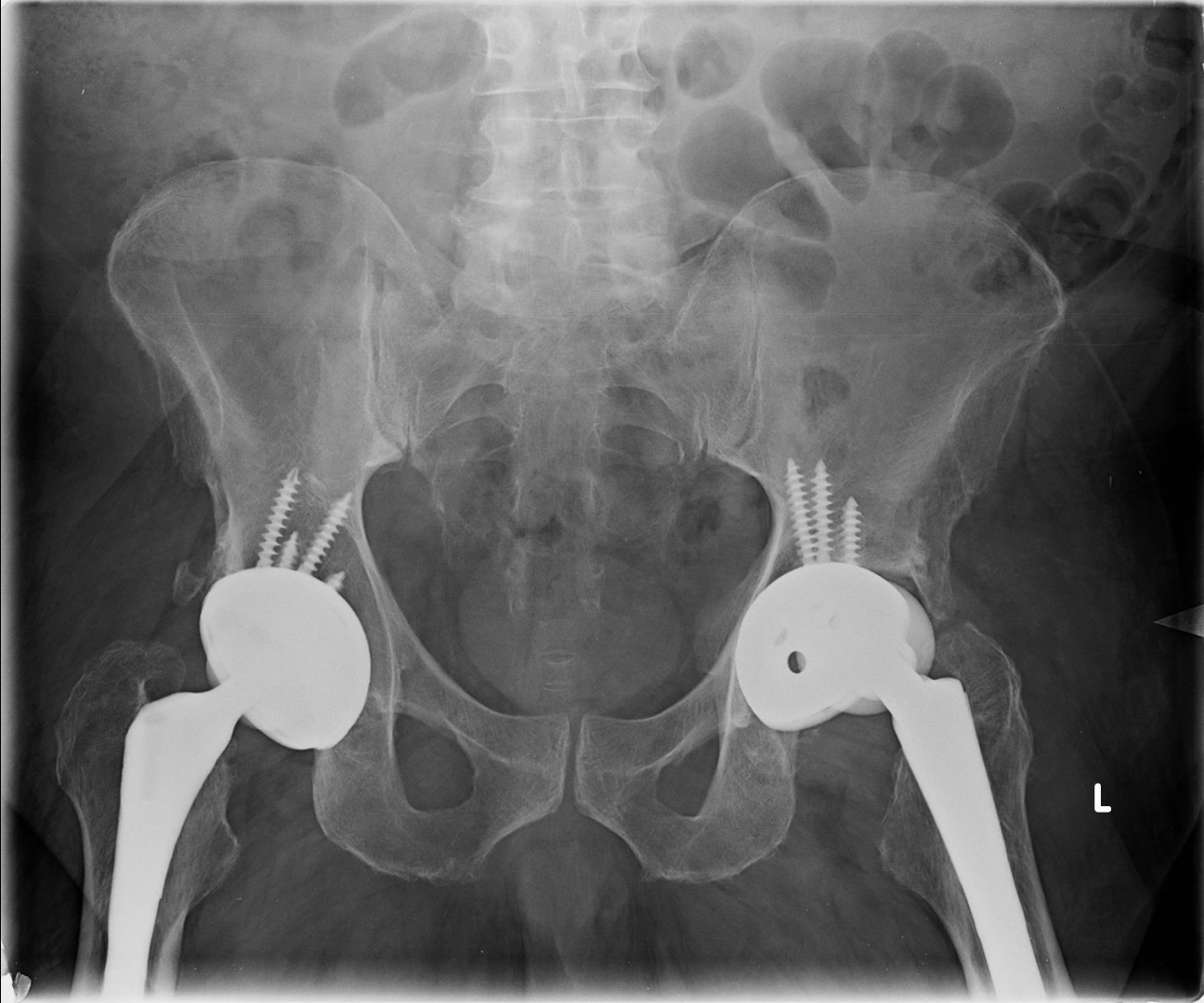




61 M h/o left THA revision with recurrent dislocations

Melanie Chang
5/19/2017



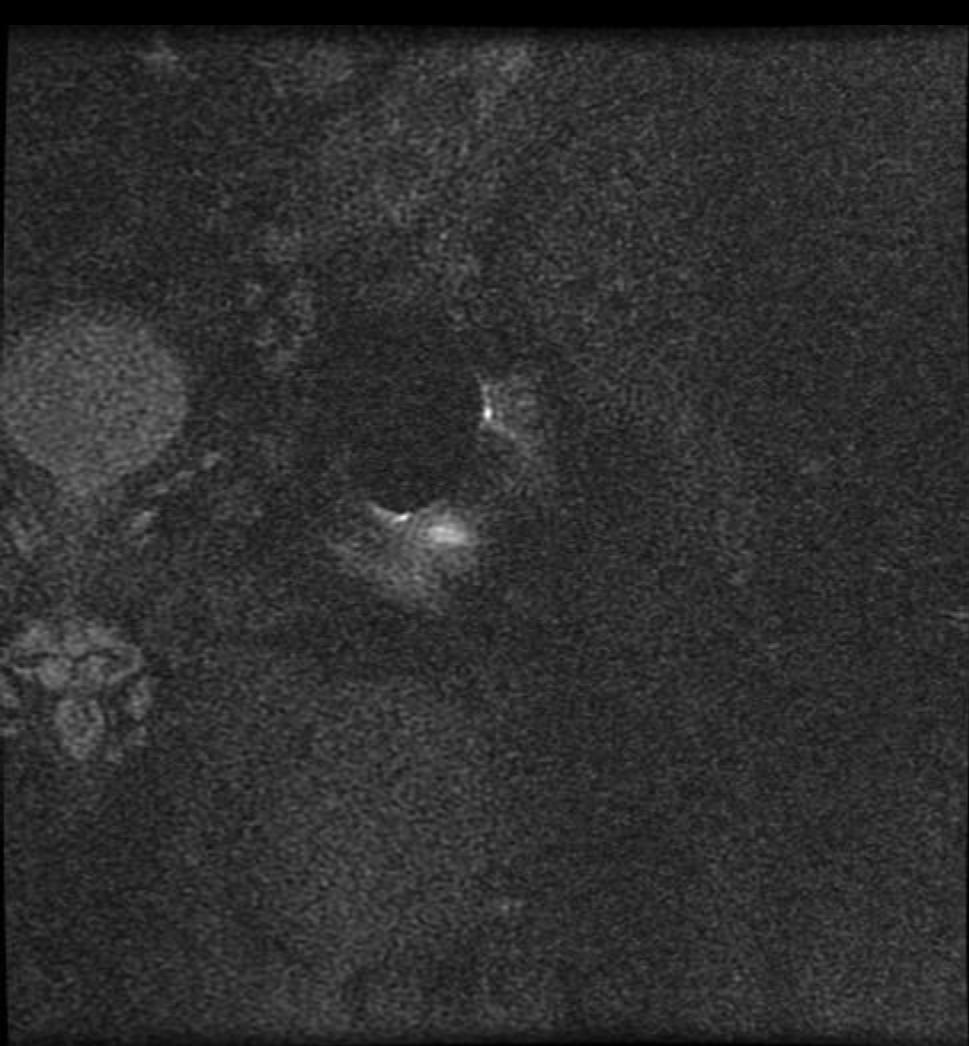
2009: original MoM THA

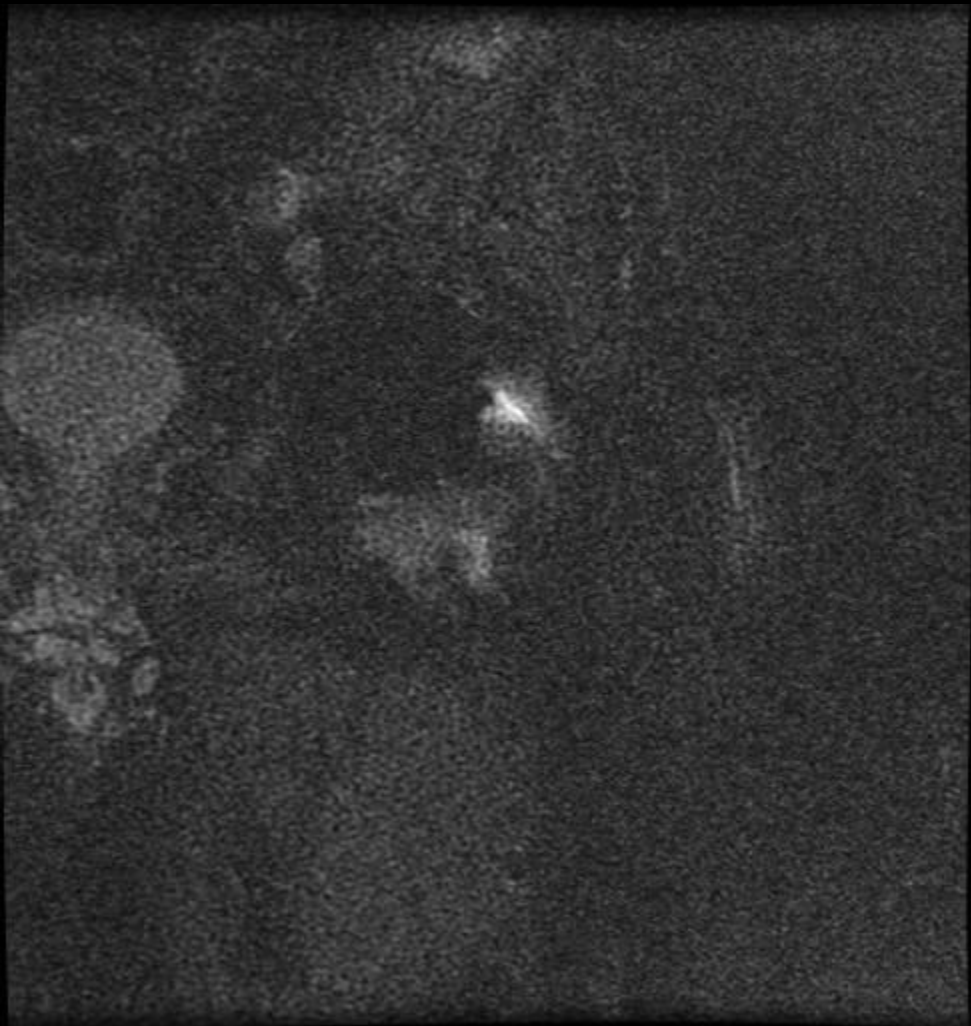
2010: revision ceramic and polyethylene liner with retained modular femoral component

