

History: 78 year old woman with progressive left hip and thigh pain after THR performed 3 years ago



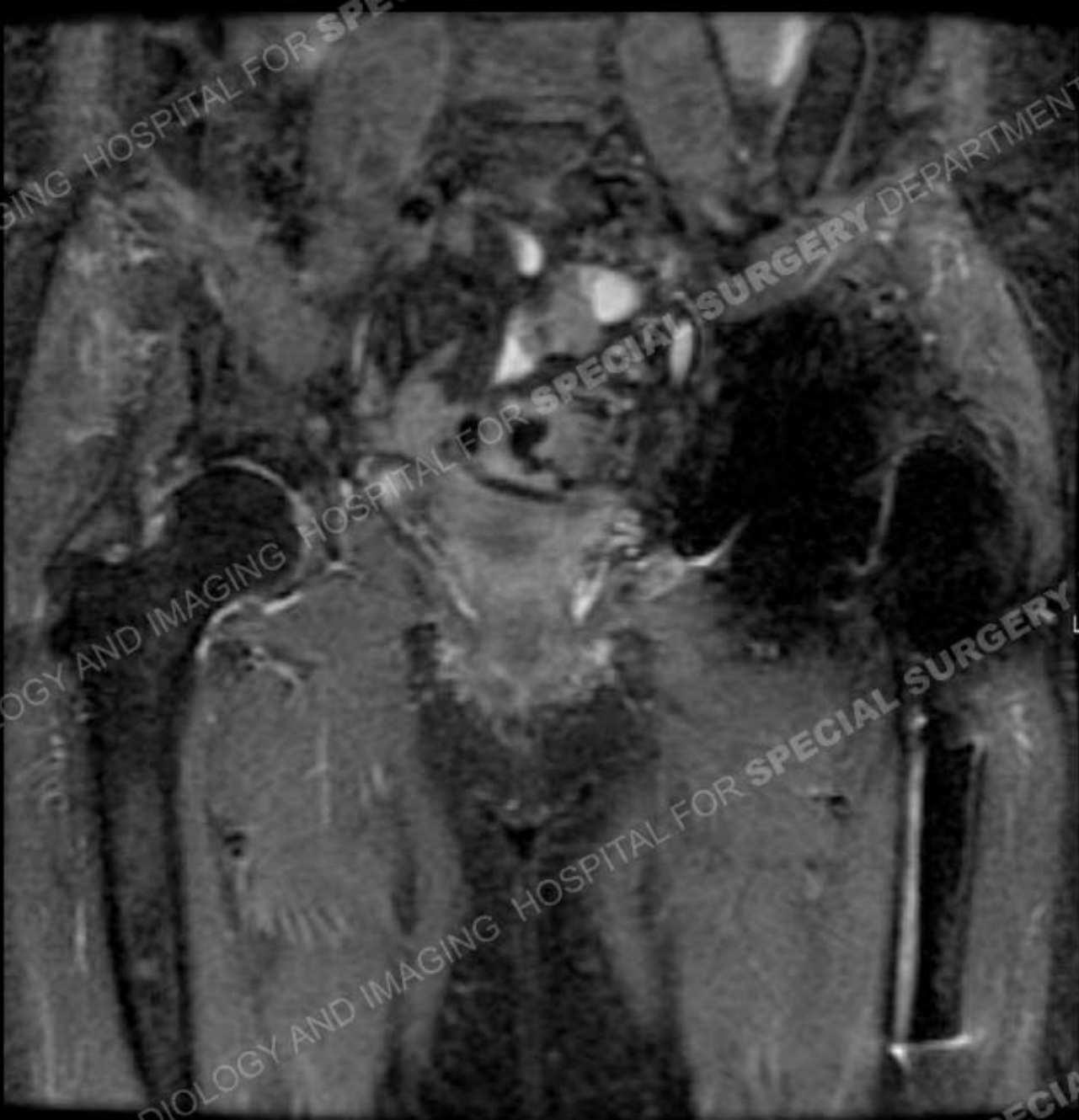
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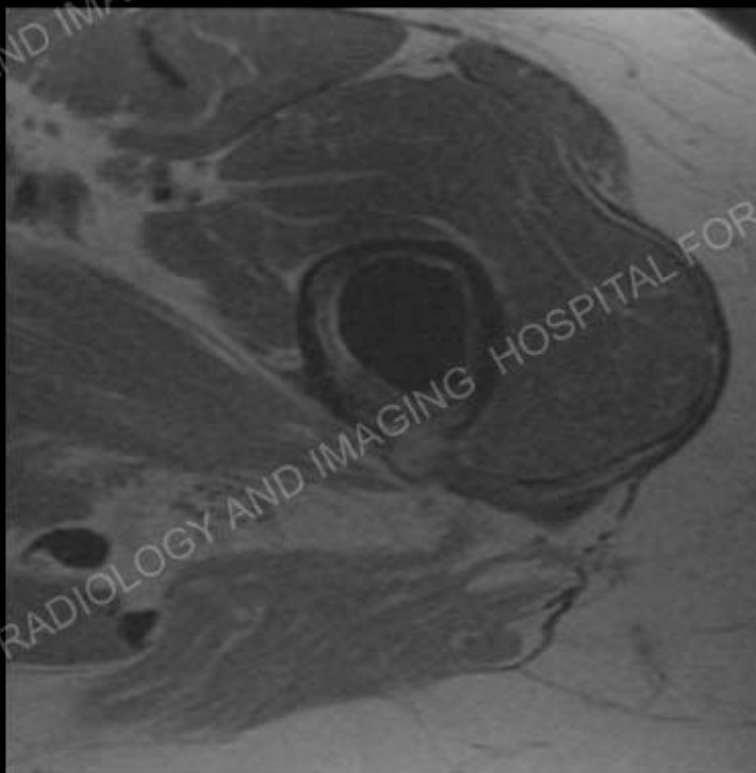
Coronal IR 2/2011



