



History: 11 year old boy with multiple sites of joint pain. Further history withheld.



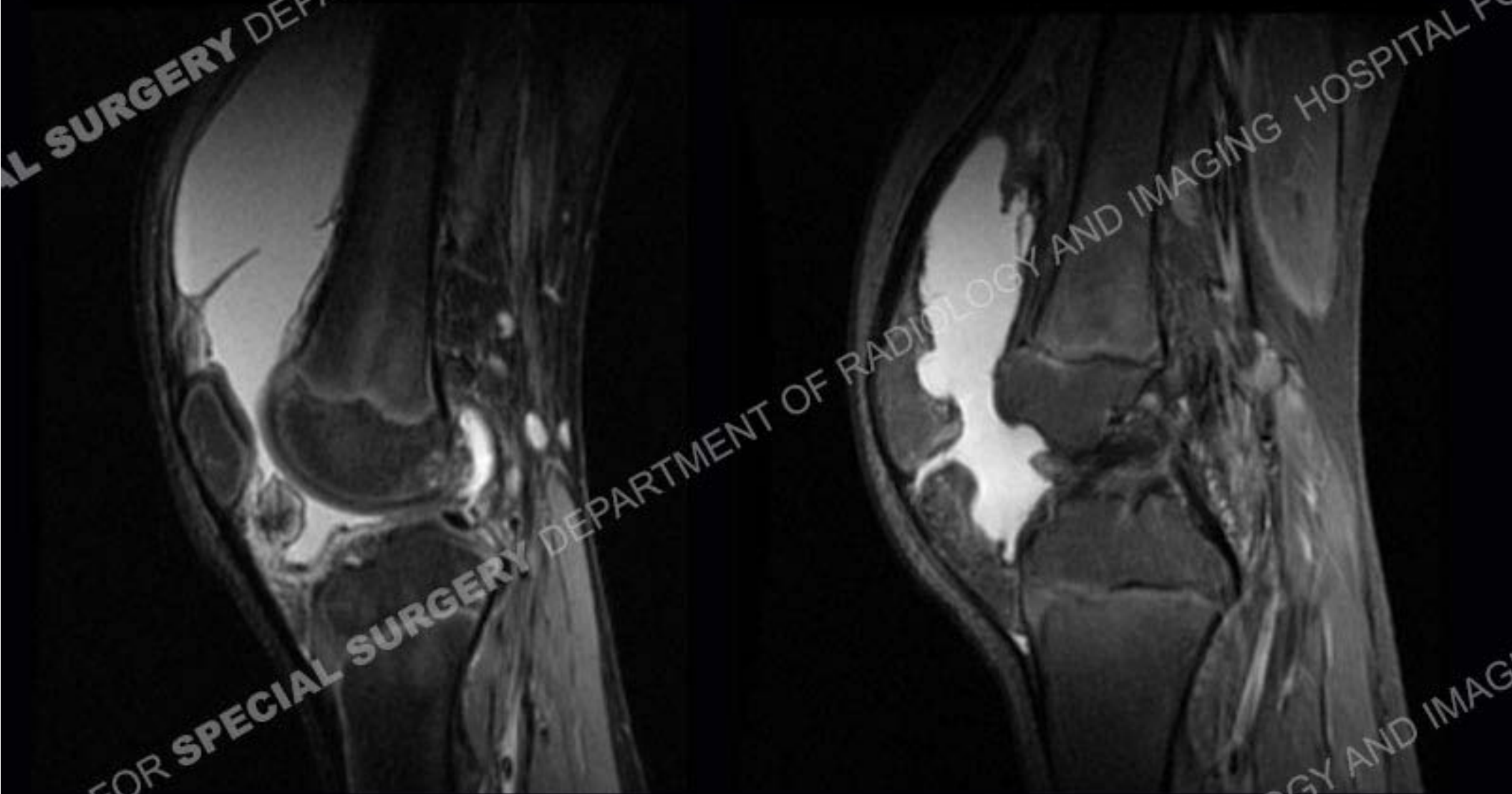
Right knee radiographs from 2013





Right elbow radiographs from 2013

