An Elderly Woman With Persistent Arm Pain

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Radiology Quiz

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Introduction. A79-year-old, right-handed woman presented to her primary care physician's office with no prior hospitalizations for persistent right arm pain associated with a right antecubital mass.

History. The patient's past medical history includes hypertension, chronic obstructive pulmonary disease (COPD), generalized osteoarthritis, and total left hip arthroplasty. The patient attributed her pain to crocheting, which she planned on continuing. She denied any trauma, muscle weakness, numbness, or tingling. She endorsed generalized myalgias and arthralgias secondary to her generalized arthritis. Her right upper extremity examination had a 2 cm soft mass in the medial aspect of the antecubital fossa. Her upper extremity strength was 5/5. She had full range of motion actively and passively. Her upper extremity reflexes were 2+ (normal response) and sensation was intact to light touch.

Diagnostic testing. Radiograph and magnetic resonance imaging (MRI) images of the right upper extremity were obtained **(Figures 1-4)**.

Fig. 1. *Anterior posterior radiograph of the right shoulder indicates radiopaque lesion of proximal humerus.*

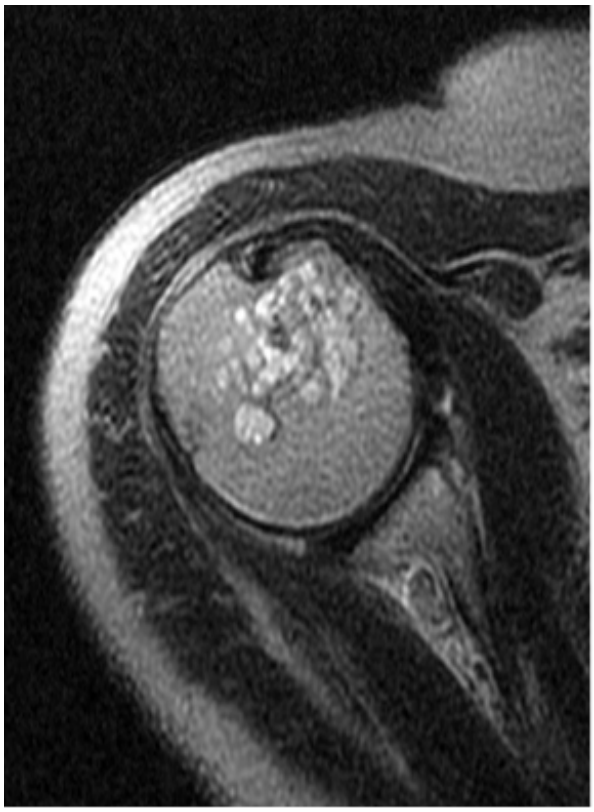

Fig. 2. *An axial T1 MRI indicating rings and arcs type lesion in proximal humerus is shown.*

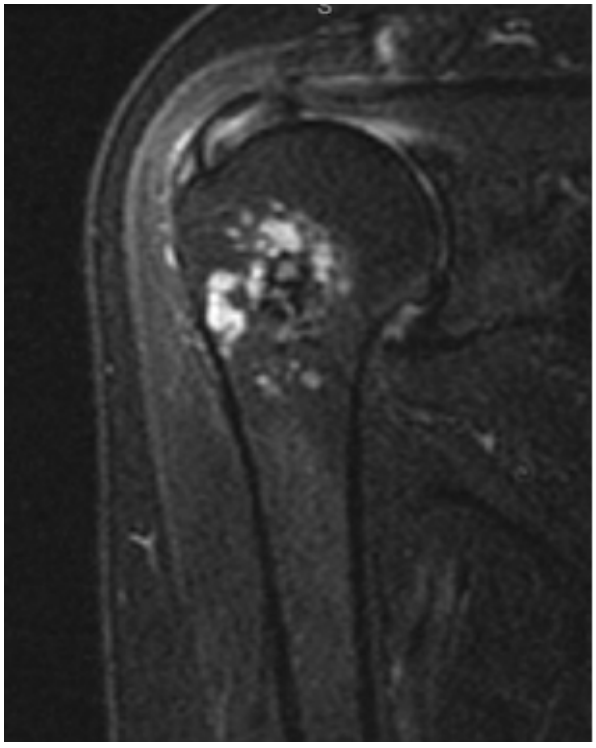

Fig. 3. *A coronal T2 MRI showing lesion right proximal humerus in rings and arcs pattern.*

