CASE REPORT

Radiological presentation of spinoglenoid notch ganglionic cyst

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ABSTRACT

Background: Among the occasional cases of upper limb neuropathy is the Spinoglenoid notch ganglion cyst due to compression of suprascapular nerve. It is a condition that befalls predominantly in males and can generate extreme weakness and shoulder pain due to weak supraspinatus and infraspinatus muscles receiving innervation via suprascapular nerve.

Aim: to provide an insight for the practitioners into the condition of suprascapular nerve malfunction prompted via Spinoglenoid notch -ganglion cyst.

Methods: The first case was of a young male patient (28-year-old) who was agonized from a right shoulder pain and a difficulty in lifting his arm upward for 5 months. The diagnosis of this case is via ultrasound. The second case is for a young female (32-year-old) suffering from left shoulder pain and the diagnosis of this case is the via ultrasound and Magnetic Resonance Imaging (MRI).

Results: Both cases were managed simply with physio-therapy beside non-steroidal anti-inflammatory agents, but beyond 12 weeks of non-invasive treatment, stagnant condition was registered. The two patients were appointed for ganglionectomy for decompression.

Conclusion: The ultrasound and MRI were useful to reach the diagnosis and appropriate treatment. In these case reports, authors tried to focus on the one of the rare cases of upper limb pathologies to enhance the orientation of radiologist to detect these cases early and accurately

Keywords: spinoglenoid notch, ganglion cyst, neuropathy.

INTRODUCTION

A wide spectrum of upper limb pathologies may be encountered by clinicians during their practical life. However, these pathologies, for unfortunate reasons, could be not diagnosed until after a period of several months [1]. These lesions may be due to either traumatic or nontraumatic causes and are frequently associated with shoulder pain resulting from tears in the rotator cuff muscles, shoulder joint encroachment, shoulder joint dislocation, frozen shoulder, and osteoarthritic lesions. Among these conditions, spinoglenoid Ganglion cysts can generates extreme shoulder malfunction and shoulder pain due to compression of suprascapular nerve [2].

The suprascapular nerve (supplying supraspinatus and infraspinatus muscles located at supraspinous and infraspinous fossae respectively) is frequently compressed at either the suprascapular notch (a small slit at the superior border of the scapula) or at the spinoglenoid notch (a little depressed area in posterior scapula) [2]. The occurrence of these two conditions is comparable and ranged from 0.4-2.0 % [2-4]. Entrapment of the suprascapular nerve may be generated after many causes such as trauma (scapular or proximal humerus fractures), shoulder dislocation, shoulder overuse and mass- lesions like hematoma, tumors and cysts (para labral, ganglion) [3]. Historically, the first case of spinoglenoid cyst as a cause of shoulder pain was reported in 1959 [2]. The clinical scenario of suprascapular nerve malfunction differs according to the location of nerve entrapment. Including one or all of the followings, painful shoulder, weak arm abduction or external rotation, atrophied supraspinatus and infraspinatus muscles [2]. Most of times, history and physical examination clarify and determine the condition. However, ultrasound, MRI can assist in reaching the best management [3-5]. In fact, there was a relation between the presence of shoulder cyst with the complaining of shoulder pain in such rare cases [1, 4]. Labrum tear may be concomitant to such cases [1, 5]. Moreover, the cause of the pain and weakness in shoulder region was mainly due to the pressure on the suprascapular nerve [6-10]. In general, the cause of entrapment (compression) is regarded as the main guide

to treatment. Often, non-invasive protocol (physio-therapy, injections) are worthwhile, while intervention is obligatory in others to reduce the pressure [4, 5]. Two case reports are presented in this article to highlight the condition of spinoglenoid notch ganglion cyst providing an insight into such condition for the practitioners.

CASE PRESENTATION

Case number 1.