Sagittal IR images of the right knee from 2013 and 2015



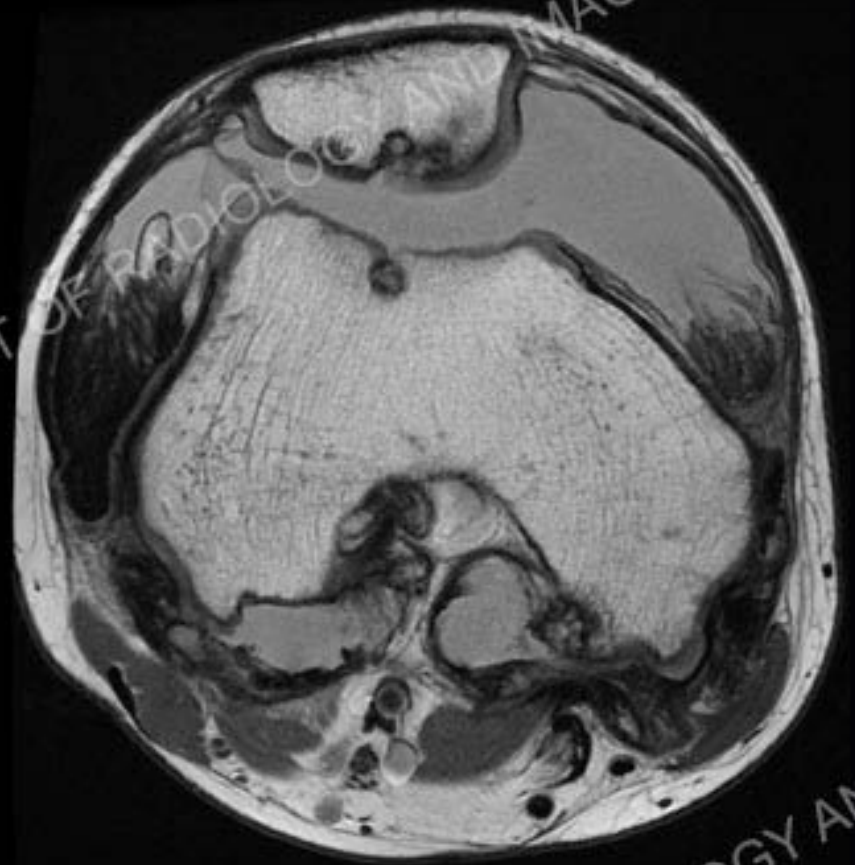
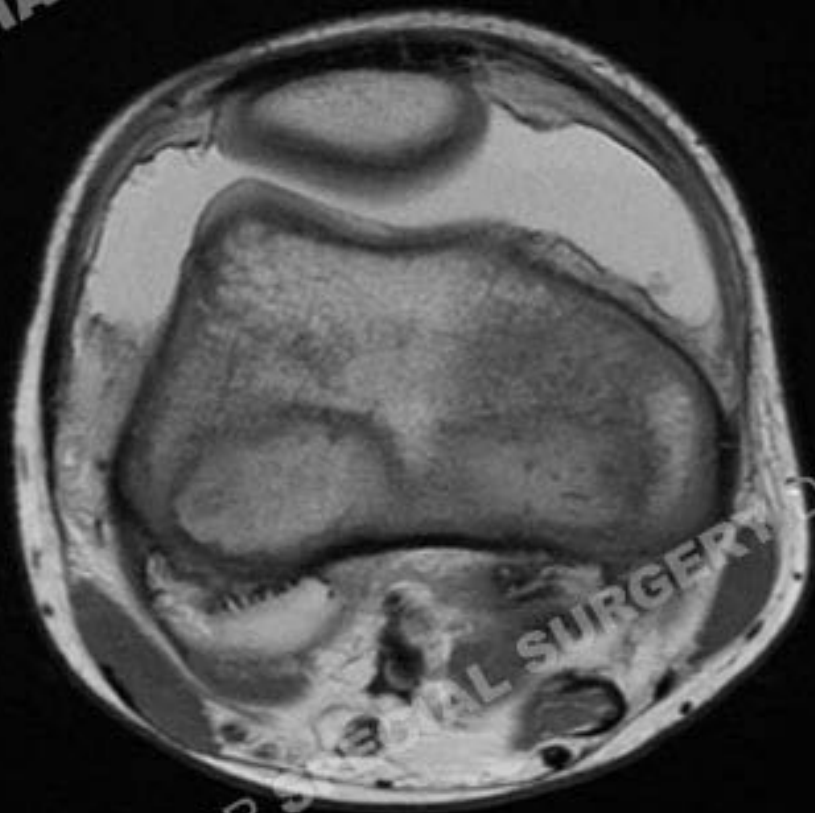
Sagittal Proton Density (PD) images from 2013 and 2015



