

Case Report

Interesting neurological cause of scapular fracture

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Abstract

A 42 year old male patient presented with sudden onset painless drooping of right shoulder while lifting himself up with his right arm from squatting position. He was diagnosed to have fracture of spine of right scapula. Neurological examination of the patient revealed patient's inability to abduct the right arm and mild weakness of handgrip without associated wasting or fasciculations. Impairment of pain sensation in right half of face, right cervical and upper thoracic dermatomes (T1–T4), and absence of deep tendon reflexes in right upper limb with brisk deep tendon reflexes in lower limbs were discovered on examination. The patient's cervico-dorsal Magnetic Resonance Imaging confirmed a syrinx extending from cervico-medullary junction to the upper thoracic segments. The patient did not have any obvious features suggestive of Charcot's arthropathy on clinical and radiological examination. The case highlights the importance of detailed neurological examination and unusual presentation of fracture of spine of scapula in a patient harbouring cervico-dorsal syrinx.

Key words: Syringomyelia; scapula; shoulder fractures; Charcot's joint; neurogenic arthropathy.

Case report

A 42 year old male developed sudden onset drooping of right shoulder while lifting himself up with his right arm from squatting position. The patient sought medical help and he was found to have fracture of spine of right scapula with disruption of acromioclavicular joint (figure 1). The patient was referred to Neurology Department for assessment of possible brachial plexus injury in view of apparent weakness of right arm. The patient had no swelling, erythema, tenderness or pain in the shoulder region. He had inability to abduct the right arm and mild weakness of handgrip without associated wasting or fasciculations. Impairment of pain sensation in right half of face, right cervical and upper thoracic dermatomes (T1–T4) was discovered on examination. Right upper limb deep tendon reflexes were absent while the reflexes in left upper limb were diminished. Bilateral knee and ankle jerks were brisk and plantar responses were bilaterally flexor. Rest of the neurological examination was unremarkable. The patient's haematological and metabolic profile including haemoglobin, total leukocyte count, differential count, erythrocyte sedimentation rate, liver function tests, kidney

function tests, serum calcium and phosphate were all within normal limits. Nerve conduction study of the upper limbs did not reveal any abnormality. The patient's cervico-dorsal Magnetic Resonance Imaging (MRI) confirmed a syrinx extending from cervico-medullary junction to the upper thoracic segments (figure 2). Later, patient retrospectively recalled that he had absent pain sensation for more than 8 years in the right upper limb. X ray of the shoulder joint did not reveal any definite changes suggestive of Charcot's arthropathy. Conservative



Figure 1: X-ray Shoulder joint (AP view) showing fracture of spine of scapula (marked by black arrow) and disruption of acromioclavicular joint (white arrows)

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Figure 2: MRI Cervical Spine T2W image showing syrinx extending from cervicomedullary junction downwards. Incidental first thoracic vertebral haemangioma is seen as hyperintense signal

management of fracture was done. Repeat evaluation after around 8 weeks revealed persistent fracture without any signs of healing.

Discussion

Syringomyelia can lead to chronic neuropathic degenerative changes in joints usually shoulder and elbow. At presentation the X-ray appearance of Charcot's joint may be normal or show soft tissue calcification, intra-articular fractures, bone fragmentation and dislocation. Soft tissue swelling is an early finding. In the present case, only fracture of spinous process of scapula was evident and the patient did not have clinical and radiological evidence of Charcot's arthropathy. It was the peculiar lack of pain and tenderness despite fracture of spine of scapula following relatively trivial trauma that led to further detailed assessment and discovery of syringomyelia.

First descriptions of the destructive neuropathic arthropathy are by Mitchell and Charcot [1].

Mitchell and Charcot proposed that the arthropathy is result of damage to central nervous system trophic centres controlling nutrition of bones and joints. This theory is popularly known as the French theory. The theory proposed by Volkman and Virchow called the German theory, suggests that the arthropathy is the result of recurrent subclinical trauma that accumulates over years due to insensate joints. The reports of neuroarthropathy in patients who do not undergo repeated trauma or are bedridden prompted Brower and Allman to propose two theories, the neurotraumatic theory and the neurovascular theory [2]. The neurotraumatic theory suggests that repeated trauma resulting from loss of normal protective reflexes that prevent joints from exceeding the limits of normal range of motion, causes joint destruction. The neurovascular theory states that Charcot joint develops when sensory deficit disrupts the normal neurovascular reflexes around the joint resulting in hyperemia and activation of osteoclasts causing resorption of bone. Burcu Yanik and coauthors reported neuropathic arthropathy of shoulder and elbow joints in a patient with Arnold Chiari malformation with syringomyelia [3]. Neuropathic arthropathy may be the first manifestation of syringomyelia. Painless dislocation of shoulder joint without other changes are reported in literature [4]. As a result, an orthopaedician may be the first person of contact for a patient with syrinx. The present case differed from the reported cases in literature as there were no obvious features of Charcot arthropathy on clinical and radiological examination. However, MRI and technitium bone scan have been added to the armamentarium for investigation of Charcot's arthropathy. These are more sensitive than a plain radiograph. The patient fractured his spine of scapula while doing the simple act of pulling himself up from sitting to standing position with the help of his arm. The sudden onset inability to abduct his arm with normal nerve conduction study and finding of cervical syrinx pointed towards recent development of fracture of spine of scapula with disruption of acromioclavicular joint as the cause of patient's abrupt inability to abduct his right arm. The patient had lower motor neuron type of involvement in both the upper limbs (absent deep tendon reflexes in right upper limb with mild right hand grip weakness and diminished left upper limb deep tendon reflexes) and upper motor neuron type of involvement in lower limbs (bilateral brisk knee and ankle jerks). The patient did not have any

difficulty to abduct his arm prior to the act of suddenly getting up from floor while taking support with his right arm. We believe that the inability to abduct the right arm was due to fracture of spine of scapula and not due to neurological cause. While patients with intramedullary lesion such as syringomyelia classically have early urinary and bowel dysfunction, it is not uncommon to see patients without significant involvement of bladder and bowel. This patient had bilateral brisk knee and ankle jerks with flexor plantar reflex. Typically, one expects plantar response to be extensor in such situations. It is well known clinical experience that plantars may be flexor in some of patients with pyramidal tract involvement. The impression of upper motor neuron type of involvement of lower limbs is made in the light of all the clinical symptoms and other signs elicited. This was further confirmed by MRI of the spine. Vinod kumar et al reported a case of fracture and displacement of body and neck of scapula in a post-traumatic paraplegic patient developing during the transfer from wheel chair to bed [5]. They reported that the patient was diagnosed to have cervicodorsal syrinx after it was realised postoperatively that the patient did not have the expected pain despite the fracture and subsequent operative intervention. They opined that the scapular fracture was a stress fracture consequent to underlying syringomyelia. To the best of our knowledge there is no other reported case in literature of scapular fracture in a patient with syrinx. In our case, there was no prior complaint to suggest syringomyelia. It was the detailed clinical examination which led to discovery of clinical signs

of spinal cord involvement and confirmation of syrinx in the patient by MRI. The case underlines the need to be thorough in neurological assessment of patients presenting with upper body fractures particularly incident upon a trivial trauma and consider the possibility of syringomyelia as a causative factor.

Key Points

- Fracture of the scapula due to a neurological cause is unusual.
- Cervico-dorsal syrinx contributing to fracture of the scapula is being reported.

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