

Thermal Ablation for Musculoskeletal Lesions: How I Do It

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Disclosures

Consultant – Johnson and Johnson/Neuwave,
Medtronic

Grant Support – EDDA, BTG/Galil Medical

*Brand names are included in this presentation for participant
clarification purposes only. No product promotion should be inferred.*

Case-Based MSK Ablation

Displacement to Avoid Injury

CO₂

Fluid

Avoid Articular Surfaces

Bipolar RFA

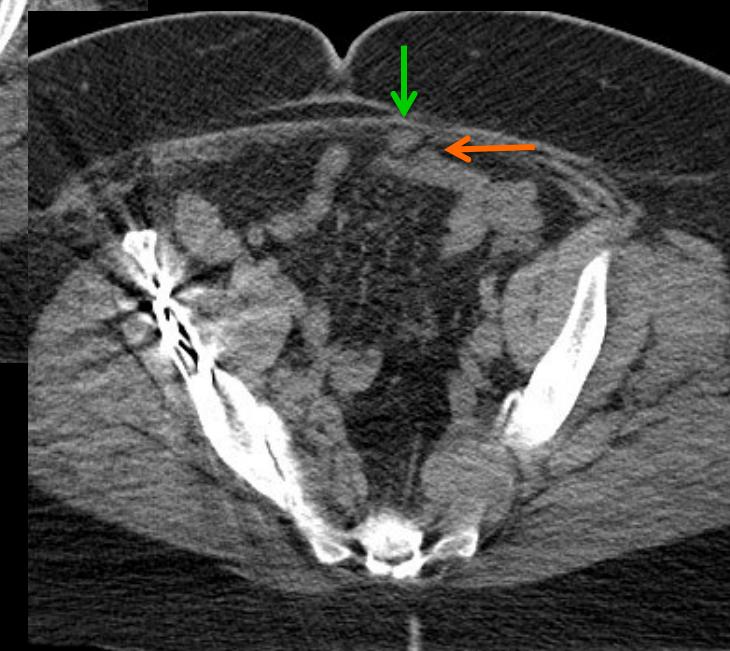
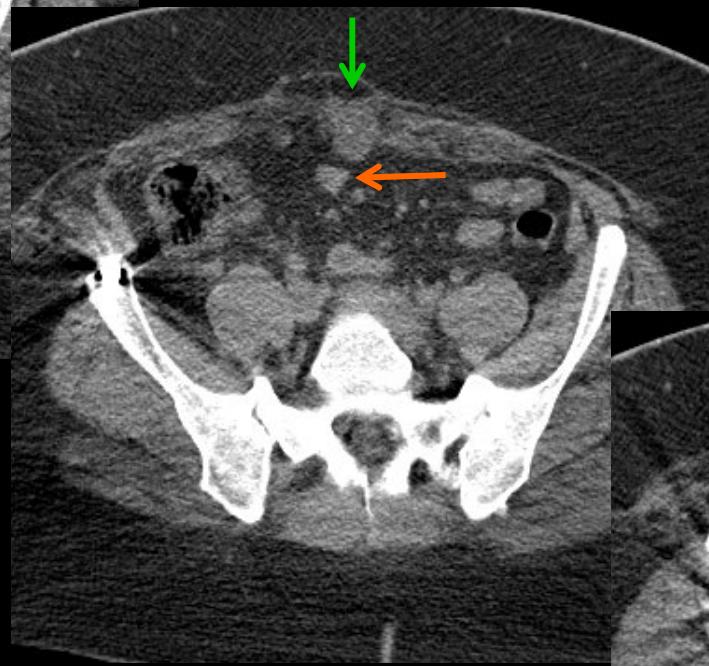
Cryoablation