2013: greater trochanteric pain started

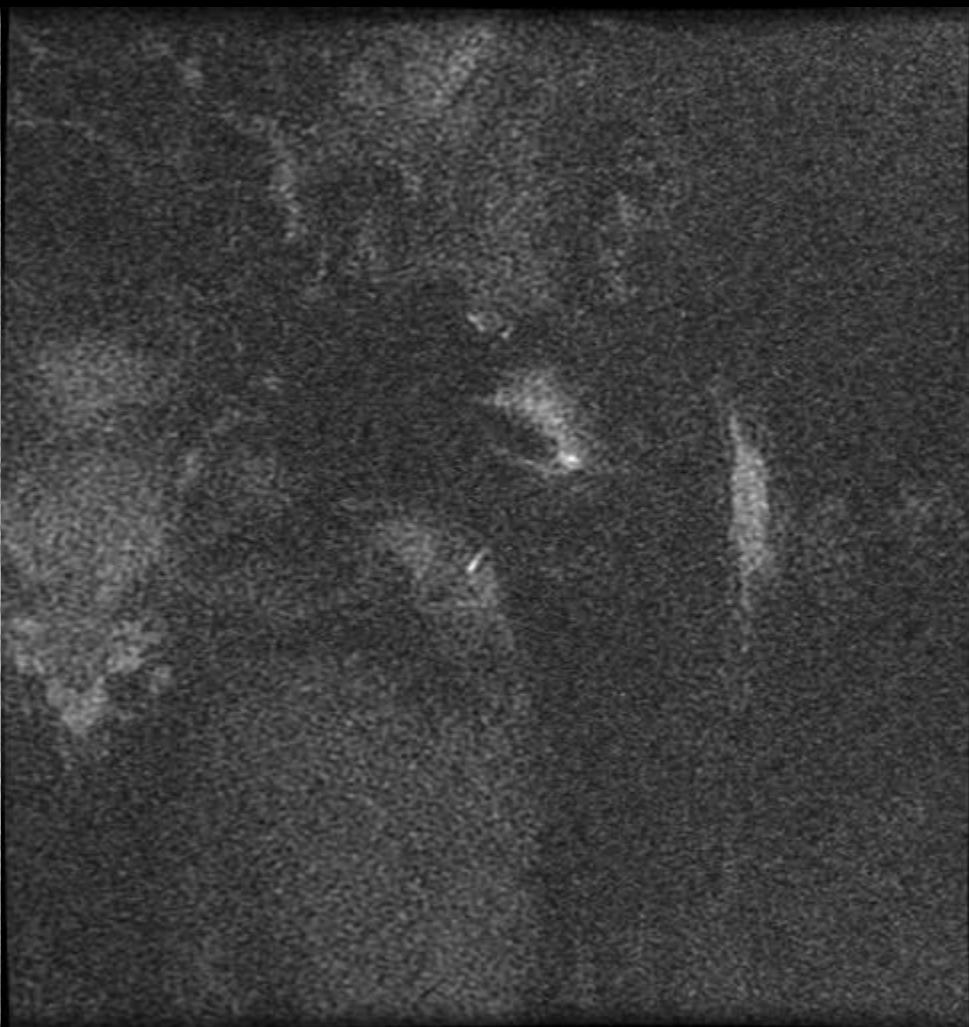
2015: bursectomy with removal of 9cm inflammatory vascular mass, significant soft tissue damage

