History: 9 year old girl with ankle pain following twisting injury 3 weeks prior

Repeat radiographs 1 month later

MRI exam obtained at time of second set of radiographs

Sagittal T1

Post gadolinum fat sat sagittal T1

11/24/2014, 6:16:29 PM
Series: 9
Image no: 12
Image 12 of 24

11/24/2014, 5:16:29 PM
Series: 9
Image no: 13
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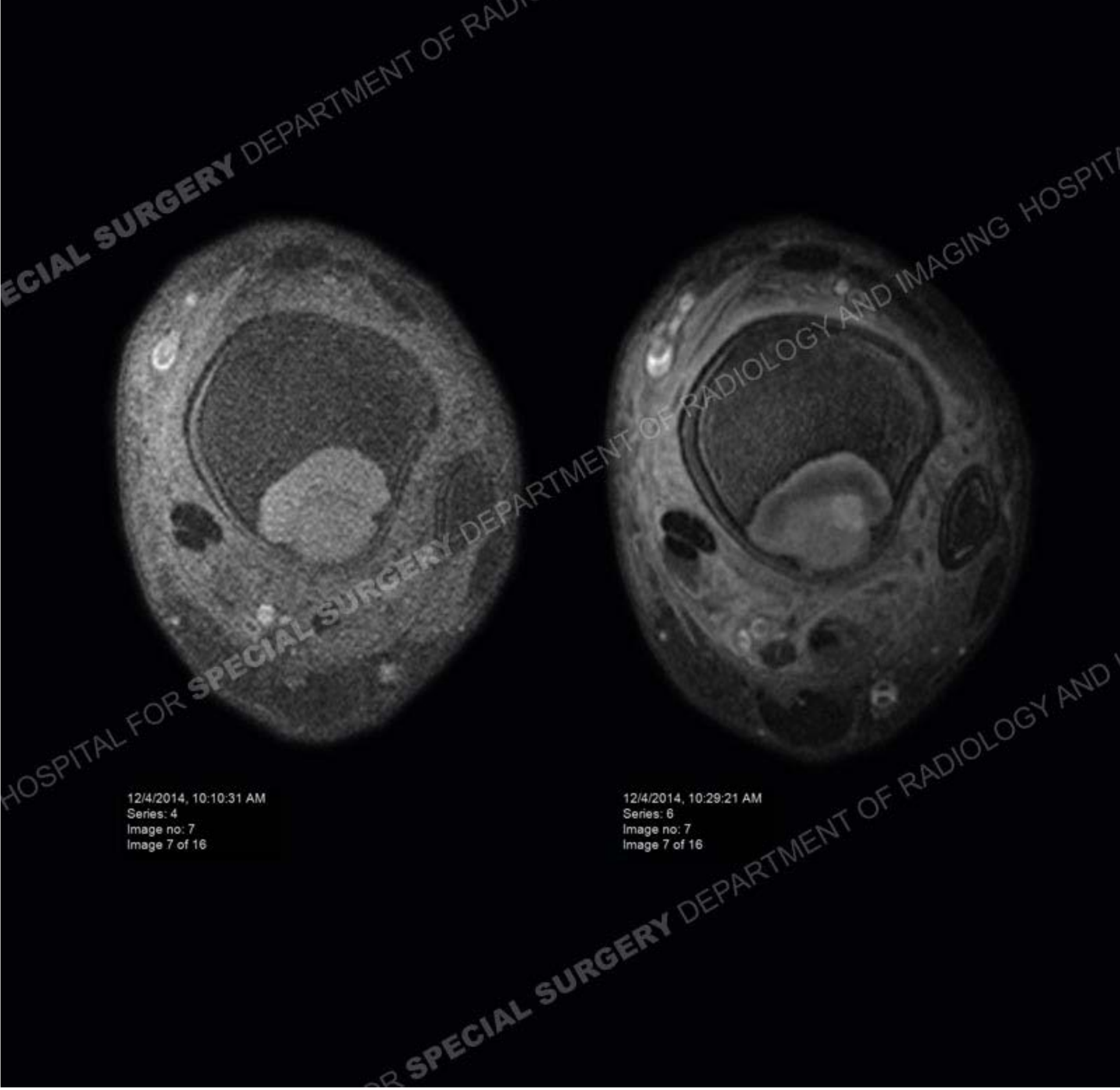