Periacetabular Ablation and Cement

Balloons for Void Filling

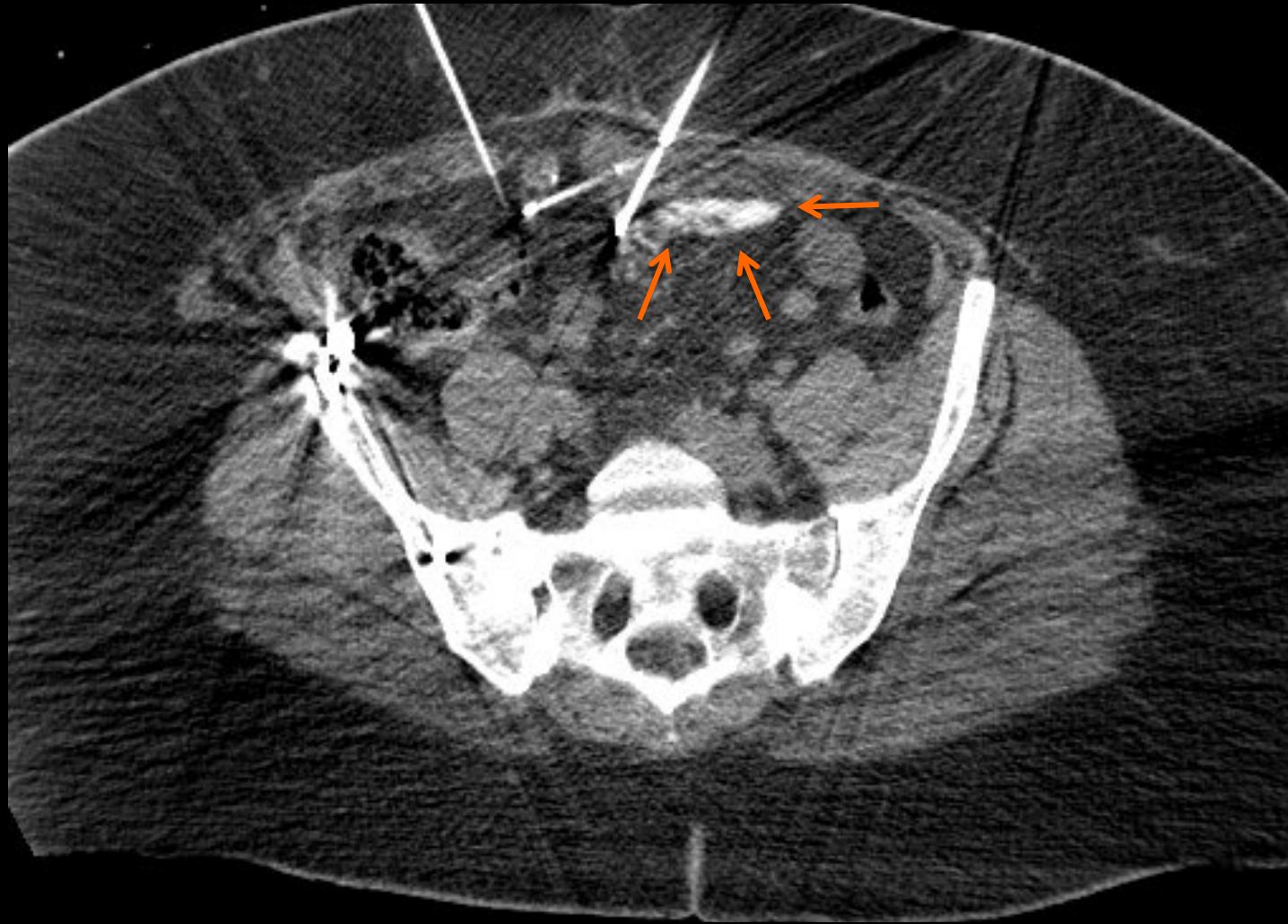
Femoral Nerve

Case — 52-YO-Female with Metastatic Chondrosarcoma

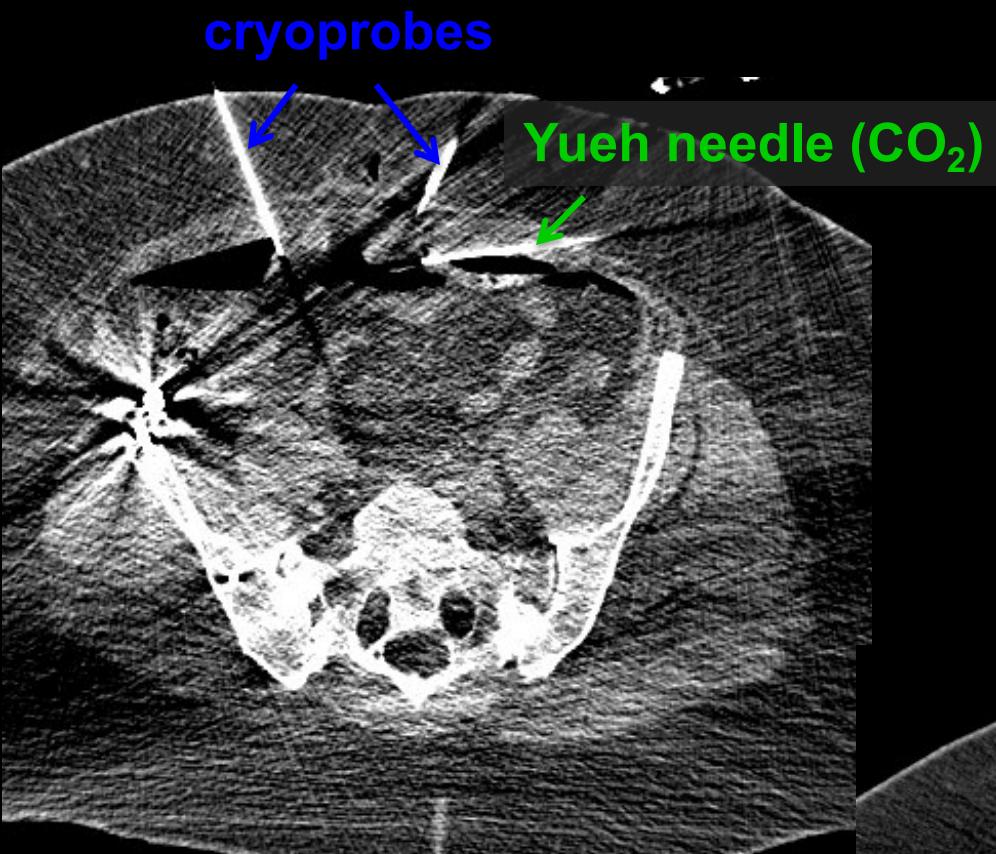


Three small nodules

Adjacent small bowel

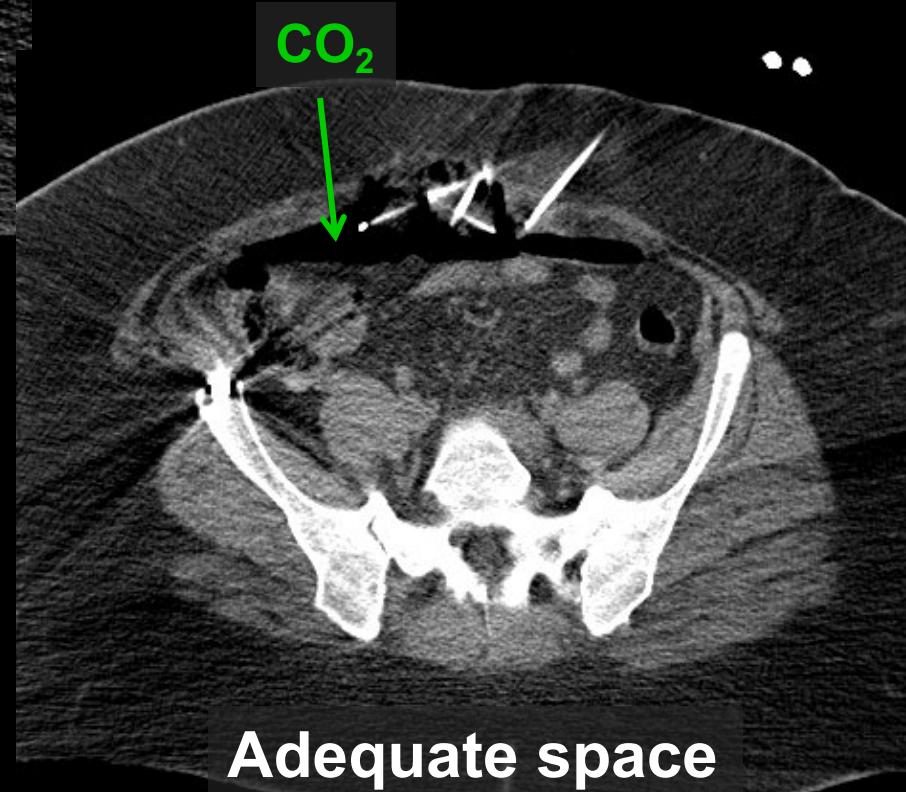
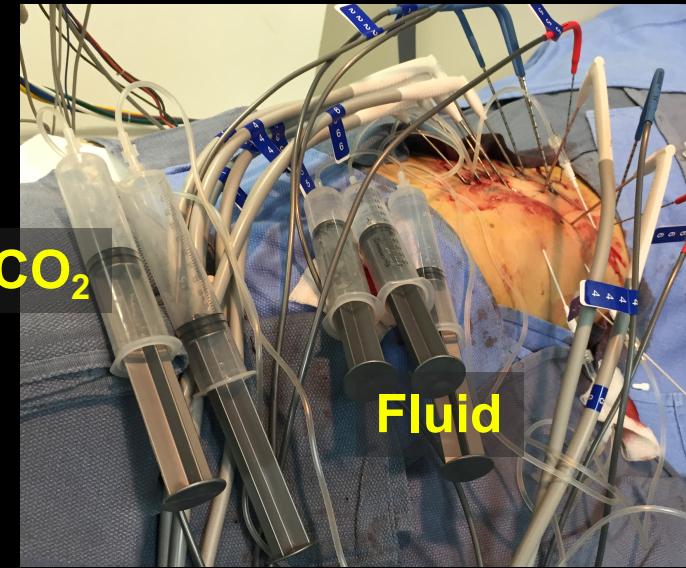


