Hello everyone!!!

Hope all of you are staying safe and taking care of yourselves during these troubling times of coronavirus

The current question again seems to have been very tough …Only ***THREE*** people got the right answer, that too after extending the deadline !!!

However we have listened to you and **decided to change the questions back to the previous easier format.**

So cheer up if you did not get it right this time and get ready to answer the next question on monday.

So let us see the baseline situation of the patient.
72-year-old female….. pain in the knee and hand joints (esp the thumb joint near the wrist)..... 10 years.
….pains worsened during any period of activity improved during rest.…...
…..stiffness in the hands in the morning relieved by 5-10 mins …...
…...knee would also become stiff after periods of rest or sitting. …...

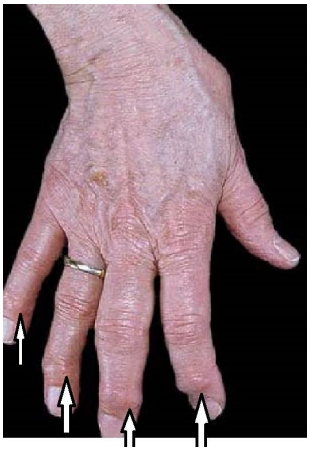
There are several causes of joint pains. However as a rheumatologist we tend to divide the several causes into 2 very broad categories. 1 is Mechanical Pain (most common cause is osteoarthritis or degenerative joint pain) and 2nd is Inflammatory arthritis pain (most common cause is rheumatoid arthritis) In terms of prevalence osteoarthritis is MUCH MUCH more common in the community compared to rheumatoid arthritis. However it is important to be able to detect rheumatoid arthritis (though it is much rarer) as it is a serious inflammatory disorder which can quickly damage joints and hurt internal organs leading to increased morbidity and mortality. Whereas the situation in osteoarthritis is definitely much less serious.

Four important points to help us diagnose or determine whether the patient has inflammatory arthritis on history alone are

1) **Does the pt have increased pain during /after rest and the pain improves with activity**
   People with degenerative arthritis have pain which worsens with activity and improves with rest. Whereas the opposite is true in inflammatory arthritis. Degenerative arthritis patients can have mild stiffness on prolonged rest (gelling phenomenon). The same is short lasting. Maximum a few minutes or a few steps. Unlike in inflammatory arthritis
2) **Does the patient have early morning stiffness lasting greater than 30 mins**
   Patient with inflammatory arthritis have early morning stiffness lasting greater than 1 hour whereas that in osteoarthritis usually lasts only 5 to 10 mins
3) **Does the patient have systemic symptoms or signs**
   Since rheumatoid arthritis and other inflammatory arthritis are part of a systemic autoimmune disease hence there are likely to be extra articular symptoms and signs. This will not occur in degenerative arthritis as the primary problem is local (i,e. Degeneration of the joint)
4) **Does the patients symptoms wax and wane on their own without any triggering activity or event**

An easy way to remember this as well as sensitize the general public is by the S-factor poster. (click here to see the S factor poster)

So, from the above 4 questions it is evident that the patient has Mechanical joint pain. In fact if you pay attention to the photos of her hand on you can see bony nodal swelling of the DIP joint. These are called Heberden nodes. (Did you know these nodes are named after Dr William Heberden? He was the 1st doctor to coin the term and describe angina pectoris. He is known as the father of clinical observation and a pioneer of scientific medicine. You can read more about him by clicking here)



So her baseline condition is clearly osteoarthritis for which she was on NSAIDs and her pains worsened once she stopped the NSAIDs at the behest of her family physician.

So **we can rule out OPTION 4 which is a flare of rheumatoid arthritis**

Coming to her main problem, she was given an intra-articular injection of Hylauronate after which she developed severe redness, pain and swelling in 1 of the knees which received the injection.

A red hot swollen joint is obviously a joint having inflammatory arthritis. The most common cause of inflammatory arthritis esp a red hot swollen one is septic arthritis. (infection)

Neither Rheumatoid arthritis nor inflammatory flare of osteoarthritis will present with red hot swollen joints. And hence **OPTION 1 can also be ruled out**

Septic arthritis is a devastating disease and is considered a rheumatological emergency. Aspiration of the joint yielded purulent looking fluid which again tends to justify our suspicion of the diagnosis. However the synovial fluid TLC count is much less than what you would find in a patient with septic arthritis. (Click here to see synovial fluid characteristics in different situations).