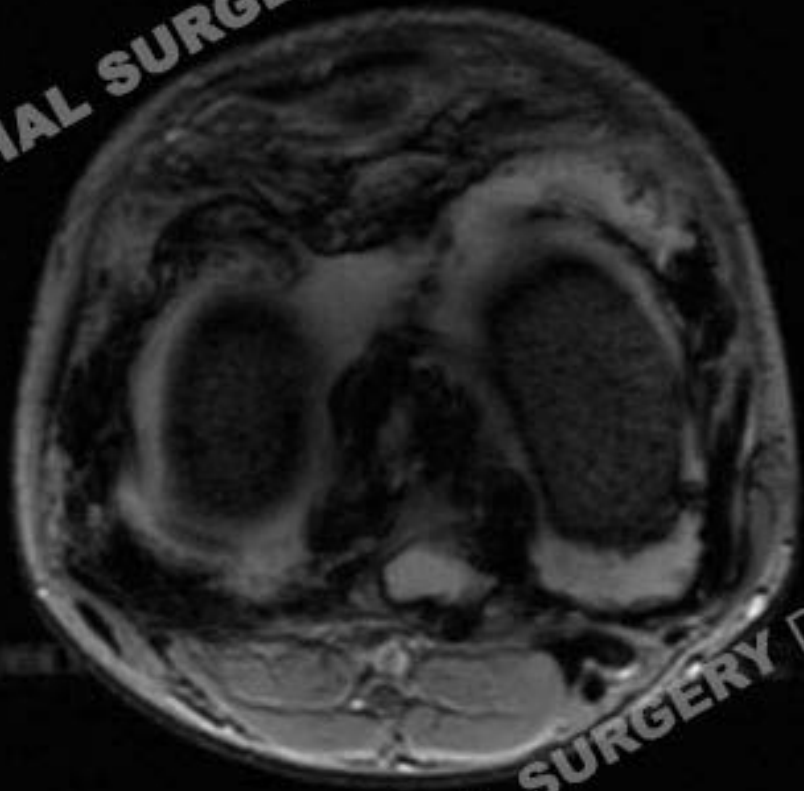
Coronal PD images from 2013 and 2015



Axial PD images from 2013 and 2015



Gradient echo axial image of 2013 and sagittal gradient image of 2015



Findings

The radiographs demonstrate knee and elbow joint effusions with a widening of the femoral notch and erosions of both the elbow and knee. Additionally seen on the full limb radiograph is less conspicuous but erosive change of both ankles. MRI's of the right knee from 2013 and 2015 demonstrate a markedly progressed degree of cartilage wear with erosive changes and large joint effusions. There is also a progressed degree of low signal and thickened synovium/joint capsule. The gradient echo images demonstrate blooming on both studies related to susceptibility phenomenon.