Fluid instillation — didn't stay in region

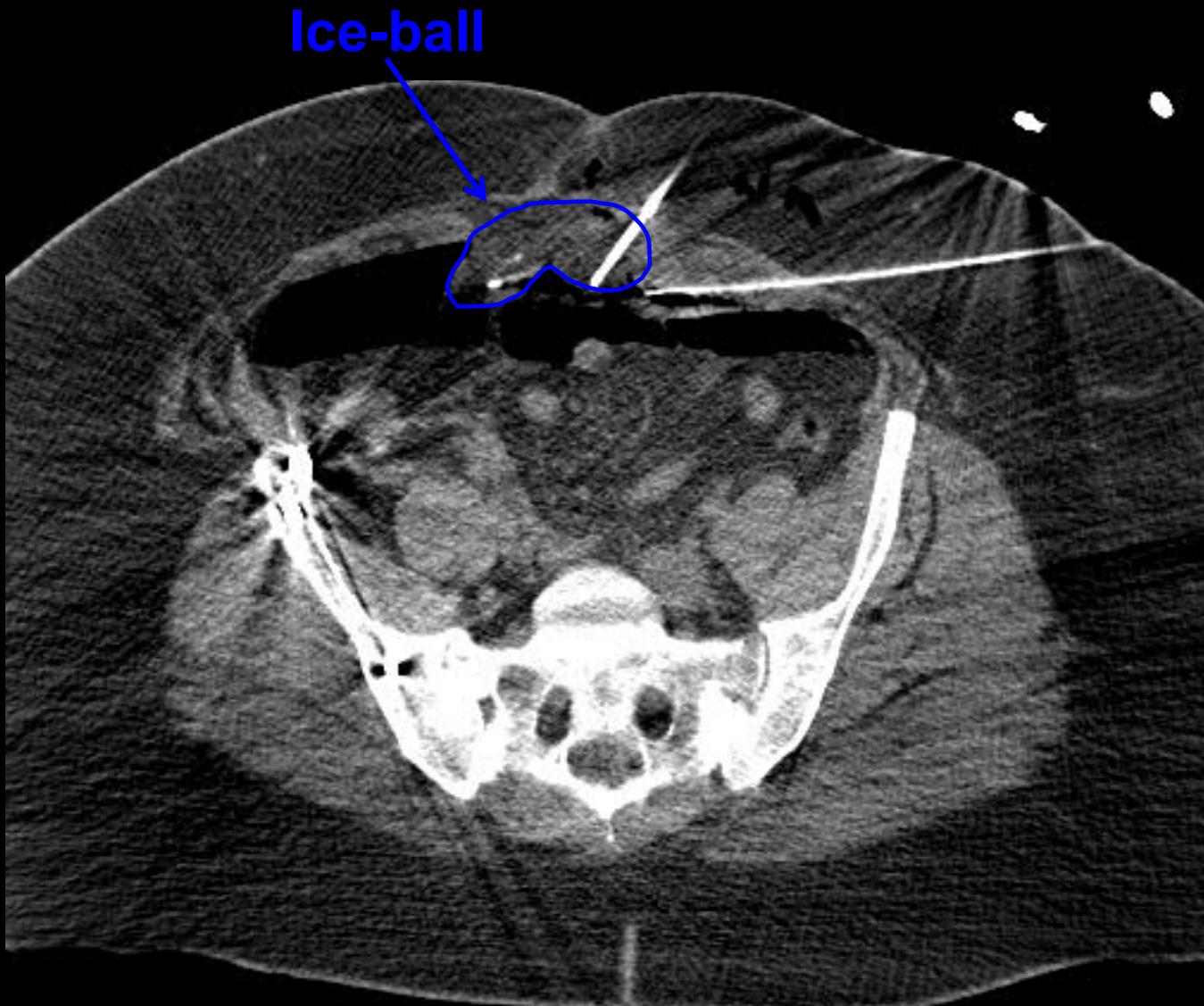


Switch to CO₂

*Target gap to anterior
abdominal wall*



Use CO₂ for Anterior Displacement

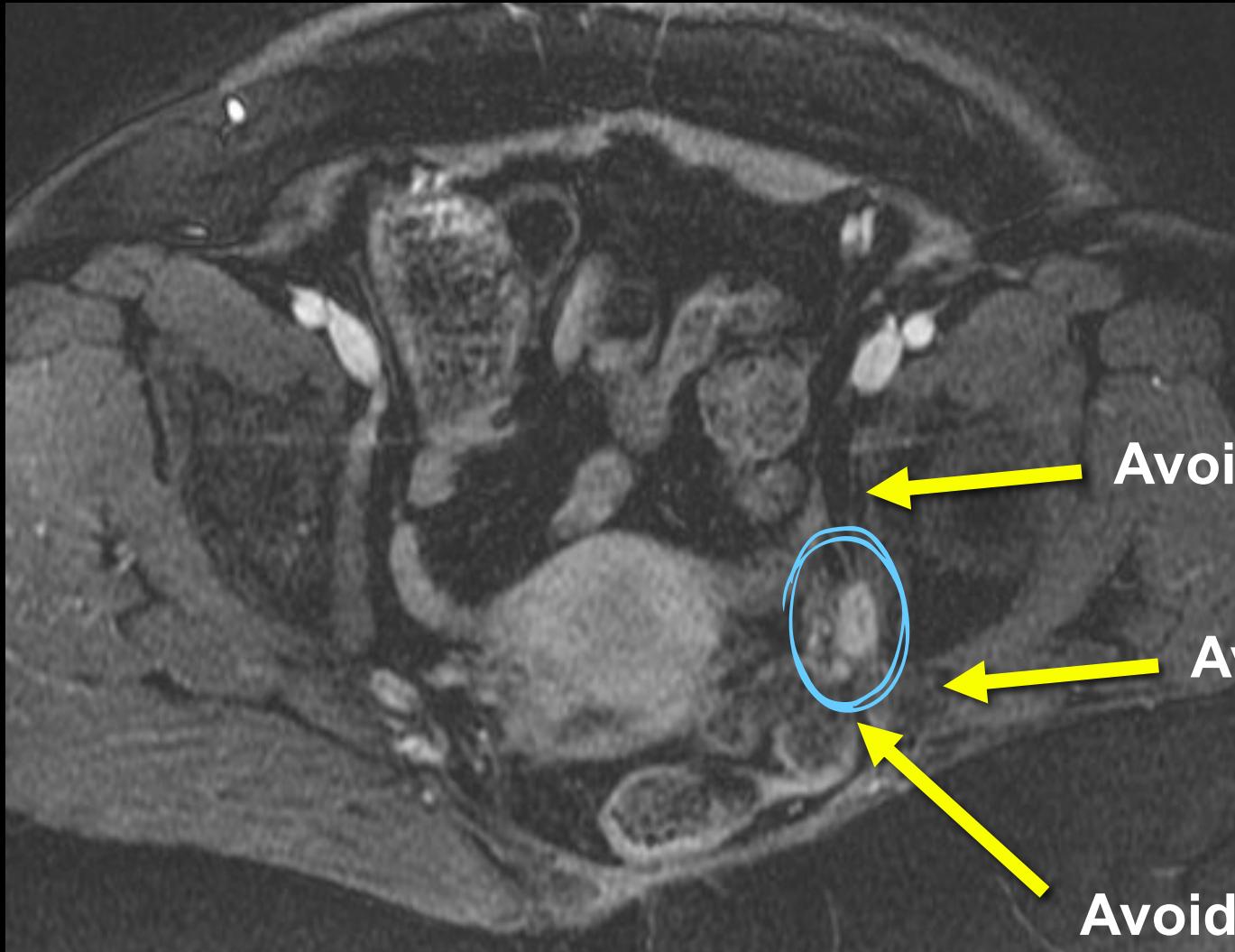


Safe boundary from adjacent bowel



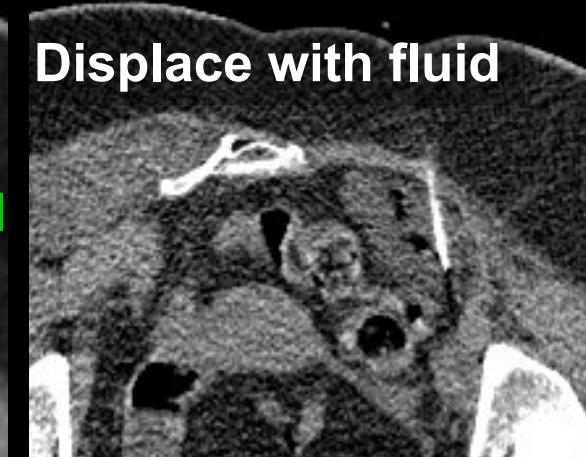
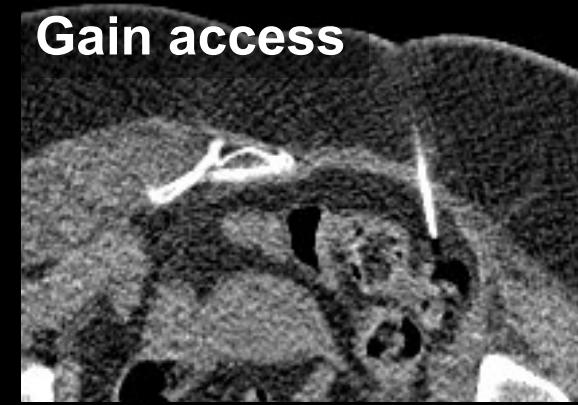
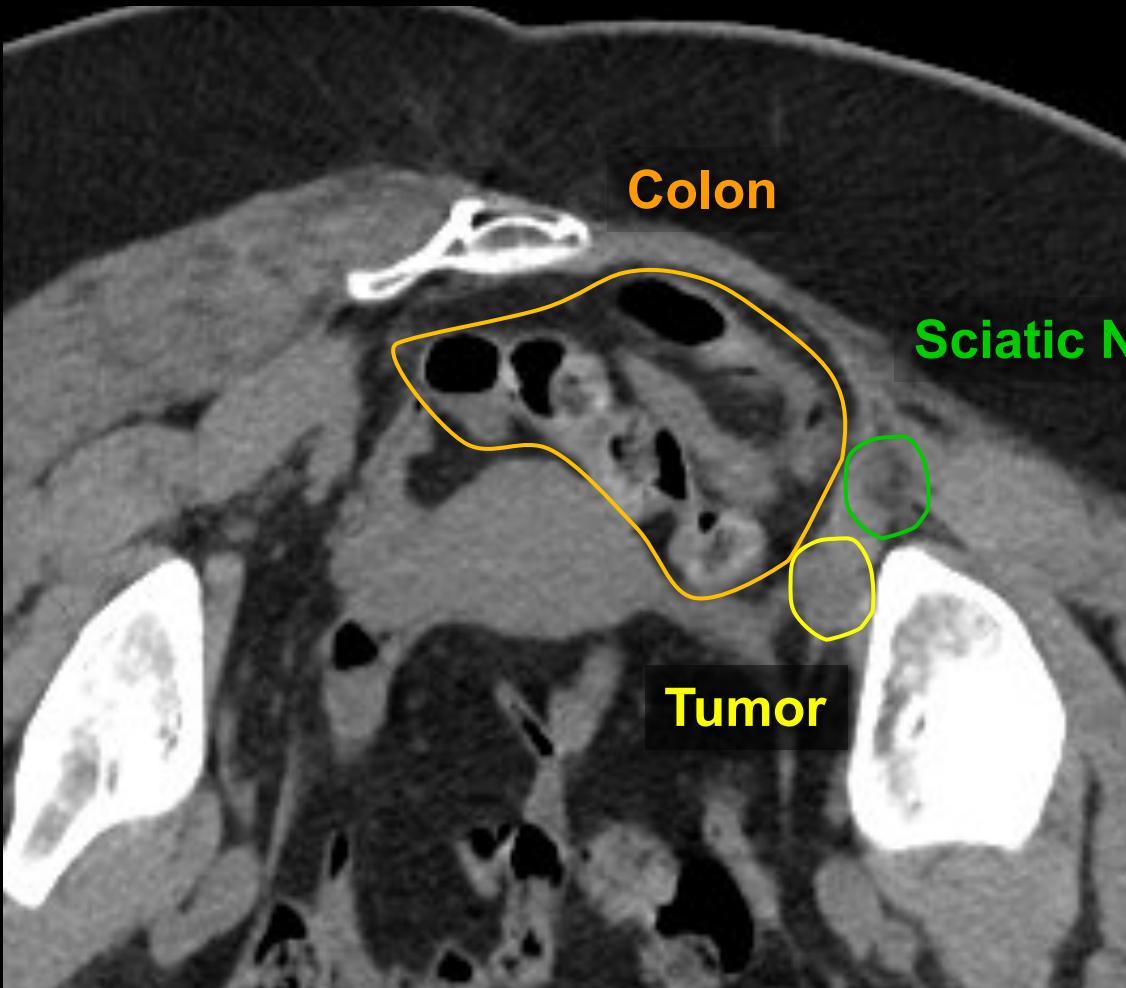
Post ablation CT — local control at 6 mos.

Recurrent Ependymal Cell Tumor *Concerns?*



Recurrent Ependymal Cell Tumor

Fluid Displacement Strategy

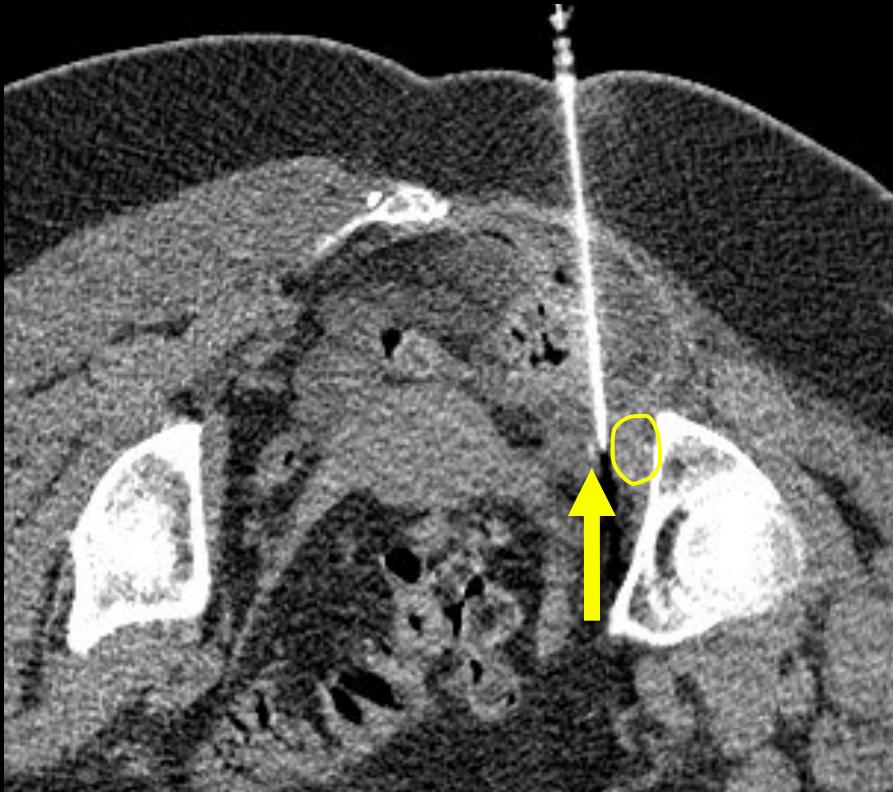


Recurrent Ependymal Cell Tumor

Fluid Displacement Strategy

Where's the ureter?