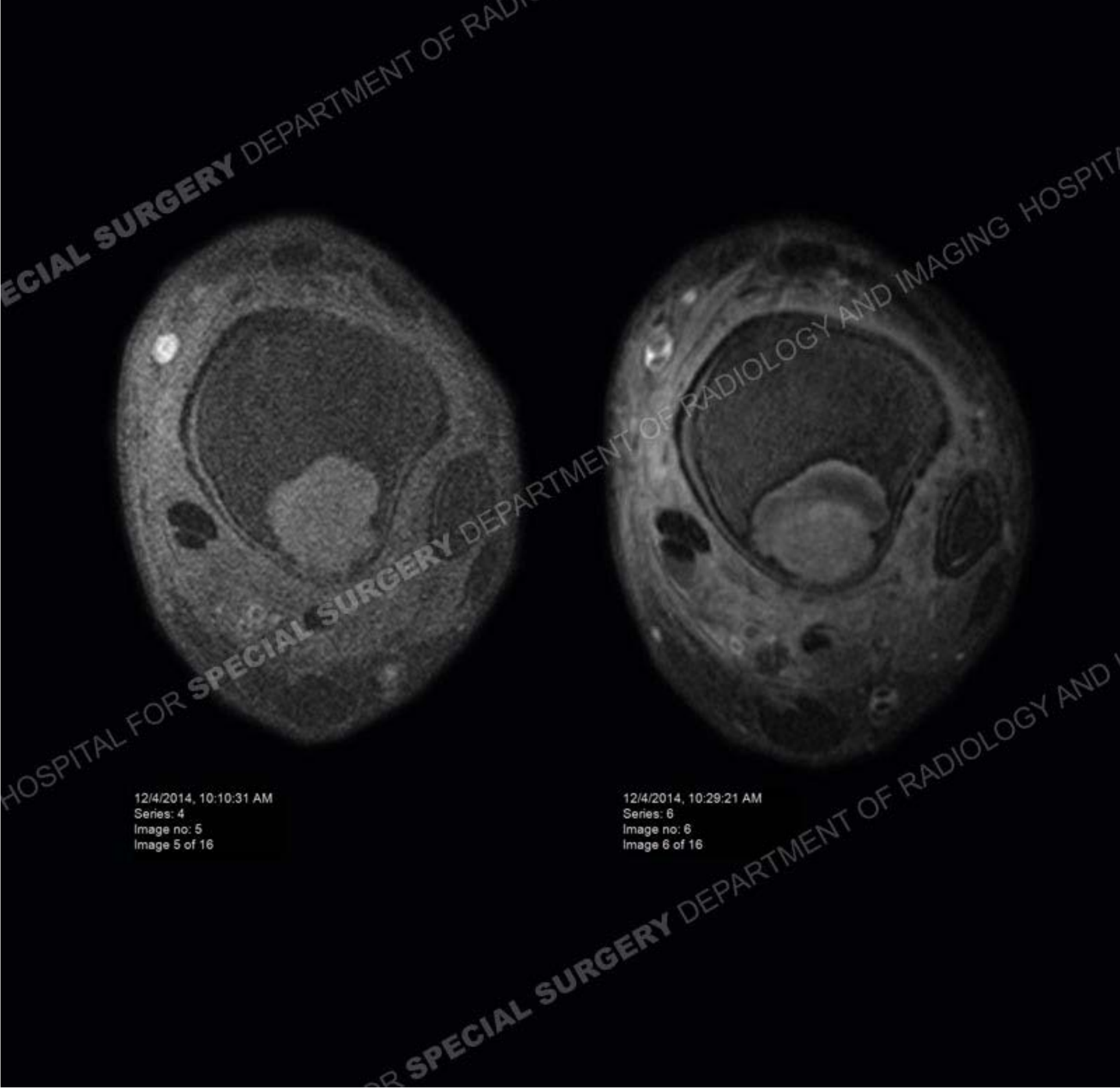
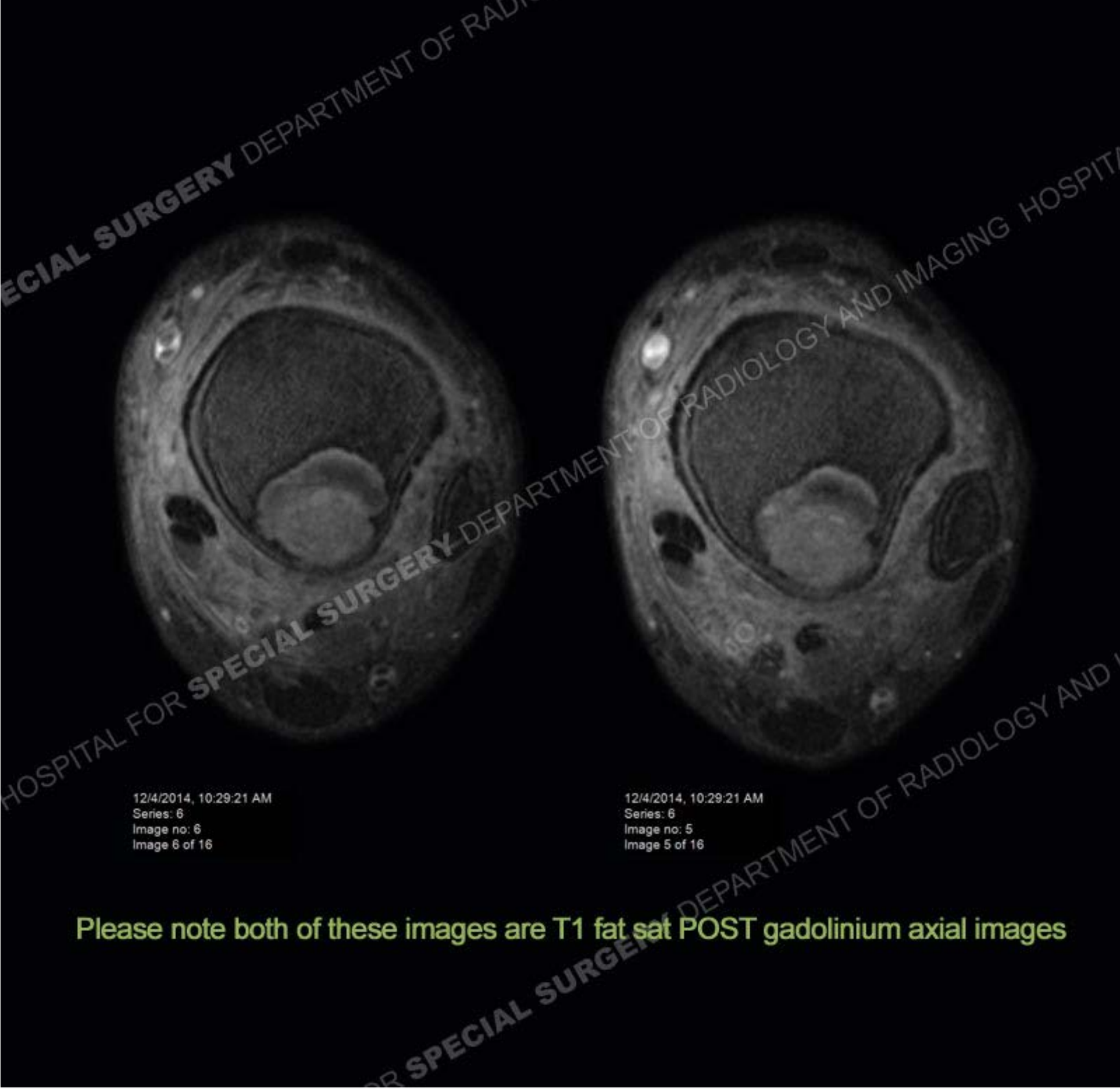
11/24/2014, 5:19:28 PM
Series: 10
Image no: 15
Image 15 of 24
11/24/2014, 4:58:39 PM
Series: 6
Image no: 33
Image 33 of 52