Widening of notch with erosions

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Erosions



Normal knee





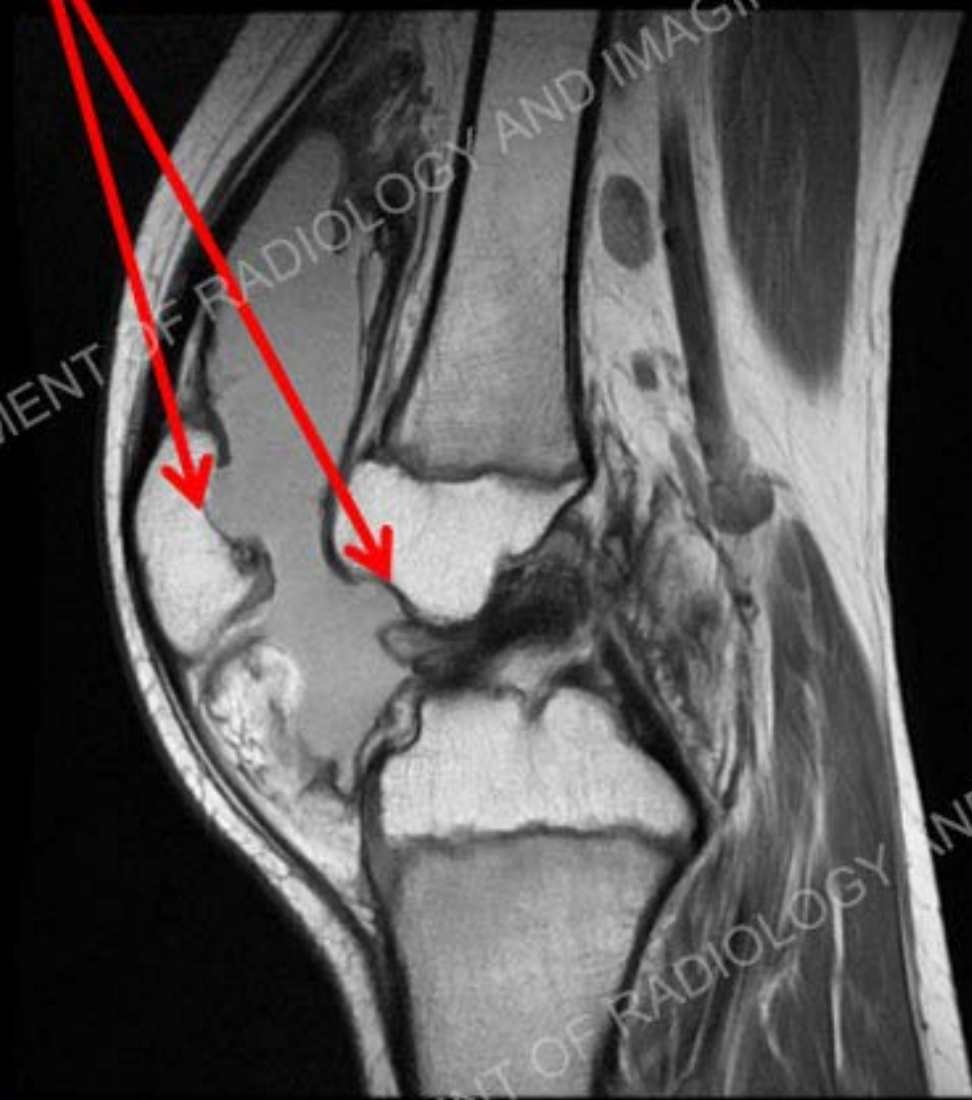