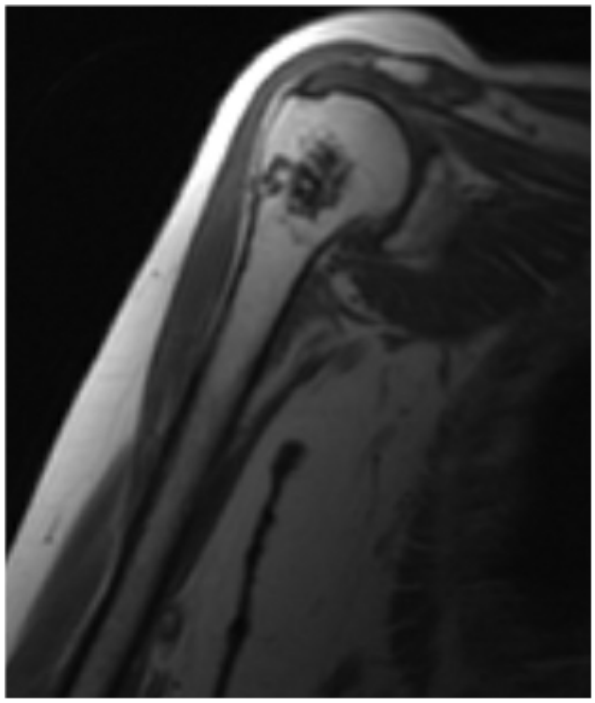

Fig. 4. *A coronal T1 MRI showing lesion of the right proximal humerus.*

Answer: B. Enchondroma

Enchondromas encompass approximately 3% of all benign bone tumors and are often painless.[1] They look like “rings and arcs” on MRI.[2] On histology, enchondromas can resemble low-grade chondrosarcoma.[2] Similarities between chondrosarcomas and enchodnromas are the ring enhancing lesions and lytic nature of the tumors and they may both present with calcifications. For an enchondroma on MRI you may see the marrow around cartilage islands which helps to distinguish them from chondrosarcomas. Therefore, clinicians who suspect enchondroma on history, physical, and radiographic examination, should make an expedient referral to orthopaedic surgery or orthopaedic oncology if such a specialized practitioner is available.

Differential Diagnosis. A fibroma is a benign tumor composed of fibrous or connective tissue.[3] It can occur in various tissues and organs throughout the body and typically presents as a well-defined, firm mass.[3,4] They can be classified based on the tissue of origin or location in the body. Bone fibromas, also known as fibrous dysplasia, are largely asymptomatic, but may cause pain, deformity, or fractures.[5] Symptoms depend on the location and extent of the involvement. Most fibrous dysplasias are first diagnosed in children or young adults and constitutes 5% of all benign bone lesions.[5] Fibrous dysplasia typically appears as a well-defined, radiolucent lesion with a ground-glass appearance on X-rays.[5] This appearance is due to the fibrous tissue replacing normal bone.[5]Surgery may have a role in symptomatic management.[5]

Chondrosarcoma is a primary malignant tumor that originates in cartilage cells.[4] It is a tumor of adulthood and older age and is the third most common primary malignancy of bone after myeloma and osteosarcoma.[4] They are usually greater than 4 cm in size, commonly arise in the pelvis or long bones (such as the proximal femur and proximal humerus).[4] Chronic, local swelling and pain are the most common presenting symptoms.[4] On X-rays, chondrosarcomas presents as a lytic bone lesion that appears darker compared to normal bone.[4] Areas of calcification within the tumor may be visible as brighter spots.[4] These calcifications can sometimes appear as a "ring-and-arc" pattern, indicating cartilaginous content. The primary treatment modality of chondrosarcoma is surgical excision.[6]

A lipoma is a benign tumor composed of fatty tissue accounting for about 16% of all benign soft tissue tumors.[7,8] It is generally soft, movable, and painless.[8]Lipomas usually range from 1 cm to 10 cm and are found anywhere on the body but tend to favor the fatty areas of the trunk, neck, forearms, and proximal extremities.[8] They can occur at any age but are most often diagnosed in adults between 40 and 60 years of age.[8]Lipomas appear as well-defined, hyperechoic lesions on ultrasound due to their fat content.[8]They are often removed surgically if they cause discomfort, are growing, or for cosmetic reasons.[8]

Treatment and management. The prognosis and management options for enchondromas depend on the size and symptomatology.[1] Tumors that involve >50% of the cortex increases the risk of fractures and requires treatment, which involves curettage and bone grafting.[1] Transformation into chondrosarcoma is rare, with solitary lesions (< 1%) and the risk of malignant transformation increases in proportion to the number of lesions present.[9] In evaluating the images, patient would not likely meet the indications for a bone graft and curettage. The most likely first option for treatment is a shoulder replacement.

Outcome and follow-up. The patient received a referral to an orthopaedic oncologist for further evaluation, however, the patient declined further intervention and did not follow-up. Although her primary care physician recommended that she reconsider her follow-up with the orthopaedic oncologist, the patient returned to her hobbies and continues to crochet and knit as tolerated.

Discussion. The prudent physician in this case ordered an X-ray to evaluate the antecubital mass which ended up being a lipoma and incidentally discovered an enchondroma in the patient's proximal humerus. Enchondromas are a common, benign bone tumor found in patients from 10 to 35 years of age with higher incidence among those 10 to 20 years old.[2] Though benign, they can present as an alarming mass and can lead to pain, which can affect quality of life.[2] Enchondromas are often found in the hands and wrist followed by the femur and other long bones.[1]

This case presents an enchondroma that was found in a patient of much more advanced age than the typical patient with an enchondroma. In patients who present with persistent pain, clinicians should evaluate the patient with imaging to further characterize the etiology of the pain. X-rays are a cost-effective way to start and further imaging with an MRI may be performed as indicated. While the incidence of enchondromas is about 3%, they can be present in Olliers and Mafucci syndrome (both cause multiple tumors in bone and are non-hereditary). Treatment for enchondromas, irrespective of age, primarily consists of serial x-rays every year for about two years to monitor for growth and changes. If one detects such changes, biopsy and subsequent shoulder replacement surgery would be the next steps.

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