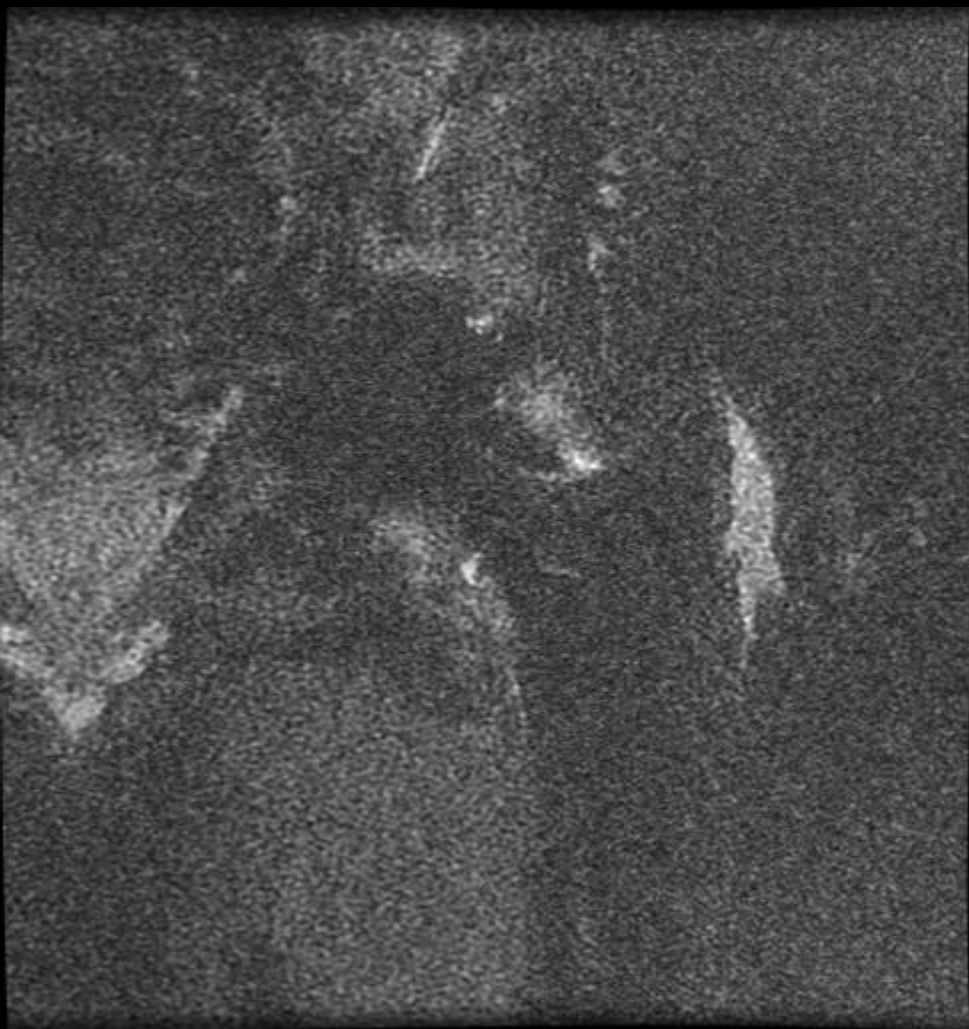
2015-16: 4 hip dislocations w/o trauma

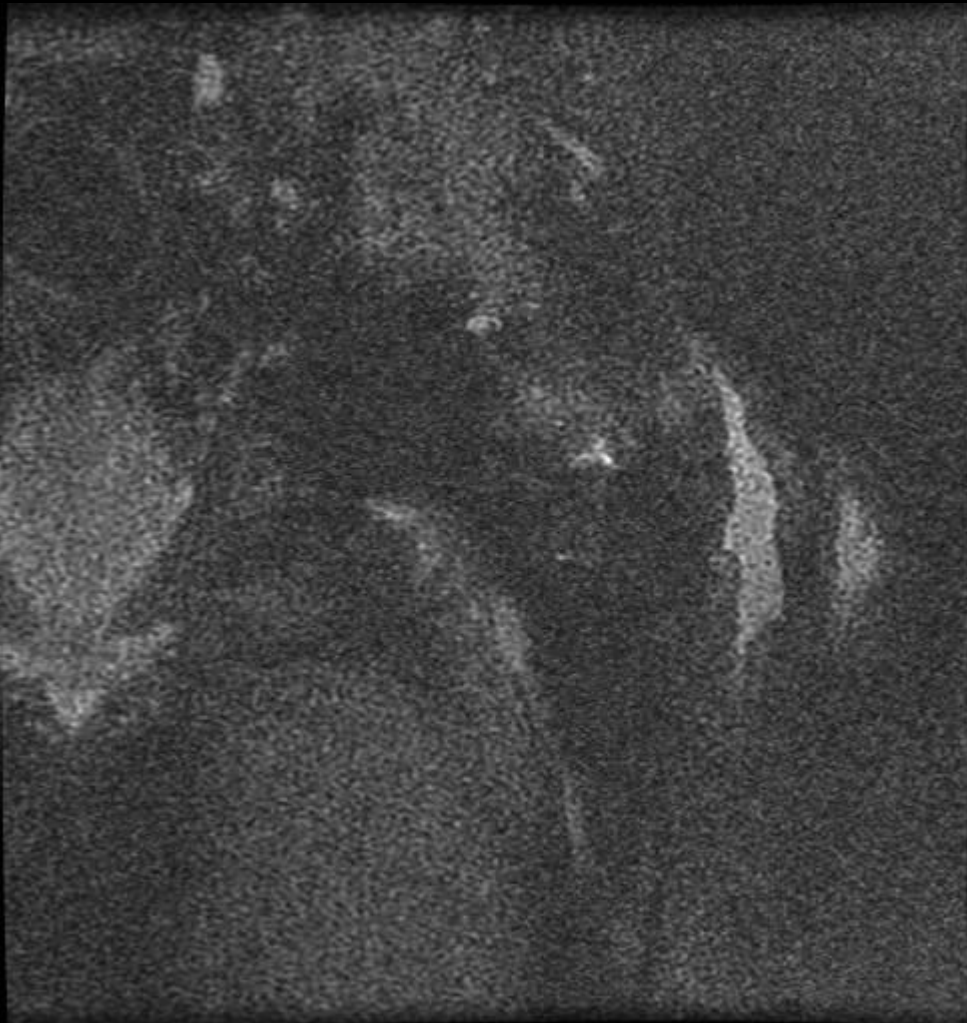


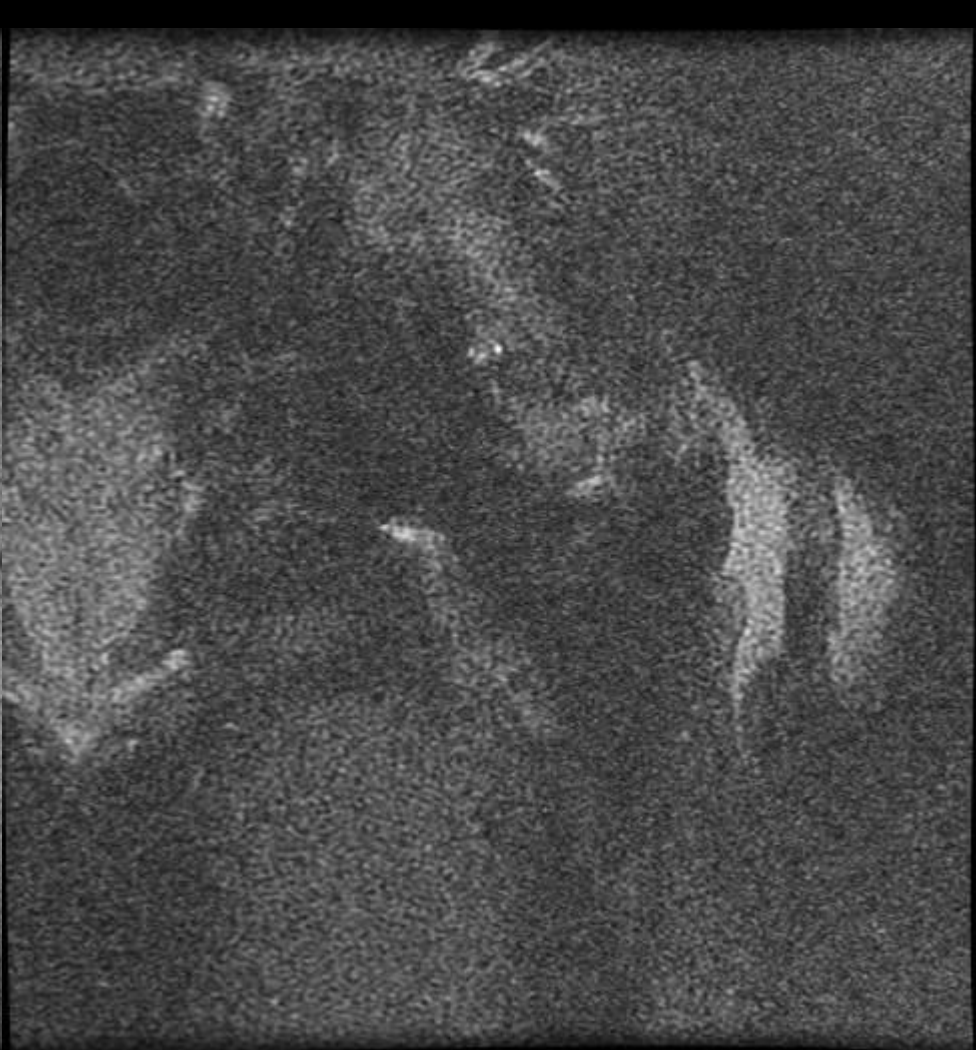


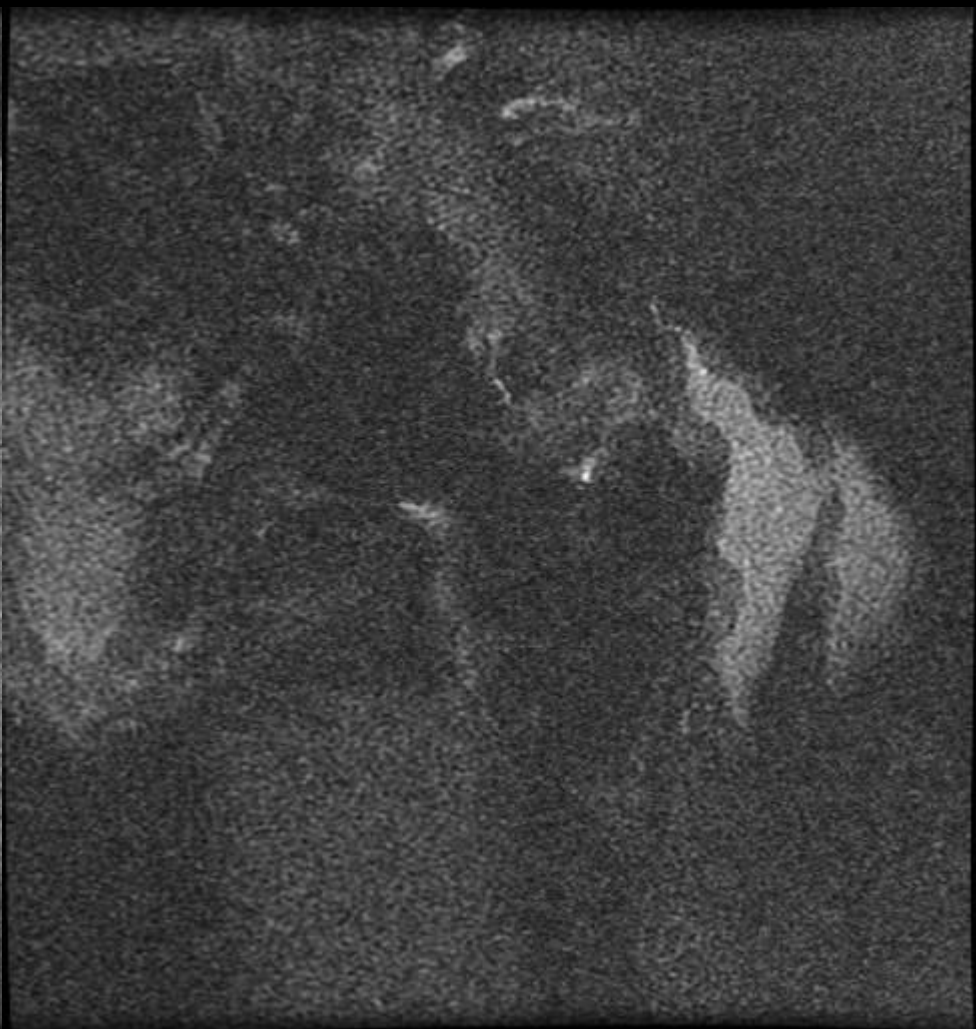