11/24/2014, 5:19:28 PM
Series: 10
Image no: 14
Image 14 of 24
11/24/2014, 4:58:39 PM
Series: 6
Image no: 32
Image 32 of 52

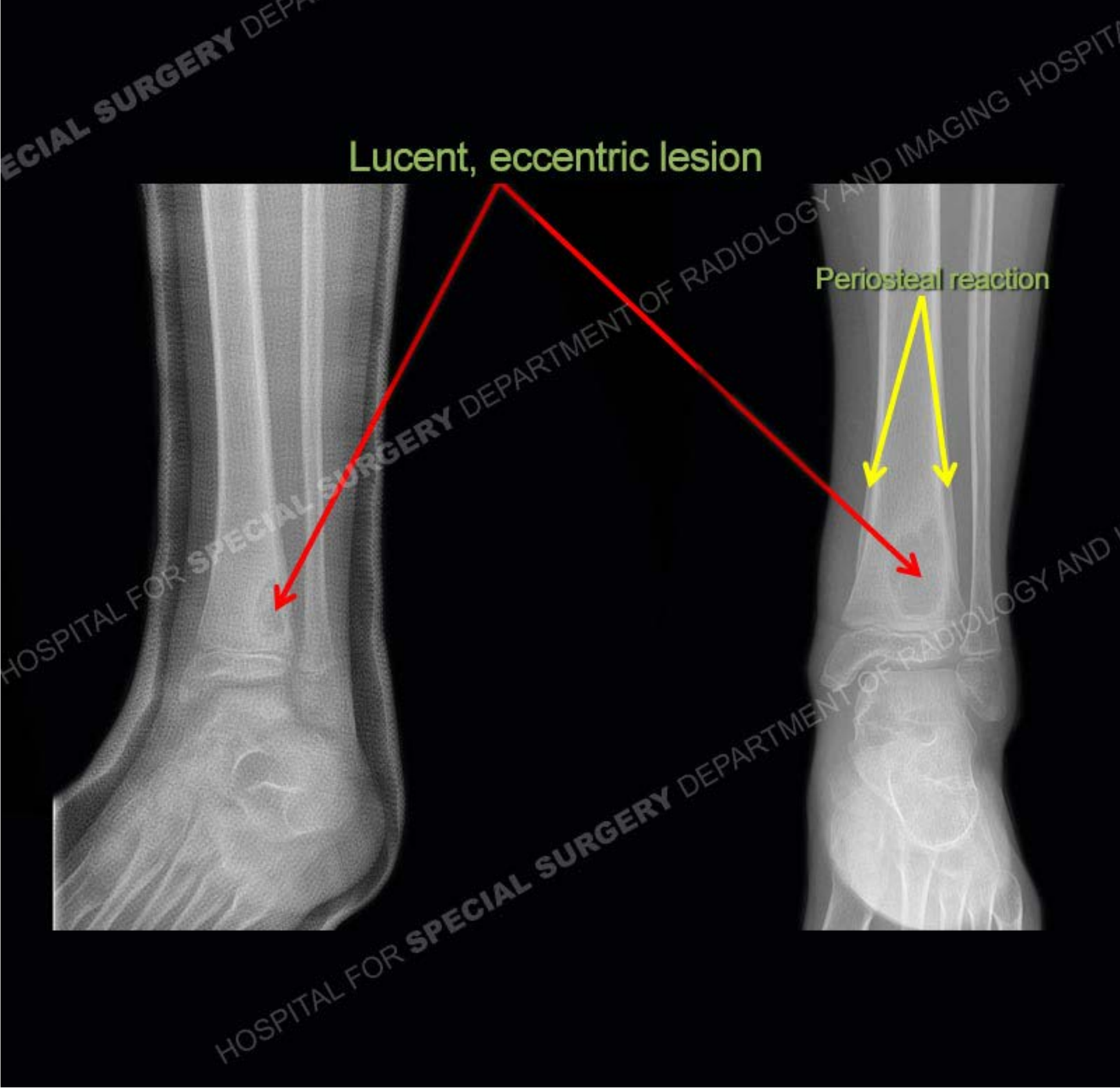


