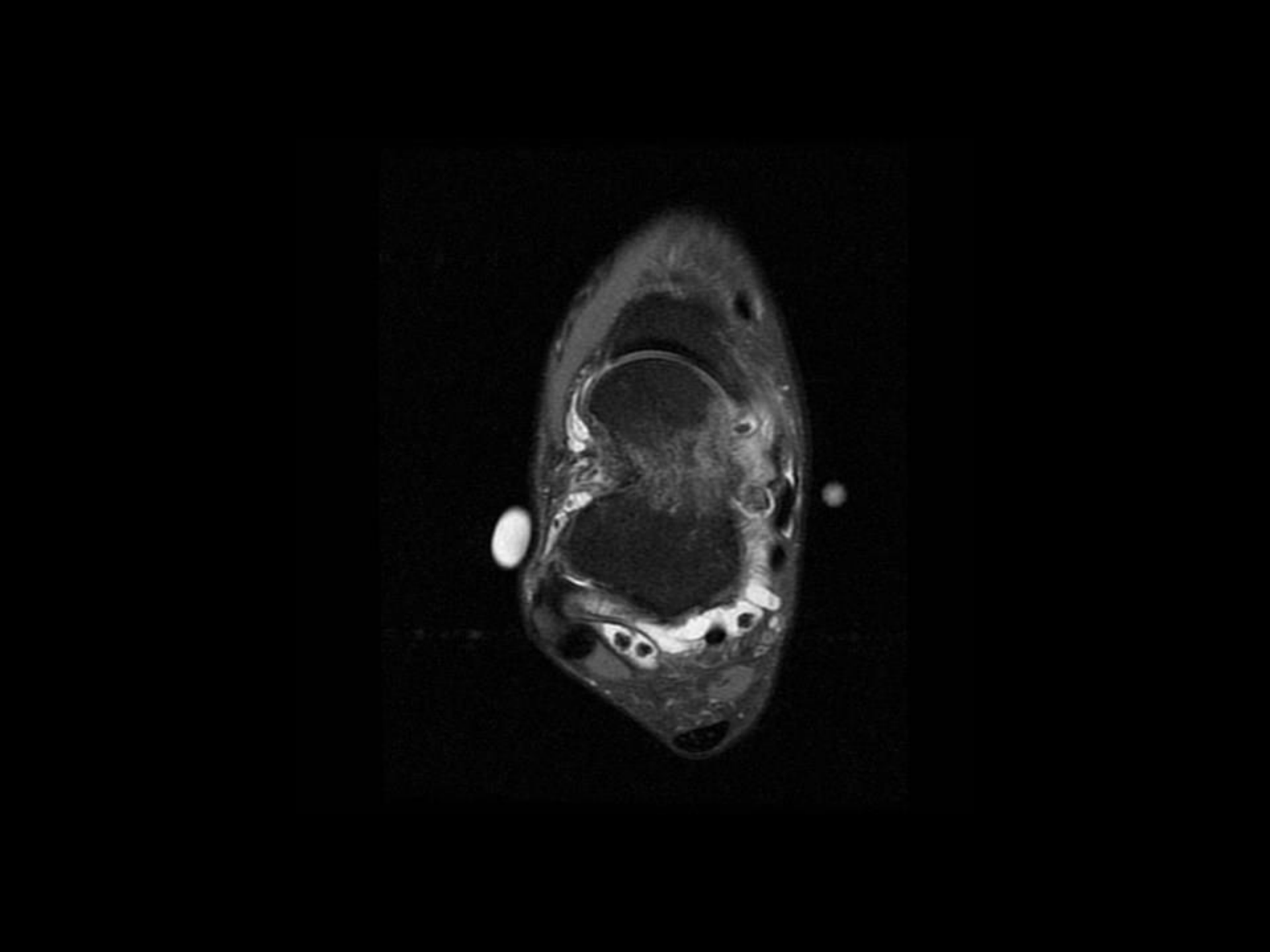
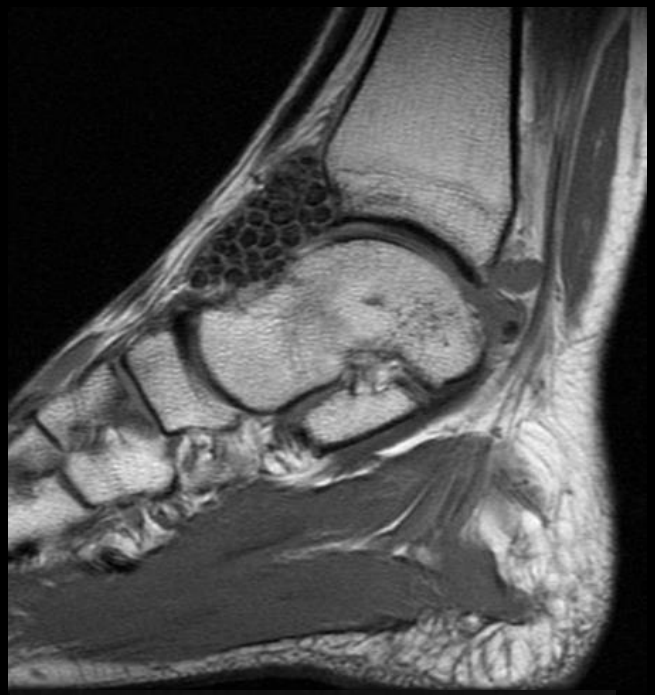