A young male patient (28-year-old) presented in the clinic suffering from a right shoulder pain and a difficulty in lifting his arm upward for 5 months. The patient has a heavy-duty job that includes lifting of heavy objects. The patient reported the absence of history of trauma. In addition, the patient suffered from painful, difficult lateral rotation of his right arm. On examination, there was a depression on his right side of upper back (Fig. 1**)** accompanied by tender atrophied infraspinatus muscle.

The patient was subjected to an ultrasound examination (of high-end model-Vinno Ultimus 9E, 2024 using high frequency linear probe of 16 megahertz-MHZ) to confirm the diagnosis. Recently, this method has become among the imaging modalities options to identify the shoulder pain's origin in addition to using MRI [3]. These two methods help localizing the size and site of the lesion beside the characterization of its extent before the treatment.

The long head of Biceps tendon of this case was of normal echotexture, normal position. No degenerative changes were noticed in the acromioclavicular joint and no glenohumeral joint effusion. Cartilage and bone showed absence of degenerative changes.

The patient in this case report was diagnosed via ultrasound only with normal muscle pattern in left side and fatty infiltration and atrophy of Grade 1 in the right side (Fig. 2**)**. Hypoechoic thin septate spinoglenoid cyst, measuring 1.3 cm × 1.4 cm along the longitudinal axis (LA) of infraspinous muscle (ISM), and 2,48 cm along transverse axis (TA) of ISM, was identified (Fig. 3**)**. This spinoglenoid cyst extended to the supraspinatus (SSM) and ISM muscles (Fig. 4**)**. No further investigation (MRI) was done for the patient.

After the diagnosis of spinoglenoid notch ganglionic cyst, the patient started physio-therapy alongside non-steroidal anti-inflammatory agents. However, re-evaluation of the condition after 12 weeks of non-invasive treatment, stagnant condition was registered. This person was appointed for ganglionectomy to decompress the spinoglenoid notch.

Fig. 1. A photo of young male (case number 1) with a depression in right scapular region (arrow) indicating infraspinatus muscle atrophy.

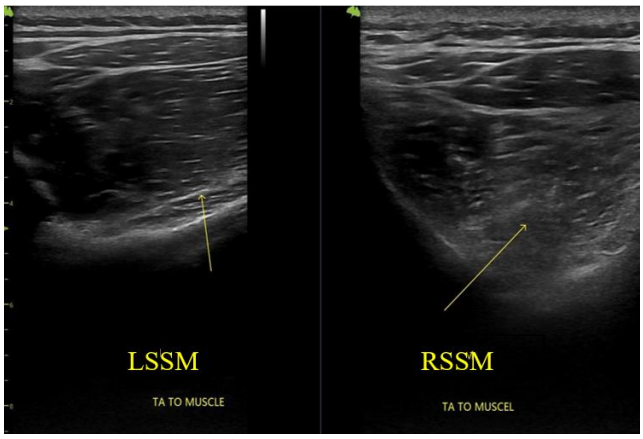

Fig. 2. An ultrasound of the left supraspinatus muscles (LSSM) and the right supraspinatus muscles (RSSM) along the Transvers axis (TA). Normal muscle pattern in left side and fatty infiltration and atrophy of Grade 1 in right side.

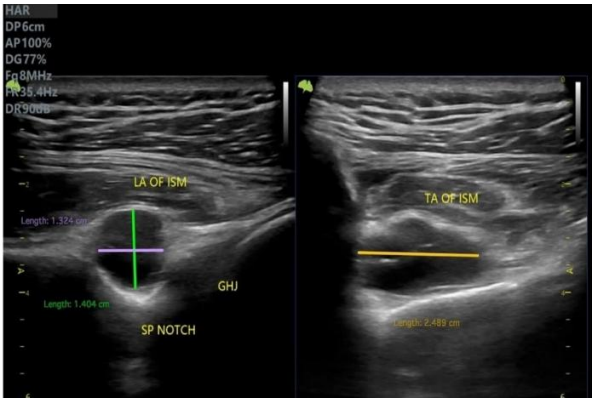

Fig. 3. An ultrasound of the spinoglenoid cyst: hypoechoic thin septate -measures 1.3cm × 1.4 cm along the longitudinal axis (LA) of infraspinous muscle (ISM), and measures 2,48cm along transverse axis (TA) of ISM.