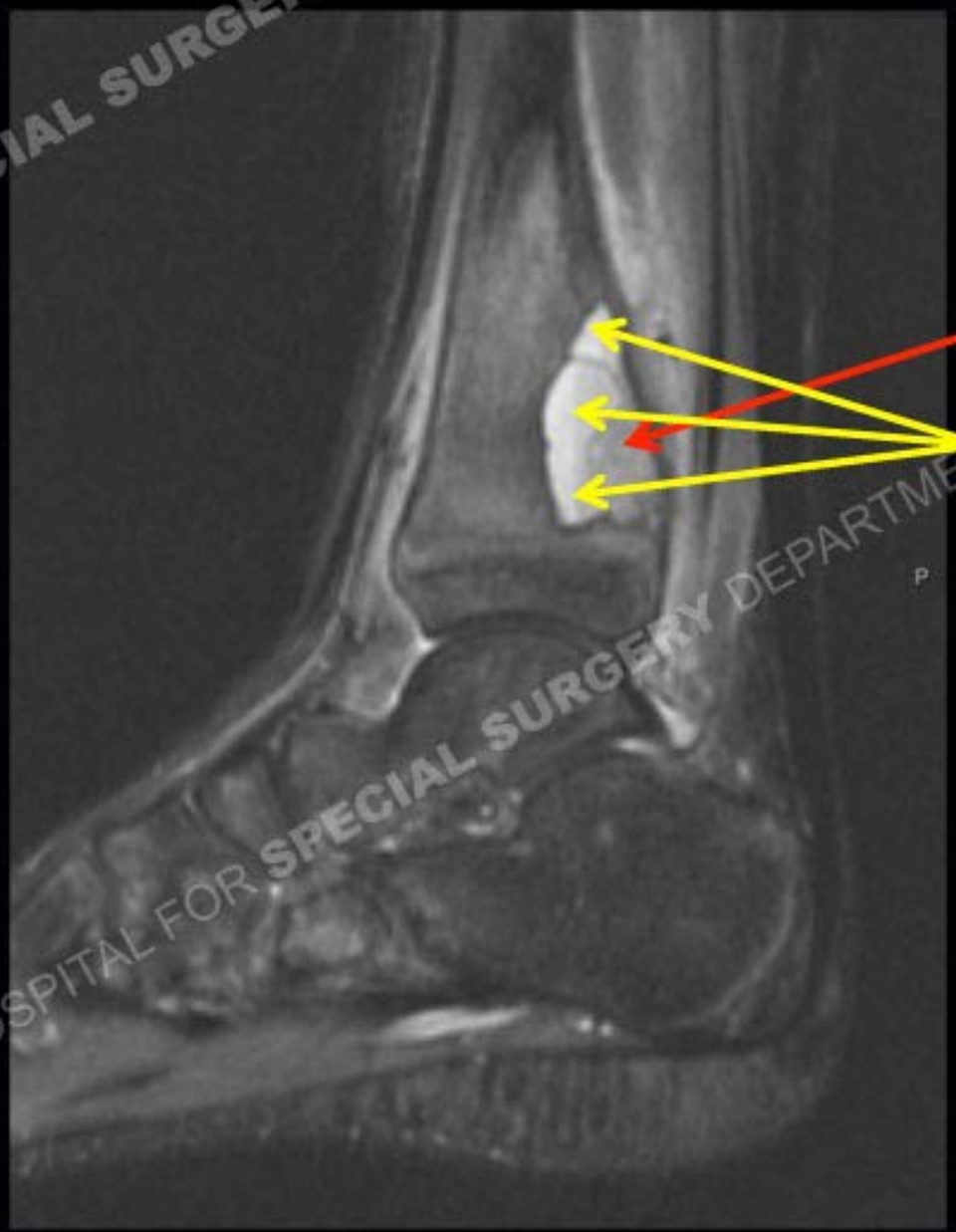


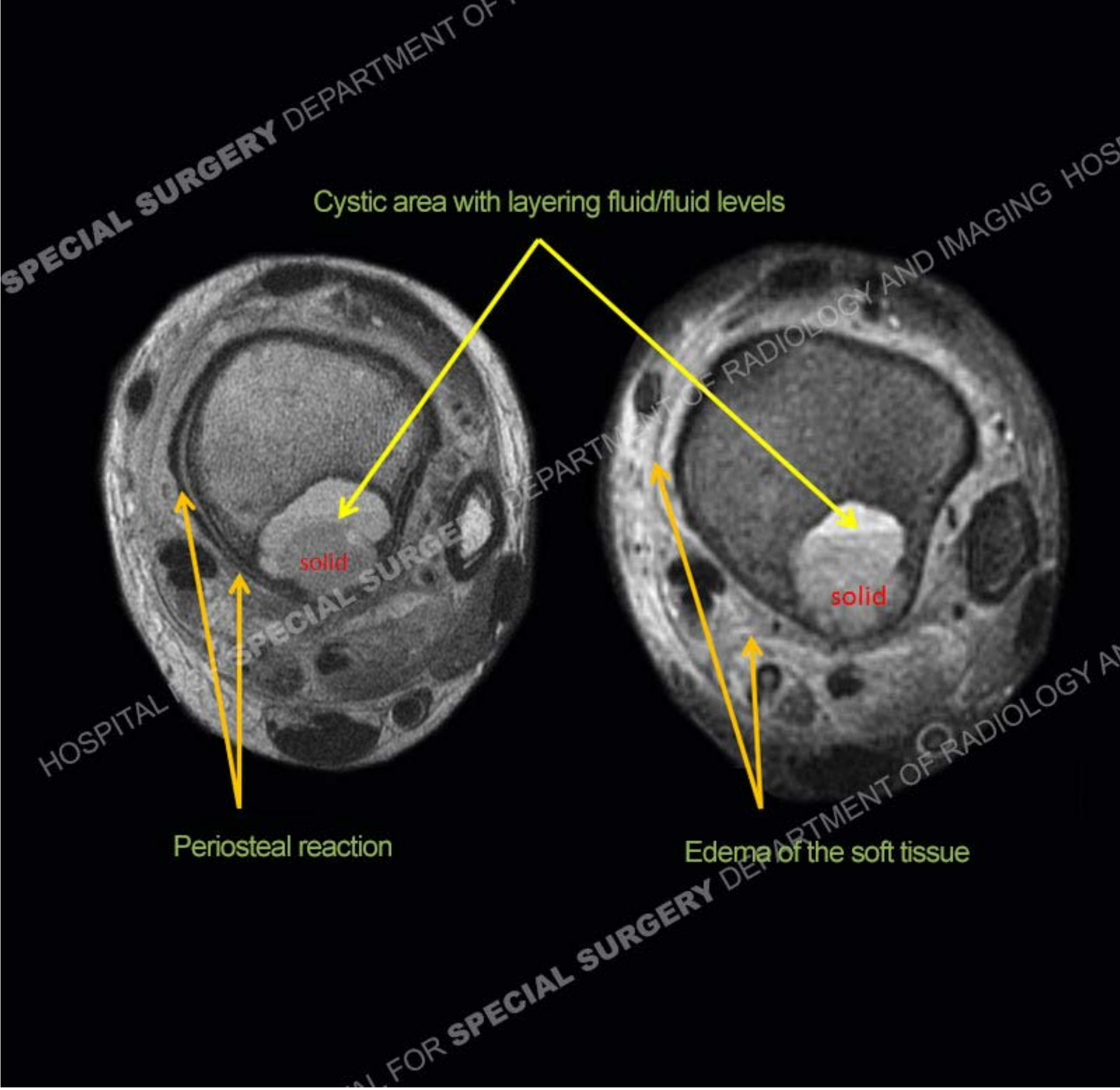

12/4/2014, 10:29:21 AM
Series: 6
Image no: 6
Image 6 of 16
12/4/2014, 10:29:21 AM
Series: 6
Image no: 5
Image 5 of 16
Please note both of these images are T1 fat sat POST gadolinium axial images

