



Multidisciplinary Approaches to Cancer Symposium

Minimally Invasive Management of Pelvic Metastasis

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Disclosures

- Consultant for Stryker

This presentation and/or comments will be free of any bias toward or promotion of the above referenced companies or their product(s) and/or other business interests.

This presentation and/or comments will provide a balanced, non-promotional, and evidence-based approach to all diagnostic, therapeutic and/or research related content.

This presentation has been peer-reviewed and no conflicts were noted.

Cultural Linguistic Competency (CLC) & Implicit Bias (IB)

STATE LAW:

The California legislature has passed Assembly Bill (AB) 1195, which states that as of July 1, 2006, all Category 1 CME activities that relate to patient care must include a cultural diversity/linguistics component. It has also passed AB 241, which states that as of January 1, 2022, all continuing education courses for a physician and surgeon **must** contain curriculum that includes specified instruction in the understanding of implicit bias in medical treatment.

The cultural and linguistic competency (CLC) and implicit bias (IB) definitions reiterate how patients' diverse backgrounds may impact their access to care.

EXEMPTION:

Business and Professions Code 2190.1 exempts activities which are dedicated solely to research or other issues that do not contain a direct patient care component.

This presentation is dedicated solely to research or other issues that do not contain a direct patient care component.

Metastatic Bone Disease

- 20 million people with cancer by 2030
- 3rd most common site of metastasis (after liver and lung)
- 300-600,000 people in a given year with MBD
- 5-6% breast cancer patients present with MBD, increasing yearly
- Nearly 1/5 total cost of oncology care is from MBD
- Patients with MBD more than double their yearly treatment cost
- A skeletal related event can significantly increase costs and burden (up to 20x)
- Prophylactic surgery has been shown to decrease overall costs, decrease LOS, and increase functionality, and life expectancy vs. surgery after fracture.

DiCaprio, et al.

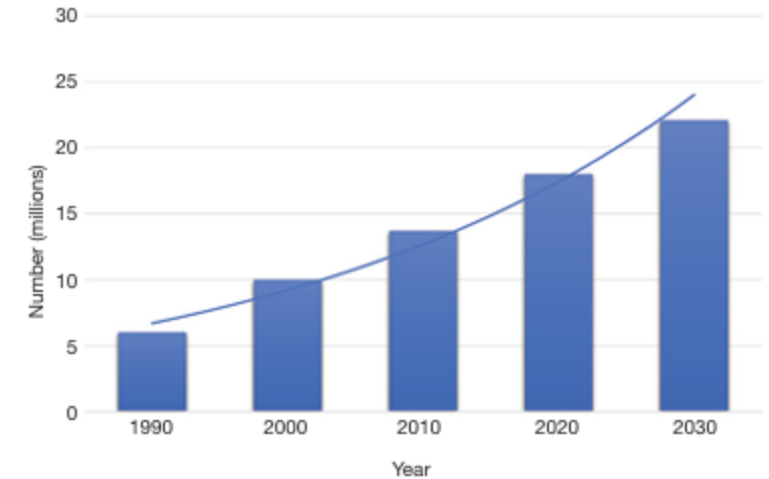


Figure 1 Cancer prevalence in the United States through the decades. Source of data: National Cancer Institute.

Table 1 Incidence of primary tumors that commonly metastasize to bone

Cancer type	Estimated number of new cases in the US, 2020	Incidence of MBD in patients with advanced disease (%)
Breast	279,100	65–75
Prostate	191,930	65–75
Lung	228,820	30–40
Renal	73,750	40
Thyroid	52,890	20–25
Bladder	81,400	60
Melanoma	100,350	14–45

MBD, metastatic bone disease.

The Problem

AXIAL

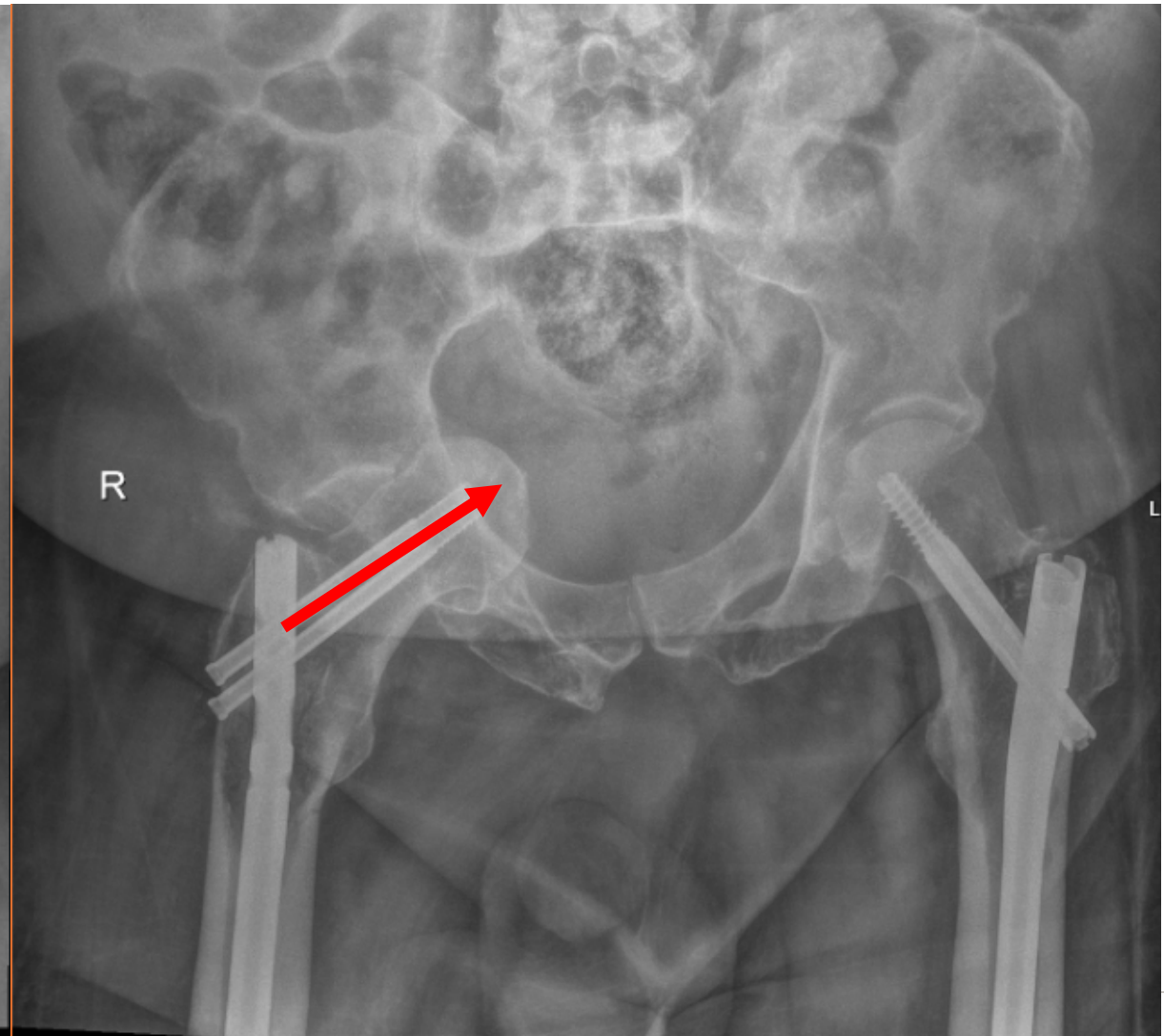


CORONAL

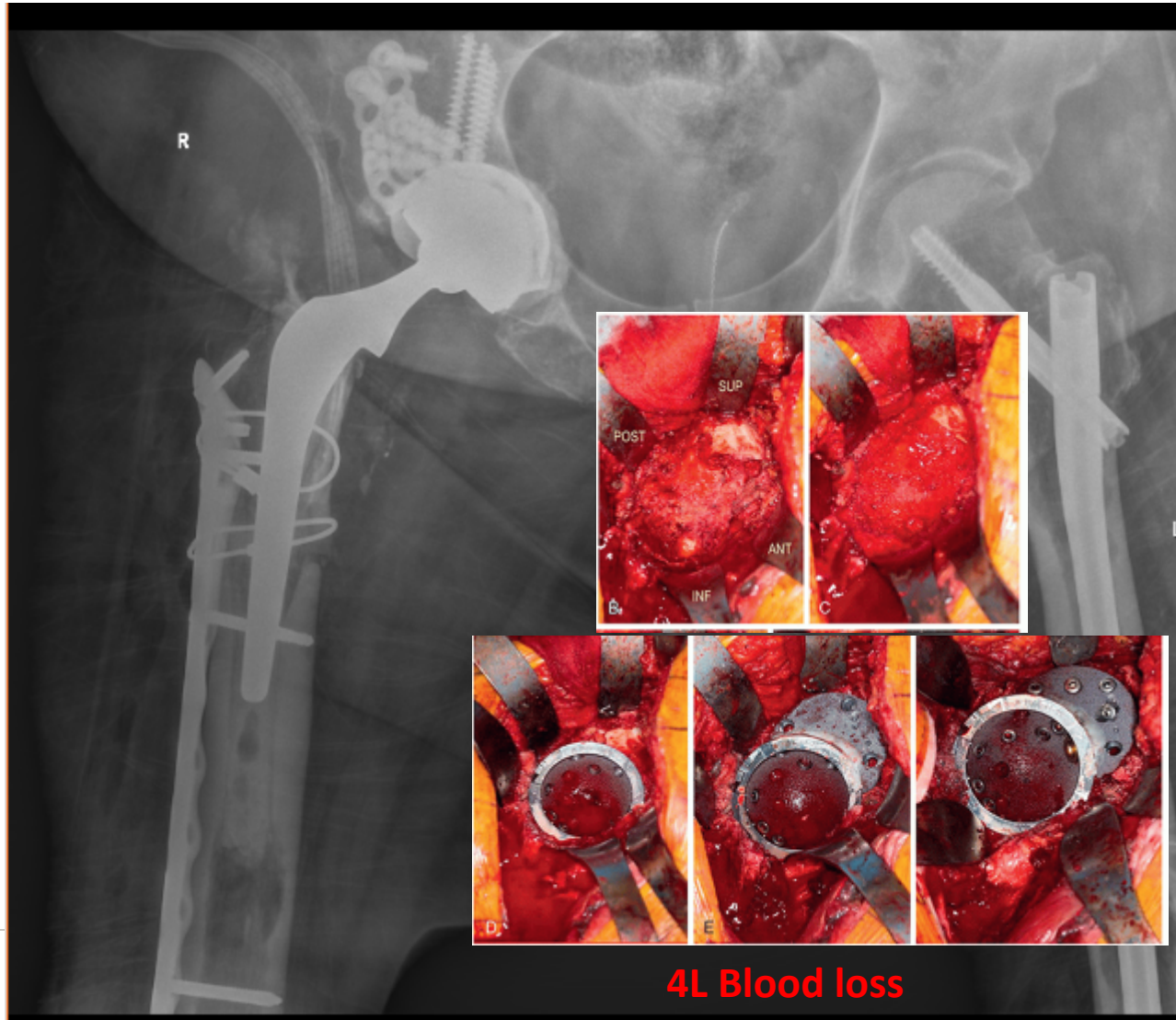


51-year-old male, new diagnosis of
multiple myeloma

Acetabular Protrusion



Cup Cage Construct



4L Blood loss



Harrington Pelvic Reconstruction



There's an easier way.



