Giant geode in distal femur
simulating a bone tumor

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Patient: 54 years, male

Clinical History:

A 54 year old man presented to A & E dept with sudden severe pain in left knee with swelling following a trivial injury due to tripped over a block while walking.

Imaging Findings:

Plain radiographs: Septate cystic lesion in lateral femoral condyle with break in lateral cortex & intra articular extension with extensive osteophytes Blood: All have come back as normal when tested for Parathyroid hormone assay, Thyroid profile, Liver profile, Iron profile, Copper profile, U & E, FBC, inflammatory markers & Uric acid. CT scan (without contrast): A large well defined lytic lesion measuring 5 x 4.5 x 5 cm noted in subarticular location of lateral femoral condyle with pathological fracture running through the roof of intercondylar notch. Surprisingly, it had a soft tissue component within the lateral soft tissues with prominent osteophytes and evidence of chondrocalcinosis. The central portion showed areas of higher soft tissue density, which were thought to represent blood products following fracture. Contrast MRI scan: Has confirmed the CT findings and the cyst itself appeared complex on STIR and PD fat sat images, and was due to blood products following pathological fracture. The post contrast images showed only minor enhancement of periphery of the lesion. Of course, there was a cortical breakthrough with considerable soft tissue component. Aspiration Cytology: 10ml of turbid reddish black fluid was aspirated and is composed of blood with numerous red cells, few neutrophils & macrophages. Macrophages did contain elongated crystals that have the optical properties of calcium pyrophosphate with few similar extra cellular crystals. No evidence of cellular atypia. Histology: There was no evidence of infection or neoplasia and the appearances were those of reactive changes consistent with haemorrhage and degenerative joint disease.

Discussion:

Subarticular cystic lesions, known as GEODES, a geological term (2) for hollows within rocks have been associated with osteoarthritis, rheumatoid arthritis, osteonecrosis, and calcium pyrophosphate dihydrate deposition disease. The association of cysts with degenerative joint disease has been known for many years, and usually involves the joints under greatest pressure like hips & knees. These could also occur in non weight bearing bones like distal humerus, olecranon (3) & wrist especially in patients with rheumatoid arthritis. Calcium pyrophosphate crystal deposition (Chondrocalcinosis) can be often asymptomatic presenting only with radiographic changes. It may cause an acute or chronic arthritis. Chronic chondrocalcinosis (1) although mimics primary osteoarthritis in view of having osteophytes however, the osteophytes are more extensive, associated with patello femoral arthritis and calcification of articular cartilage & menisci and also geodes in Chondrocalcinosis are larger, more numerous and widespread than in osteoarthritis. It is very rare to see a giant geode measuring to a size of 50 mm complicating with a pathological fracture (4) and a soft tissue component. The radiological appearances of such a lesion, situated close to articular surface, with irregular margins, in a mature bone would create a suspicion of a giant cell tumor. CT / MRI scan together followed by aspiration cytology could be very useful diagnostic tools to diagnose a subchondral bone
cyst with successful exclusion of a giant cell tumor. Operative findings in this particular case confirm thin yellow coloured fluid in a cavitary lesion of lateral femoral condyle with out any evidence of tumor mass and is treated with thorough curettage, packing the cavity with combined allo & synthetic bone graft followed by cancellous screw fixation. The histology has confirmed the benign nature of the cyst with out any evidence of infection or neoplasia. 

**Differential Diagnosis List:** Giant geode with pathological fracture in secondary osteoarthritis with chondrocalcinosis

**Final Diagnosis:** Giant geode with pathological fracture in secondary osteoarthritis with chondrocalcinosis

**References:**


Description: Cystic lesion with multiple septae in the lateral femoral condyle with break in the outer cortex. Origin:
Description: Large well defined lytic lesion involving the entire lateral femoral condyle with cortical breakdown and extensive osteophytosis Origin:
**Figure 3**

**Description:** Clear evidence of cortical break with considerable soft tissue extension

**Origin:**