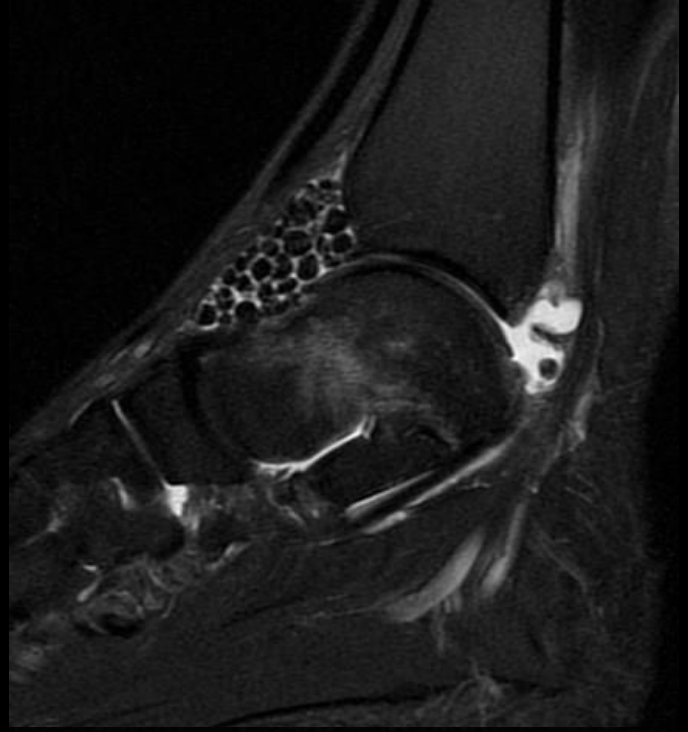
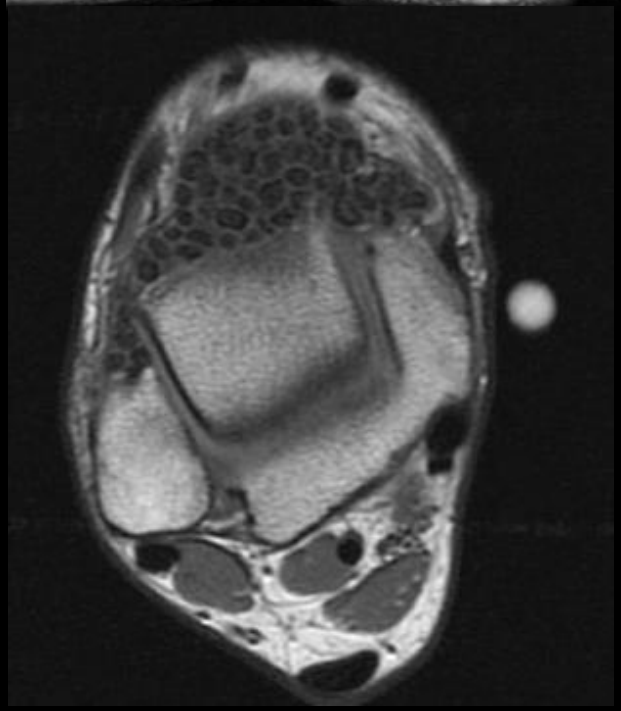
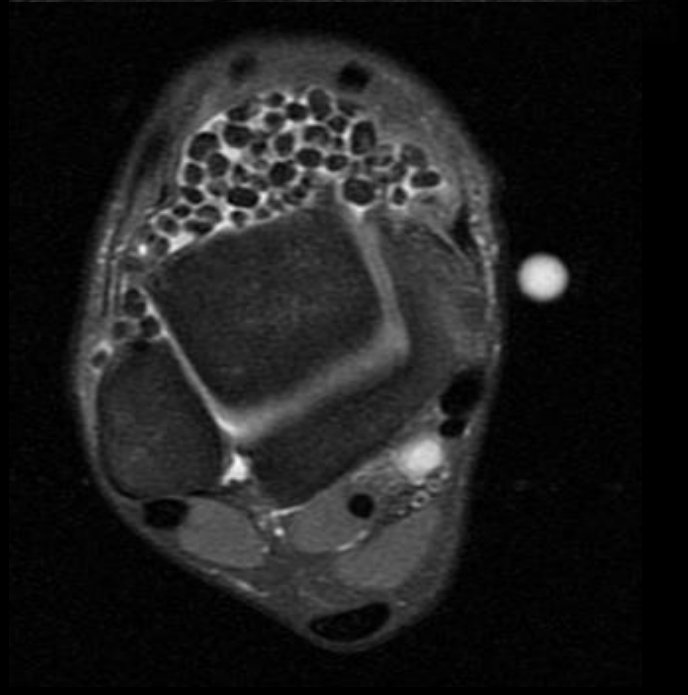
