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Case Report

Bilateral Diabetic Neuropathic Arthropathy of Shoulder: An Unusual Case Report

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Abstract

Neuropathic arthropathy, also known as Charcot joint, is a chronic disorder characterized by destruction of joint secondary to loss of sensory innervation. In patients with diabetes mellitus, Charcot neuroarthropathy commonly affects major weight-bearing joint, while neuropathic arthropathies of the upper extremity joints are frequently associated with syringomyelia. Moreover, bilateral Charcot arthropathy is an even rarer disorder, with very few cases. We herein present a case of bilateral shoulder arthropathy secondary to diabetes mellitus with classical clinical and radiological findings. Radiological finding was a severe damage destruction of the humeral heads. To our knowledge, there is only one case report in the literature, therefore we offer this observational case to keep in mind the diagnosis of Charcot joint while dealing with atraumatic joint destruction.

Keywords: *Neuroarthropathy; Charcot Joint; Shoulder; Diabetes*

Introduction

Neuropathic arthropathy, also known as Charcot joint, is characterized by rapidly progressive bone destruction in the setting of impaired nociceptive and proprioceptive innervation of the afflicted extremities [1,2]. The Charcot joint lacks the natural defense reaction in the presence of minor joint trauma. Consequently, the subchondral bone of the involved joint disintegrates, leading to considerable joint deformity. The most common conditions associated with neuropathic arthropathy include diabetes, syringomyelia, and syphilis although other less common entities have been described, such as demyelinating peripheral neuropathies, alcoholism, and even repeated corticosteroid injections [1,3,4]. The location of joint destruction along with a detailed clinical history is important factor in distinguishing the most likely etiology of the neuropathic joint. In Fact, syringomyelia is the most common cause of neuropathic arthropathy in the upper extremity [3,5-11].

However, neuropathic arthropathy associated with diabetes mellitus is seen most commonly in the foot and ankle, although it can be associated with other joints in the lower and upper extremities, and the spine [1,12,13]. There have been 4 reported cases of neuroarthropathy of the wrist secondary to diabetes mellitus [14] but only one case report of neuropathy of the shoulder due to diabetes mellitus [15].

Case Report

A 61-year-old woman with a history of type 2 diabetes mellitus began when she was approximately 34 years old. She presented with a 3-year history of gradually increasing discomfort and restricted movements of the bilateral shoulder joints. No medical treatment was taken and the patient used only some olive oil for local application. There was no history of significant trauma in the past neither a history of spinal surgery. The patient had not report any fever, chills, weight loss, anorexia or any other constitutional symptoms. Physical examination revealed no local warmth or swelling and no abnormal masses of the shoulders. There was decreased light touch, tempera-

ture and pinprick sensation involving the entire upper extremities. Vibratory and proprioceptive sensations were intact. On palpation, the shoulder joints were nontender. Muscle testing revealed 4/5 shoulder abductor strength and 4/5 shoulder flexor and extensor strength bilaterally. Active abduction was limited to 45°, she had 40° of active forward flexion, 50° of external rotation and 20° of internal rotation. Passive range movement was also limited and was painful on terminal range of motion. Deep tendon reflexes were normal. Examination of the patient's right shoulder revealed only a limited active abduction up to 60°, and her bilateral lower extremity examination revealed loss of light touch sensation. The patient was worked up and X-ray, complete blood counts, erythrocyte sedimentation rate, level of vitamin B12, fasting blood glycemia, measurement of the crystal for gout, syphilis and tuberculosis tests were performed. All hematological investigations were within normal limits, despite high blood glycemia levels.

