Can residents diagnose this condition on X-ray?

Sir,

With the advent of advanced and overuse of imaging modalities like computed tomography (CT) and magnetic resonance imaging (MRI), common conditions which were once diagnosed on conventional radiographs are being subjected to unnecessary investigations. We try to highlight two such cases of neuropathic joint disease.

First case is of a 38-year-old man presented with history of gradually progressing painless swelling of left shoulder and elbow. On clinical examination, there were limited movements at these joints and along with atrophy of the thenar and hypothenar muscles.

Radiographs of the left shoulder, elbow, and wrist joint revealed disorganized joint, resorption, dislocation, soft tissue swelling with osseous debris [Figure 1a and b]. MRI of cervical spine revealed Arnold Chiari I malformation with syringohydromyelia from C4 to D7 level with associated basilar invagination and atlanto-occipital assimilation [Figure 2].

Second case is of a 40-year-old female with left elbow swelling, and limited joint movements. X-ray of left elbow revealed similar findings [Figure 3]. MRI of the cervical spine was done which showed syringohydromyelia from C3 to C6 [Figure 4].

Neuropathic arthropathy refers to the spectrum of changes in joint associated with neurosensory deficit commonly affecting the weight bearing joints. It is relatively uncommon in the non-weight bearing joints of the upper limb. Shoulder is the commonest joint affected in the upper limb, commonly due to syringohydromyelia. Arthropathy of elbow and also involvement of multiple joints is even rarer. Affected joints are also called Charcot joints after Jean Martin Charcot who was the first to elucidate the relationship between neuropathic arthropathy and central nervous system lesions. Two theories have been proposed to explain the pathophysiology: Neurotraumatic theory and neurovascular theory. These lead to bone resorption, weakening, and destruction. Radiologically, two patterns of neuropathic arthropathy are described: (i) Hypertrophic-characterized by joint destruction, fragmentation, osseous sclerosis, fracture, heterotopic bone formation, osteophyte formation, and ultimately fusion. (ii) Atrophic-characterized by substantial bone resorption which may simulate surgical amputation. Fractures may occur spontaneously or following trivial trauma and heal with exuberant and bizarre callus formation. Both types are considered to be just-different stages in the natural course of the disease. Shoulder joint, although the most common involved site in upper limb, is involved in only 5-6% of patients with neuropathic arthropathy. The most common etiologic factor is cervical syringomyelia seen in 75% of cases. Other causes are diabetes mellitus, frequent intraarticular steroid injection, chronic alcoholism, and congenital insensitivity to pain.

Neuropathic arthropathy of the elbow is a rare entity that is seen in association with syringomyelia. Even rarer is the involvement of shoulder and elbow in the same patient. Neuropathy in the form of concentric bone atrophy with...
resultant licked candy appearance or acroosteolysis is more often seen in leprosy, diabetes mellitus, scleroderma, frostbite, etc. Differential diagnosis includes osteoarthritis, bone tumors, tumoral calcinosis, calcium pyrophosphate deposition disease, avascular necrosis, and synovial chondromatosis.

The purpose of this article is to emphasize on the importance of knowledge of the X-ray and MRI findings in neuropathic arthropathy so that unnecessary investigations can be avoided.

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