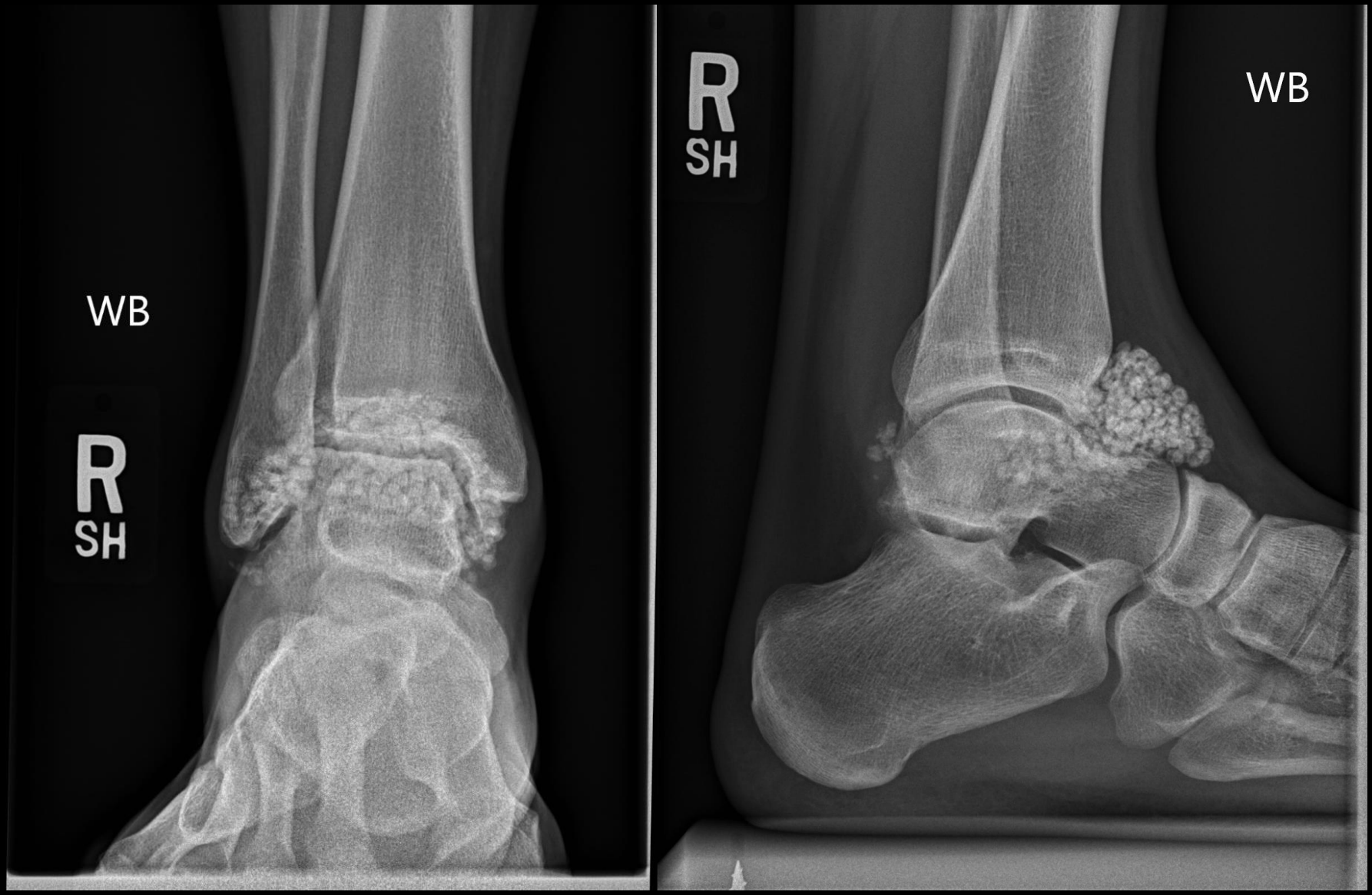
25 yo M with right ankle pain for the past 5 years.