Minimally Invasive Stabilization with or without Ablation for Metastatic Periacetabular Tumors

D. Ian English, MD, MA, William B. Lea, MD, David M. King, MD, Sean M. Tutton, MD, FSIR, and John C. Neilson, MD

Investigation performed at the Division of Orthopaedic Surgery, Froedtert Hospital, Wauwatosa, and the Division of Interventional Radiology, Medical College of Wisconsin, Milwaukee Wisconsin

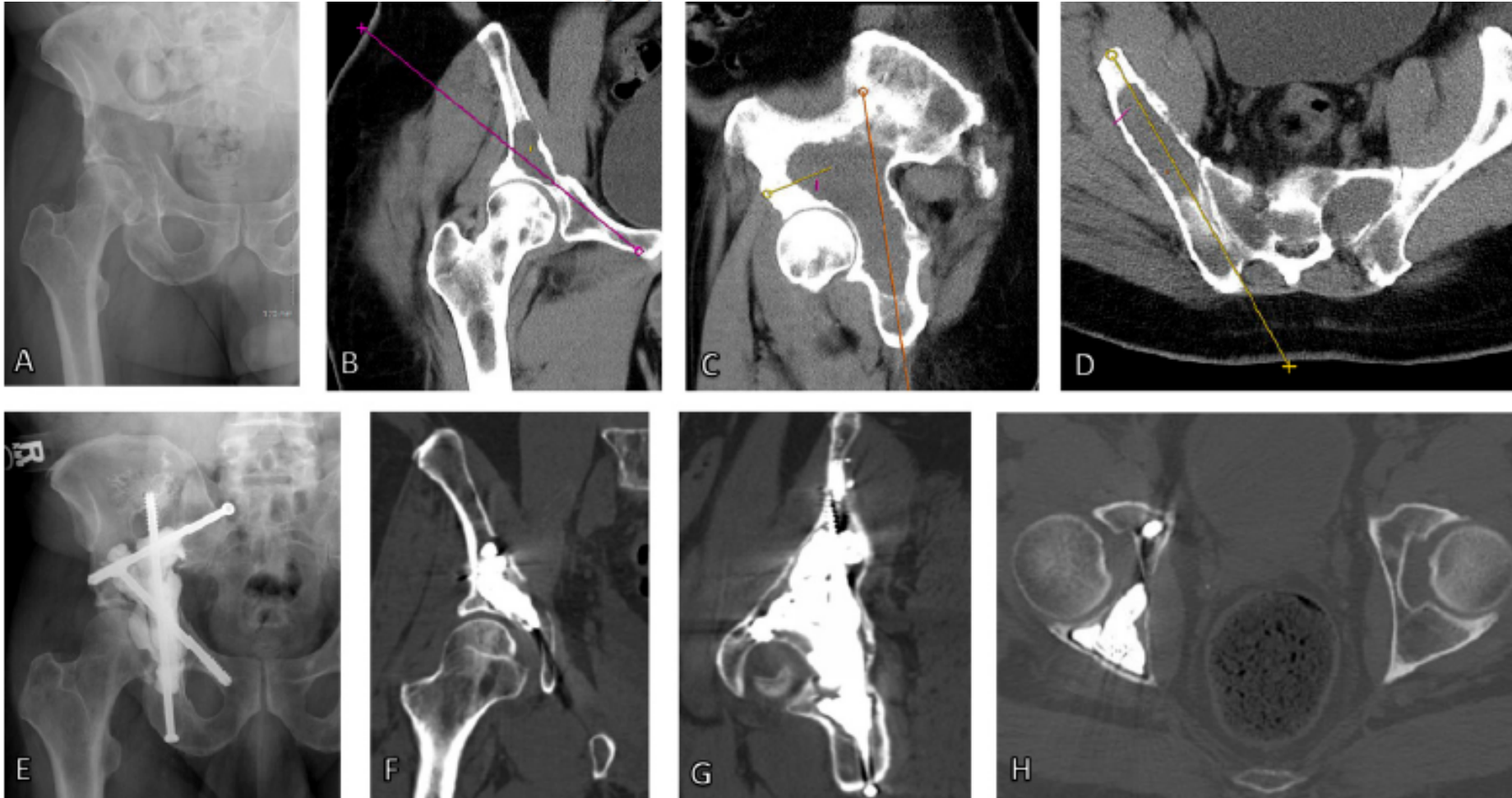


TABLE IV MSTS Scores*						
	All Patients (N = 38)			Patients without Other Surgical Treatments (N = 29)		
	Preoperative	Postoperative	P Value	Preoperative	Postoperative	P Value
Total	7.8	19.6	<0.001	7.9	19.7	<0.001
Pain	0.9	3.7	<0.001	0.8	3.5	<0.001
Emotional acceptance	1.1	4.2	<0.001	1.0	4.2	<0.001
Use of supports	1.1	2.3	<0.001	1.1	2.2	0.0014
Walking ability	1.8	3.1	<0.001	1.9	3.2	<0.001
Gait	1.5	3.2	<0.001	1.6	3.2	<0.001
Function	1.5	3.2	<0.001	1.4	3.0	<0.001
*Musculoskeletal Tumor Society Scoring system; a score of 0 to 5 is assigned in each of 6 categories, which are then combined for a maximum possible score of 30.						

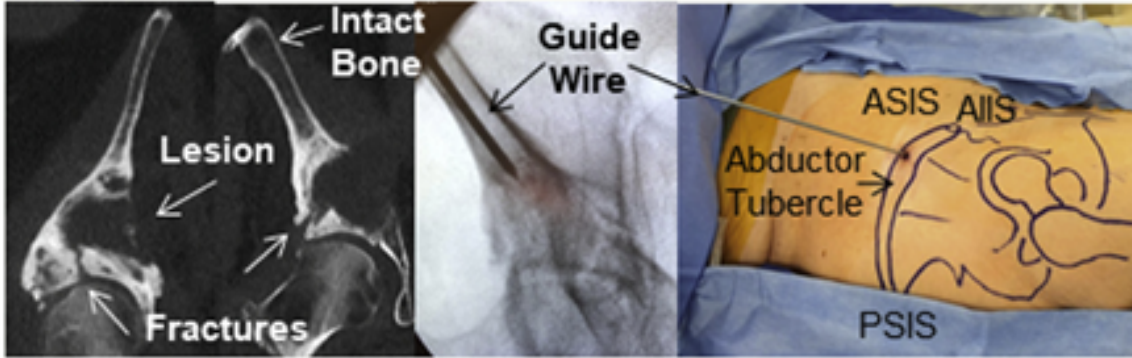
Narcotic use†

Reduced	81% (26 of 32)	87% (20 of 23)
No change	16% (5 of 32)	9% (2 of 23)
Increased	3% (1 of 32)	4% (1 of 23)

Minimally Invasive Stabilization with or without Ablation for Metastatic Periacetabular Tumors

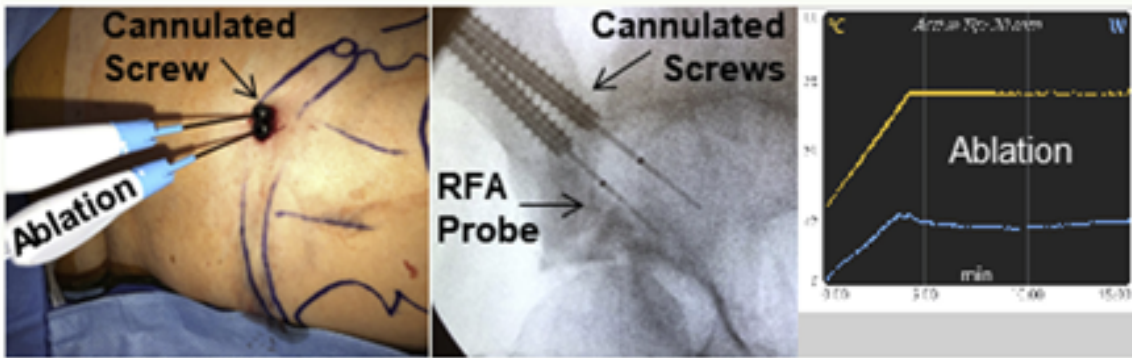
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Preparation for AORIF: Partial insertion of Cannulated Screws



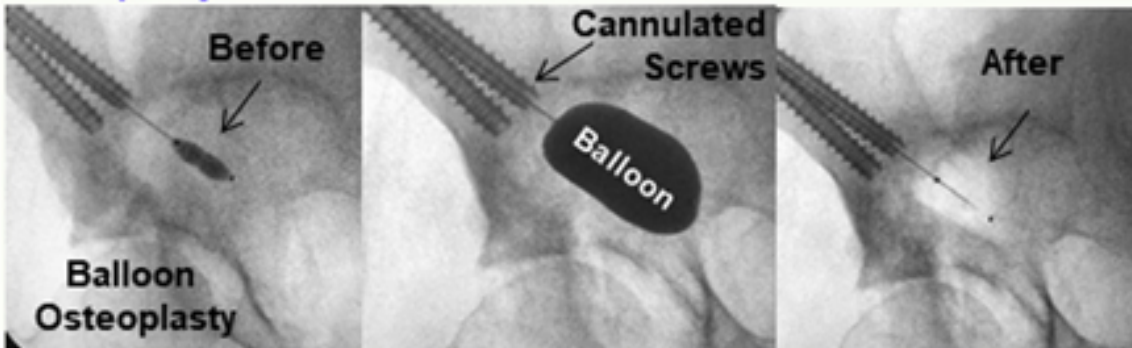
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Ablation



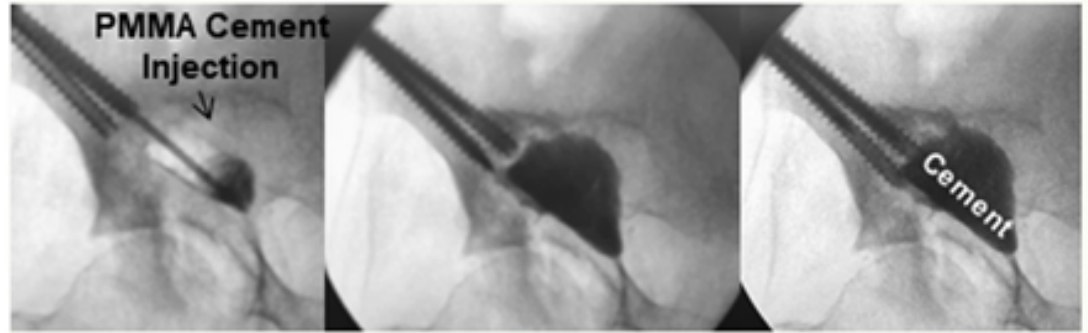
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Osteoplasty with a balloon



