

## Radiological Quiz – Musculoskeletal

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**A** 45 year female patient was referred for CT guided FNAC of a mass in the right shoulder diagnosed elsewhere as a neoplastic process on MRI. The swelling was present since 4 months and was attributed to a fall. On examination, near complete range of shoulder

movements were present. The swelling was firm to hard, non-tender and with normal temperature. Plain X rays of the right shoulder (Figure 1a & 1b) as well as shoulder MRI (Figure 2a and b) are provided.



Figure 1 Plain radiographs of the right shoulder in neutral (a) and abduction (b) positions.

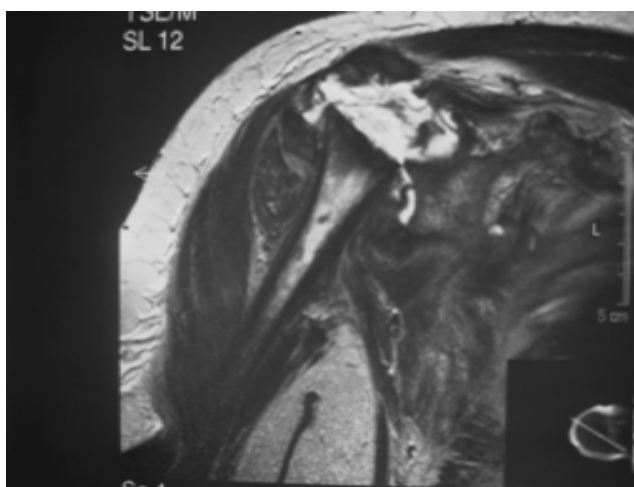


Figure 2 Oblique coronal T1 (a) and TSE T2 (b) weighted MR scans of the right shoulder.

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## Radiological Diagnosis

### NEUROPATHIC (CHARCOT'S) OSTEOARTHROPATHY OF THE SHOULDER



Figure 3 Sagittal TSE T2 weighted MR scan of the cervico-dorsal spine.



Figure 4 Plain radiographs of the right (a) and left (b) hands.

Plain X rays show a typical blunt amputated appearance of the proximal right humerus. The proximal right humerus and the glenoid cavity are sclerosed and the proximal humerus is subluxed superiorly. Osseous densities are noted in the soft tissues around the right shoulder joint, with displacement of the adjacent fat planes. The amputated humerus forms a pseudo-arthrosis with the distorted glenoid on abduction.

Oblique Coronal T1 and TSE T2 MR scans of the right shoulder show a heterogeneous lesion in the right shoulder distending the capsule and surrounding the upper end of the humerus with linear hypo-intensities within the joint. The humeral head is not seen and the residual humerus is subluxed superiorly, with sharp margins. The glenoid also shows destructive changes.

Based on these radiological findings, a diagnosis of Charcot's joint was suspected and an MRI of the cervical spine was suggested instead of FNAC of the shoulder.

The sagittal T2 W image of the cervical spine (Figure 3) shows an extensive syrinx cavity in the cervico-dorsal region.

Physical examination of the patient also showed atrophy of the thenar muscles and neuropathic changes in the inter-phalangeal joint. A plain radiograph of the hand (figure 4) confirmed the finding.

### Neuropathic Osteoarthropathy

Neuropathic osteoarthropathy comprises of both hypertrophic and atrophic patterns which can be discerned radiologically [1].

The classically described hypertrophic joint is manifested radiologically as joint destruction and fragmentation, osseous sclerosis, and osteophyte formation. The six Ds of neuropathic joint include distension of the joint, increased density, debris, destruction of the articular surface, dislocation and disorganization of the joint [2]. Osteophytes formed in the setting of neuropathic arthropathy may differ from those of osteoarthritis on the basis of early production of ill-defined and rounded margins and later attainment of enormous size.

The atrophic form of neuropathic osteoarthropathy has an appearance of osseous resorption that often gives the impression of surgical amputation. Joint disorganization and large persistent bloody joint effusion are features of both atrophic and hypertrophic types of neuropathic osteoarthropathy.

The most common cause of a neuropathic shoulder is syringomyelia [3, 4]. The discovery of neuropathic arthropathy of the upper extremity in the absence of a known spinal cord lesion should prompt imaging of the cervical cord [5].

Osseous fragmentation and debris, a hallmark of neuropathic osteoarthropathy, may be confused with tumor matrix on radiographs. Not uncommonly, a neuropathic shoulder is initially misdiagnosed radiographically as a neoplasm, particularly as chondrosarcoma. Imaging features that help differentiate soft-tissue tumors from neuropathic arthropathy of the shoulder include an amputated appearance of the proximal humerus, dislocation, large joint effusion, and fragmented osseous debris. Most important, the abnormality is centered at

the joint with osseous involvement on both sides of the joint. Bone tumors, on the other hand, localize to bone on one side of the joint and only rarely violate cartilage boundaries

The differential diagnosis includes Milwaukee shoulder, rapidly destructive articular disease, amyloid arthropathy, hemophilic arthropathy, primary synovial osteochondromatosis, pigmented villonodular synovitis, and foreign-body synovitis [6].

### References

1. Resnick, D, Neuropathic Osteoarthropathy. In: Resnick D., ed. Bone and Joint Imaging, 3rd Edition, Philadelphia, USA : W.B.Saunders, 1995 ; 930-940
2. Yochum T. & Rowe L. Neuropathic arthropathy. In : Yochum T. & Rowe L eds, Essentials of Skeletal Radiology. 2nd edition, Baltimore, USA, William & Wilkins, 1987; 842-849.
3. Hatzis N, Kaar TK, Wirth MA, Toro F, Rockwood CA Jr ; Neuropathic arthropathy of the shoulder. J Bone Joint Surg Am 1998 Sep;80(9):1314-9.
4. Rawat B, Bell RS ; Case report: rapidly progressive neuropathic arthropathy in syringohydromyelia--radiographic and magnetic resonance imaging findings. Clin Radiol 1994 Jul;49(7):504-7.
5. Tully JG Jr, Latteri A ; Clin Orthop 1978 Jul-Aug;(134):244-8; Paraplegia, syringomyelia tarda and neuropathic arthrosis of the shoulder: a triad ;.
6. Llauger J, Palmer J, Roson N, Bague S, Camins A, Cremades R. Nonseptic monoarthritis: imaging features with clinical and histopathologic correlation. Radiographics 2000 Oct;20 Spec No:S263-78;