WB
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Primary Synovial Osteochondromatosis

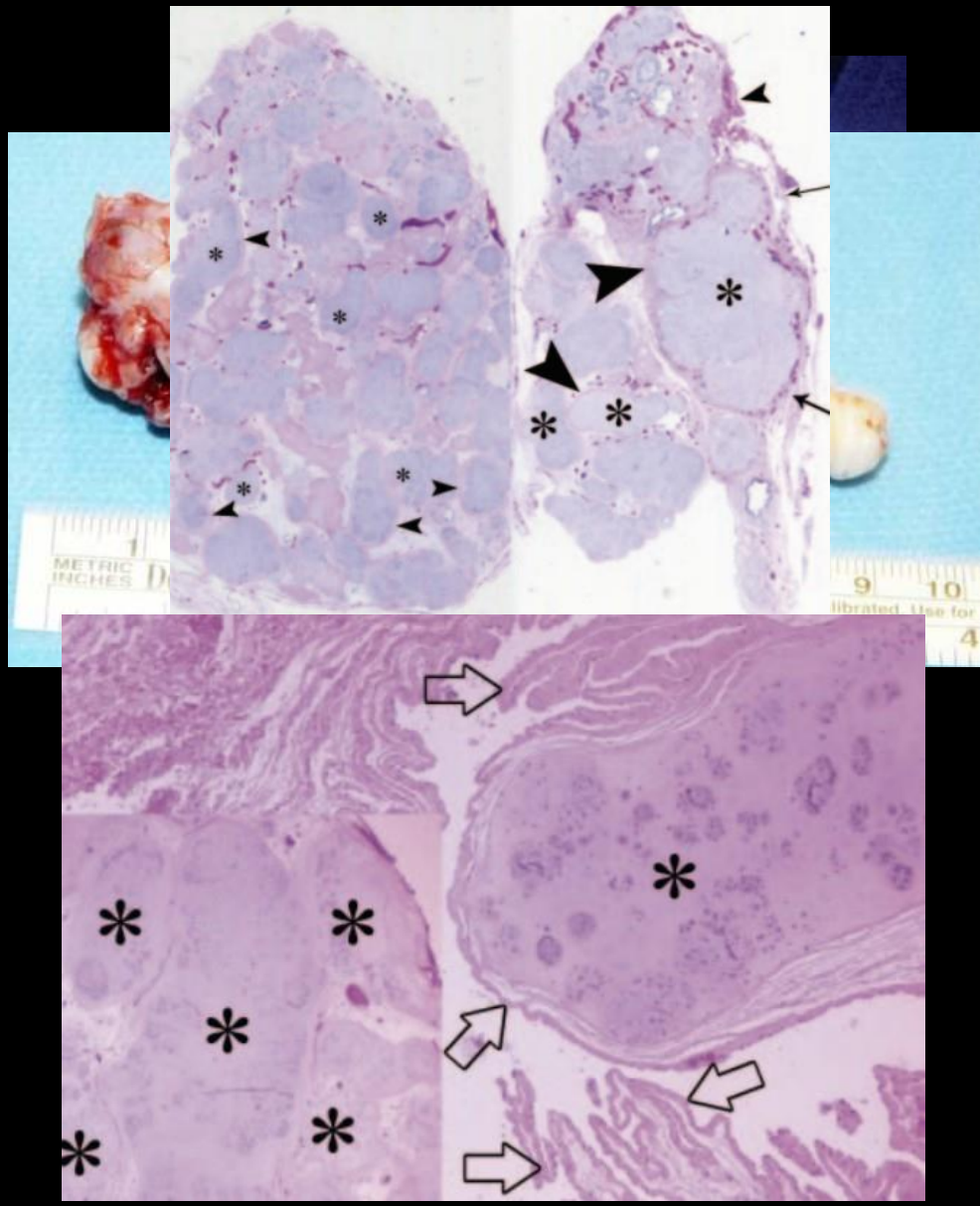
- debate as to whether a metaplastic or benign neoplastic process
- can also involve tendon sheaths and bursae
- wide age range but typically affects pt in 3rd-5th decades, M > F
- symptoms often insidious and gradually progressive; avg delay of dx is 5 yrs
- monarticular, rarely more than 1 joint
- knee most common joint (50-65%), followed by hip, shoulder, elbow, ankle