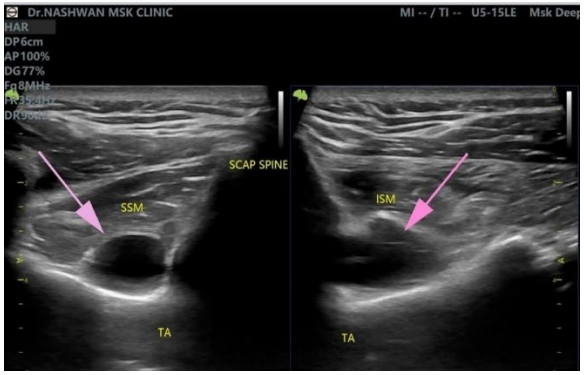

Fig. 4. An ultrasound of the spinoglenoid cyst extended to the supraspinatus (SSM) and infraspinatus (ISM) muscles.

Case number 2.

A young female patient (32-year-old) who suffered from a shoulder pain for 4 months was presented in the clinic. Tenderness of whole shoulder (left) was documented during examination, limited movement (external and lateral rotation) with an absence of history of trauma. Multi-planar MR images were carried out (using 3T closed MR scanner using sequences). The Subscapularis / Supraspinatus /infraspinatus /teres minor muscles were of normal signal intensities. An oval, lobulated-margin, thin-walled ganglion cyst like structure was insinuated at infraspinatus fossa below scapular spine set at spinoglenoid notch. The cyst measures 26.6 mm x 12.4 mm in axial plane and 31.4 mm x 14.4 mm in coronal plane and 13.3 mm x 24.6 mm in sagittal plane, causing mass effect on overlying infraspinatus muscle which show fatty infiltration affecting this muscle only (Fig. 5 and Fig. 6**).**

The long head of Biceps tendon was with normal pattern and position. No glenohumeral joint has effusion. The Acromioclavicular joint showed no degenerative changes. No degenerative changes have been seen in cartilage and bone. The humeral head has normal configuration and articulates properly with normally developed glenoid and smooth articular surfaces. The width of the joint space is normal. The bone marrow displays homogenous, fat equivalent signal intensity. The glenoid labrum is intact on all sides. The subacromial fat is intact. The muscles that cover the shoulder joint appear normal.

The patient was managed conservatively with physio-therapy and non-steroidal anti-inflammatory agents. Re-evaluation of the clinical presentation after 12 weeks suggested no improvement. This person was appointed for ganglionectomy to decompress the spinoglenoid notch.

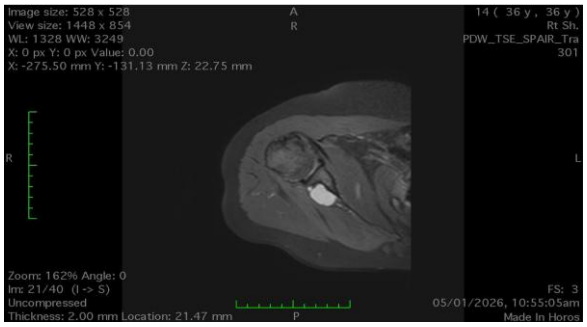

Fig. 5. An MRI image of a female patient (case number 2) suggesting presence of spinoglenoid notch ganglionic cyst.

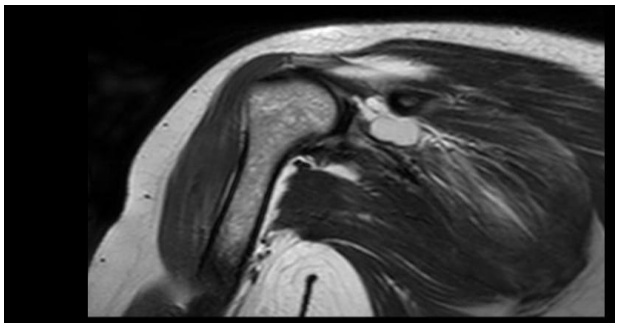

Fig. 6. An image of MRI of a female patient suggesting presence of spinoglenoid notch ganglionic cyst (arrow).