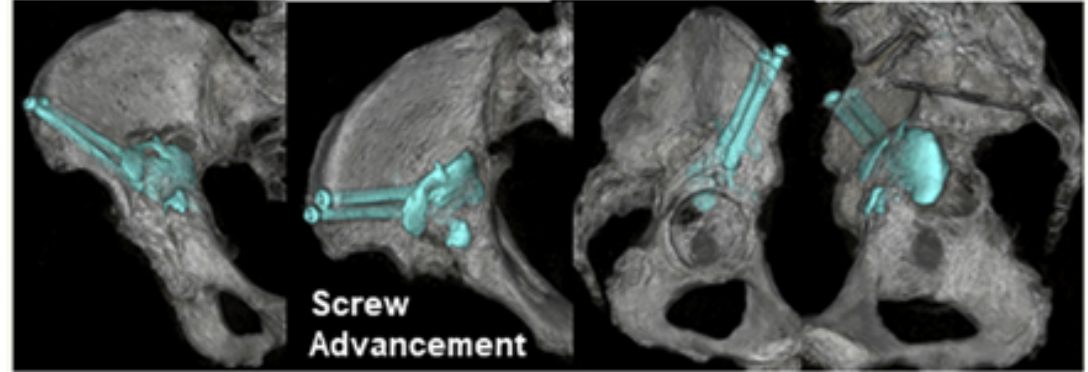
c

Reinforcement with bone cement



d

Internal Fixation



e

Minimally Invasive Image-Guided Ablation, Osteoplasty, Reinforcement, and Internal Fixation (AORIF) for Osteolytic Lesions in the Pelvis and Periarticular Regions of Weight-Bearing Bones  

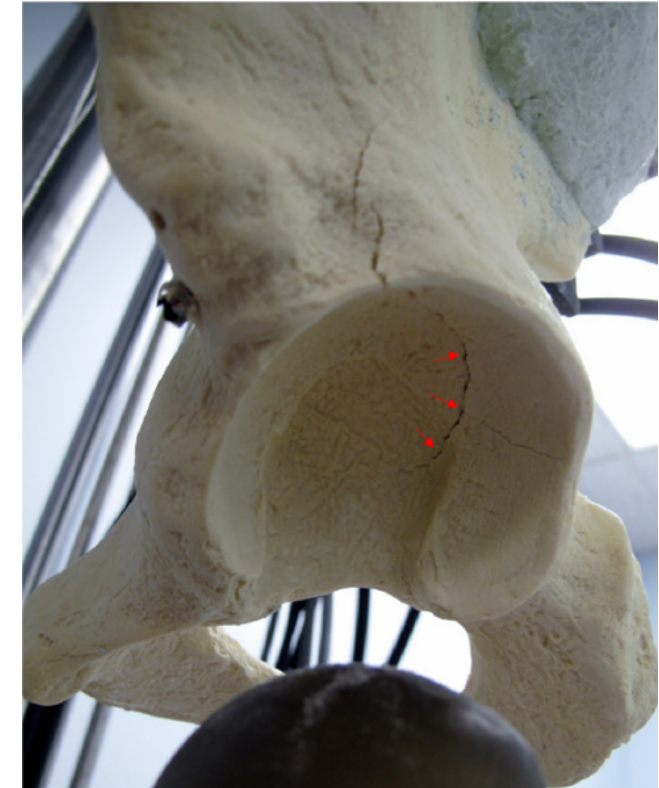
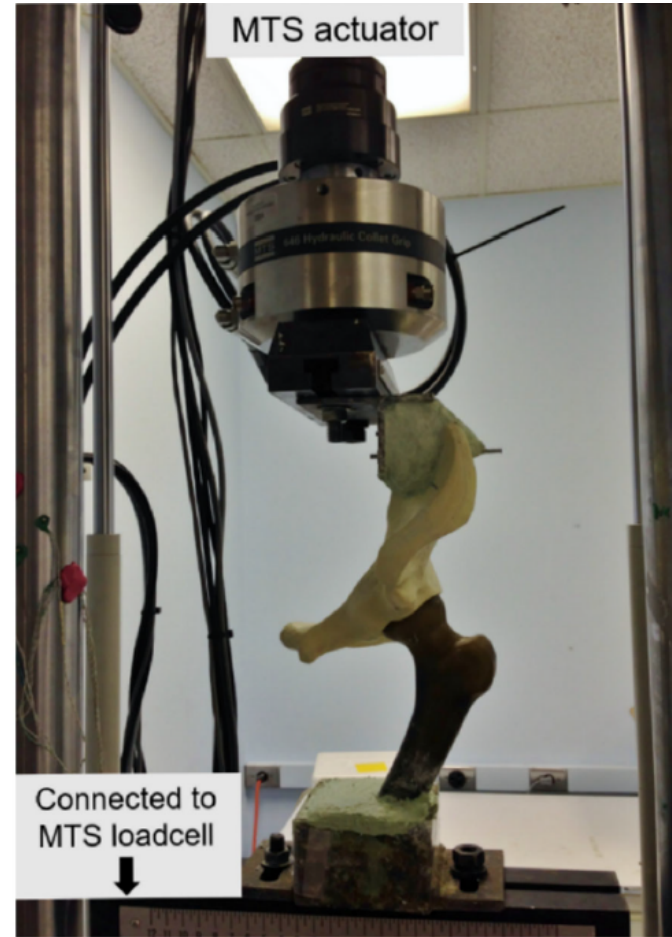
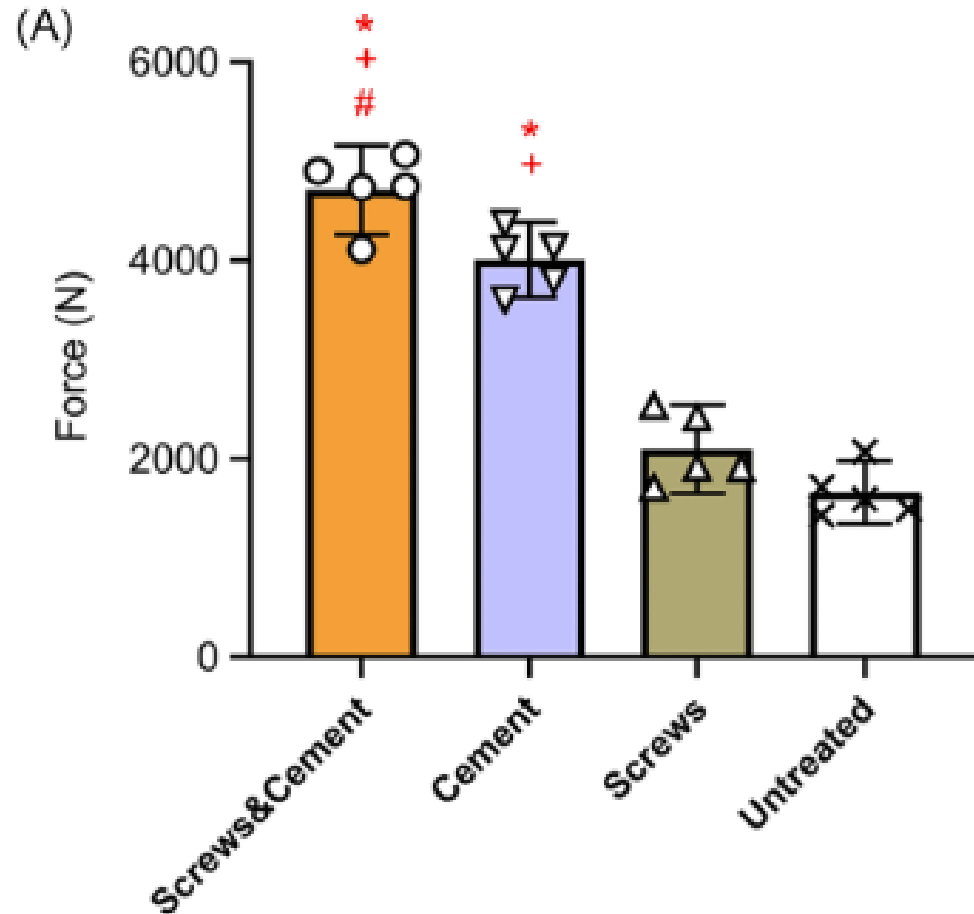
Francis Y. Lee MD, PhD, Igor Latich MD, Courtney Toombs MD, Alana Mungur MD, Devin Conway MD, Kareme Alder BS, Izuchukwu Ibe MD, Dieter Lindsog MD and Gary Friedlaender MD

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Pain Reduction and Function

- Lee et al. – 26 patients, VAS scores 8.32 -> 2.36, statistical improvement of MSTS score
- Hirase et al. – Systemic review 579 patients (mostly cement alone) 74.2% significant pain and function improvement
- Lozano-Calderon et al. – 39 patients with photodynamic intrapelvic nails VAS 8 -> 0 at 6 weeks.

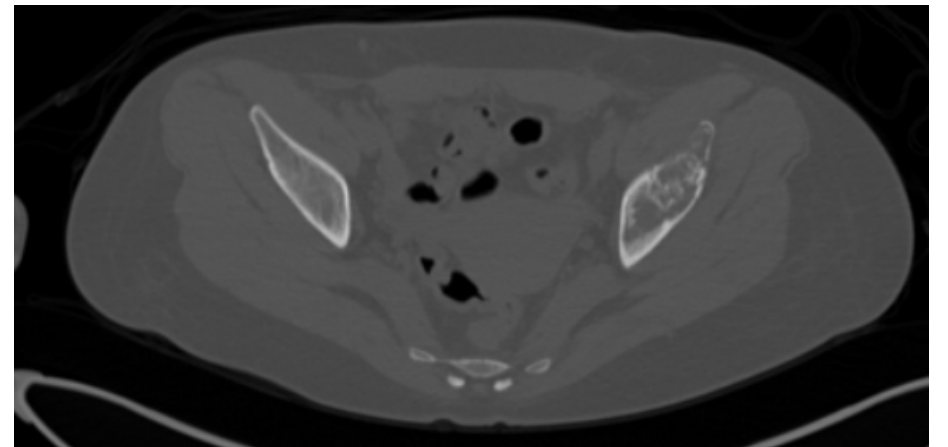
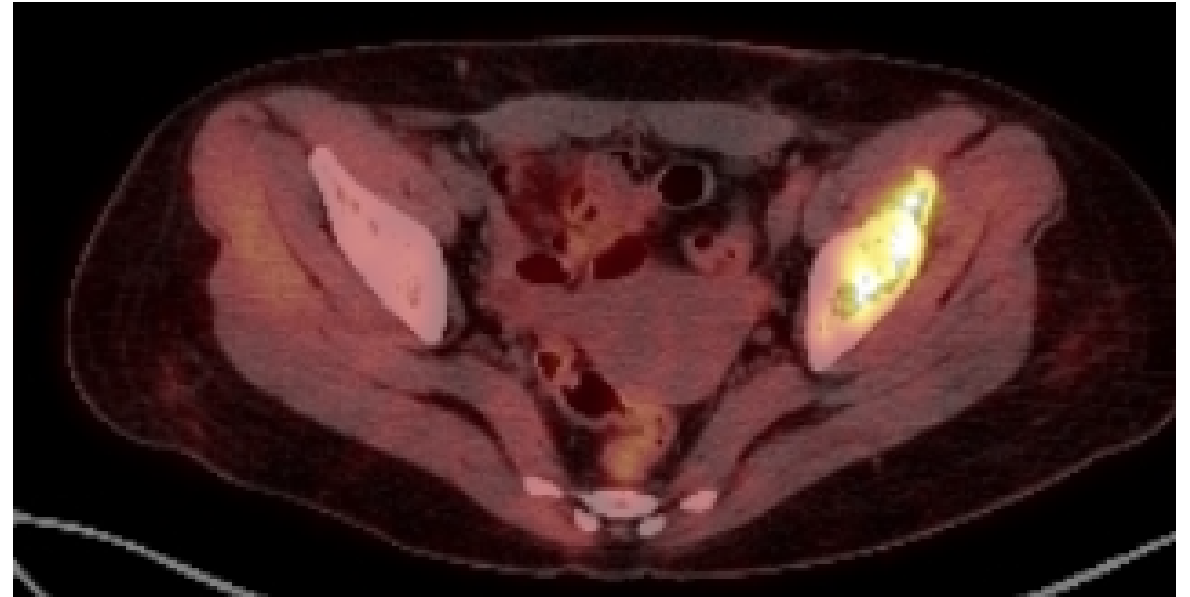
Mechanical Studies