Ankle erosions

Ankle erosions

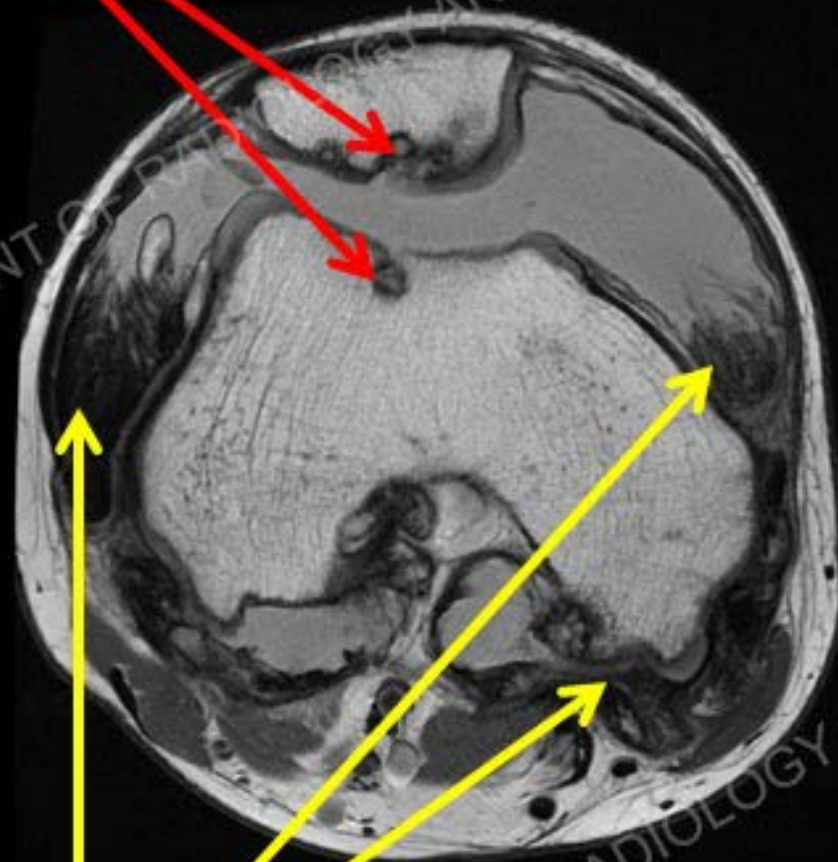
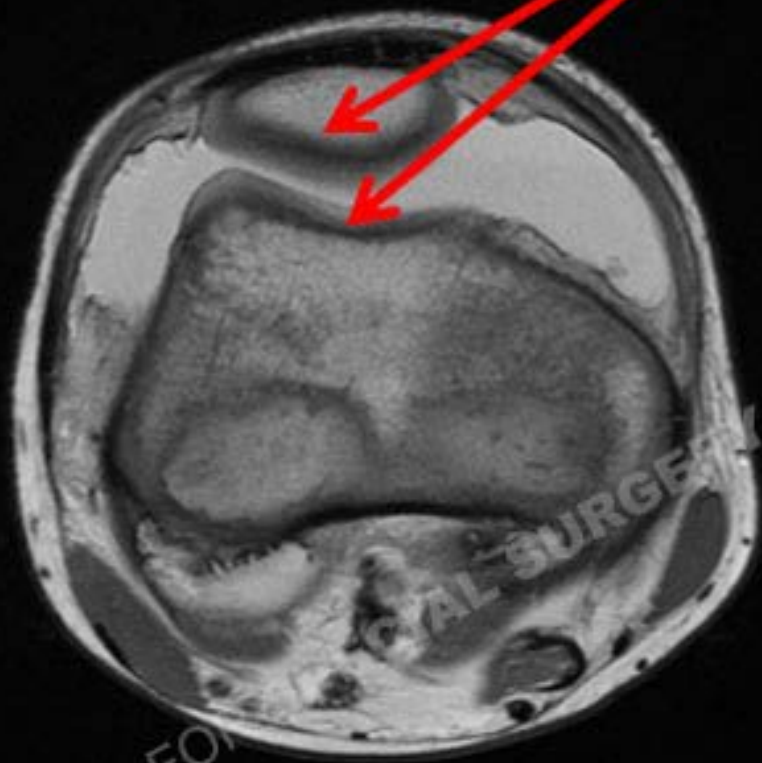
Enlarged view of ankles