Pathogenesis and Pathologic Features

- 1st phase: active formation of hyaline cartilaginous bodies within synovium with no loose bodies
- 2nd phase: both synovial cartilaginous proliferation and shedding of intra-articular bodies
- 3rd phase: complete shedding of numerous intra-articular bodies and inactive synovial proliferation
- No evidence in the literature that PSOC actually progresses through these three stages in any definite order

Pathogenesis and Pathologic Features

- subsynovial cartilage neoplasia, synovial hyperplasia, and production of synovial bodies
- loose bodies can continue to grow nourished by synovial fluid
- synovial bodies typically similar in size and shape; range from few mm to several cm
- fusion or coalescence of bodies may occur
- at microscopy lobules of hyaline cartilage surrounded by synovial lining
- low-grade chondrosarcoma can be particularly difficult to differentiate due to both having hypercellular and atypical hyaline cartilage features



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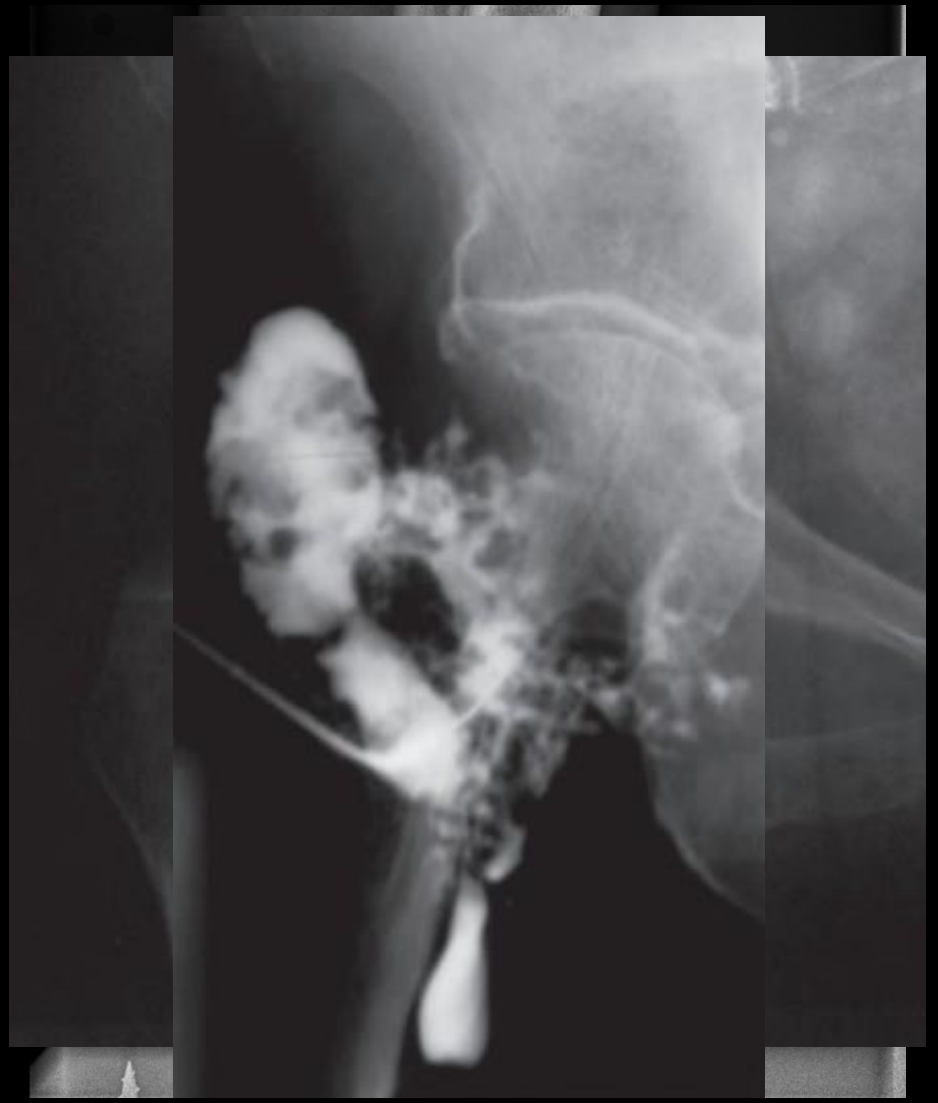
Murphey MD, et al. Radiographics. 2007; 27:1465-1488.