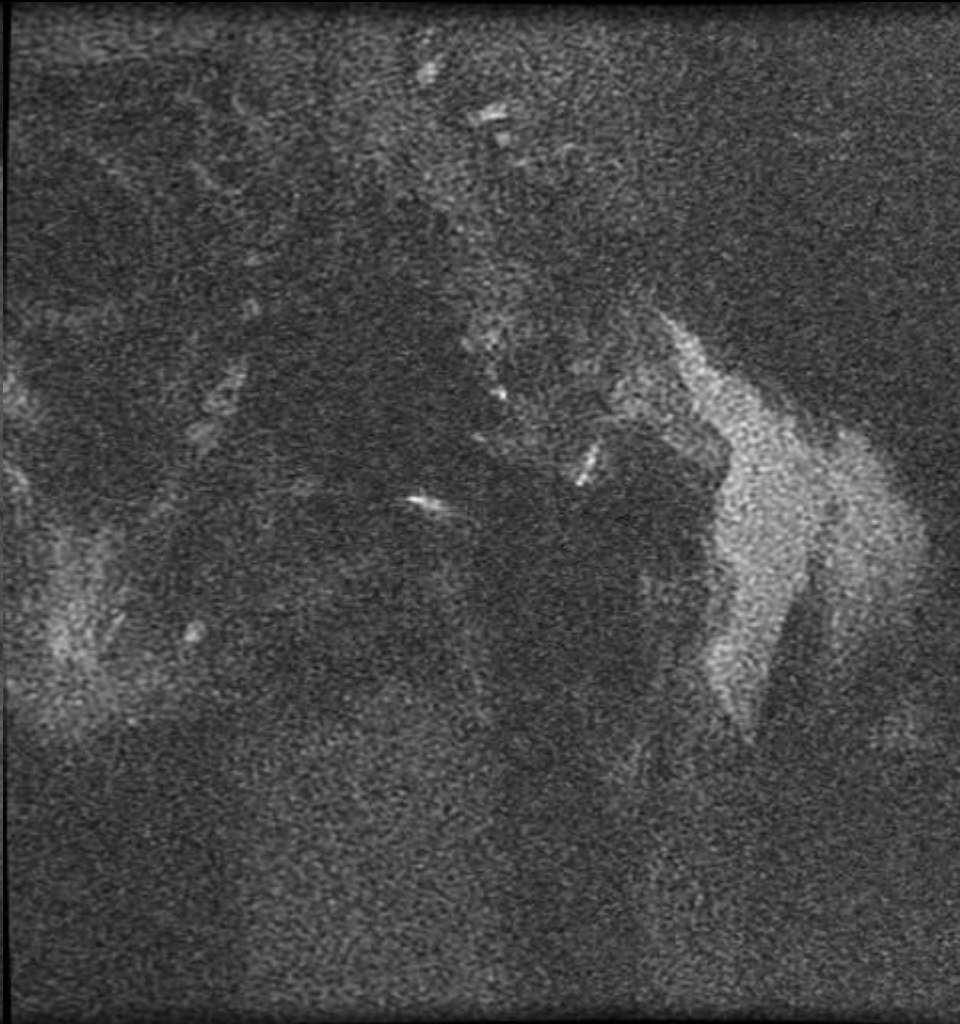




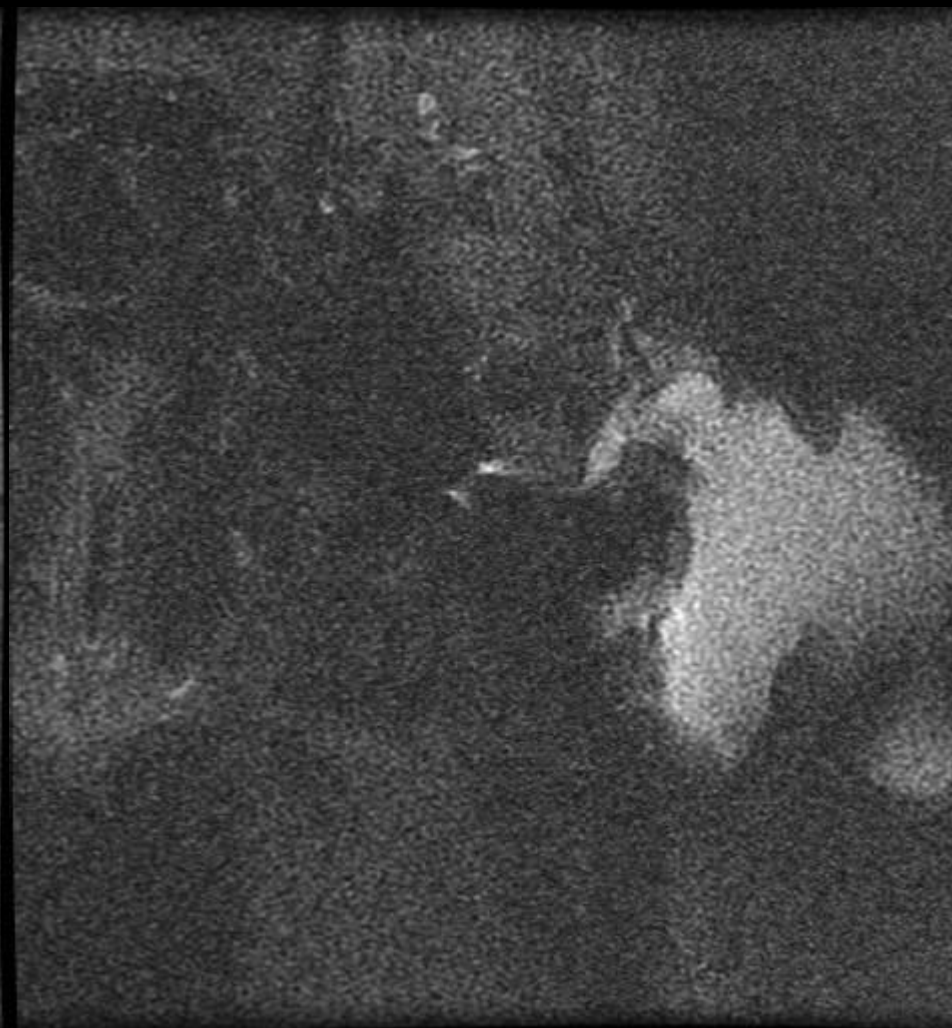


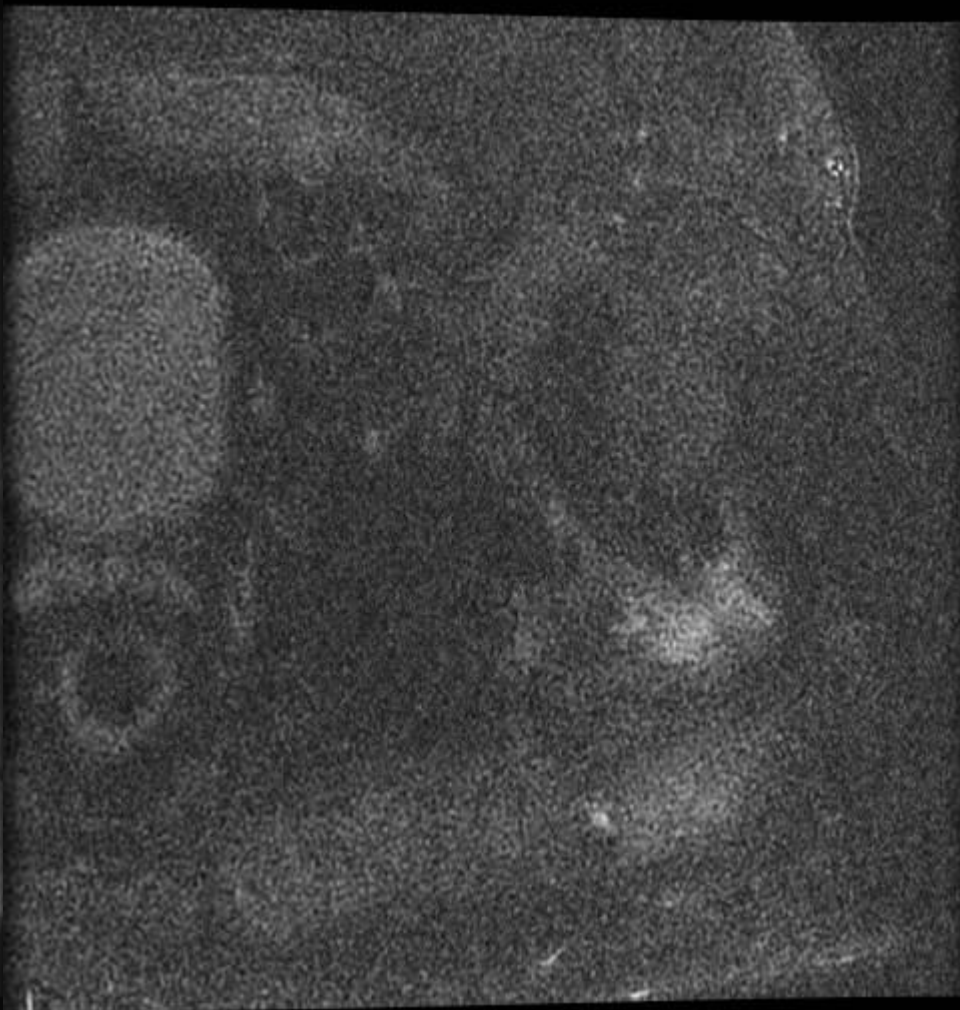
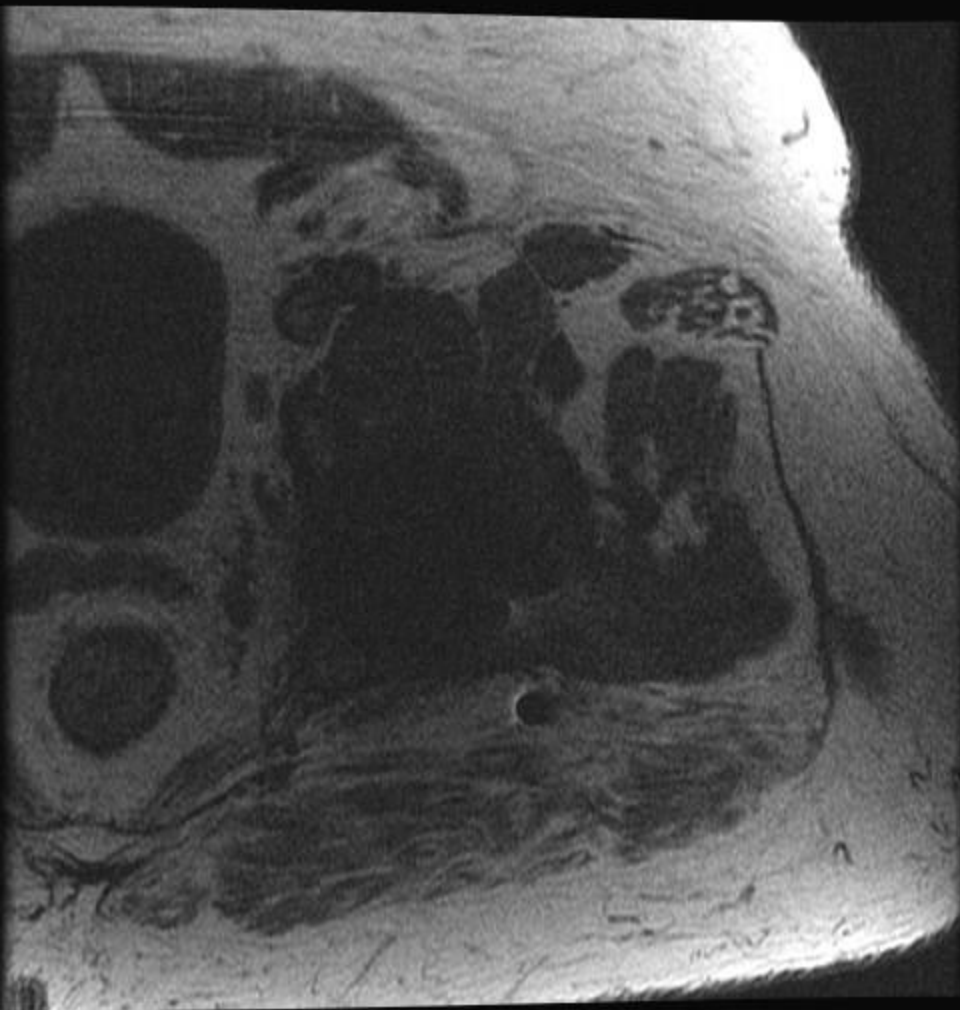