Findings

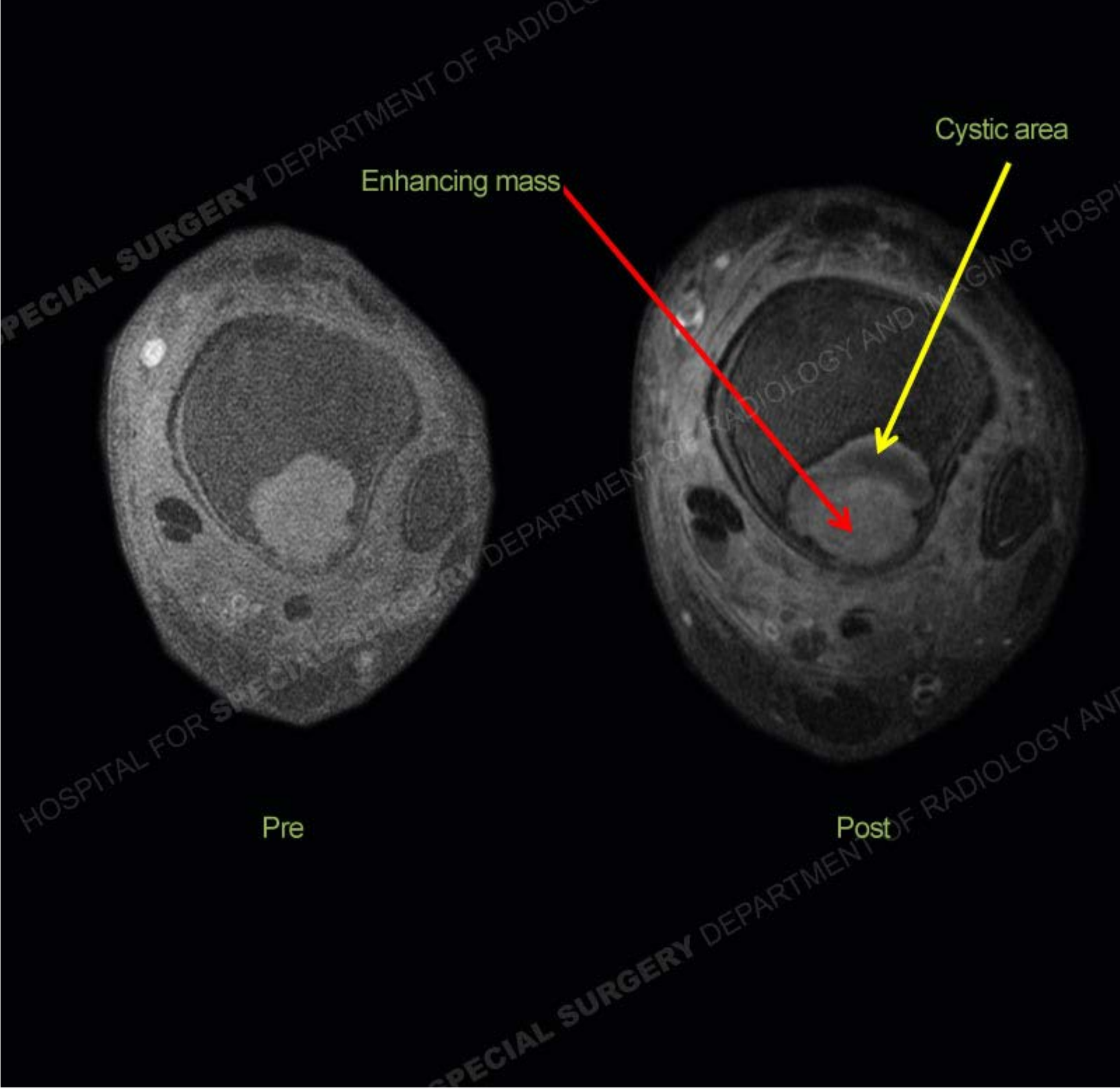
Radiographs demonstrate a lucent lesion of the distal tibia that is eccentrically located and associated with prominent periosteal reaction. The MRI demonstrates a complex mass with a marked amount of edema in the soft tissue and periosteal reaction. The mass has both cystic components and enhancing solid components. It is associated with a mark thinning of the cortex but without penetration through the cortex or an associated soft tissue mass.