Imaging: Radiographs

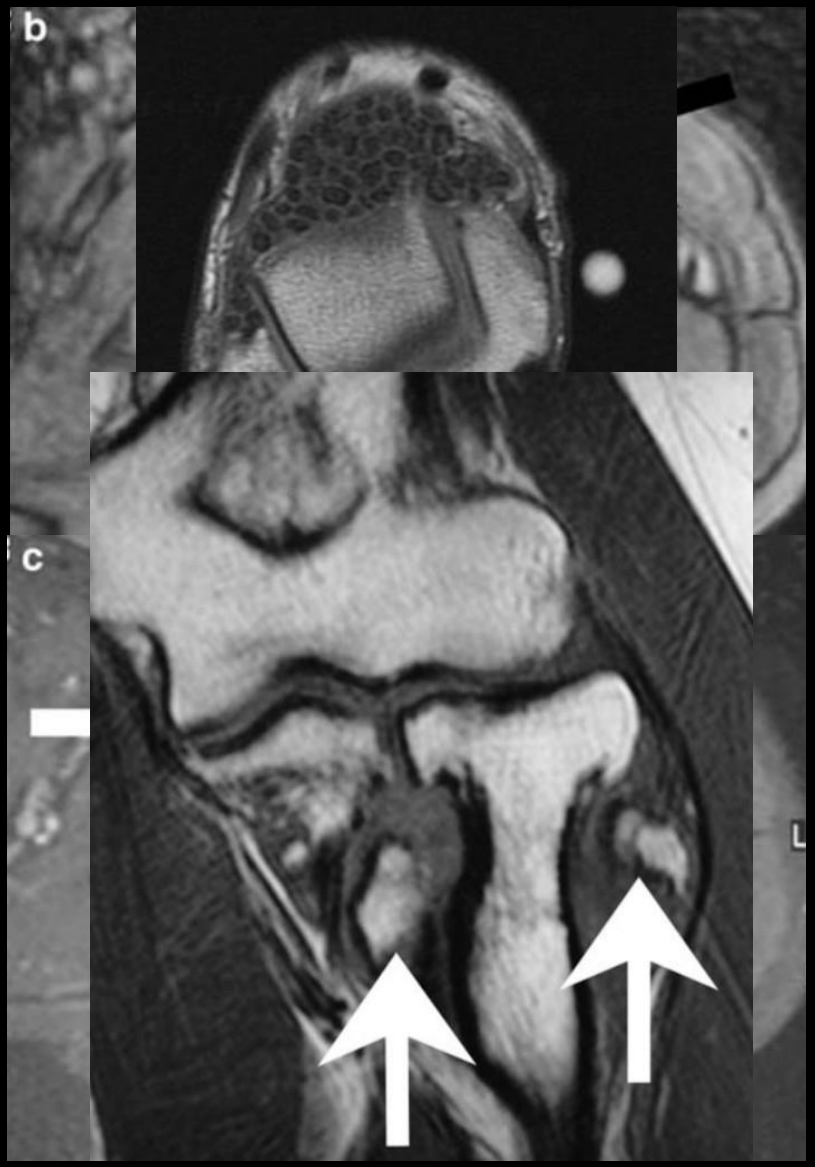
- classically multiple (> 5) calcified or ossified bodies of similar shape and size, evenly distributed, normal joint space
- normal in 5%-30% when purely cartilaginous
- chronic disease or multiple recurrences may lead to 2nd oa
- bone erosion in less capacious joints (hip, wrist, ankle)
- juxta-articular osteopenia not typically present unless the result of disuse



Murphey MD, et al. Radiographics. 2007;27:1465-1488.