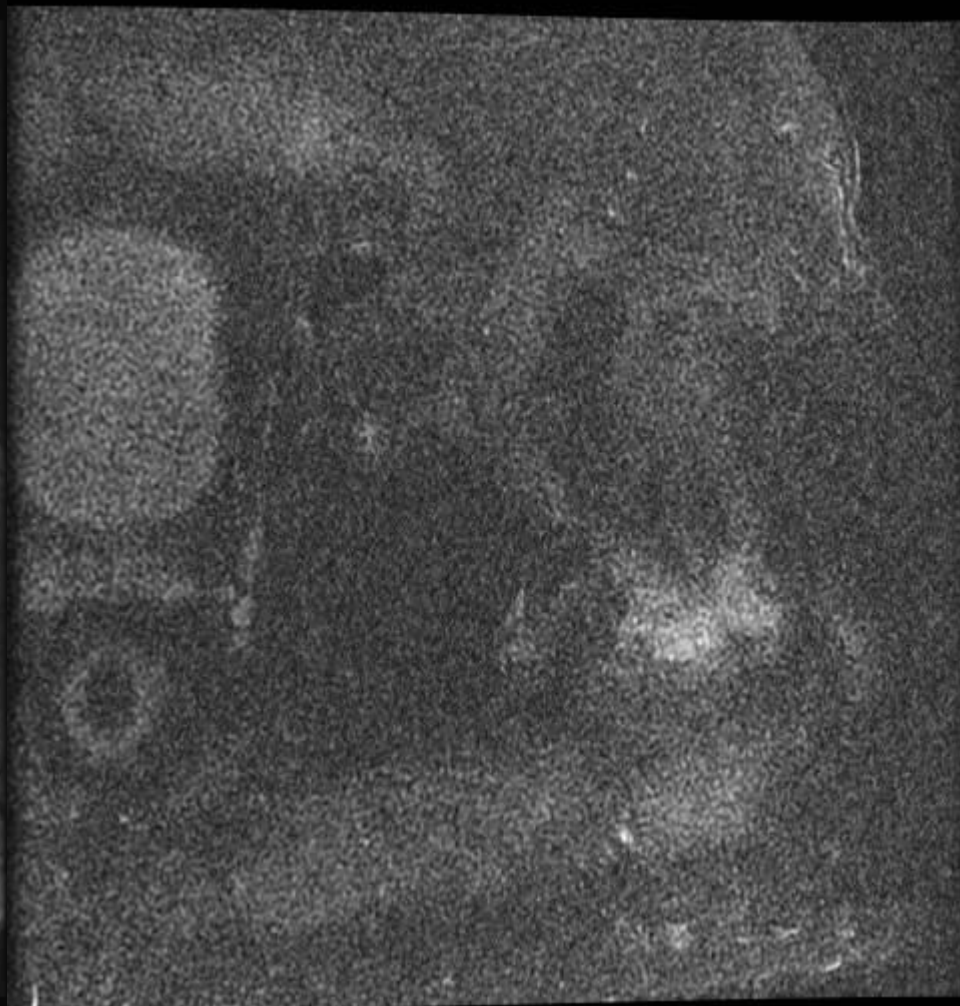
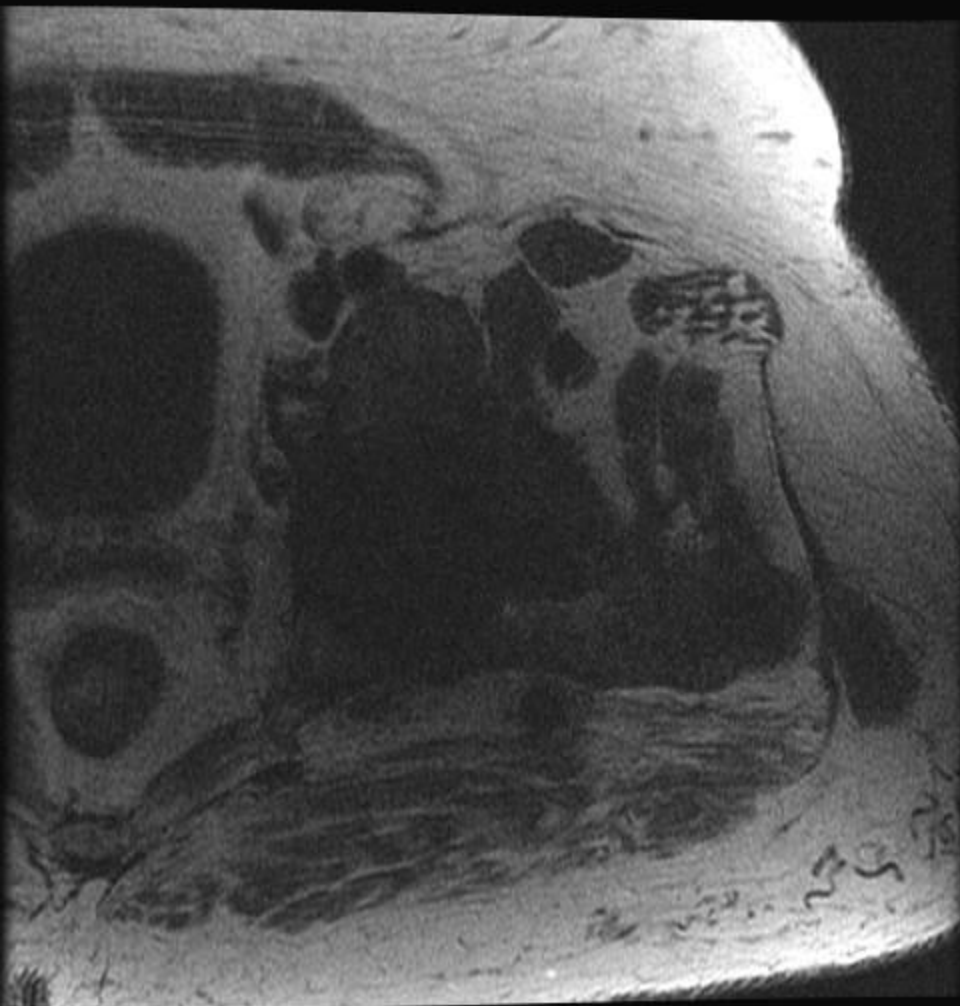


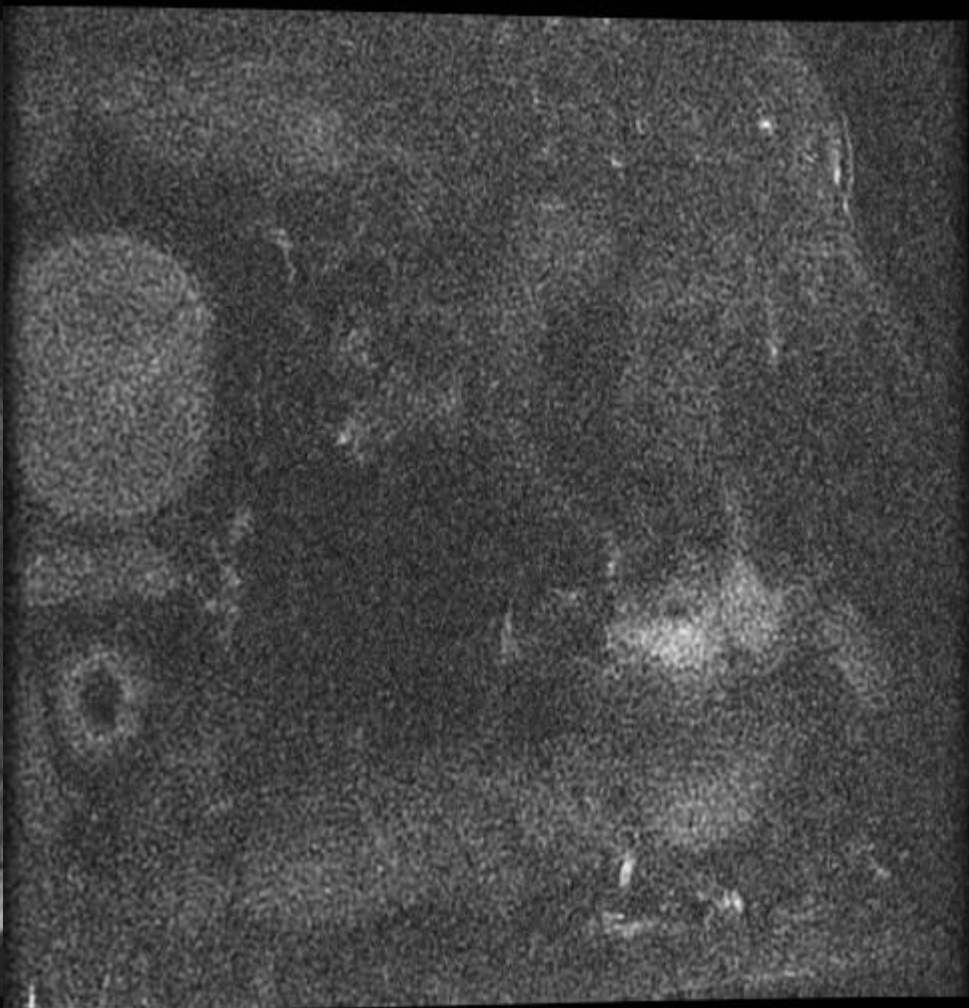
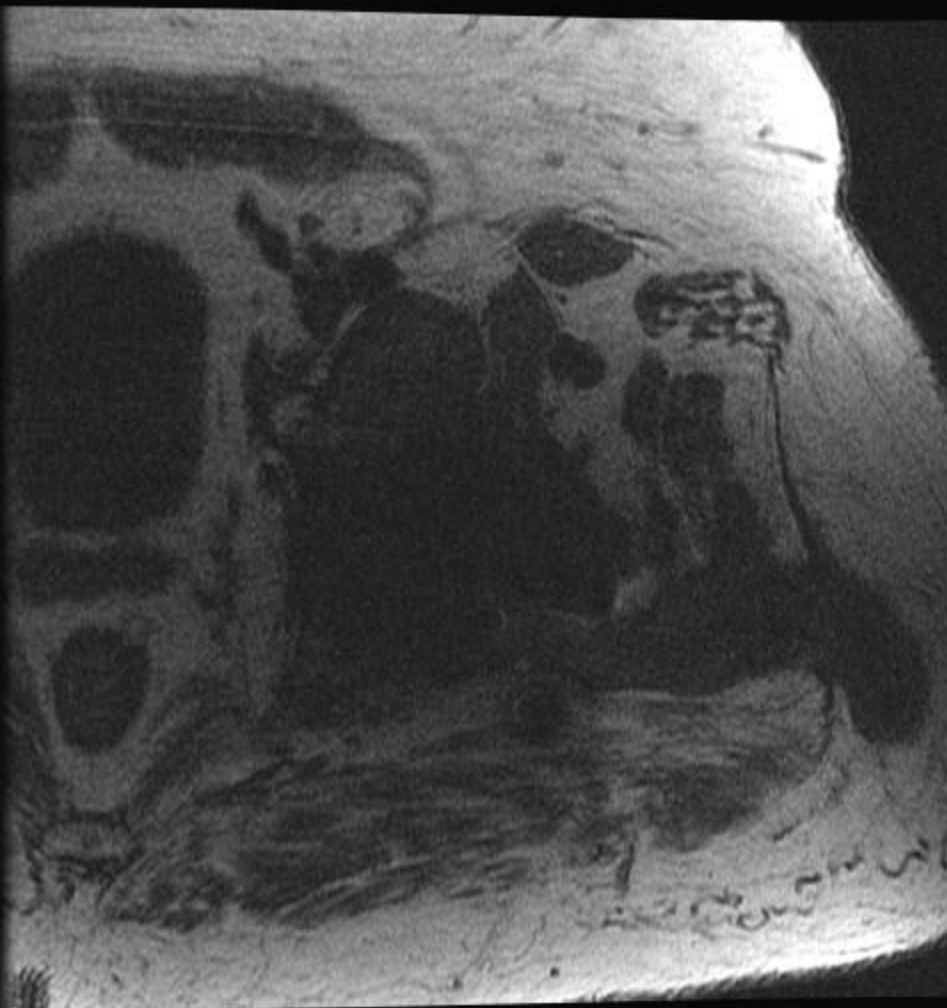