Give IV contrast

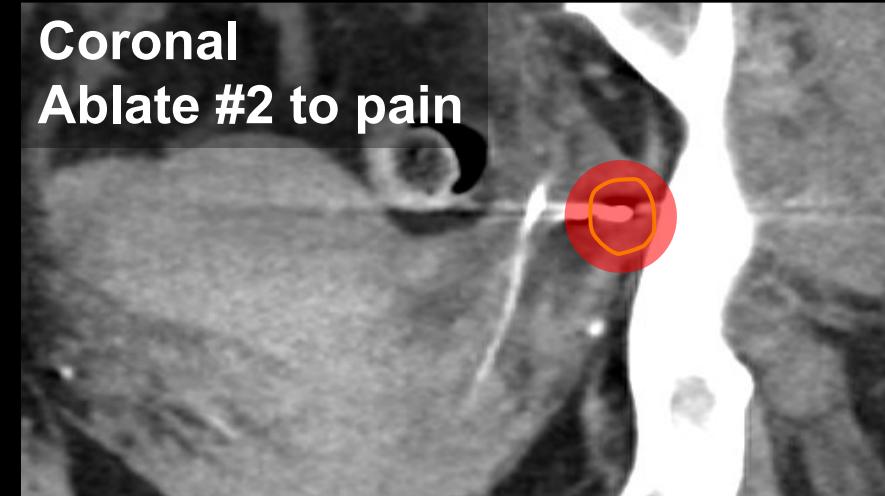
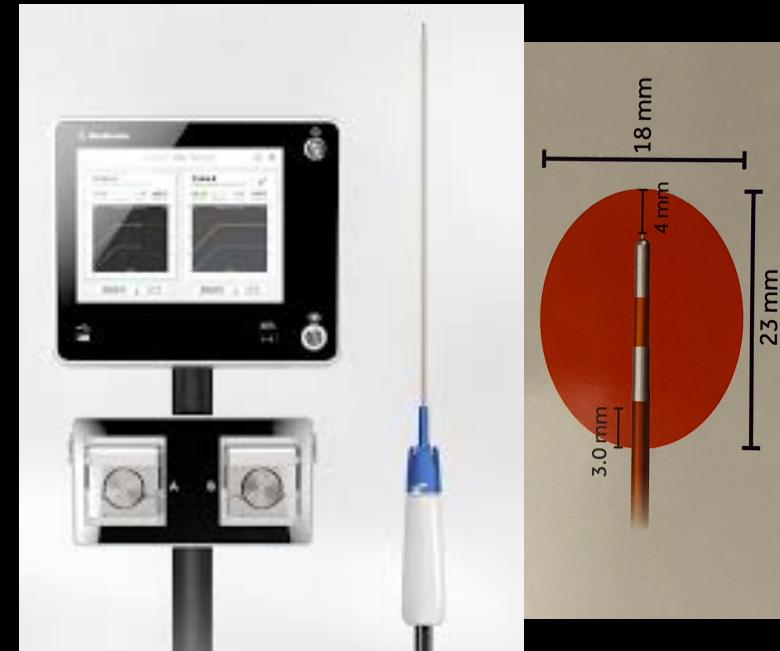
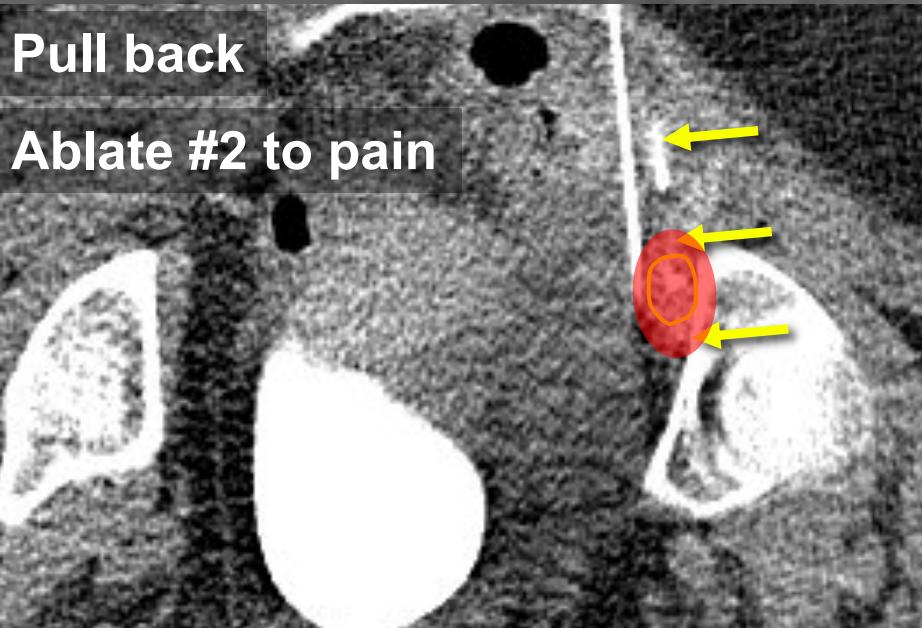
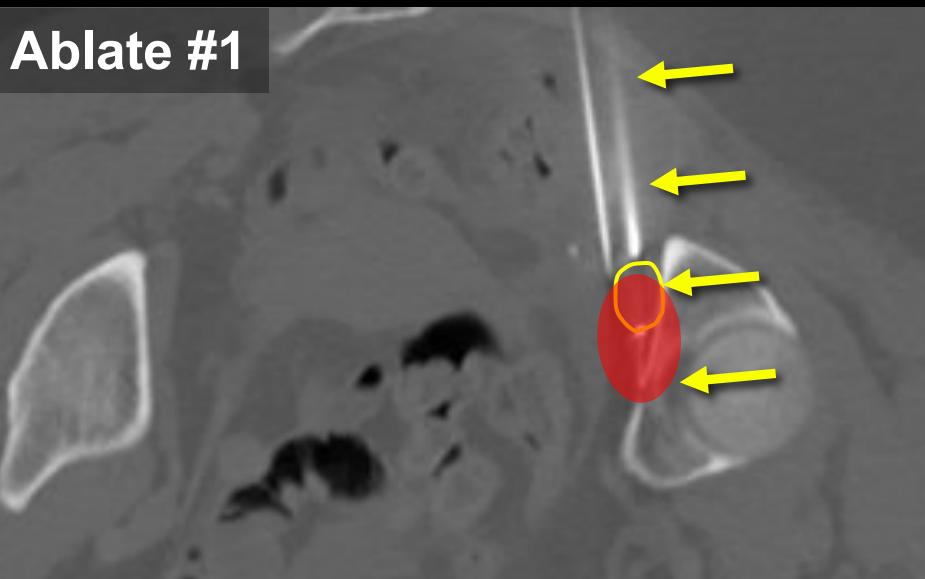


Adjust needle
Displace with more fluid

ADEQUATE DISPLACEMENT

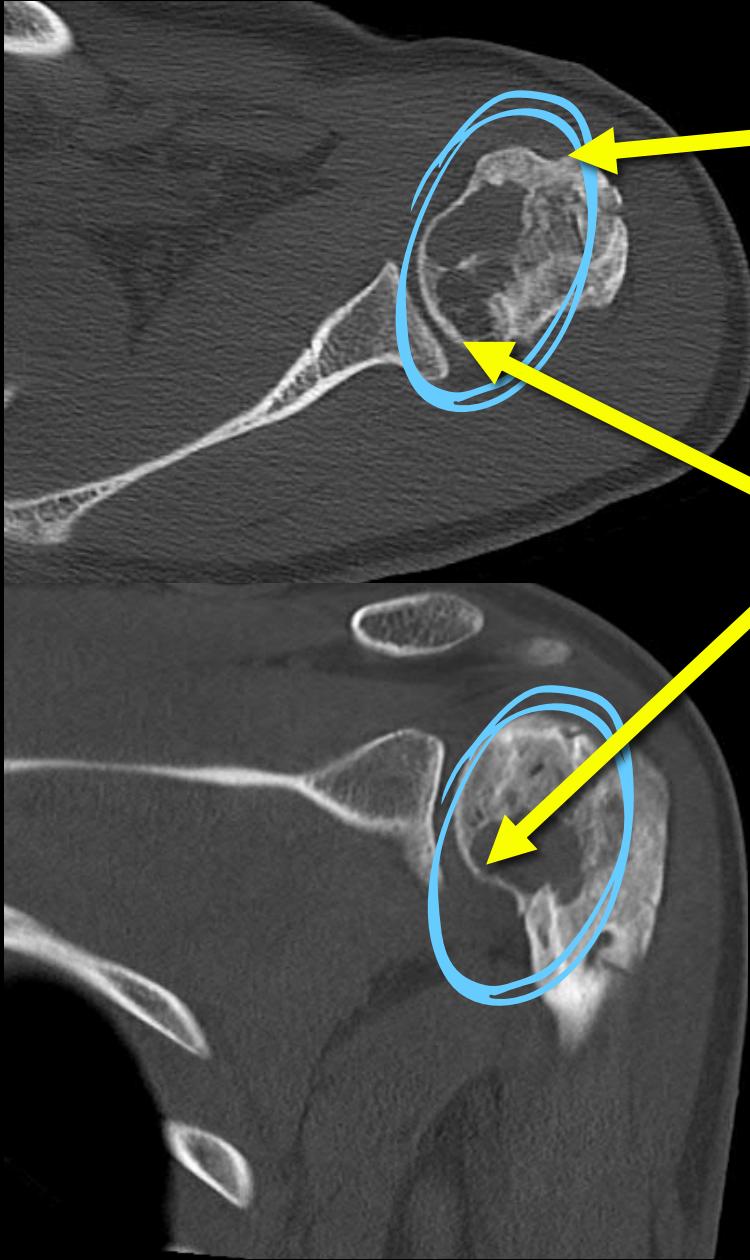
Recurrent Ependymal Cell Tumor

Bipolar RFA — Conscious Sedation



Recurrent Giant Cell Tumor

Concerns?