Pelvis weight-bearing ability after minimally invasive stabilizations for periacetabular lesion

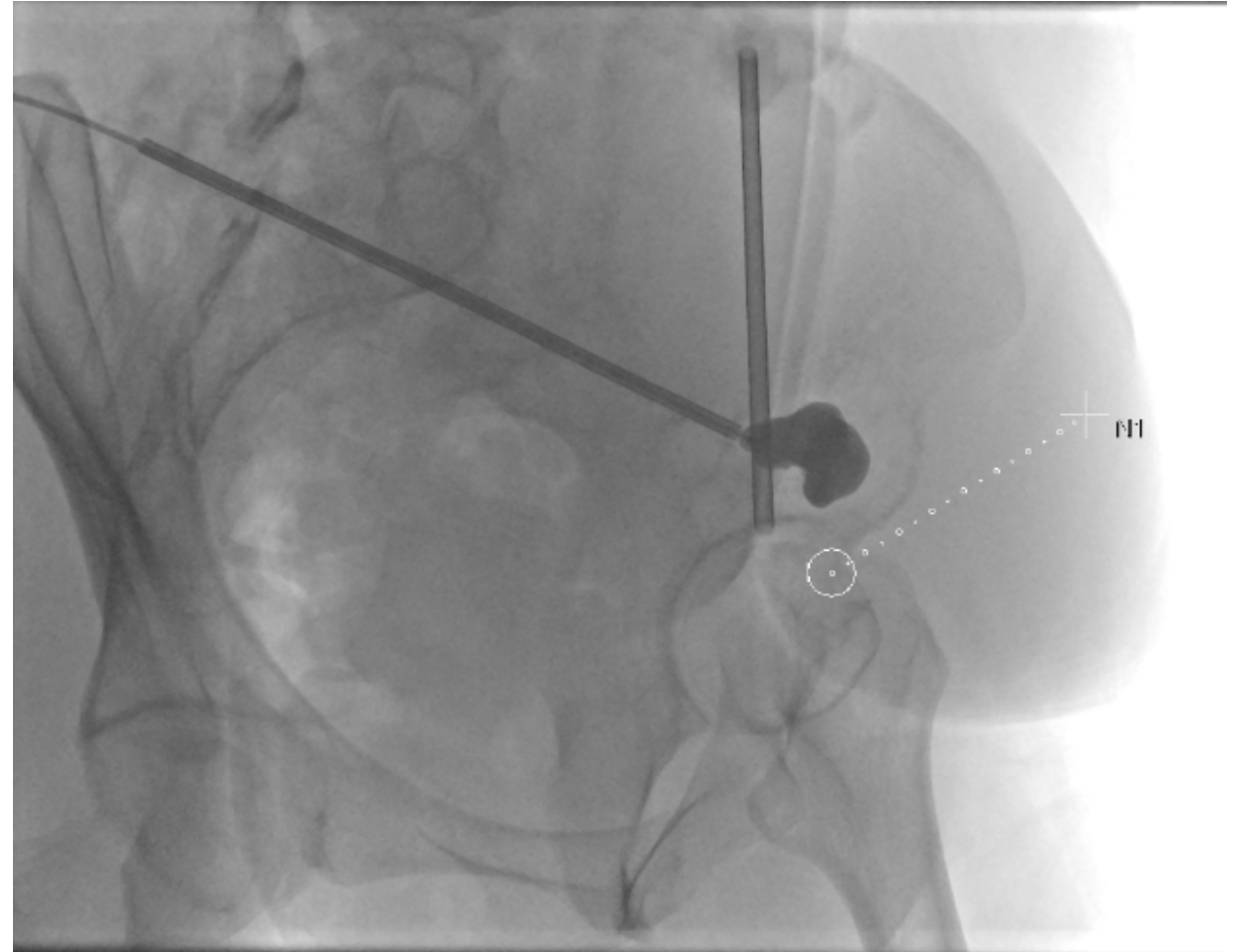
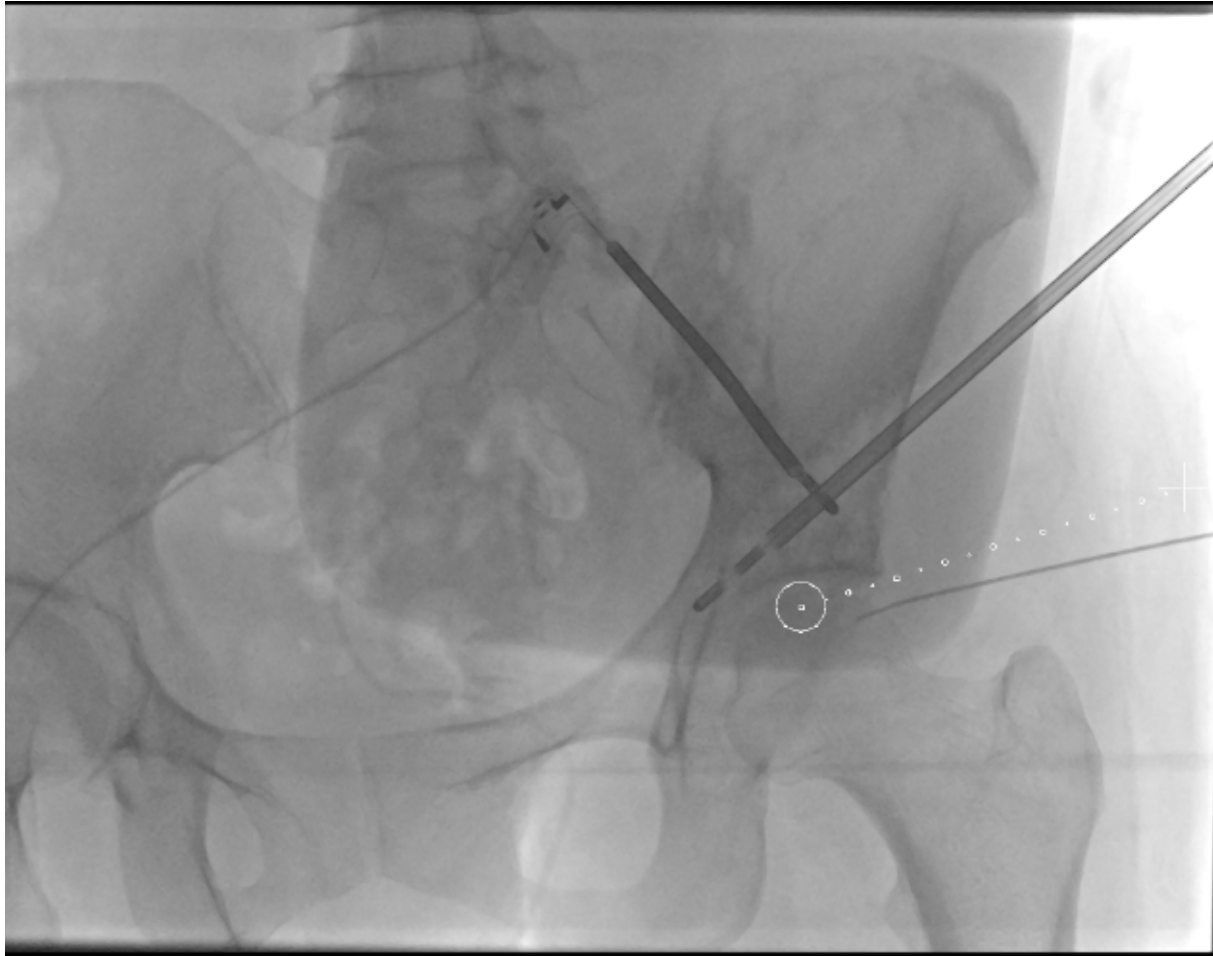
William B. Lea¹ | Sean M. Tutton¹ | Naif Alsaikhan¹ | John C. Neilson² |
 Sebastian Schafer³ | David M. King² | Mei Wang^{2,4}