Interval destruction of cartilage and erosions

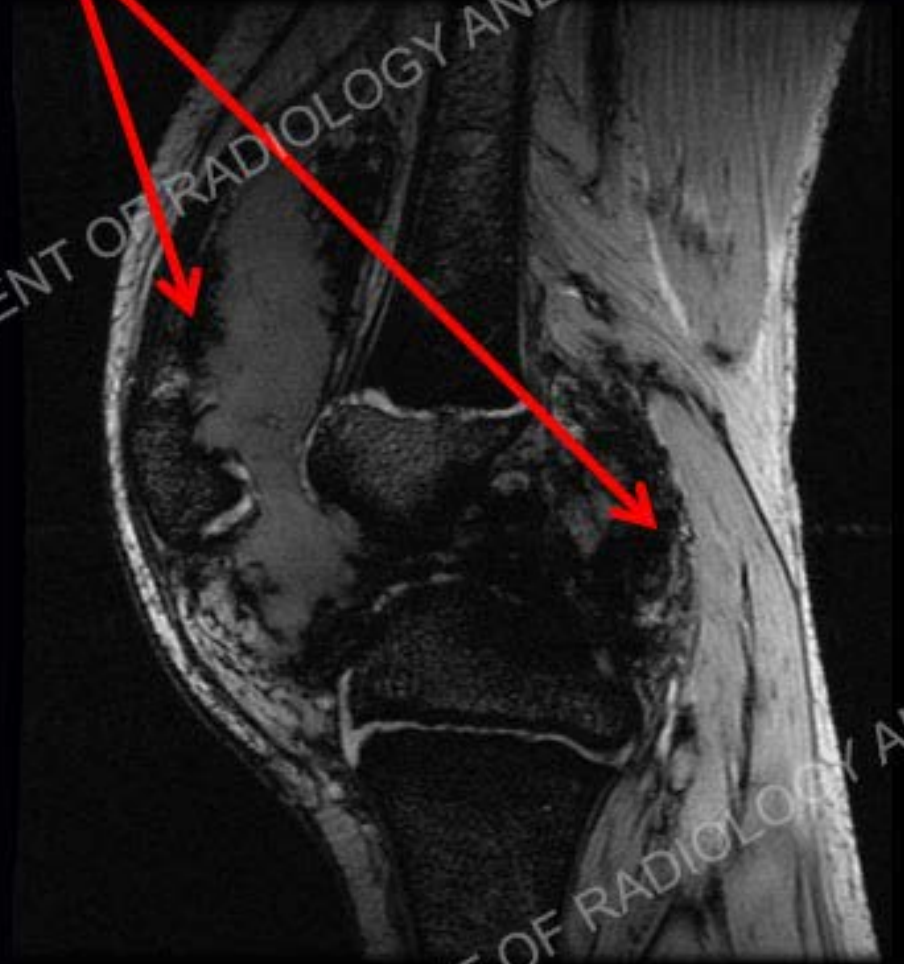
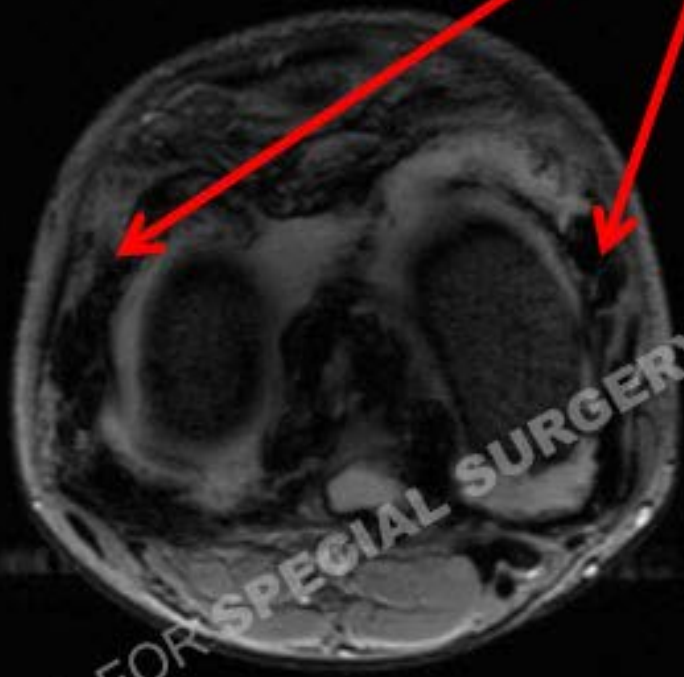


Interval destruction of cartilage and precipitated large erosions



Markedly thickened and increasingly low signal synovium/capsule

Blooming phenomenon



Diagnosis: Hemophilia

In this case, Hemophilia A, or a bleeding disorder where clotting factor VIII is absent. Other similar bleeding disorders related to absent clotting factors can present in a similar fashion. Typically, hemophilia involves the hinge joints such as elbow, ankle, and knee, as seen in this case. Bleeding into the joints causes synovial hyperplasia and inflammatory change that destroys cartilage. Bleeding precipitating cystic change may also occur directly in the bone or soft tissue yielding a so called hemophilic pseudotumor. On imaging, the effusions with erosions are seen on all modalities. MRI helps to further show the synovial thickening with the low signal related to blood break down products (hemosiderin) within the synovium. The susceptibility from the hemosiderin yields the blooming phenomenon seen on gradient echo sequences.

Unfortunately, this patient has developed an inhibitor or antibody to clotting factors used to help slow down the progression of disease. That accounts for the continued and rapid progression of the disease in this case.

References

Radiopaedia.org

[Center for Disease Control and Prevention](http://www.cdc.gov)