Imaging: MR

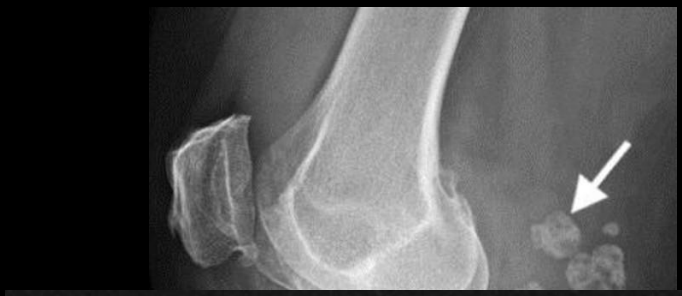
- purely cartilaginous nodules with no calcification
  - high water content of hyaline cartilage
  - intermediate to low on T1 and high on T2
  - may be mistaken for joint effusion or mass
  - contrast administration will demonstrate peripheral and septal enhancement with nonenhancing cartilage
- calcification (most common)
  - low on T1 and T2, more conspicuous on GRE
- endochondral ossification
  - high signal relative to fat and peripheral low signal



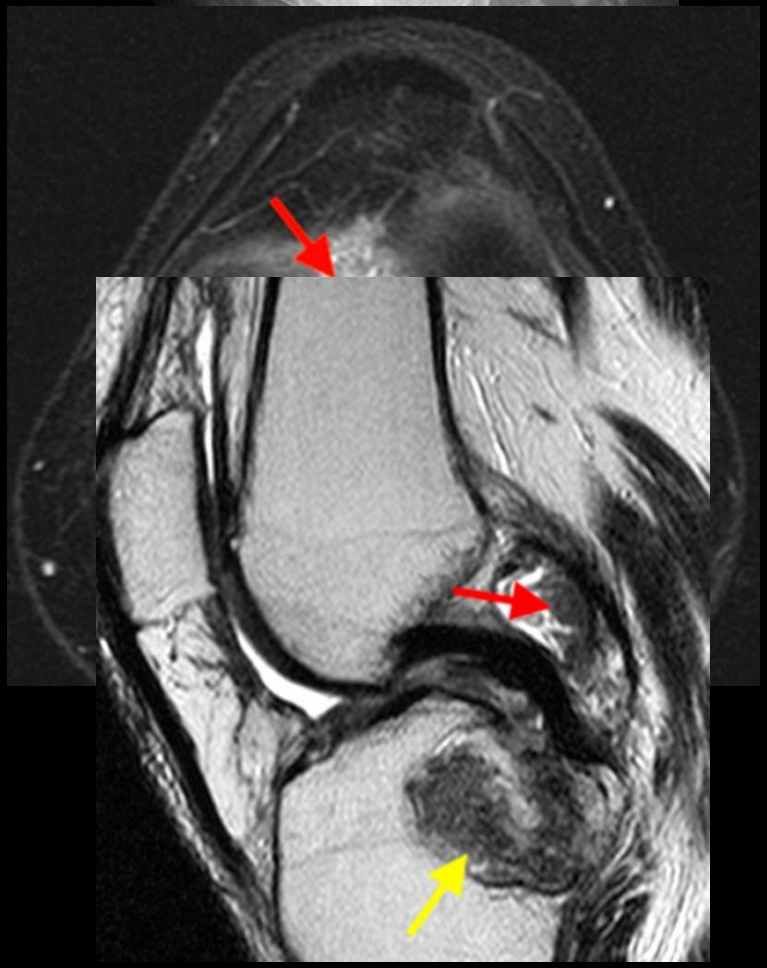
McKenzie G, Raby N, Ritchie D. A pictorial review of primary synovial osteochondromatosis. Eur Radiol. 2008;18(11):2662-2669. doi:10.1007/s00330-008-1024-8.

Differential Diagnosis

- secondary synovial osteochondromatosis
  - older age, extensive deg changes
  - fewer bodies and variable size
  - several rings of calcifications on radiographs



- infectious or inflammatory arthritis
  - rheumatoid arthritis, MAI, coccidioidomycosis, sarcoidosis
  - tiny, uniform size
  - contain no mineralization
  - more commonly layer dependently
  - intermediate on T1 and low on T2