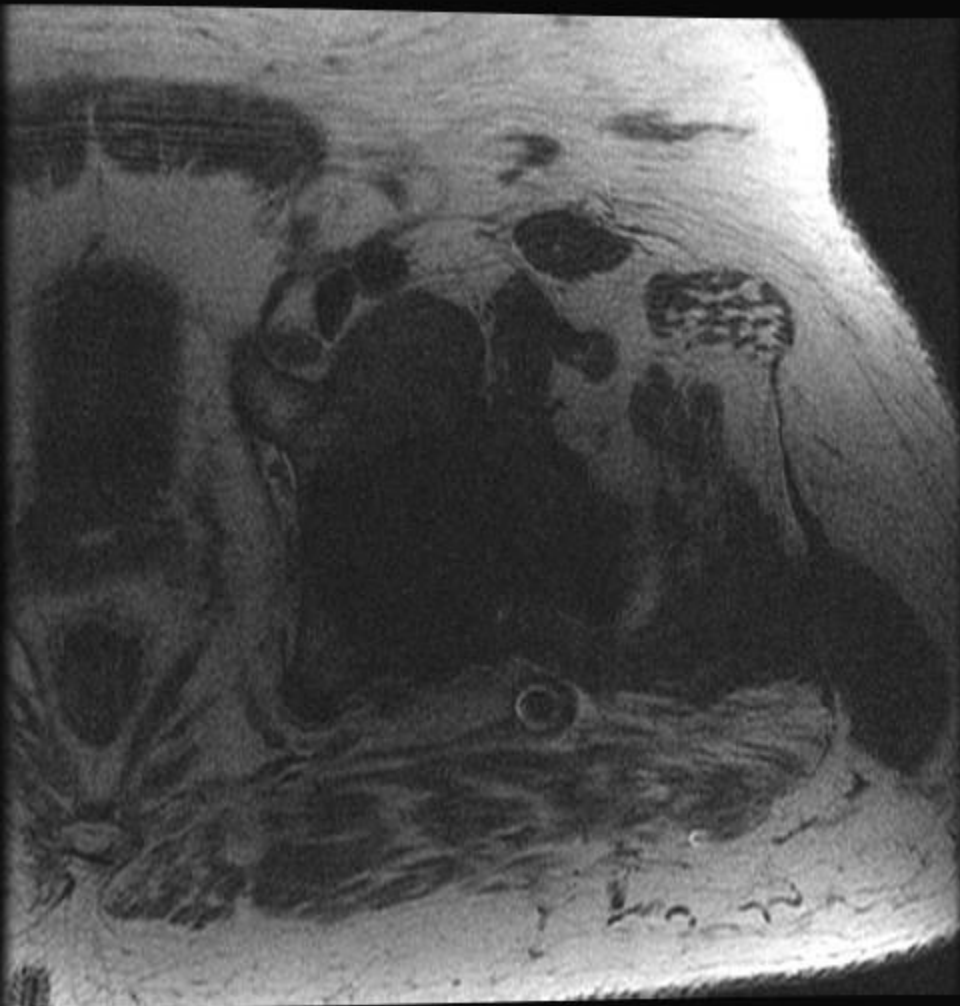


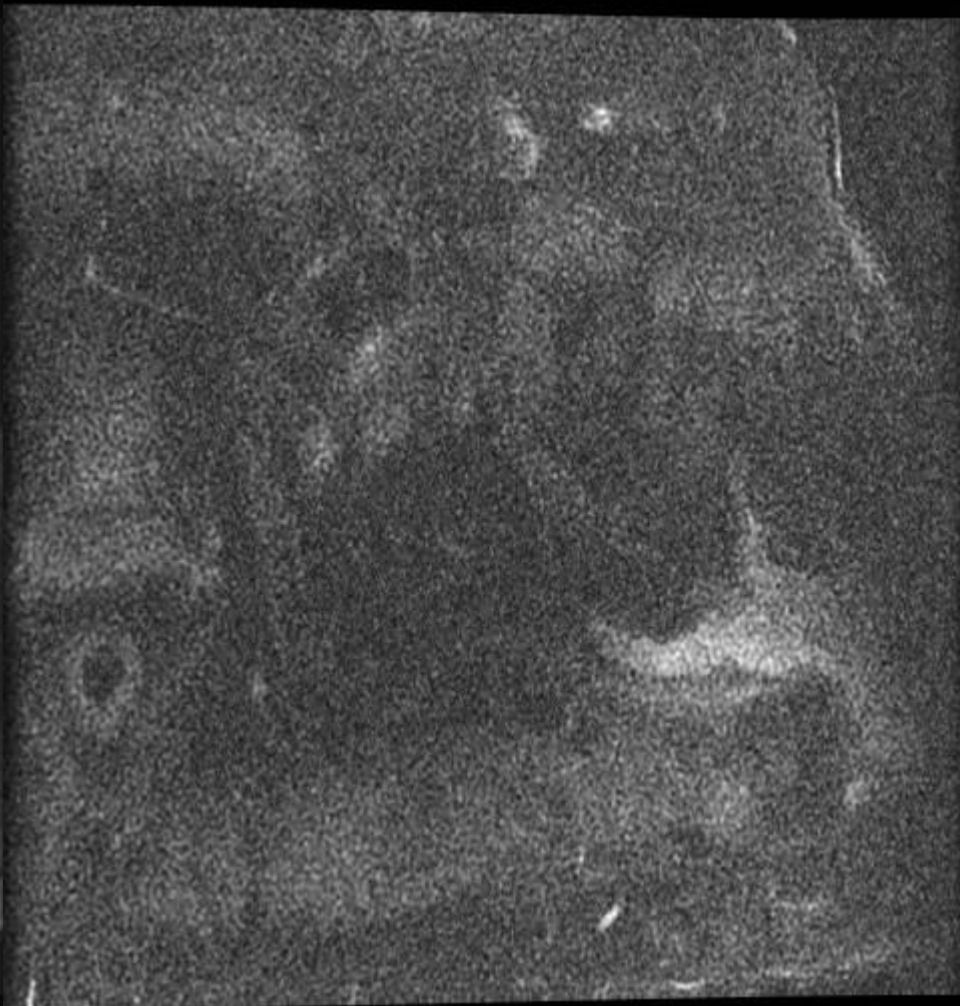


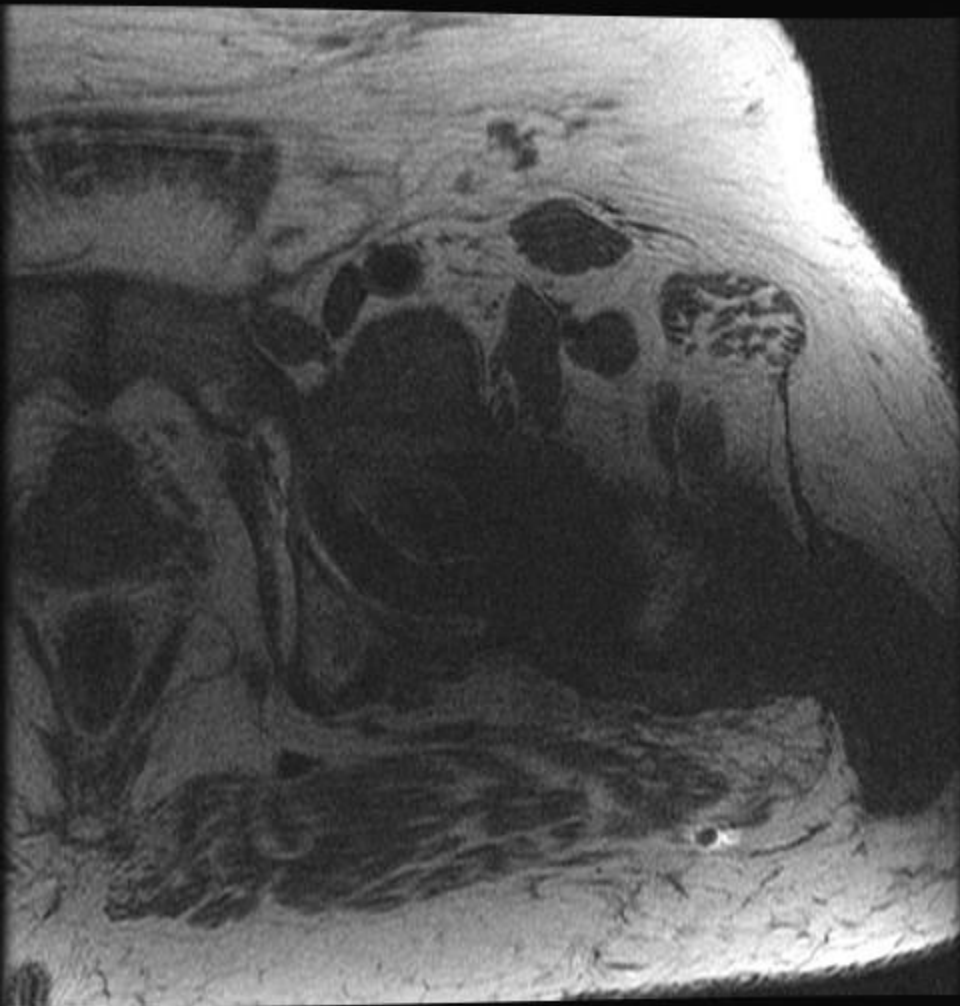


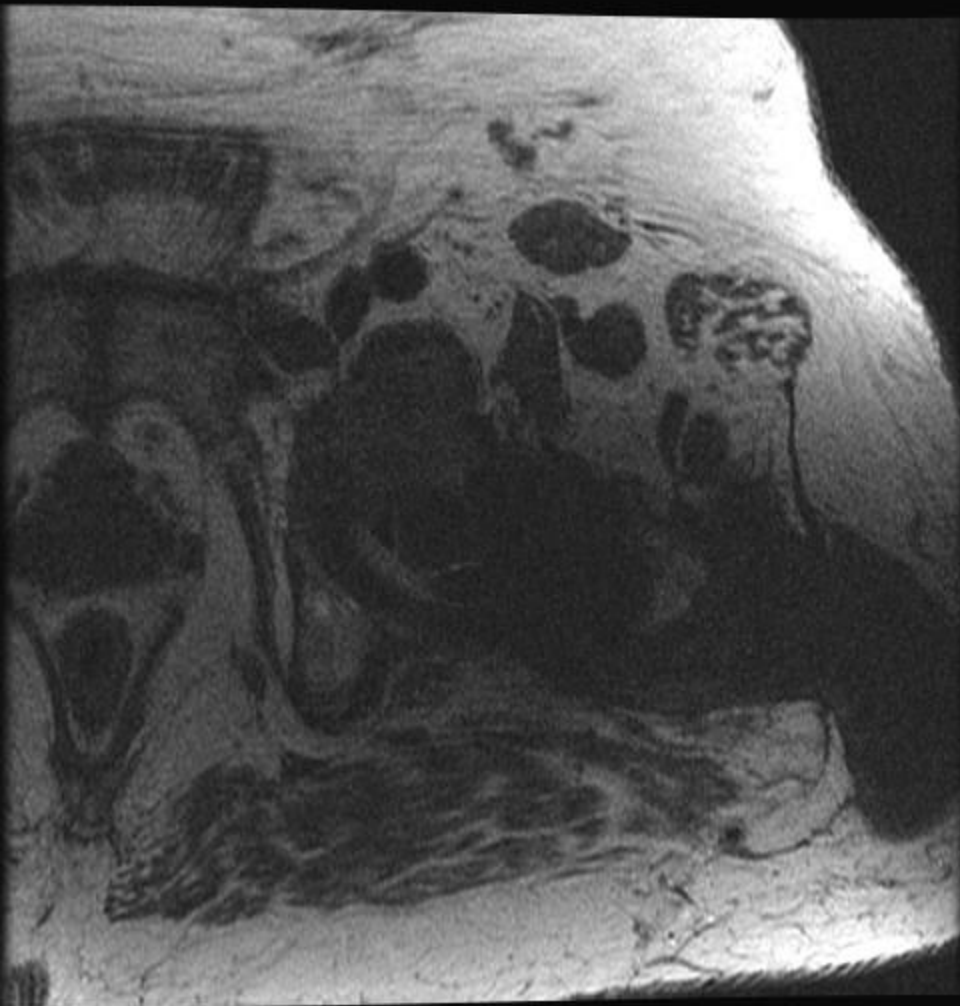












Adverse local tissue reaction

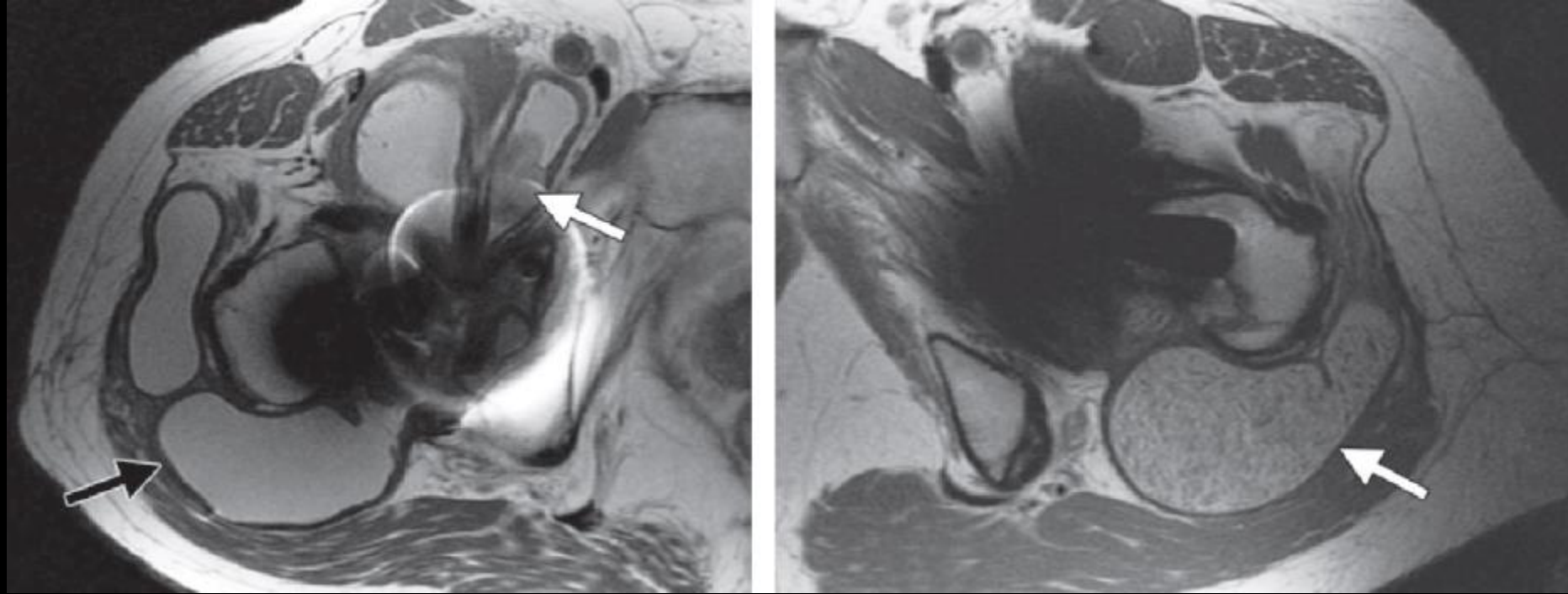
Umbrella term for rxns to arthroplasty-related metal