Lucent, eccentric lesion
Periosteal reaction




Cystic area with layering fluid/fluid levels
solid
solid
Periosteal reaction
Edema of the soft tissue

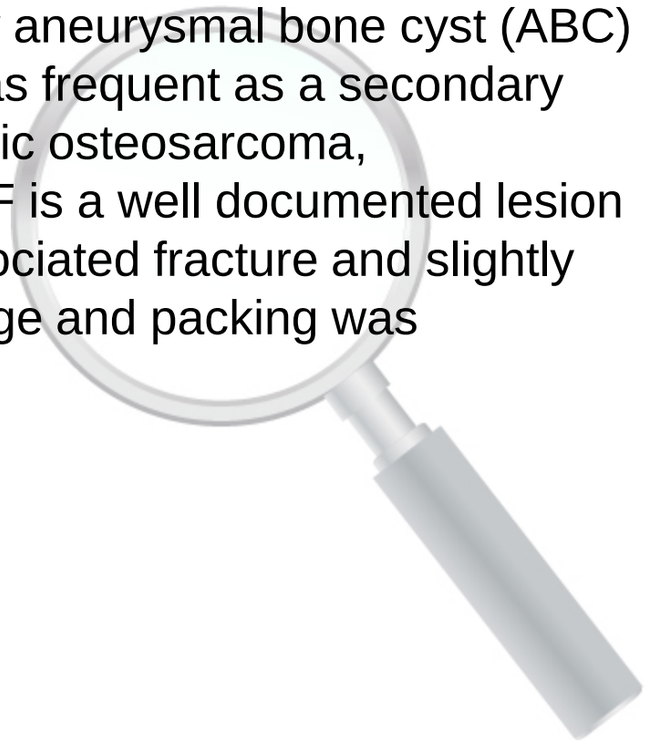
Eccentric lesion with thinning of cortex but without penetration through cortex or soft tissue mass


Cystic area
Enhancing mass
Pre
Post

Diagnosis: Non-ossifying fibroma with cystic change and pathological fracture

Non-ossifying fibroma (NOF) is a common benign entity of the bone that frequently is of no consequence. They may at times be associated with cystic change or secondary aneurysmal bone cysts. Additionally, the lesions, if large enough (typically involving greater than 50% of the transverse diameter of the bone) may be associated with a stress fracture. In this case, the patient's trauma led to a stress fracture through the area of the enlarged and cystic NOF yielding the periostitis and edema as shown.

The MRI clearly demonstrates an enhancing, solid component and an additional muticystic component containing fluid levels. This latter portion is in keeping with the imaging findings of a secondary aneurysmal bone cyst (ABC) component in the setting of NOF. Although not as frequent as a secondary ABC in the setting of giant cell tumor, telangiectaic osteosarcoma, osteoblastoma, chondroblastoma, or others, NOF is a well documented lesion associated with ABC. In this case, given the associated fracture and slightly aggressive appearance of the findings, a curettage and packing was performed.



Postoperative images

Resources

http://www.bonetumor.org/tumors-bone

Orthopedic Pathology 5th Ed. Peter G. Bullough, MD

Special thanks to Darryl B. Sneag, MD and especially Emily R. Dodwell, MD on their assistance on this presentation.