Coronal PD 2/2011



Coronal MAVRIC
prototype sequence 2/2011



Axial PD 2/2011



Coronal PD 2/2011



2/2011



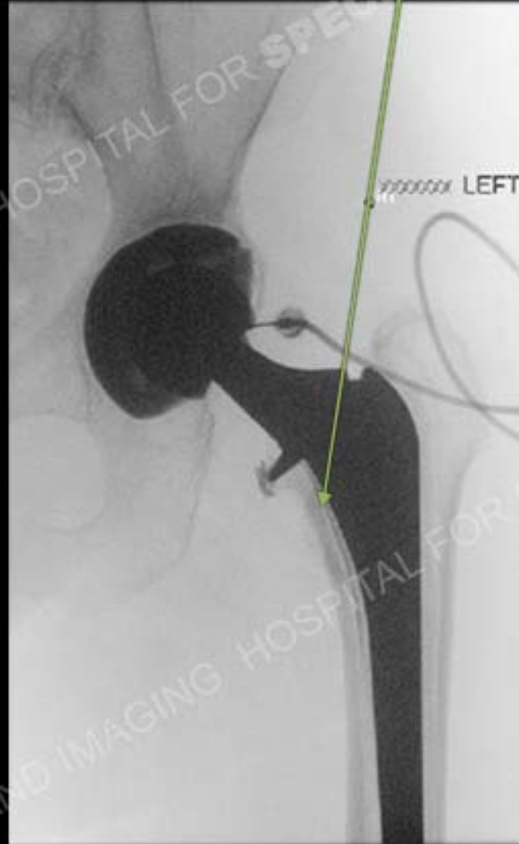
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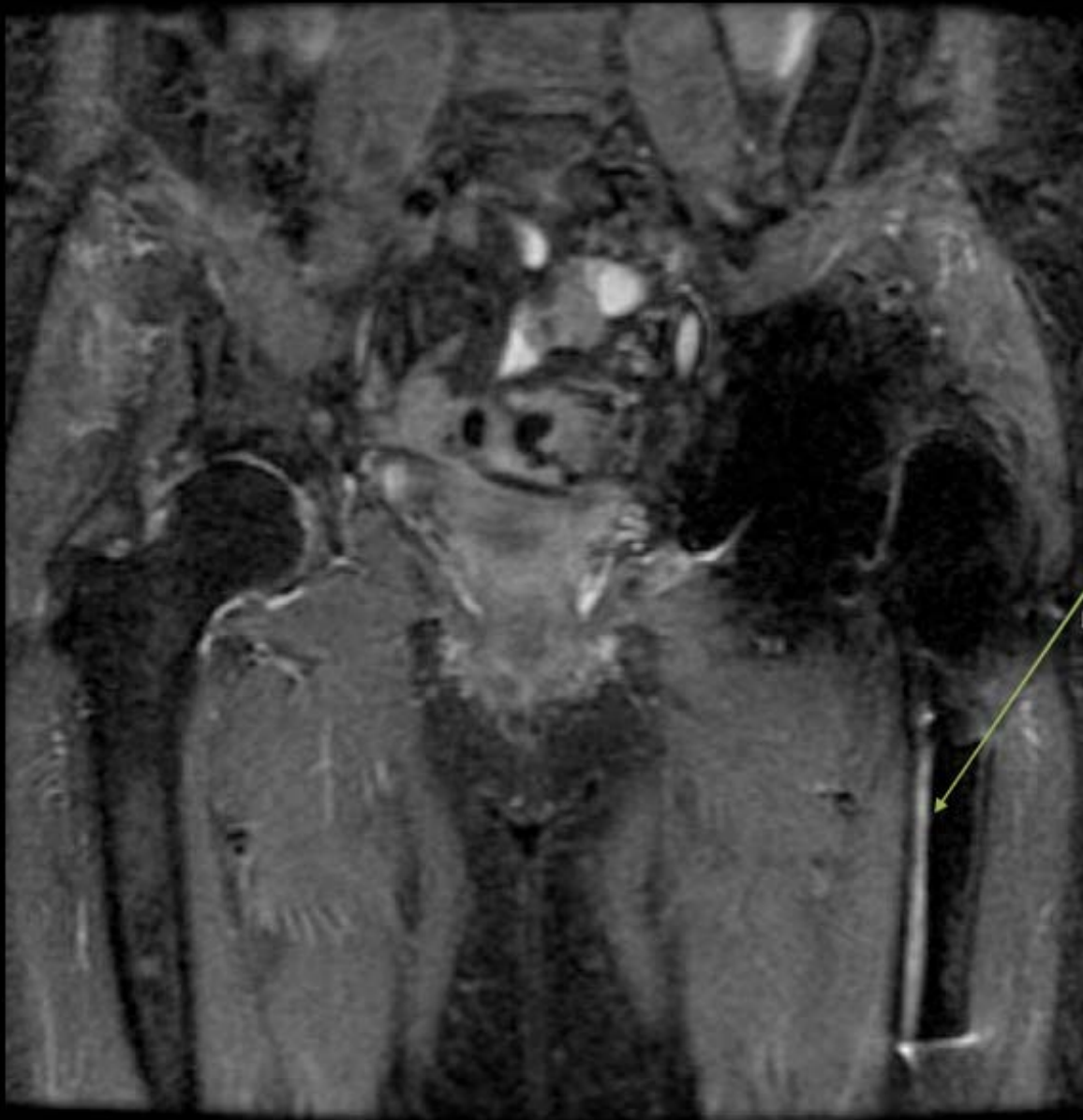
Findings