products including metallosis and reactive tissue inflammation caused by metal ions and corrosion products

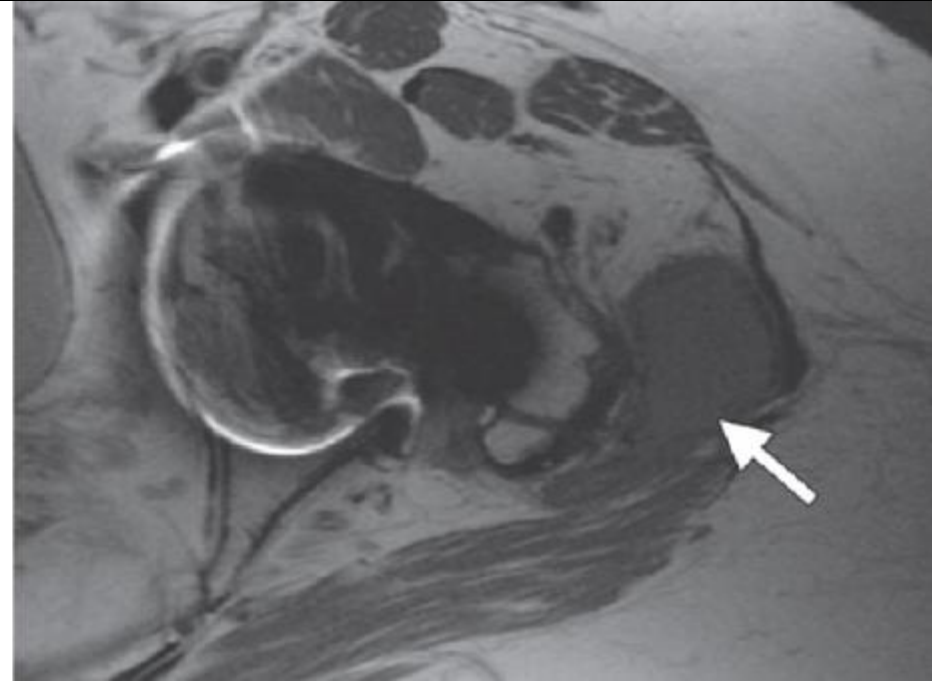
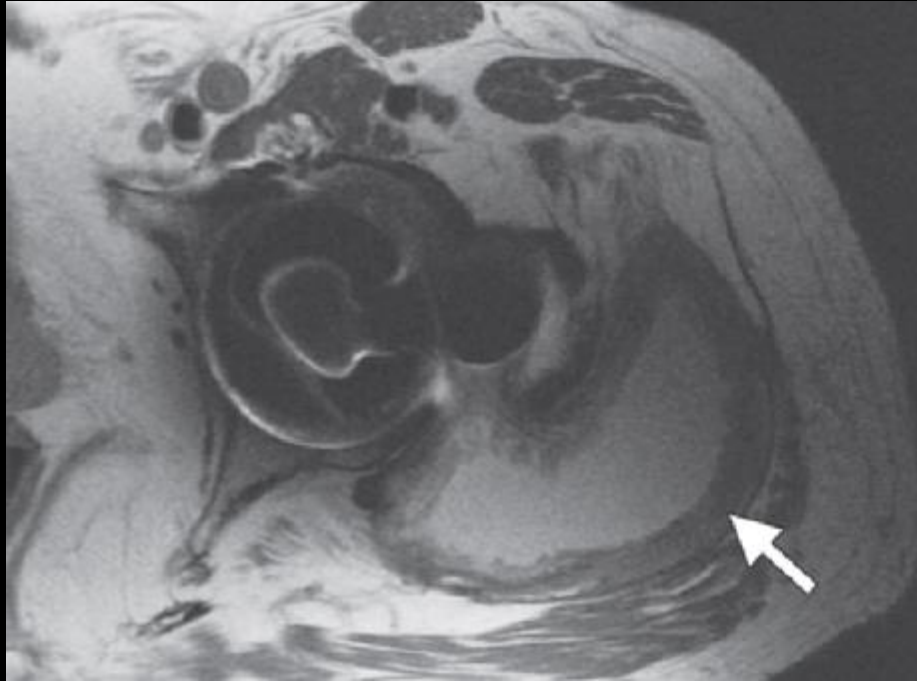
Cellular inflammatory response in the periprosthetic soft tissues resembles delayed hypersensitivity-induced inflammation

