thyroid tumours are common endocrine tumours that commonly affect young women. the classical colour incision thyroidectomy leads to a scar on the neck. The introduction of remote-access thyroid surgery using robots is becoming popular.

Purposes: We report a single surgeon's experiences and surgical outcomes of Robotic Thyroidectomy cases.

Methods: This study included and analysed one hundred and twelve patients who underwent Robotic Thyroidectomies from October 2022 to March 2025. All patients were diagnosed with thyroid tumours, including solitary thyroid nodules, multinodular goitre, thyroid cancers and Graves' disease. All patients underwent Robotic Thyroidectomies via bilateral axillary and breast and transoral vestibular approaches without axillary incision. Lymph node dissections were also performed in all cases diagnosed with PTC.

Results: N=112, M;F =1:3, mean age- 35.33±13.83 years, mean duration of goitre- 29.69±38.25 months, mean TSH- 2.65±1.55 mIU/L. The commonest FNAC was BETHESDA II (52.30%), others were III (26.20%) and VI (13.80%). 68.47% via BABA & 31.53% via TORT approach. Hemithyroidectomy, Total thyroidectomy (TT), TT+CCLND and TT+CCLND+SLND were applied in 58.04%, 25.89%, 5.36% and 06.25%, respectively. Four patients also underwent total thyroidectomy, one through the transoral and three through the axillary approach. The mean specimen size was 5.61±1.63 cm, and the mean operative time was 213.89±76.99 minutes. The Mean console Time was 141.41±73.212 Min. The mean hospital stay was 4.03±1.35 days. 17.86% diagnosed with papillary thyroid cancer and 54.46% diagnosed with follicular nodular disease. Others were MNG 7.14%, Hyperplasia 2.68%, Follicular adenoma 7.14%, Follicular thyroid cancer 4.46% and MTC 0.89%. 43.48% of patients developed transient hypocalcemia after TT and neck dissection, which were managed with calcium and vitamin D. 17.12% had transient vocal cord palsy. Focal transient numbness in the Neck area was observed only in 5.41% of patients, and all patients recovered fully after surgery. Compared with BABA vs TORT, the size of the tumour and hospital stay were significantly lower in the TORT group, while the wound closure time was shorter in the BABA group.

Conclusion: Robotic Thyroidectomy is an effective and safe treatment option for thyroid tumours. It is a surgical option for patients with selected large benign and malignant thyroid tumours who do not want to have visible scars on their neck area post-thyroidectomy.

Keywords: Outcome; Robotic; Thyroidectomy; Transoral, BABA

Abstract Categories

Endocrine

Robotic Laparoscopic Lateral Heller Myotomy Without Fundoplication Versus Robotic Laparoscopic Anterior Heller Myotomy With Dor Fundoplication

A Prospective Randomized Double Blind Clinical Trial

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Farid Gharagozloo, M.D.

Center for Advanced Thoracic Surgery, University of Central Florida College of Medicine, And
 University of Arizona College of Medicine

Abstract

We sought to compare robotic laparoscopic lateral Heller myotomy without a fundoplication (RLHM) to robotic laparoscopic anterior Heller myotomy with Dor fundoplication (RAHM).

Background

It is postulated that anterior Heller myotomy results in disruption of the Gastroesophageal valve (GEV), thereby resulting in wide open reflux and requiring an antireflux procedure. We hypothesized that a myotomy lateral to the GEV would leave the valve intact and obviate the need for an antireflux procedure.

Patients and Methods:

In this prospective, randomized, double-blind, institutional review board-approved clinical trial, patients with achalasia were assigned to undergo RLHM vs. RAHM . Patients were studied via 24-hour pH study and manometry at 6 months postoperatively. Pathologic GER was defined as distal esophageal time acid exposure time greater than 4.2% per 24-hour period. The outcome variables were analyzed on an intention-to-treat basis.

Results:

Forty-eight patients were enrolled. There were no differences in the baseline characteristics between study groups. Median Postoperative dysphagia Score was 1 (range 0-1) with RLHM and 3 (range 0-4) with RAHM (P = 0.015). Pathologic GER occurred in 1 of 24 patients (4.2%) after RLHM and in 2 of 24 patients (8.3%) after RAHM. Median Acid Exposure and Demeester Scores were similar when comparing RLHM to RAHM .

Conclusions:

The results of this study indicate that RLHM results in greater relief of dysphagia while preventing GER to the same level as RAHM.

Abstract Categories

Cardio-Thoracic

Robotic Transthoracic First Rib Resection for Neurogenic Thoracic Outlet Syndrome.

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Center for Advanced Thoracic Surgery, University of Central Florida College of Medicine, Orlando, Florida USA.

Abstract

Background

Neurogenic Thoracic Outlet Syndrome accounts for over 95% of patients with TOS. We report a single institution experience with robotic first rib resection in patients with Neurogenic TOS.

Methods:

The diagnosis of NTOS was made in patients in whom all specific localizing and diagnostic orthopedic and neurologic conditions were ruled out. Preoperative diagnostic tests included a comprehensive history and physical exam, Chest X-ray, Chest CT, MRI if the cervical spine, Nerve conduction studies, and Magnetic Resonance angiography of the Thoracic outlet with arm maneuvers (MRA). Patients with NTOS who underwent robotic first rib resection with disarticulation of the costosternal joint and scalenectomy.

Results:

There were 137 patients (47 men and 90 women). Mean age was 34 ± 9.5 years. Operative time was 93 minutes ± 10.3 minutes. There were no intraoperative complications. There was no injury to the subclavian vessels during the dissection. There were no neurovascular complications. There was no 30- or 90-day mortality. Quick DASH Scores (Mean $\pm$ SEM) decreased from 60.3 ± 2.1 preoperatively to 5 ± 2.3 in the immediate postoperative period, and 3.5 ± 1.1 at 6 months. ($P < 0.01$) Immediate relief of symptoms was seen in all patients (100%). Complete relief of symptoms was seen in 133/137 (97%) of patients.

Conclusions:

Robotic resection of the medial aspect of the first rib with disarticulation of the costo-sternal joint is associated with excellent relief of neurologic symptoms in patients with Neurogenic Thoracic Outlet Syndrome.

Abstract Categories

Cardio-Thoracic