Case #1



42-year-old female with metastatic breast cancer progressing after RT/chemo

Intra Operative Ablation and Planning

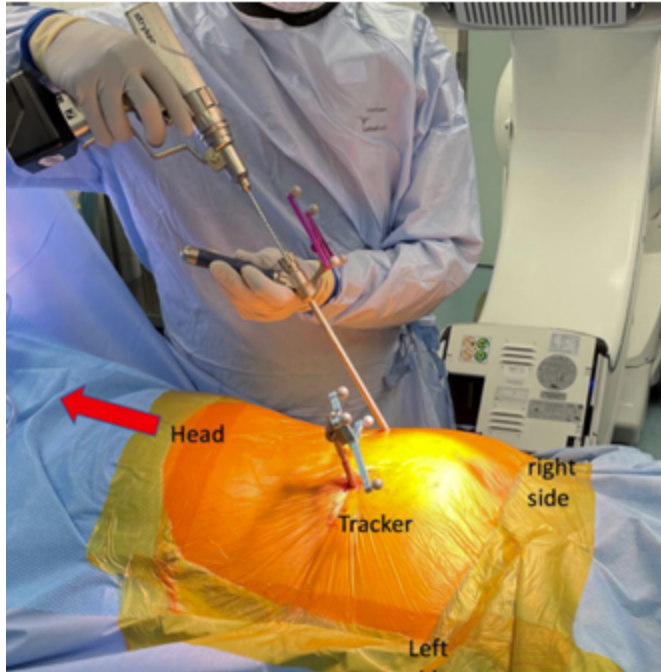


Post Operative Course

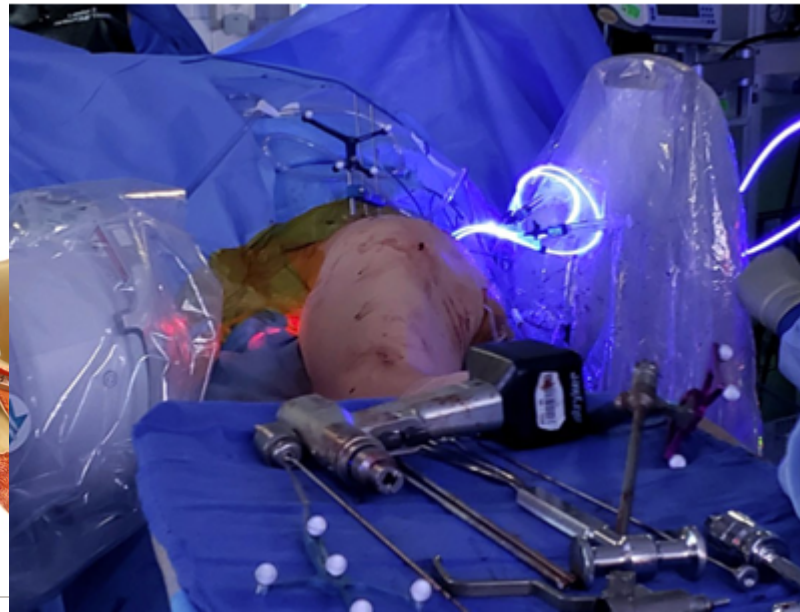


Pre-op walker and 8/10 pain -> 1/10, no pain meds, no limp, 23 hr hospital stay

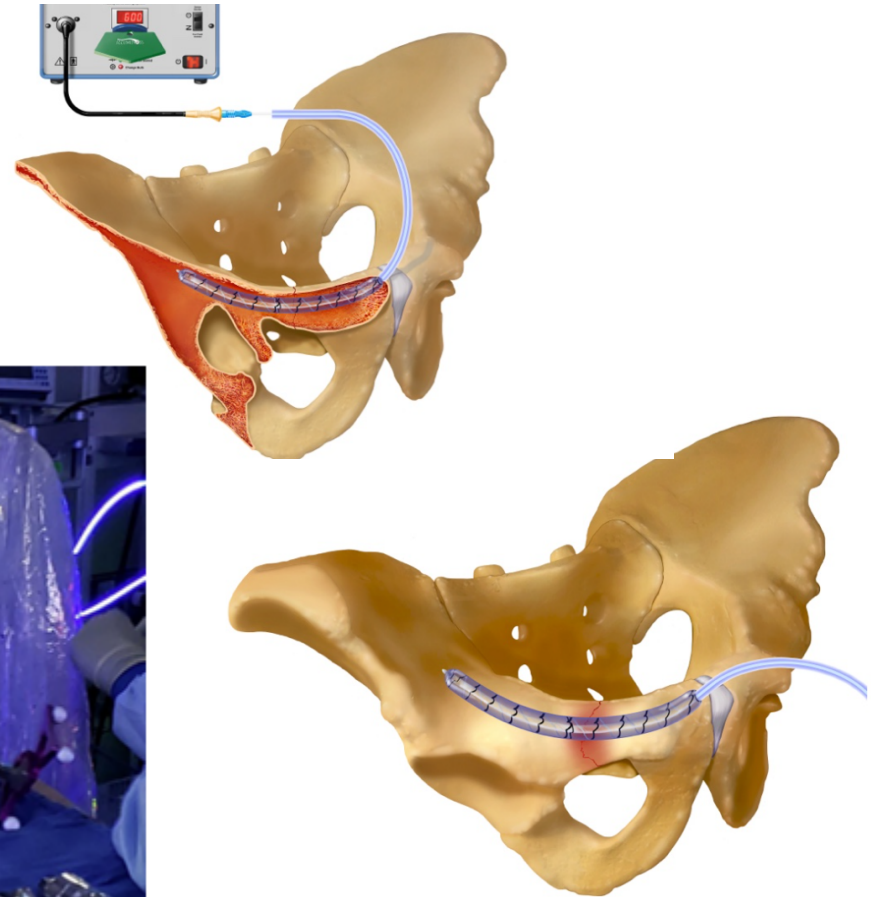
Minimally Invasive Photodynamic Nails - Illuminoss



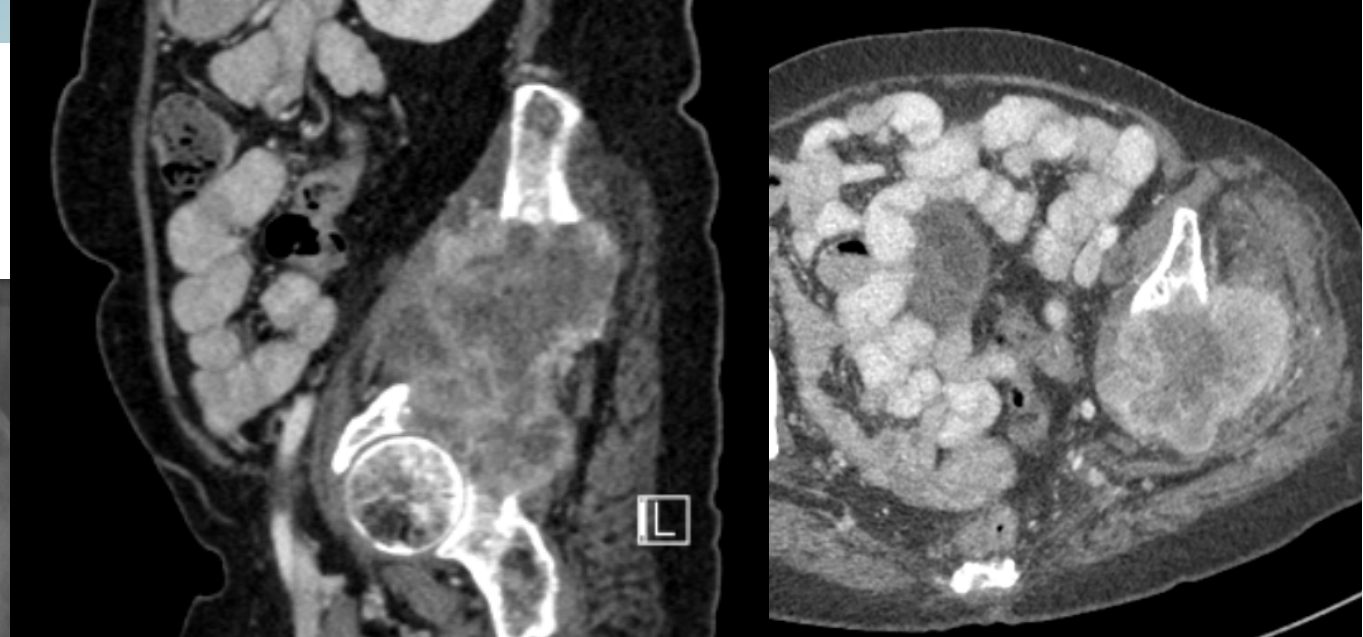
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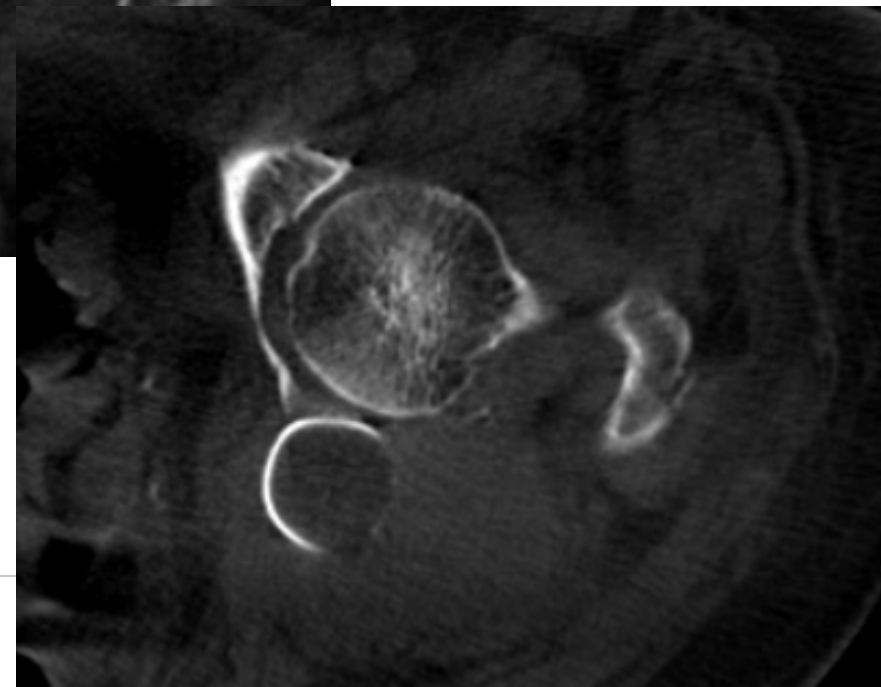
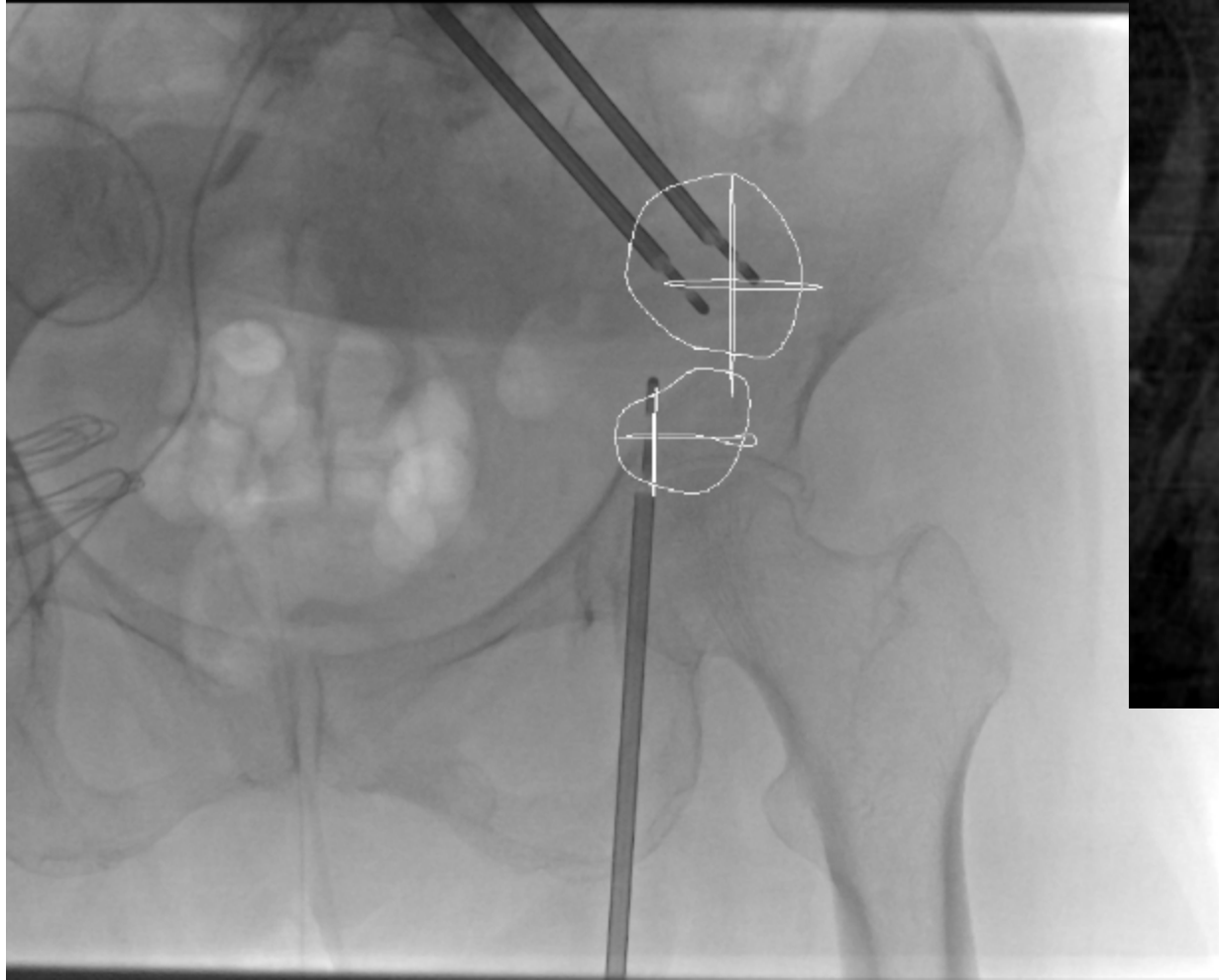
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Case #2