Avoid biceps tendon

Concern for articular surface

Treatment options?

Surgery

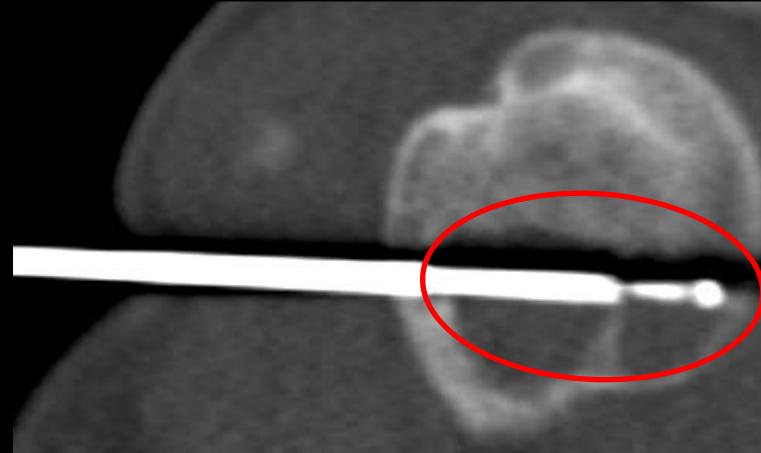
Cryoablation

Radiofrequency ablation

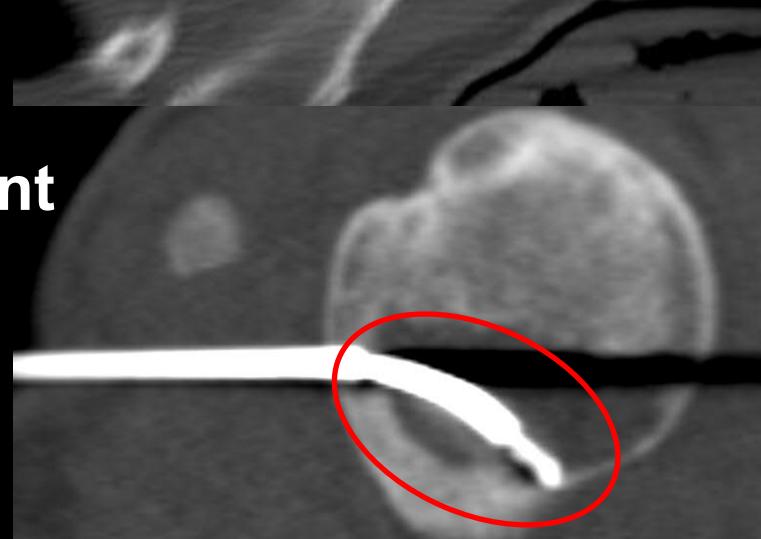
Avoid Articular Surface

Bipolar RFA

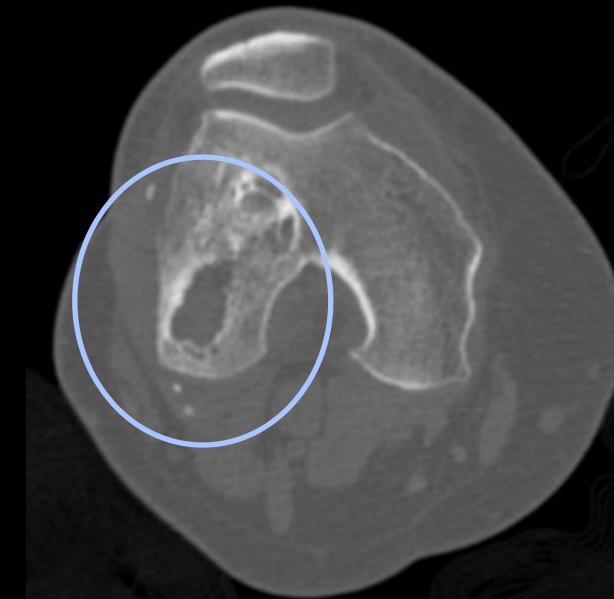
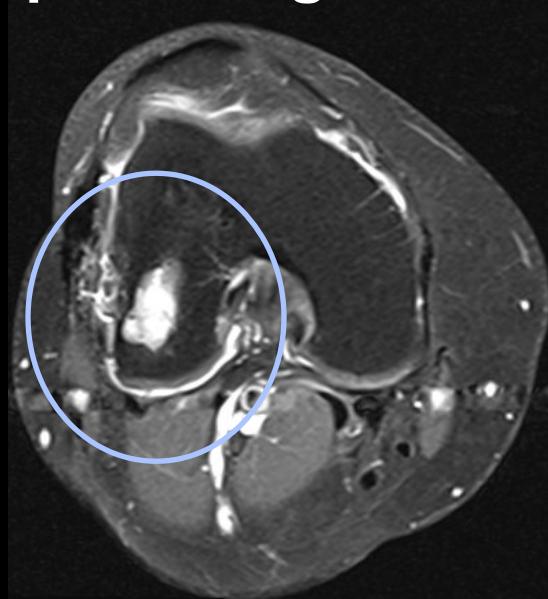
Controlled size



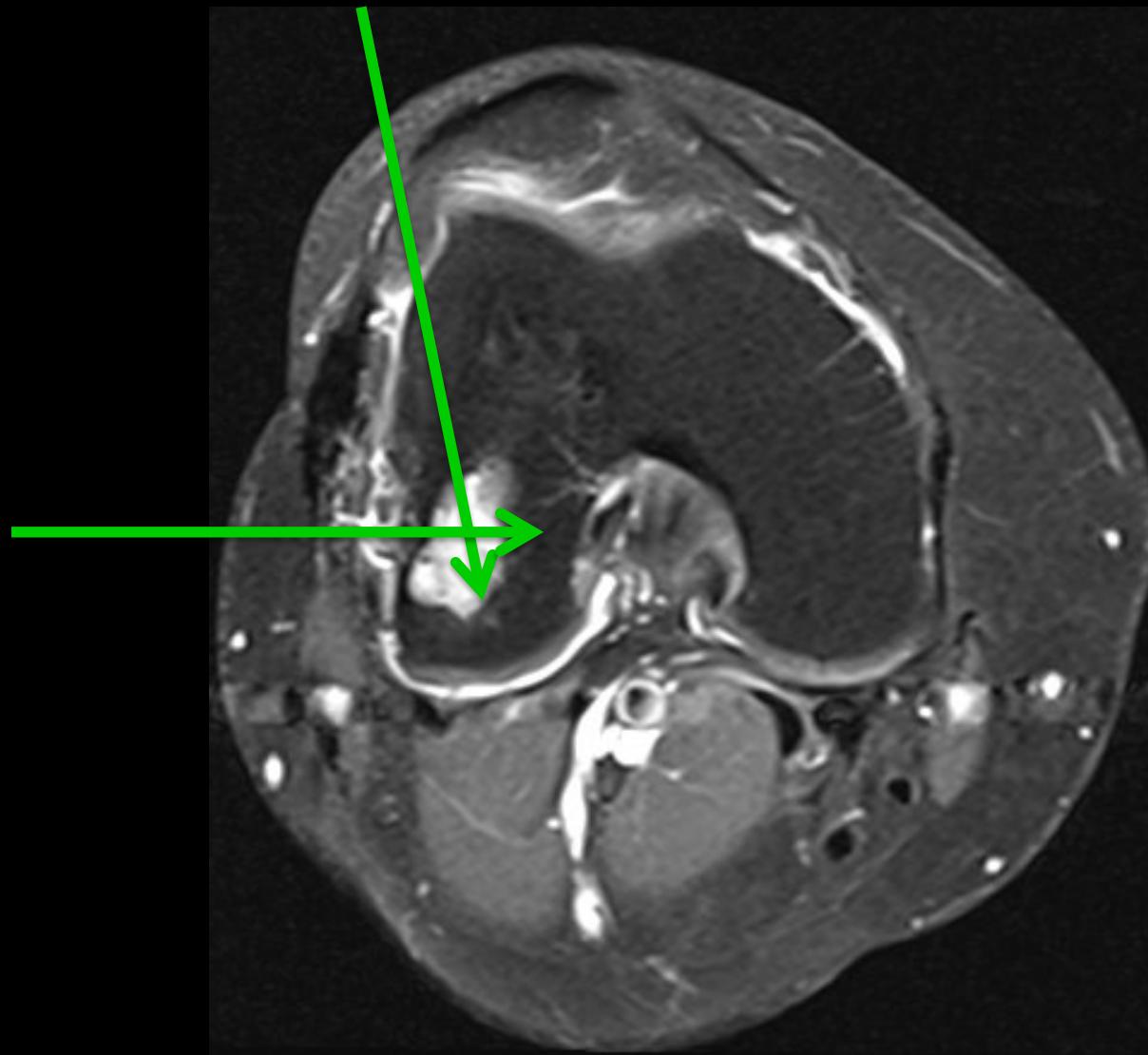
Articulated placement



Recurrent Giant Cell Tumor
38 yo with 3 prior surgeries



Technical Approach?