X-ray of the left and right shoulders (figures 1 and 2) showed total destruction of the proximal humerus with bilateral fragmentation of the humeral head and tuberosities. We further evaluated the patient using a cervical spine magnetic resonance image (MRI), which revealed no evidence of syrinx or other related etiologic factor for the neuroarthropathy. Still joint aspiration was performed to rule the remote possibilities of infected joint but neither organism grew on culture nor crystals were found. Based on these results and the diabetic neuropathy of the patient, diagnosis of diabetic Charcot neuroarthropathy of the shoulders was assumed. The treatment was conservative. We prescribed a nonsteroidal anti-inflammatory drugs. No surgical intervention was recommended at this time, as the patient had minimal complaints. The discomfort gradually subsided after 10 days of treatment. At this time, a progressive shoulder rehabilitation programme were advised. After 3 months, the patient remained better, performing his daily activities and she was satisfied with her shoulder mobility improving.

Figure 1: X-ray of the right shoulder showing resorptive changes with fragmentation of the humeral head and glenoid defomity.

Figure 2: X-ray of the left shoulder: destruction of the humeral head with only mild changes of the glenoid, clavicle seem to be intact.

Discussion

Neuroarthropathy is a chronic, progressive disease that results in the destruction of joints and the surrounding bony structures [16,17]. Numerous cases of neuroarthropathy in the upper extremity have been reported in the literature, we cited the syphilis, alcoholism, syringomyelia, Lyme disease, and human immunodeficiency virus [3,18]. Approximately 6% of patients with neuropathic arthropathy have shoulder joint involvement [8]. In nearly all of these cases, the patients were found to have a syrinx when an MRI study was performed [7-9].

The one outlier reported was a patient with neuroarthropathy secondary to chronic alcoholism [8].

The diabetic neuroathropathy is rare with prevalence between 0.1 and 13% [19]. Diabetic patients tend to have involvement of foot and ankle, but is not limited to these joints [12-14]. In the present case, the unusual delay in presentation urged us to perform an extensive literature search and we found this interesting fact that our case has presented for the second time. There is only one case report previously in the literature of shoulder neuroarthropathy due to diabetes mellitus [15].

The exact underlying pathogenesis of Charcot's arthropathy remains controversial. There are two theories describing the pathophysiologic pathways of neuropathic osteoarthropathy. These are the neurotraumatic and the neurovascular theories [4,8]. The neurotraumatic theory, which states that the changes result from mechanical trauma and repetitive trauma sustained by an insensitive extremity or joint. The neurovascular theory describes an increase in the blood flow to subchondral bone resulting from sympathetic dysfunction and leading to active bone resorption by osteoclasts and a consequent fragmentation, disorganization and destruction of joints [20].

Neuropathic arthropathy progresses in three distinct stages described by Eichenholtz. The initial hyper vascular stage is characterized by joint laxity, subluxation and osteochondral fragmentation. This stage is induced by microtrauma and is exacerbated by continued stresses across the joint. The second stage is the coalescence defined by absorption of debris, subchondral sclerosis, avascular necrosis and reactive new bone formation. The third stage of reconstruction and remodeling shows restoration of joint structure with fusion [21]. A classical clinical manifestation of active Charcot's disease is an abnormally pain free joint. Pain may be present but discomfort tends to be disproportionately mild in relation to the degree of the destructive change, other marks of Charcot arthropathy include local erythema and wormth [18,22]. Both clinical symptoms and X-ray imaging are needed to diagnose Charcot neuroarthropathy. The most typical radiological changes in the early stage of the disease are: narrowing of joint spaces, subchondral bone sclerosis, and presence of osteophytes [22]. Even if the early stage of Charcot's neuroarthropathy is suspected, there are no definitive criteria or tests to confirm it. In fact, there is no significant differences in clinical or radiographic presentations appear to be present between reported etiologies of the pathology including diabetes. The high index of suspicion is essential in the case of any diabetic patient with a swollen and warm joint area in the presence of somatic or autonomic neuropathy [18].

Conclusion

Charcot arthropathy of the shoulder due to diabetes mellitus, although rare, can occur and it's often misdiagnosed. This appears to be the second documented case report. Therefore, we suggest that diabetes mellitus be included in the differential diagnosis for patients with neuroarthropathy of the shoulder.

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