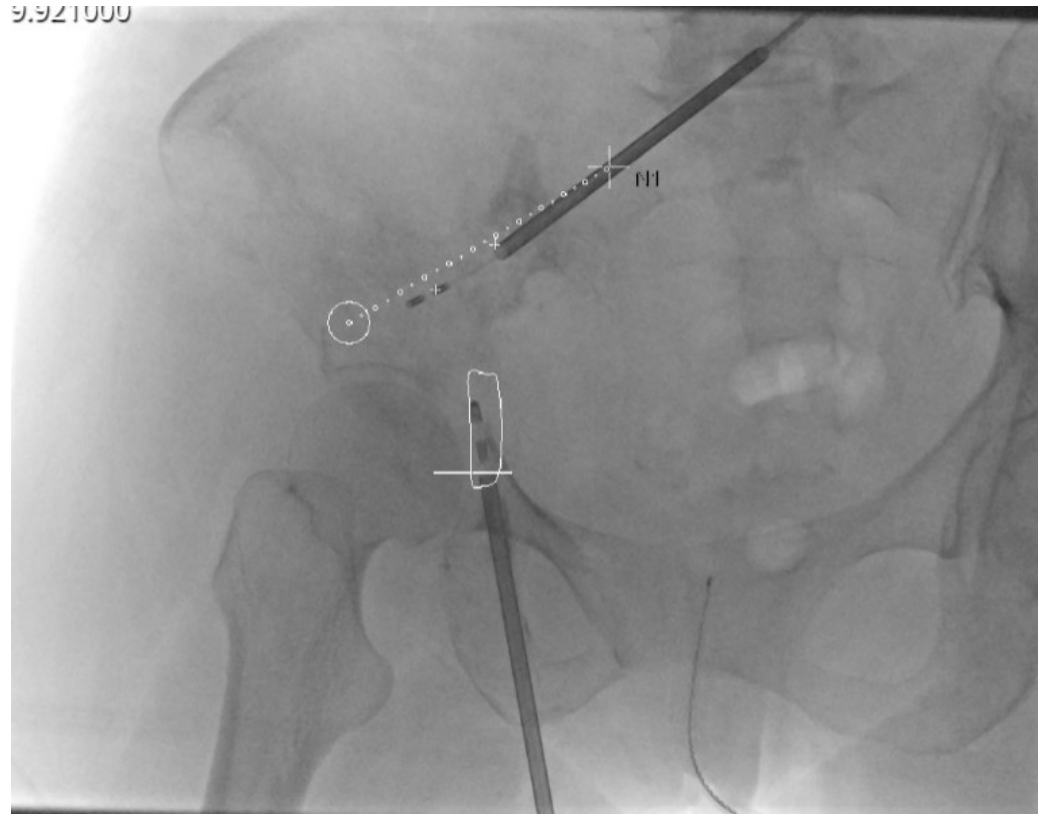
73-year-old female, metastatic renal cell, wheelchair bound





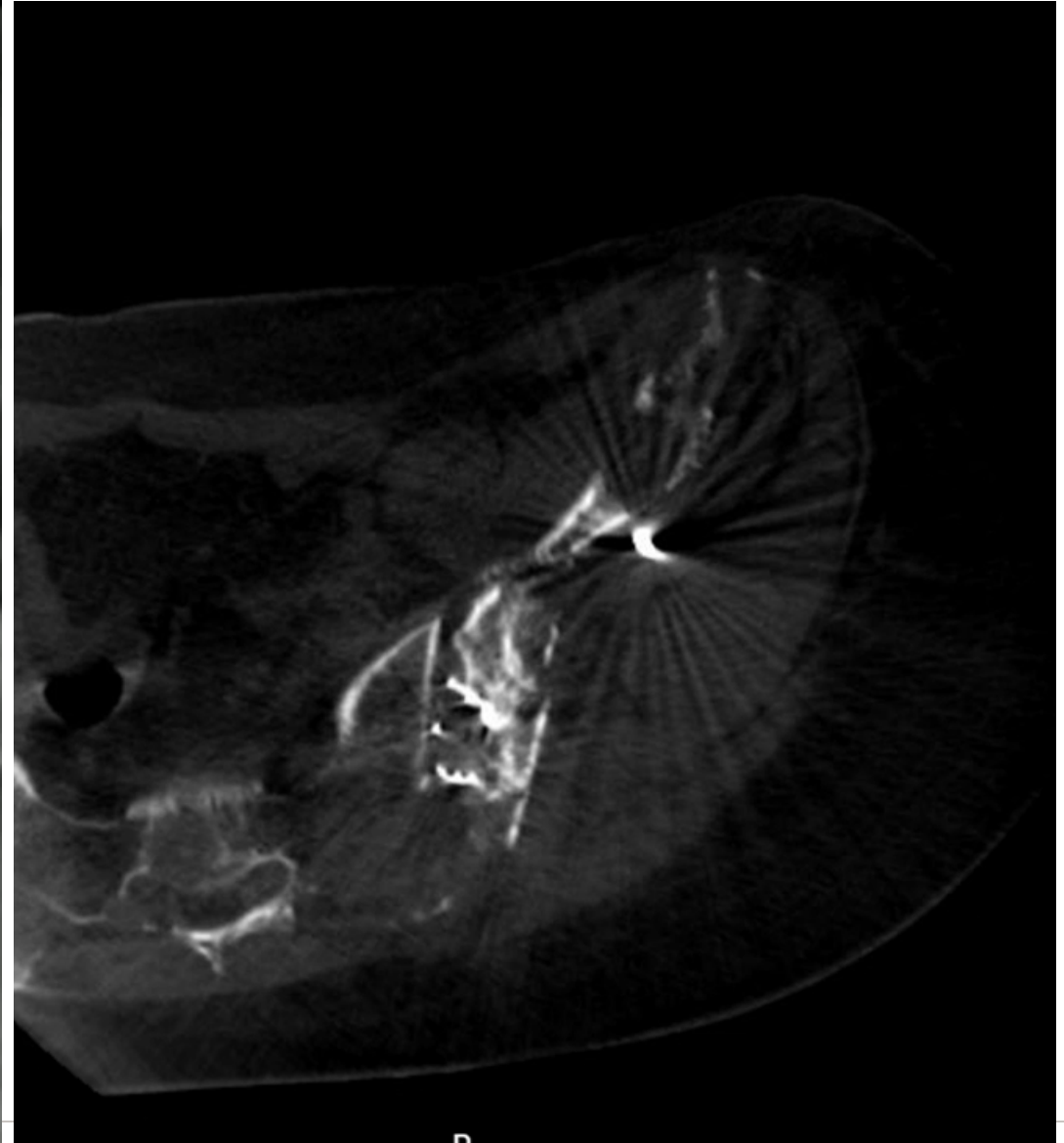
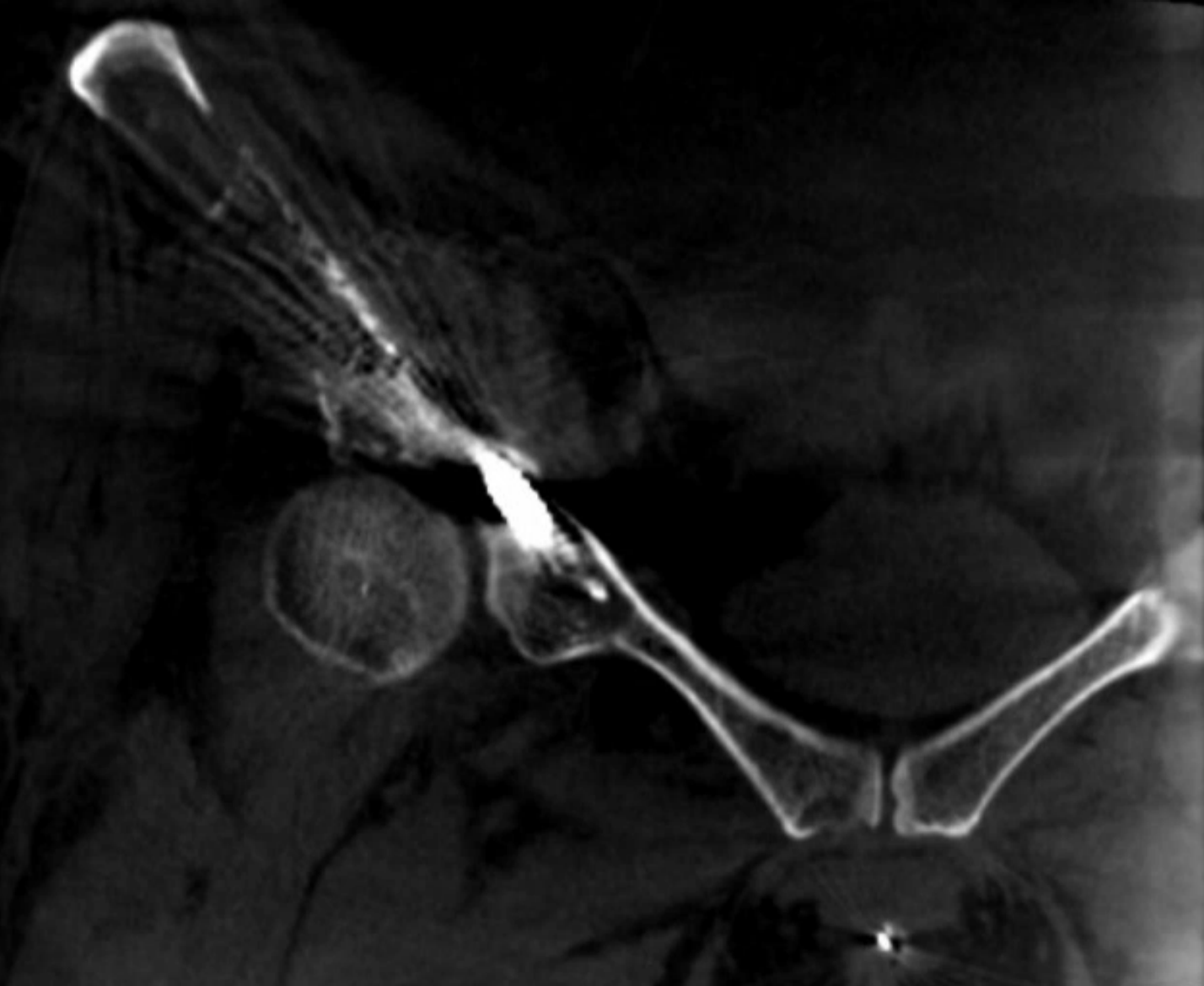
Minimal Pain, Walker for Balance, 12 months post op