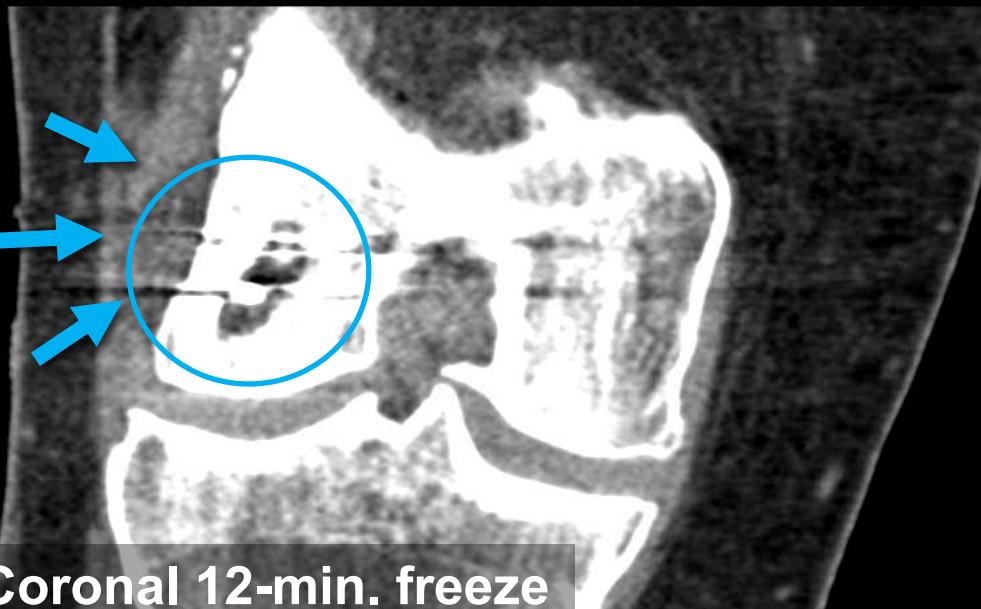
Avoid Articular Surface



Axial one of 2 probes



Axial 12-min. freeze



Coronal 12-min. freeze

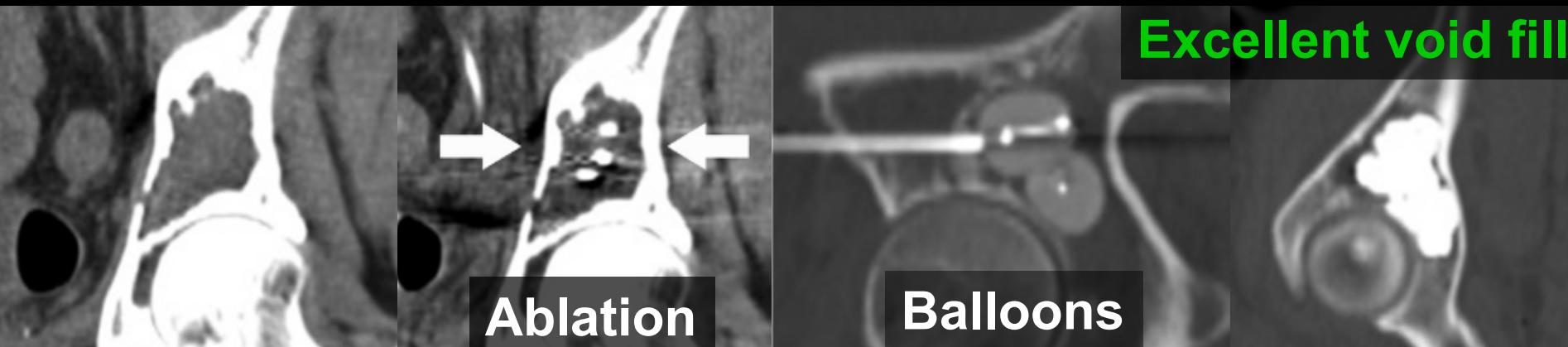
Balloon-Assisted Osteoplasty of Periacetabular Tumors following Percutaneous Cryoablation

A. Nicholas Kurup, MD, Jonathan M. Morris, MD, Grant D. Schmit, MD, Thomas D. Atwell, MD, John J. Schmitz, MD, Peter S. Rose, MD, and Matthew R. Callstrom, MD, PhD

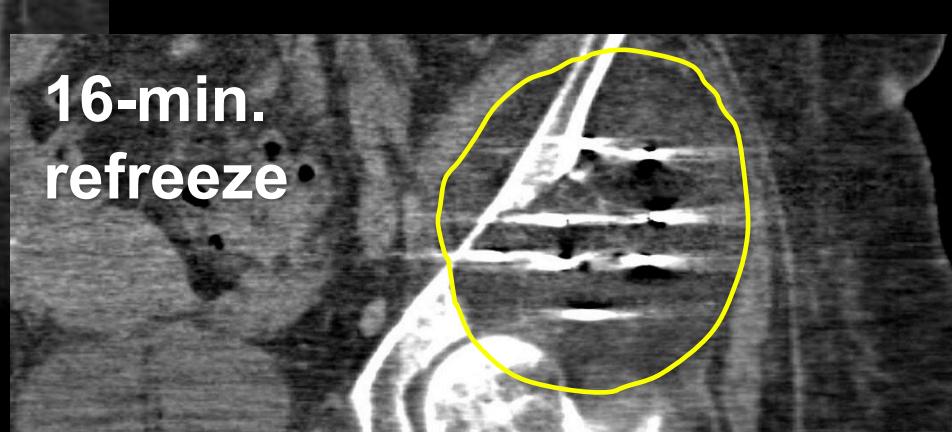
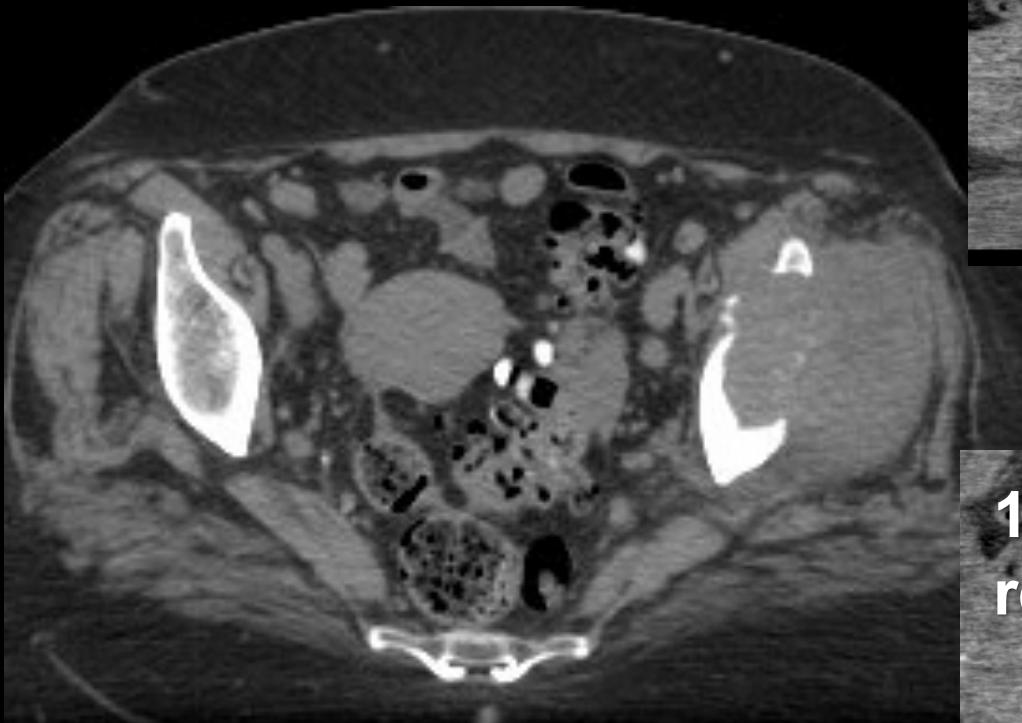
Ablation Followed by Osteoplasty



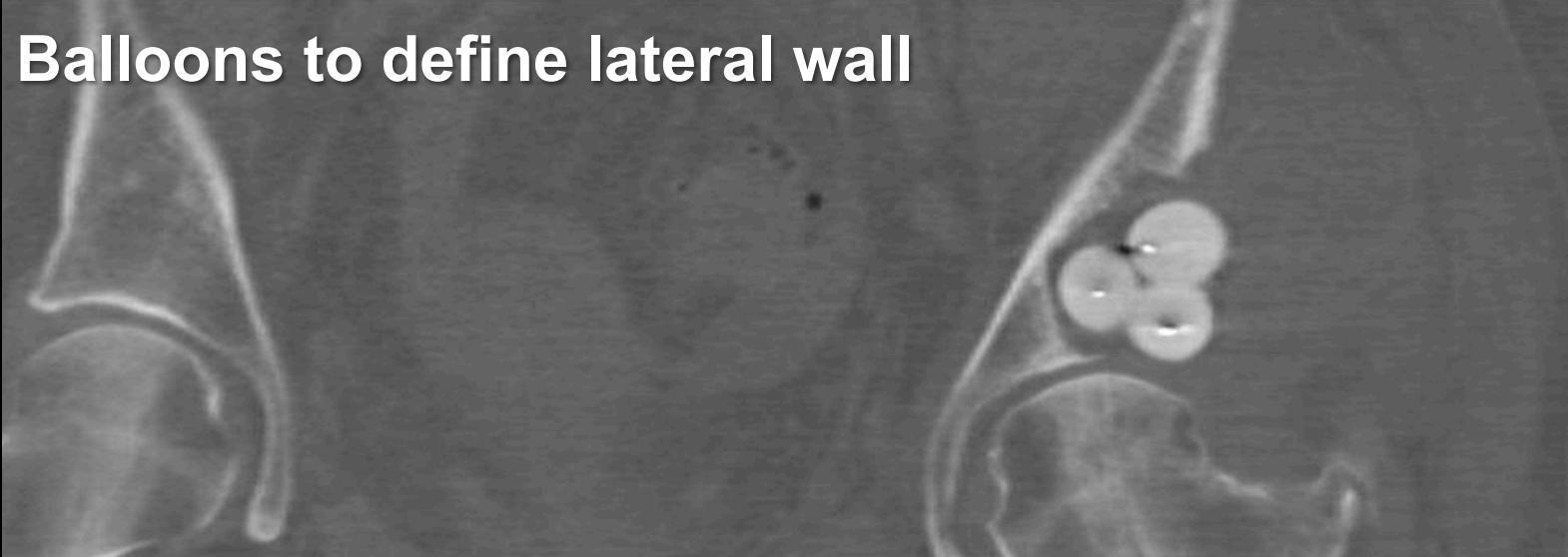
Ablation Followed by Kyphoplasty and Osteoplasty