Aka pseudotumor, adverse reactions to metal debris

Can result in aggressive soft tissue destruction

Prevalence of ALTR related to MoM arthroplasty ~39-66%





Implant-related wear

Mechanical wear- can result from abrasion of well-positioned opposing metallic bearing surfaces, neck-on-cup impingement, or edge loading

- Edge loading results when there is abnormal load distribution across bearing surfaces that is due to component positioning outside the “safe” zones of anteversion and inclination

Corrosion- electrochemical type of wear, source of free metallic products, problematic at the neck-stem junctions or head-neck junctions of modular arthroplasty systems

ALVAL

Aseptic lymphocytic vasculitis-associated lesion

Histologic appearance of an adverse local tissue reaction caused by metal products that has features of hypersensitivity

Monocytic infiltrate consisting of extra- and intracellular particles of metal ions, corrosion products, and metal debris; interstitial or perivascular lymphocytes; variable presence of plasma cells and eosinophils; varying amounts of tissue necrosis and tissue infarction

Histologic grading of ALVAL

10 point scale

Based on appearance of synovial lining, type of cellular infiltrate, degree of tissue organization

Grade 5 or greater → moderate to severe adverse local tissue reaction (reflects degree of tissue damage found at revision)

Grade less than 5 → low grade or early phase adverse local tissue reaction

Host response affected by size, type, concentration of metal debris, metal ions, corrosion products, and duration of exposure

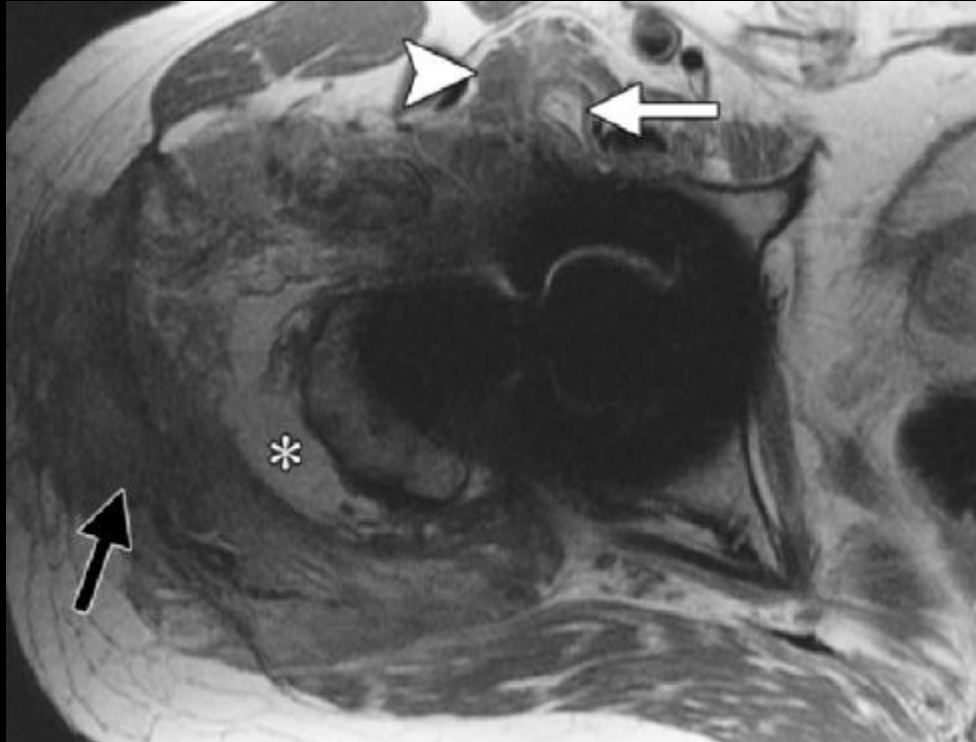
Metallosis

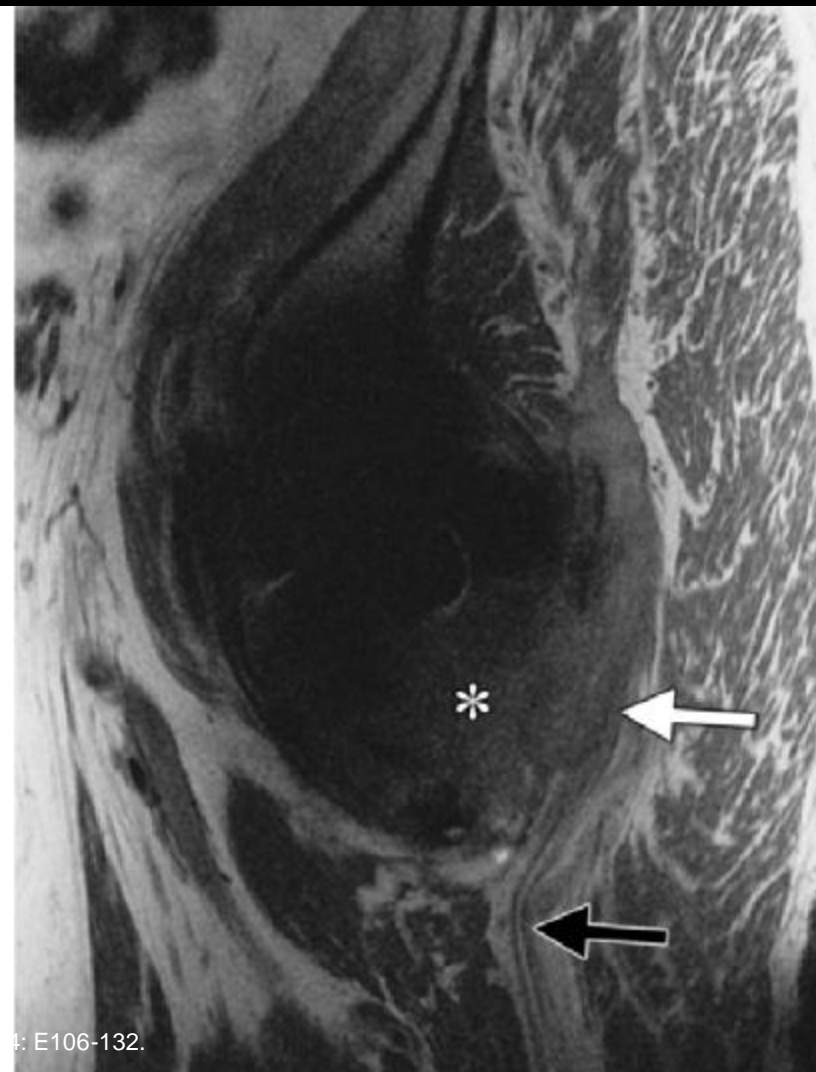
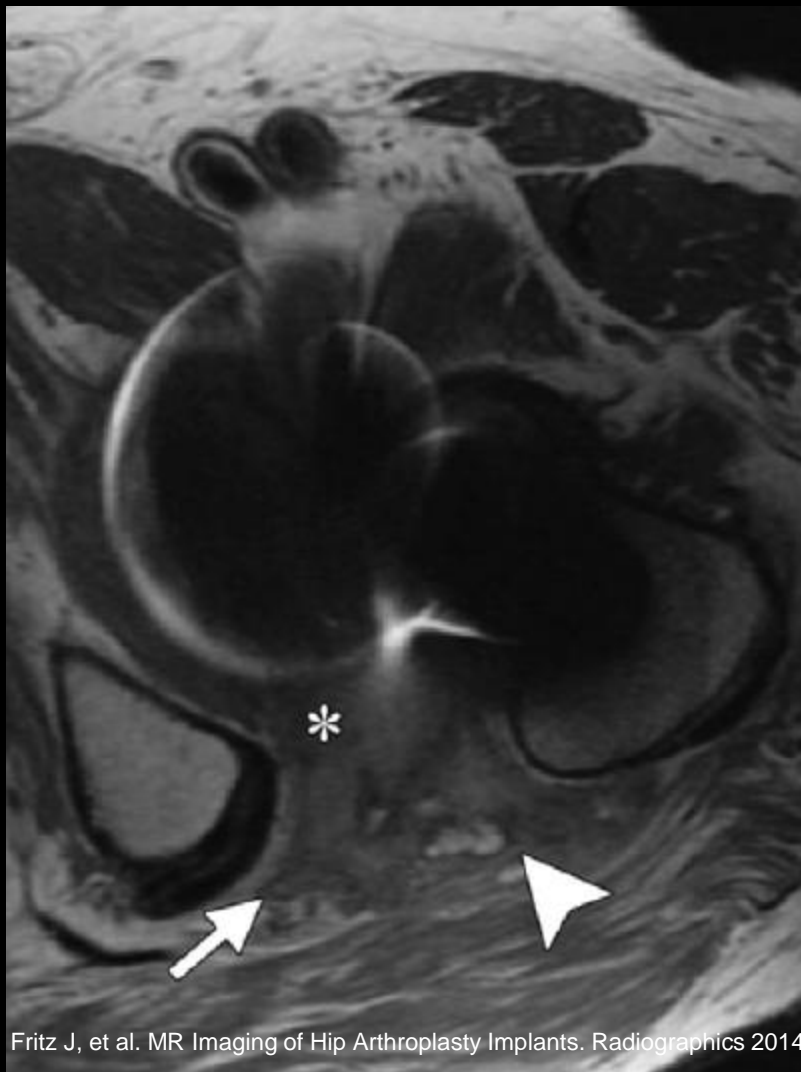
Typically occurs with high rates of implant wear, associated w/ a low ALVAL grade

Caused by shedding of larger metallic debris → incites macrophage activation that causes synovitis and indolent osteolysis with eventual implant loosening



48 M with severe ALTR





Fritz J, et al. MR Imaging of Hip Arthroplasty Implants. Radiographics 2014; 34: E106-132.

MR imaging predictive model

Moderate or severe ALTR

- Maximal synovial thickness >7mm
- Mixed solid-cystic synovial pattern

Intraoperative tissue damage

- Pseudocapsular dehiscence
- Mixed pattern of synovitis
- Decompression of synovitis into adjacent soft tissues

References

Fritz J, et al. MR Imaging of Hip Arthroplasty Implants. Radiographics 2014; 34: E106-132.

Nawabi DH, et al. MRI predicts ALVAL and tissue damage in metal-on-metal hip arthroplasty. Clin Orthop Relat Res 2014; 472(2): 471-481.