Case #3



51 yoF bedbound, pelvic breast cancer Mets,
S/p RT





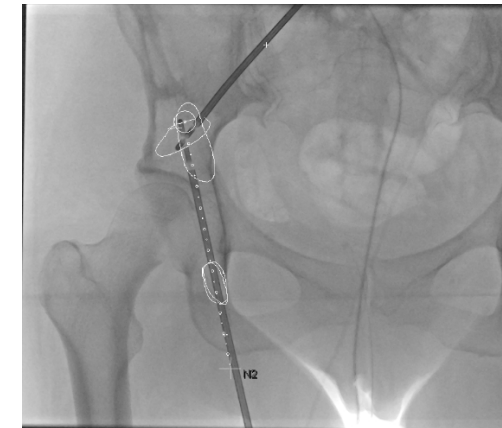
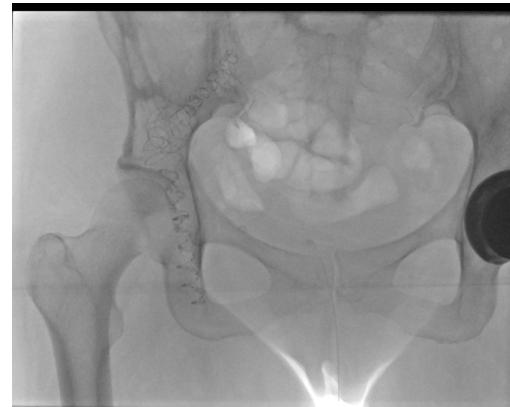
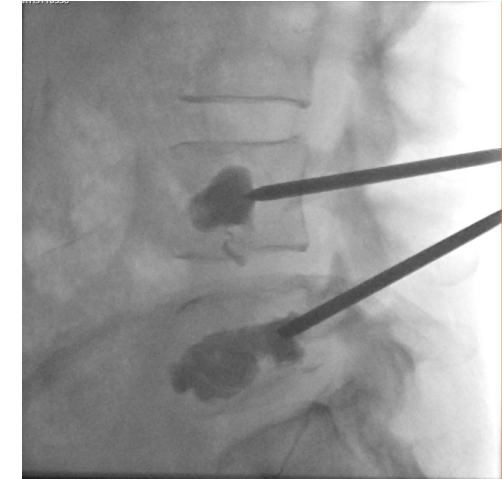
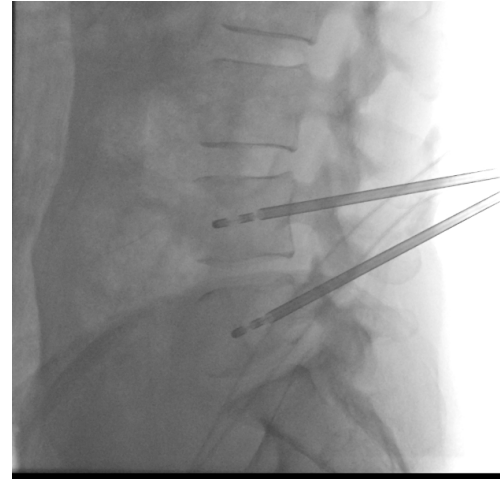
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PORTABLE

L

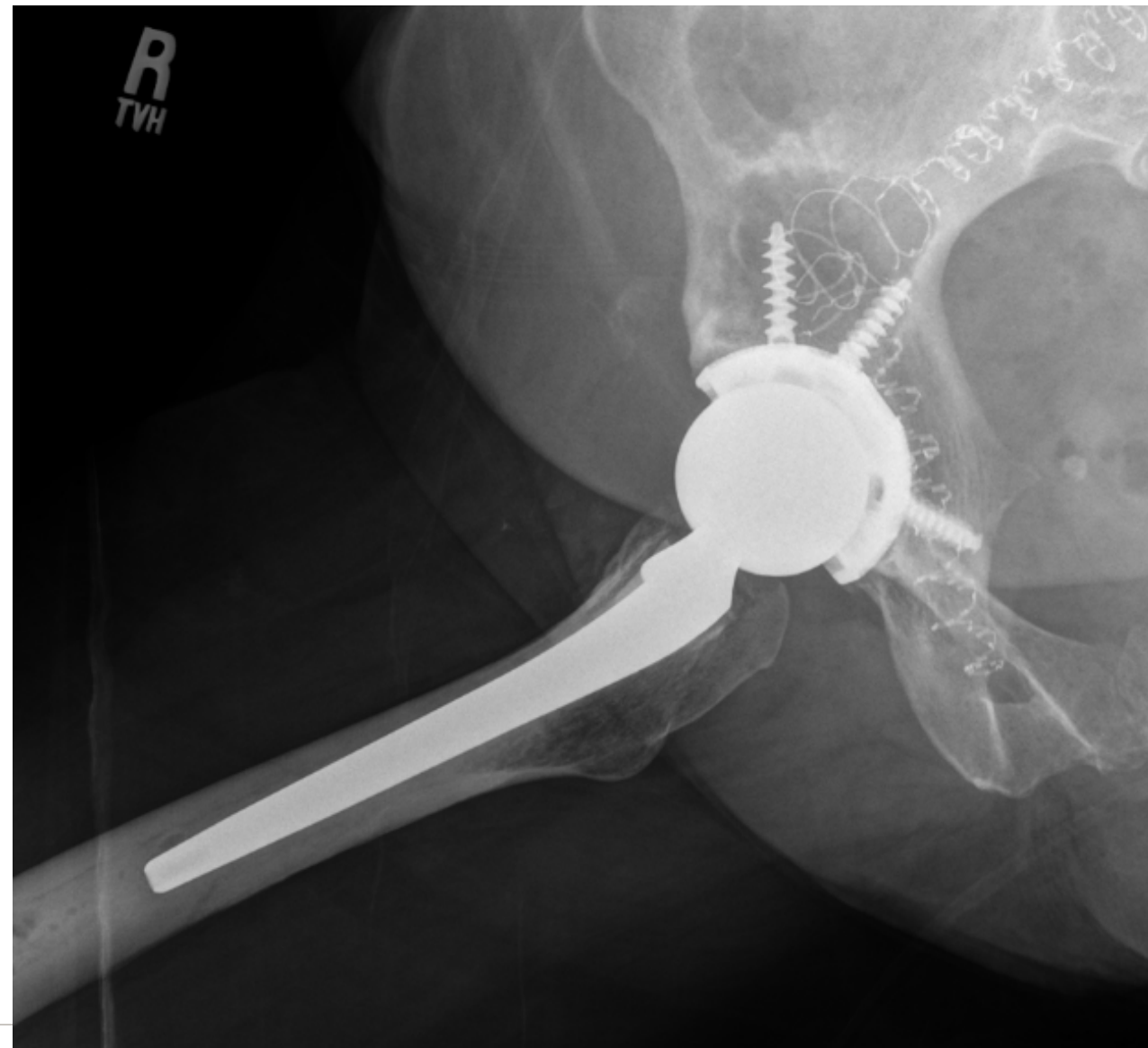
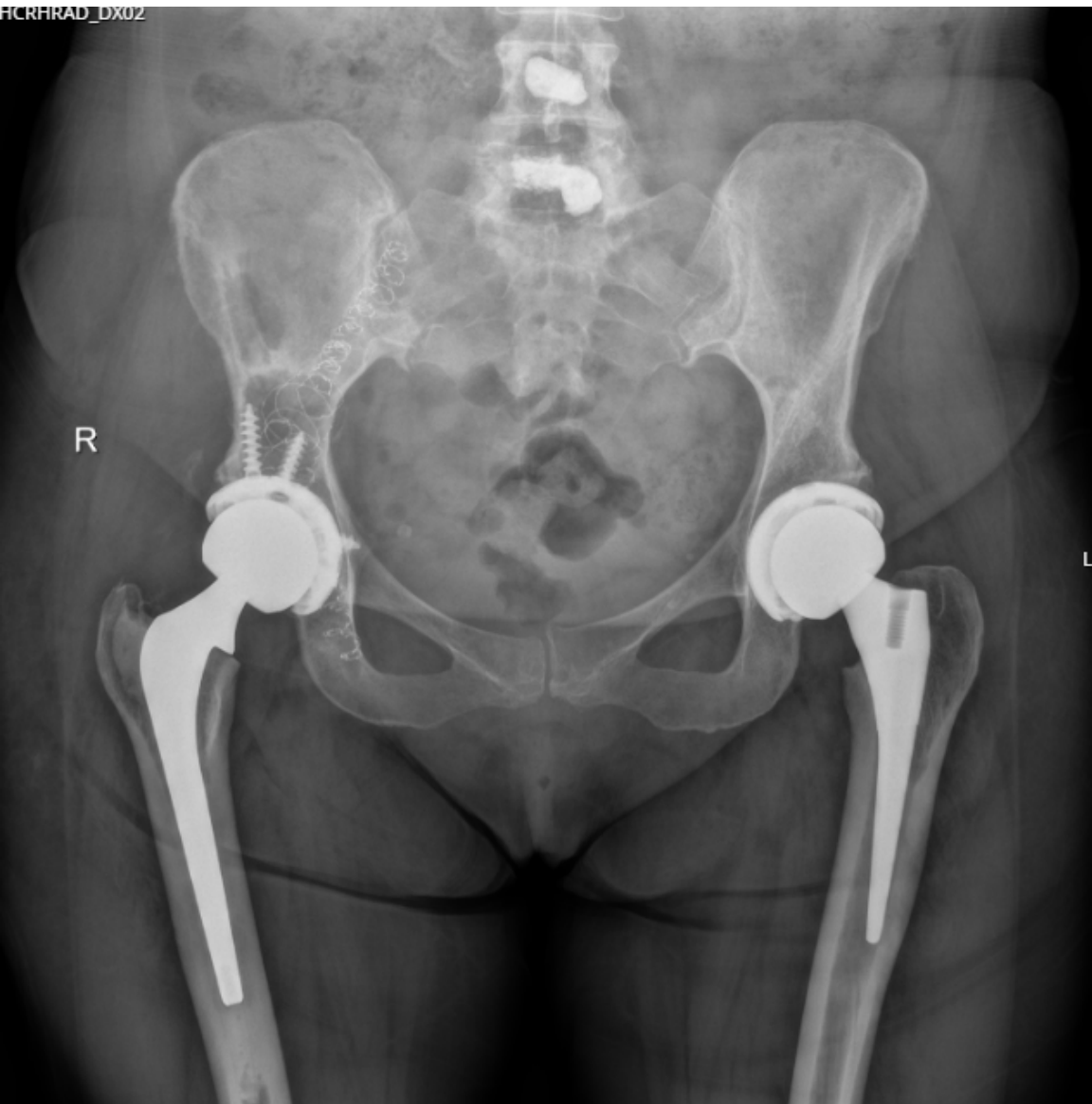
WBAT, 23 hr observation, significant pain control, decrease in narcotics,
immediately back on treatment, walker for long distance only