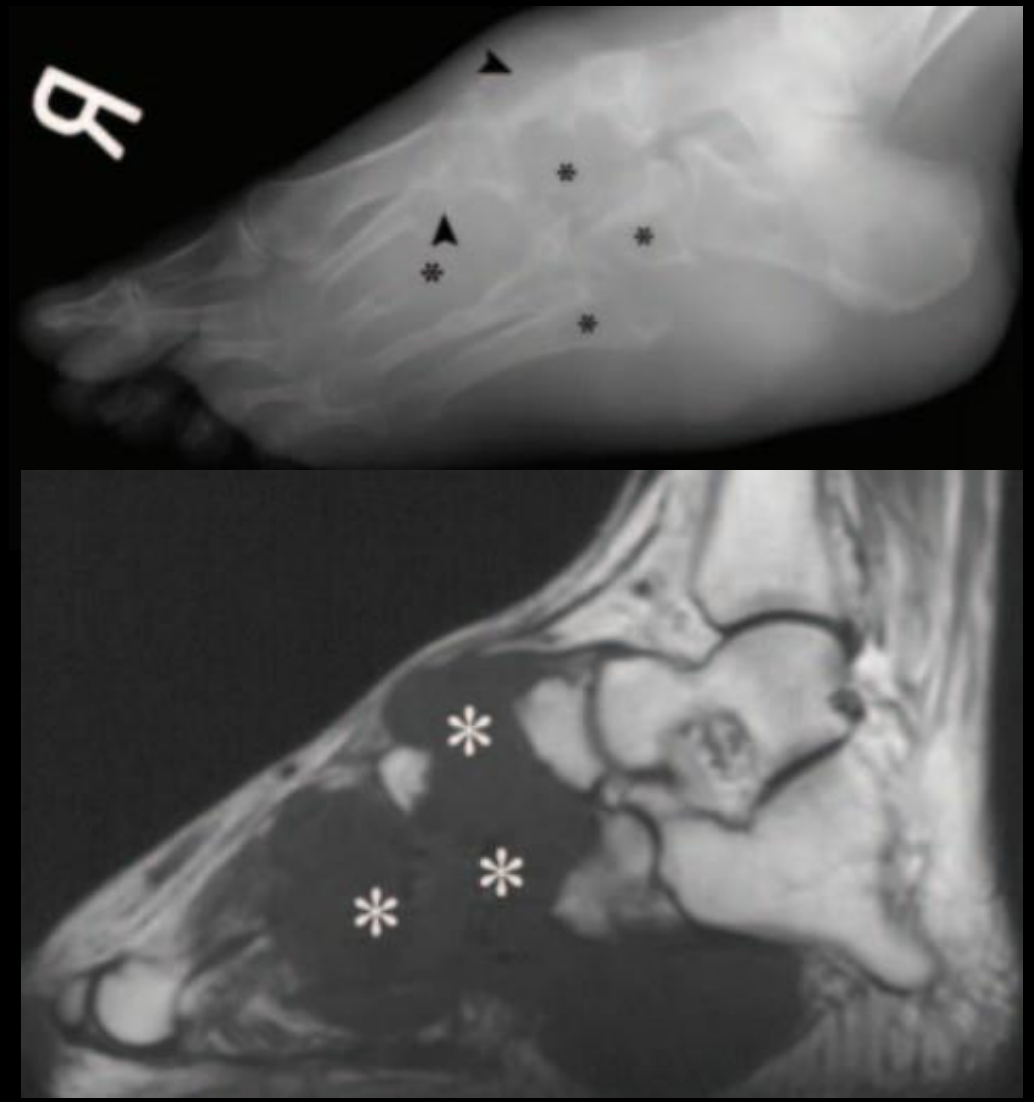
- PVNS
  - more confluent and frond like
  - dark signal and blooming of hemosiderin deposits

http://radsource.us/primary-synovial-chondromatosis/

Malignant Transformation

- rare
- largest series in the literature, reported by Davis et al. (53 cases) 5% prevalence
- synovial chondrosarcoma may arise as the 1^{o} condition but vast majority related to preexisting disease
- rapid increase in size of lesion or rapidly deteriorating clinical course → biopsy
- most are low grade and can be histologically similar to synovial osteochondromatosis

- may be difficult to distinguish between recurrence and transformation
  - true cortical erosion with marrow invasion and permeation



Murphey MD, et al. Radiographics. 2007;27:1465-1488

Treatment

- treatment of choice is surgical resection (synovectomy and removal of bodies)
- controversy regarding surgical treatment
  - conflicting results may be explained by differing phases
  - phase 1: synovectomy
  - phase 2: synovectomy and chondral body removal
  - phase 3: removal of bodies and no synovectomy
- extra-articular disease (whether 1^{o} or due to extension) is important to detect as it **can not** be treated arthroscopically
- overall recurrence for intra-articular disease ranged from 3-23% and higher rates for extra-articular
- recurrence typically within 5 years after initial resection

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