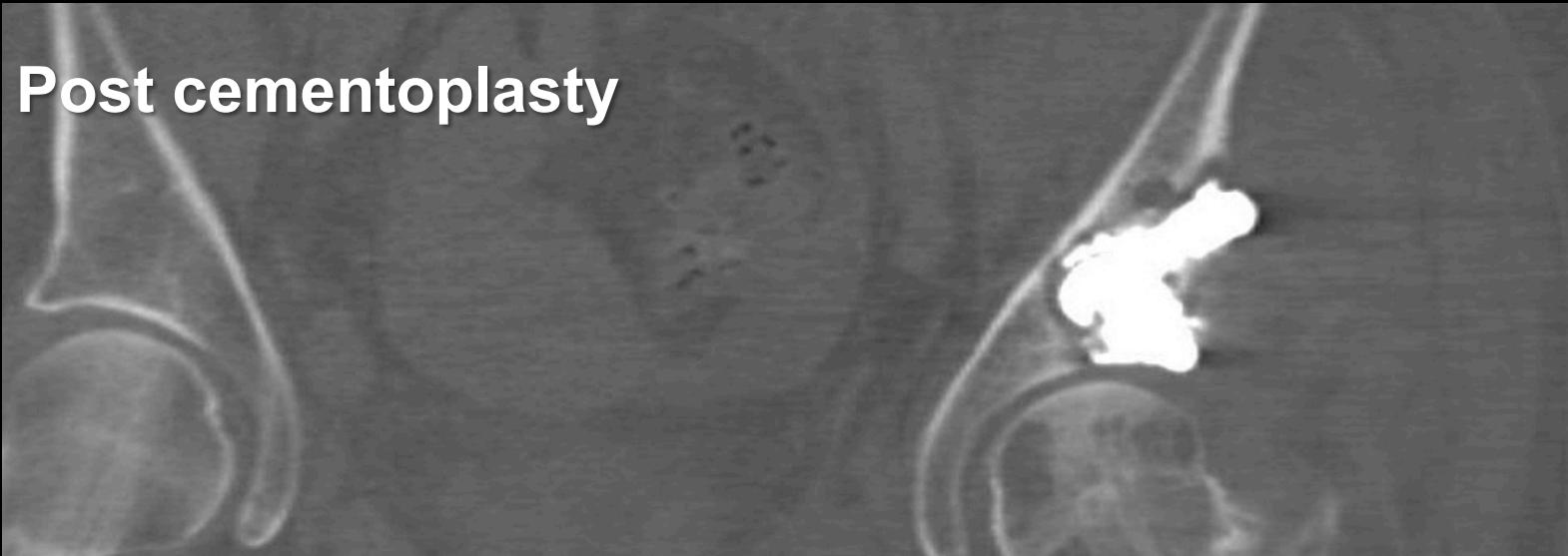
Periacetabular Mass — Prevent Fracture



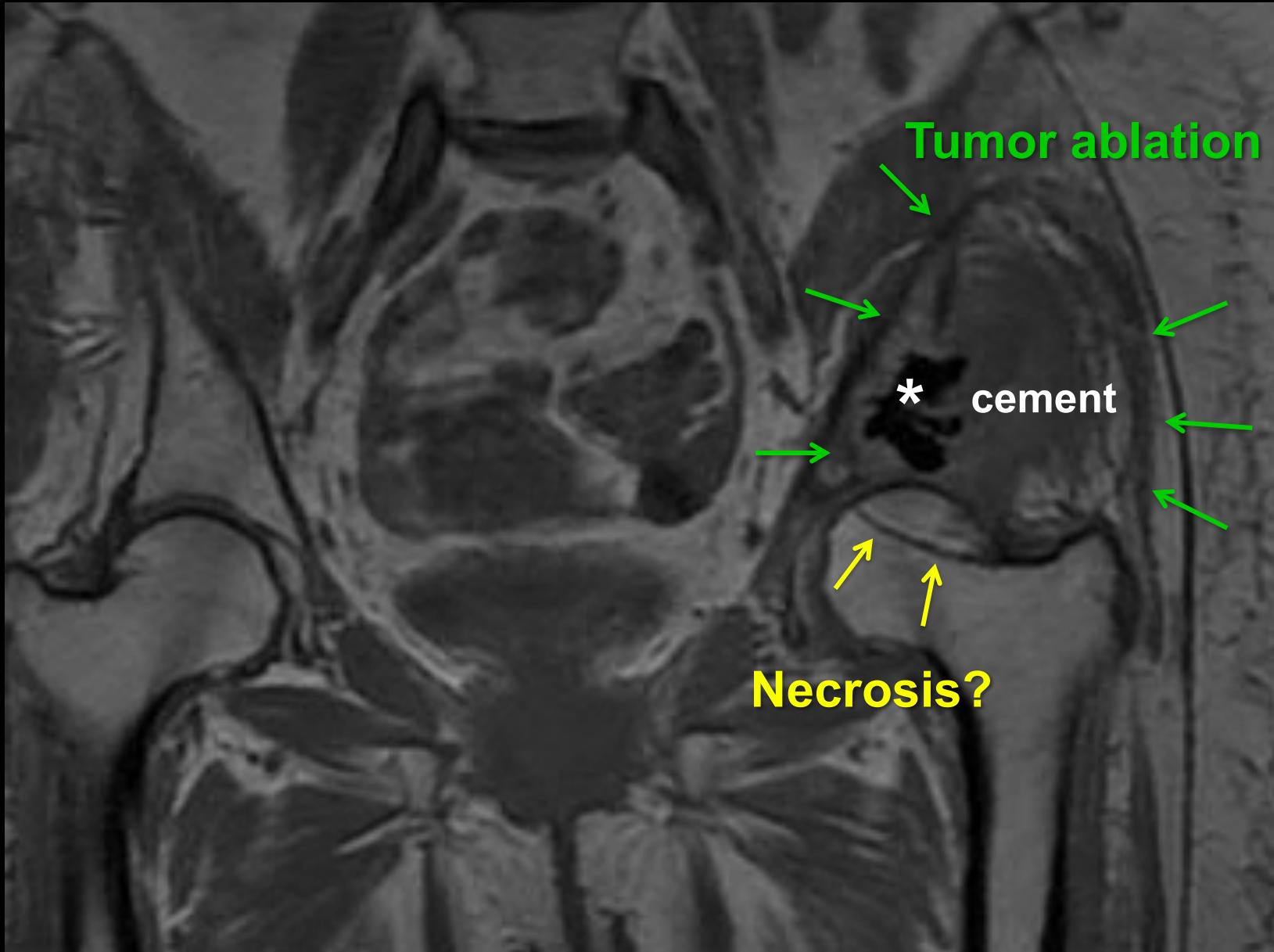
Balloons to define lateral wall



Post cementoplasty



Excellent void filling without extravasation



2 months post-cryoablation

Fracture



6 months post-cryoablation

Protrusio

Femoral head
collapse

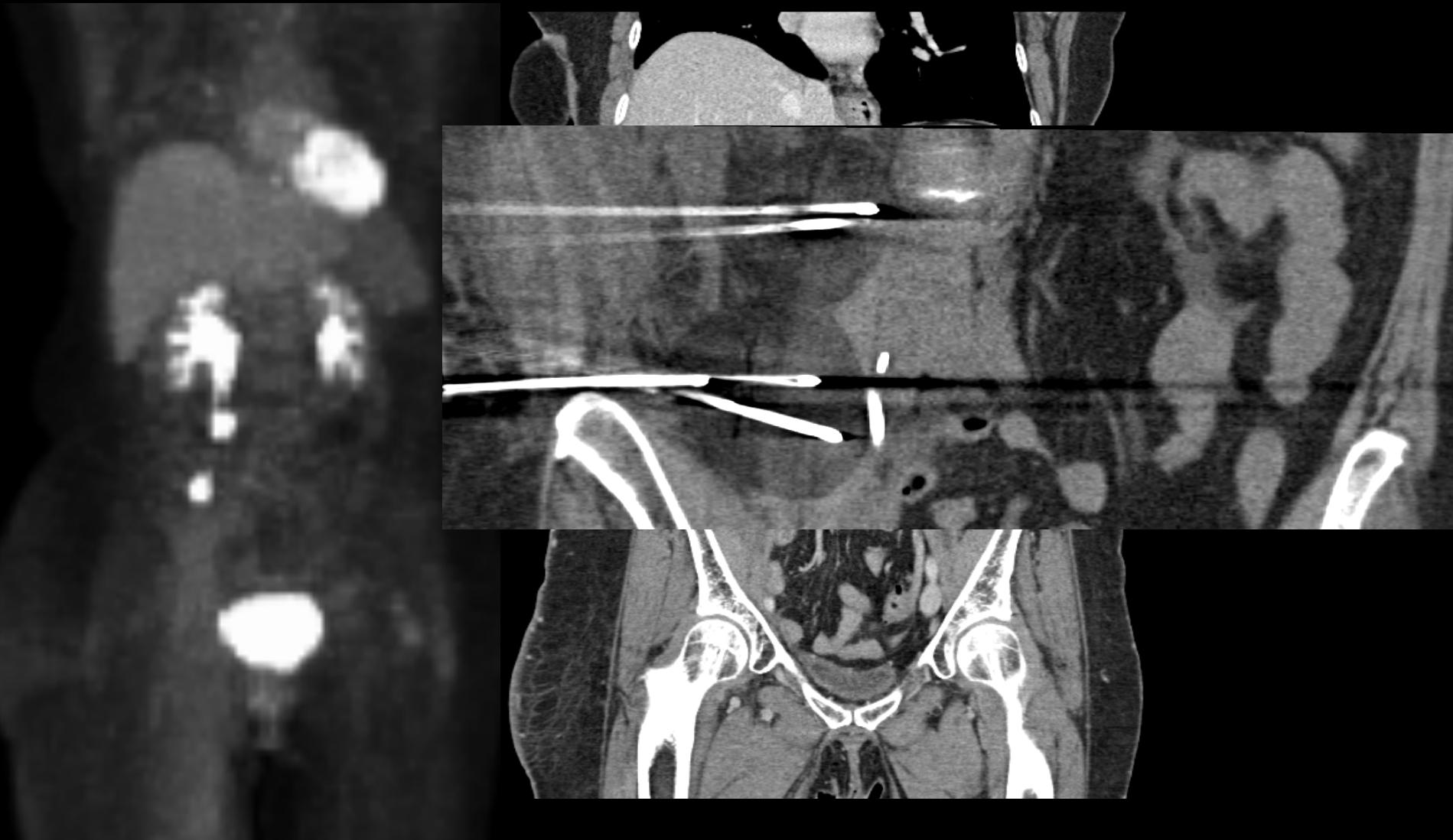
Two green arrows point to the femoral head collapse and the protrusion of the femoral head into the acetabulum.

Lessons:

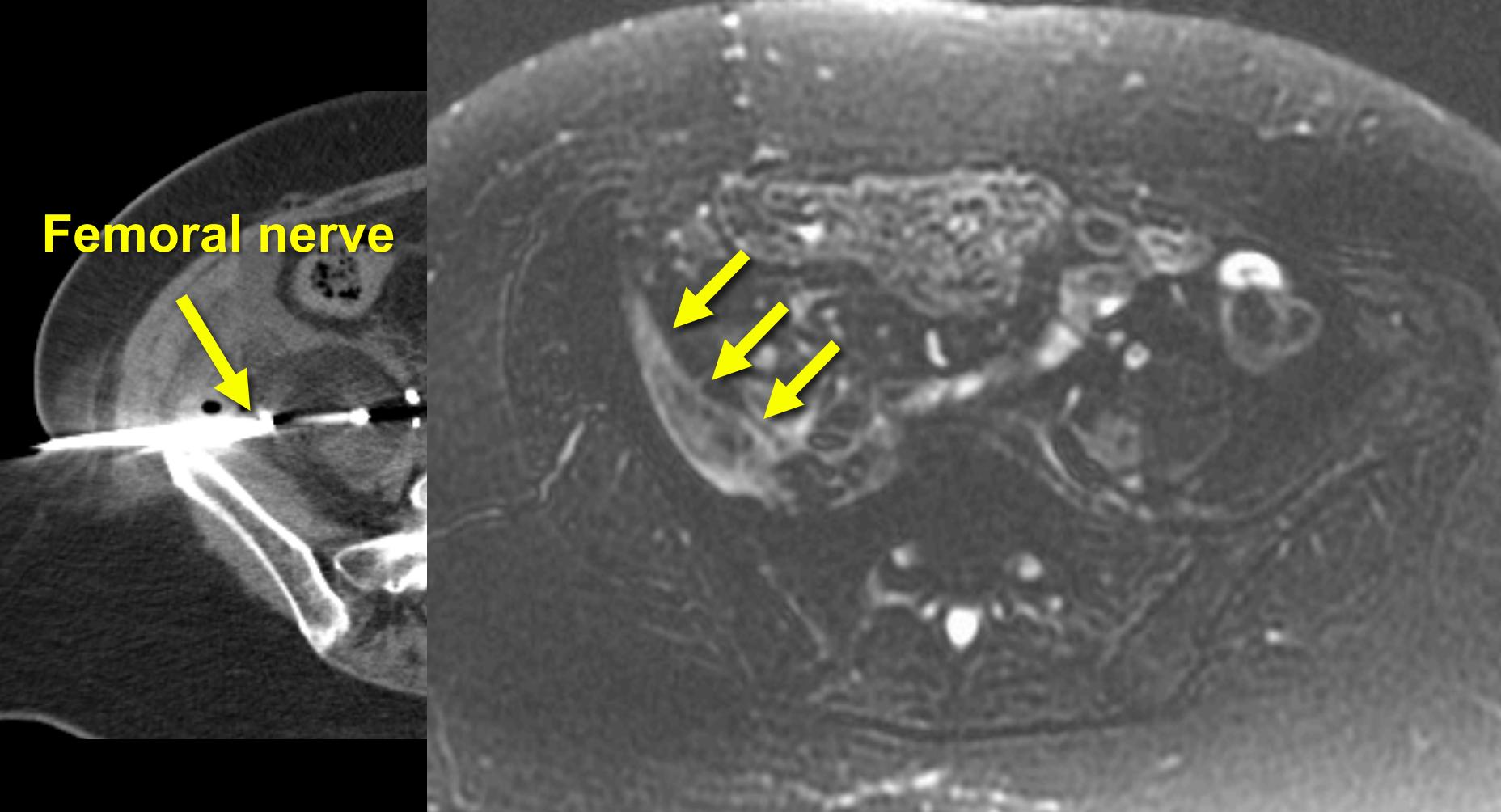
Ice can cause fracture