Images of the fluoroscopic aspiration demonstrates contrast insinuating along the bone/cement interface along multiple Gruen zones. Images from the MRI demonstrate high signal intensity at the corresponding interfaces consistent with extensive bone resorption along the proximal femoral component. No periacetabular osteolysis was present. The MAVRIC prototype sequence demonstrates increased conspicuity of the bone resorption and a marked decrease in the susceptibility artifact limiting evaluation at the bone/cement/prosthesis interfaces. Patient underwent revision arthroplasty without subsequent complication.



With contrast injection, contrast insinuated into bone resorption at multiple Gruen zones





High signal
around the
femoral stem
at site of
resorption

Improved delineation at interfaces on prototype sequence



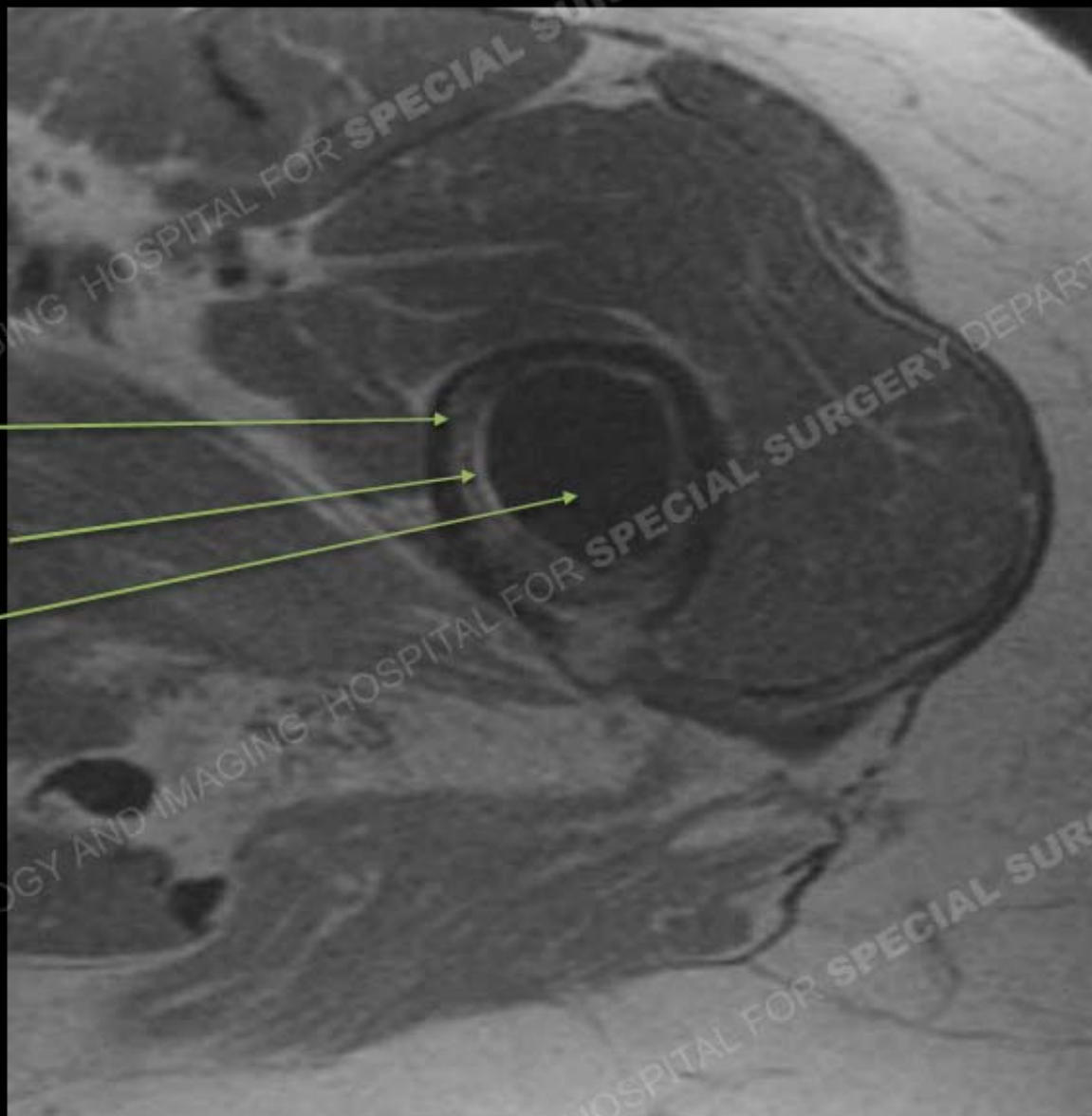
High signal at sites of bone resorption at Gruen zones 6 and 7

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Cement

Bone resorption

Metal



Diagnosis

Loosening of femoral component in THA.

In the setting of potential loosening of a component in joint arthroplasty, evaluation at the multiple interfaces (bone/prosthesis/cement) is of great consequence and requires close scrutiny. Frequently described evidence of loosening is greater than 2mm lucencies propagating among multiple Gruen zones (especially beyond those of the periarticular zones of 1,7,8,15). On arthrography, propagation beyond the intertrochanteric line is often used as an indicator of loosening. These findings do require correlation with clinical history and physical exam.



Discussion

As a means to obviate the need for percutaneous intervention, MRI protocols have been developed over the last decade to accurately assess for loosening without joint injection/aspiration. The accuracy of this modality has been validated multiple times in the literature. As a way to improve this, new prototype pulse sequences, as shown here, are being fabricated to reduce susceptibility artifact at metal/tissue interfaces as to allow even better interpretation. This is particularly important in the setting of markedly ferrous components as used in metal on metal constructs that produce a tremendous amount of susceptibility artifact.



Resources

Magnetic resonance imaging in the diagnosis and management of hip pain after total hip arthroplasty. Cooper HJ, Ranawat AS, Potter HG, Foo LF, Jawetz ST, Ranawat CS. J Arthroplasty. 2009 Aug;24(5):661-7. Epub 2008 Aug 3.

Imaging of metal-on-metal hip resurfacing. Hayter CL, Potter HG, Su EP. Orthop Clin North Am. 2011 Apr;42(2):195-205, viii.

What is the role of magnetic resonance imaging in the evaluation of total hip arthroplasty? Potter HG, Foo LF, Nestor BJ. HSS J. 2005 Sep;1(1):89-93.

Resnick. Diagnosis of Bone and Joint Disorders.
4th Ed. 2002.