Case #4

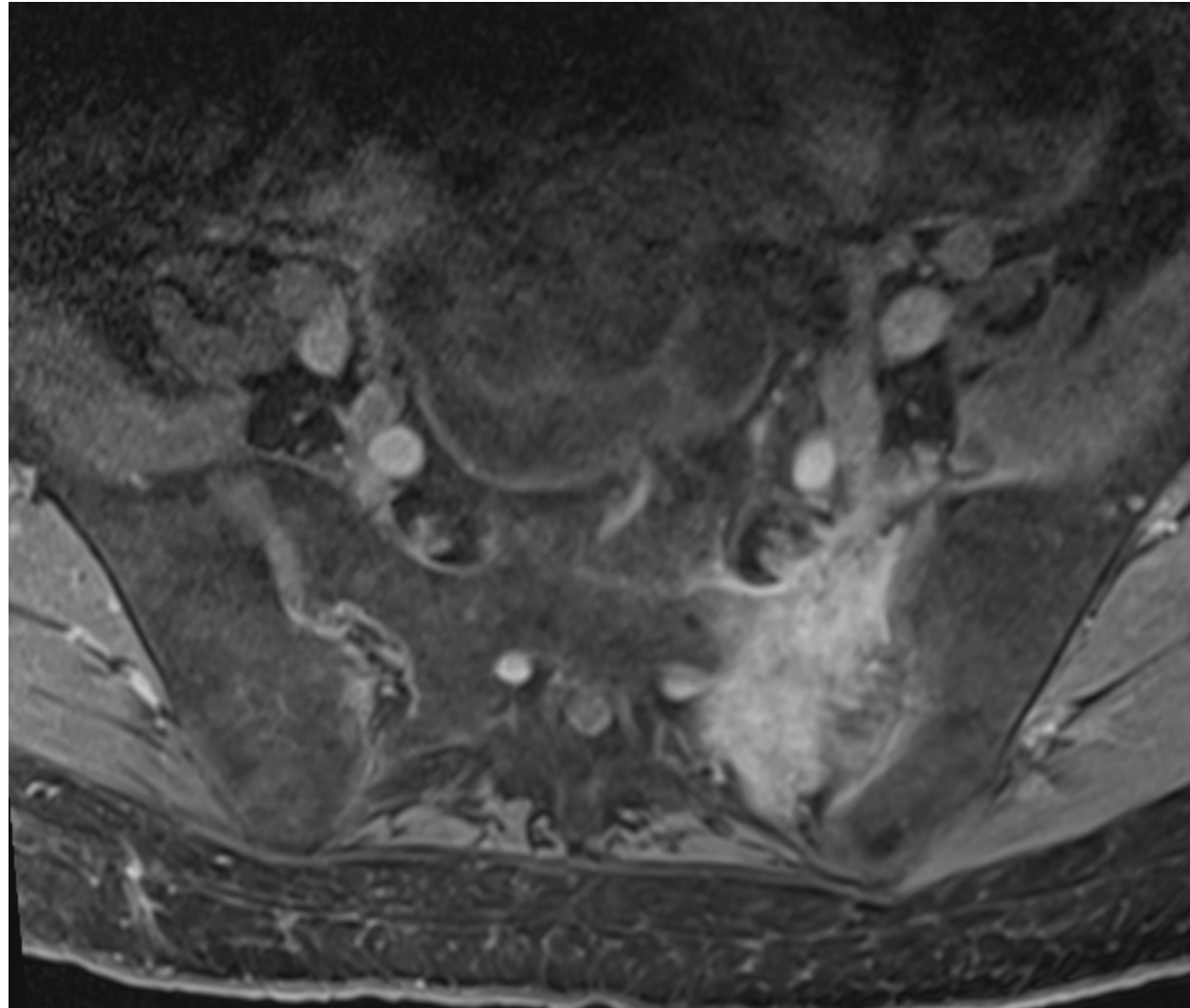


41-year-old female, metastatic breast, inability to bear weight

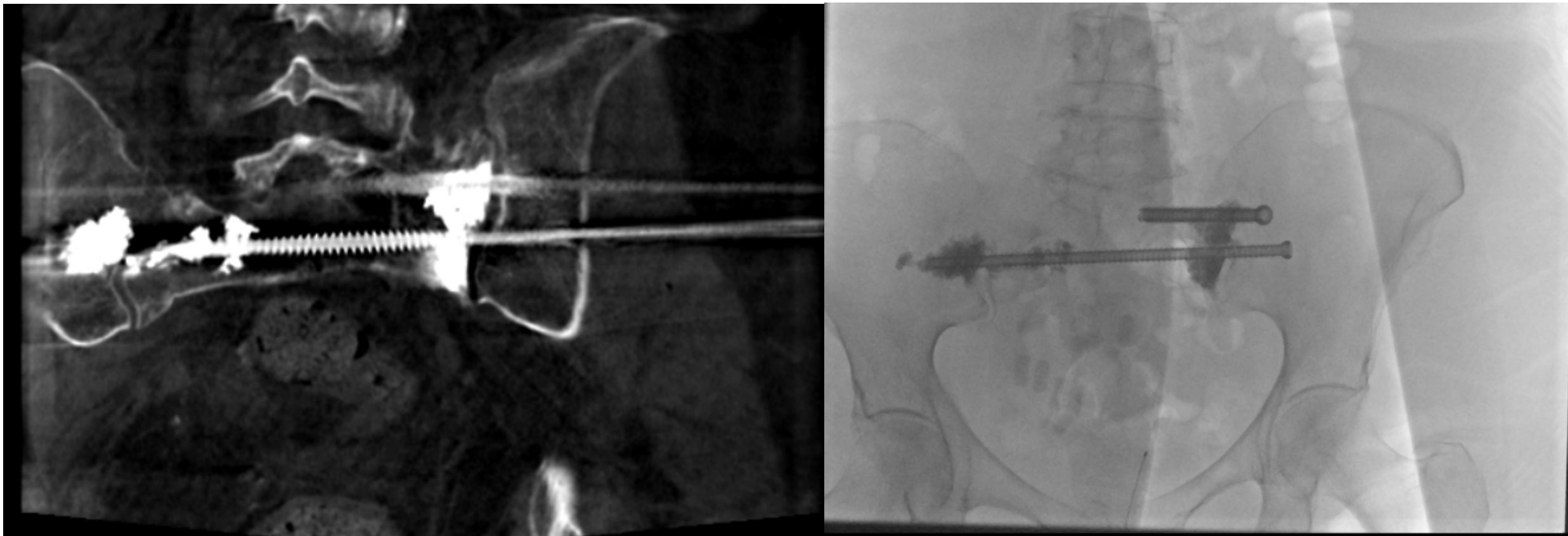
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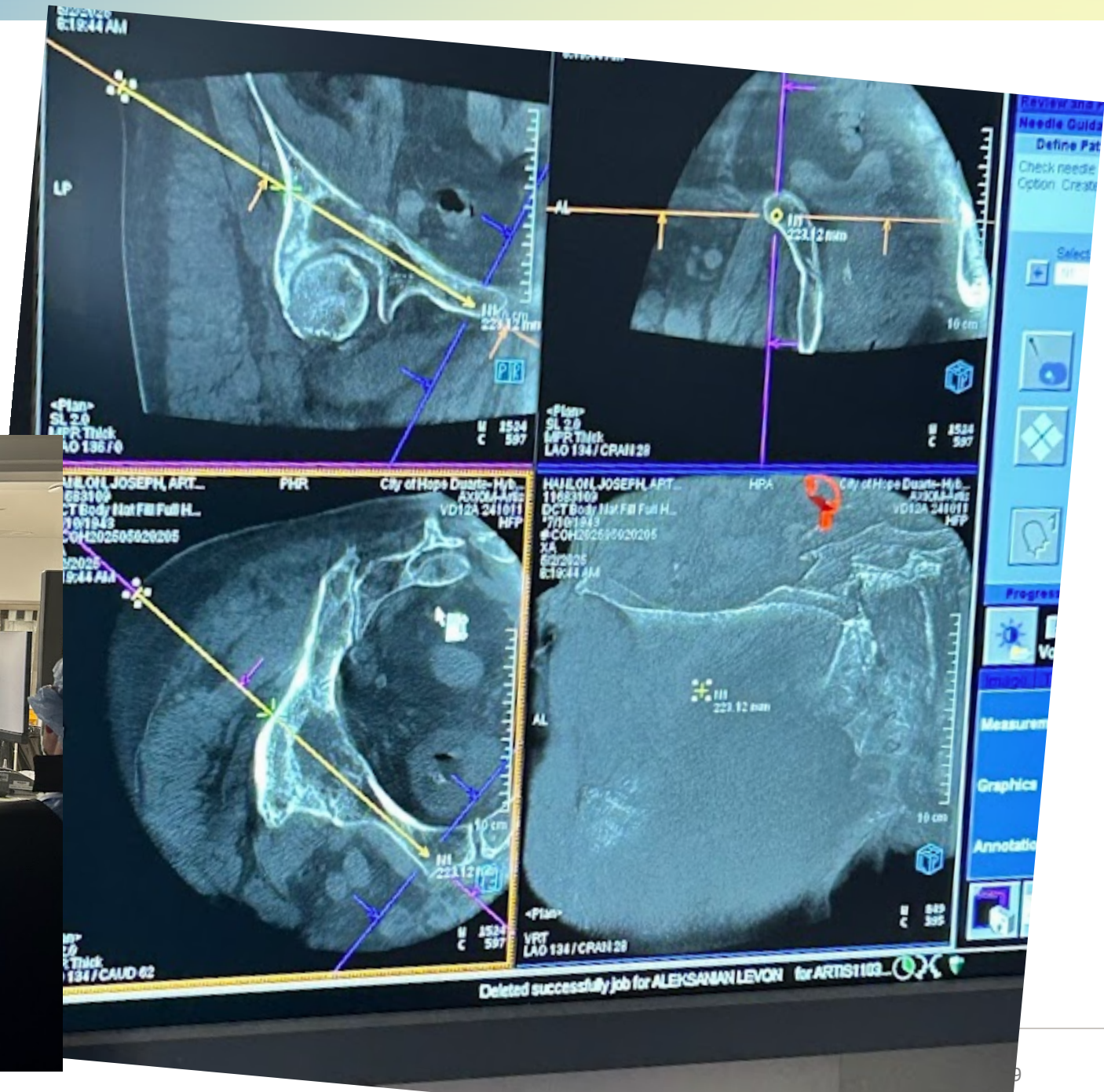
Case #5



66-year-old female with metastatic lung and sacral insufficiency fracture, progressive low back pain



VAS pain 10 to 2 on POD1



Who is a candidate?

- Any patient with painful pelvic or sacral metastasis
 - Myeloma, metastatic renal, thyroid, breast, lung, prostate
 - Even stress or insufficiency fractures if minimally displaced
- Specifically pain bearing weight, usually periacetabular, usually lytic lesion
- In conjunction with Radiation Therapy – studies ongoing
- Best patients have good preoperative function, and early diagnosis of metastasis
- Contra indicated in displaced fracture – open surgery needed if appropriate



Future Directions

- More long-term prospective pain and functional studies
- Photodynamic nails vs screw and cement constructs or both
- Utility of ablation on durability of constructs
- Similar constructs for long bones
- Timing of radiation
- Wider adoption outside of tertiary care facilities



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Questions?

- Thank you to Dr. Jonathon Kessler and Dr. Alana Munger for collaboration