Balloons define cavity

Femoral nerve

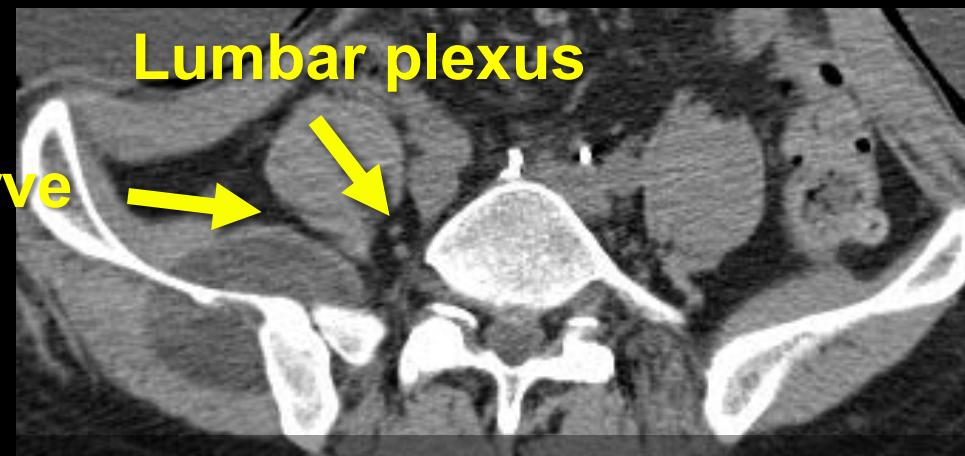
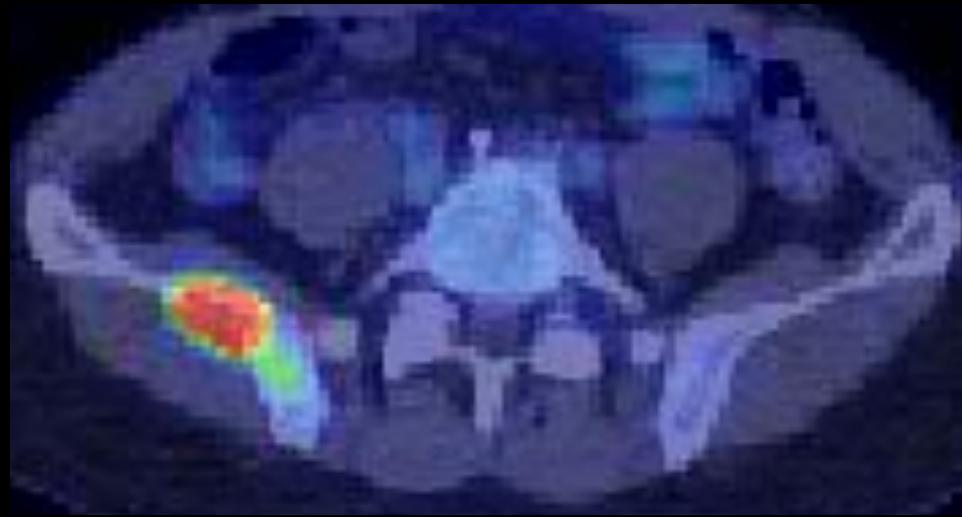


Femoral nerve



Loss of iliopsoas and quadriceps function improved over 6 mos.

Lumbar plexus and femoral nerve



Pain palliation — no neural injury

Thermal Ablation for MSK Lesions: How I Do It

Lessons Learned

Fluid and CO₂ for Tissue Displacement

Avoid Articular Surfaces

Bipolar RFA and Cryoablation

Periacetabular Tumors

Avoid Ablation into Femoral Head

Void Filling with Kyphoplasty Balloons

Femoral Nerve

Recognize Complex Path