The other clue (or rather red herring) in this patient was the intra-articular injection. There is a common misconception that joint injections can cause or precipitate joint infections. The same is not true. The data shows that joint injections are an extremely safe procedure. The chance of developing joint infection after injection are around 1 in 50,000/-. Most rheumatologists who routinely inject joints have never encountered a single case of septic arthritis.
A review of bacterial arthritis shows that the overall incidence is around 2 / 100,000 per year and the **main risk factors are**

1) **an abnormal joint** (joint surgery, the presence of prosthetic or osteosynthetic material, pre-existing joint disease (especially rheumatoid arthritis)) or
2) **a malfunctioning immune system** (diabetes mellitus, advanced age and immunosuppressive medication)

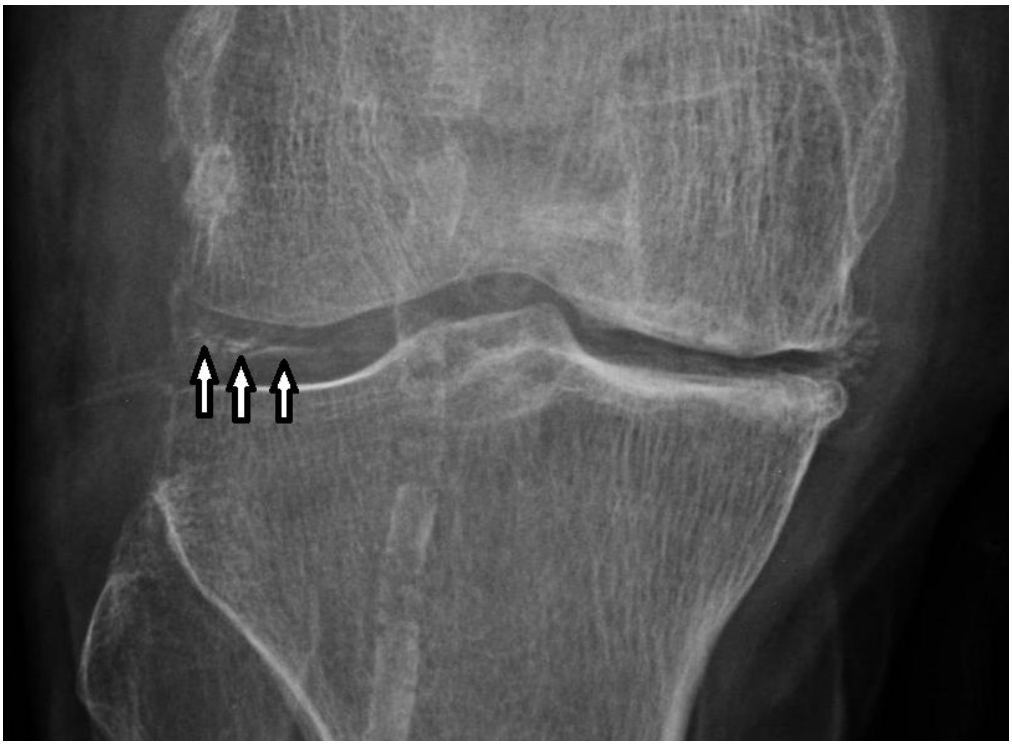
Thus joint injections are similar to lumbar puncture or pleural taps (you do NOT expect any patients to develop septic meningitis or empyema respectively due to the procedures)
So our patient had a higher risk of septic arthritis due to her age rather than due to the joint injection.

So disregarding the joint injection and based on the synovial fluid TLC the possibility of septic arthritis is unlikely. **Thus OPTION 2 is ruled out**

Now coming back to the cause of her red hot swollen monoarthritis. If the TLC is not in favour of septic arthritis. Then what could be the cause?
The next most common cause of monoarthritis (after infection) is crystal arthritis. The most well known crystal arthritis is of course gout. But there is another crystal arthritis called Calcium pyrophosphate disease. In this there is deposition of CPP crystals in the cartilage. This conditions tends to occur more commonly in elederly women (in contrast to gout which develops in middle age men)

So among the 2 causes of crystal arthritis in our patient CPP disease seems more likely. The final 2 clues are in the X-ray and the substance which was injected into the joint.

Though the X-ray was reported as showing only osteoarthritis a close examination clearly shows calcification of the cartilage. See arrows



CPP is an important cause of chondrocalcinosis. (other causes of chondrocalcinosis are mentioned in this article)

Patients with CPP disease can present with red hot swollen joint called Pseudogout. The same can be precipitated by an acute infection or illness, surgery , parathyroidectomy or Trauma to the joint. Intra -articular injection can be given by minimal trauma to the joint. However what was injected in this patient is important Sodium Hyaluronate a visco supplement which is known to precipitate pseudogout. It is not known exactly why this reaction is seen in pts with CPP disease. HA interacts with its receptor CD44, an adhesion molecule

involved in leucocyte migration during inflammation. Degradation of HA may have a pathogenic role by producing proinflammatory agents. (reference)

Hence the answer is option no 3. Pseudo-Gout flare of CPP disease

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