DISCUSSION

Suprascapular nerve's compressive damage is a scarce pathological entity responsible for pain and shoulder's dysfunction. In both reported cases, the patients suffered from an incapacitating shoulder pain (in the posterolateral region) continuing primarily for 4-5 months. In addition, obvious limitation in abduction and external rotation of arm with atrophied infraspinatus muscle noticed on physical examination. The first case report was diagnosed via ultrasound, while the second case was diagnosed via both ultrasound and MRI. Both patients were managed initially with physio-therapy and non-steroidal anti-inflammatory agents but with little improvement. Therefore, they were appointed for ganglionectomy to decompress the spinoglenoid notch which improved their condition. Indirect arthroscopic decompression of the spinoglenoid ganglion cyst may serve a little chance of recurrence of such cyst and is associated with good results in comparison with the open method [1, 2, 11].

In addition to ultrasound which is used in the preoperative assessment [1] , electromyography (EMG) is vital for detection of the spinoglenoid ganglion cyst's exhaustive influence upon muscles (supraspinatus and the infraspinatus or uniquely the infraspinatus), especially in cases presented with weakness and/or muscular atrophy [1].

The ordinary sites of suprascapular nerve entrapment are the suprascapular and the spinoglenoid notches with

approximate chances. This entrapment registered firstly in 1959 at suprascapular notch and then in 1989 at the spinoglenoid notch [7, 12]. One of the challenging issues that affect patient care is the delay in diagnoses due to misdiagnosing these entrapment conditions with other conditions as adhesive capsulitis, labral tear, impingement syndrome, rotator cuff tear, and tumors [13].

The typical presentation of these patients, as reported by Moen et al. [13], is chronic shoulder pain (especially in posterolateral region) associated with history of trauma or overuse of the shoulder. The patients usually report increase in pain intensity with movement (adduction with internal rotation) and with diverging to the upper thoracic region, upper limb or neck. The diagnosis may be reached by careful clinical examination were difficult abduction and external rotation accompanied with infraspinatus and supraspinatus wasting are reported. Identification of area of tender notch (suprascapular or spinoglenoid) does not easily occurs [13]. Currently, the optimal diagnostic method of suprascapular nerve dysfunction is electromyography and nerve conduction study (sensitivity and specificity is 91%) [13]. The use of these methods with MRI is crucial to reach a prompt way of treatment depending on the patient's needs [14]. Any suspicion of soft tissue lesions around shoulder joint needs MRI for avoiding of misdiagnosis and performing the assessment [7].

Several factors guide the suprascapular nerve dysfunction's treatment including the dysfunction's site, evidence of space-occupying lesion, and the response to non-surgical methods of treatment. Conservative treatment (rest, physiotherapy and NSAIDs) is assumed when the space-occupying lesion is absent [7, 15]. Injection of suprascapular nerve with steroids and local anesthetic drugs are helpful in more severe cases [8]. In other cases, pulsed radiofrequency ablation, cryoneurolysis and neurostimulation may be used [16]. Surgery is recommended in resistant cases to conservative treatment and in those of space-occupying lesion. To ameliorate the pain and weakness, surgical release of the spinoglenoid ligament is done. Due to lack of studies comparing the outcomes of this surgical release to that of conservative treatment, the latter is continued for up to 6 months before surgical intervention [7].

Emerging evidences suggest that the nonsurgical (noninvasive) policy is not effective in nerve entrapment (especially those due to ganglion cysts), however, some authors recorded the spontaneous resolution (in non-significant nerve involvement) is potential [7].

Different surgical methods are used to manage the supraclavicular nerve entrapment by ganglion cyst at the spinoglenoid notch. These range from ganglionectomy, cyst's aspiration guided by radiology and decompression by arthroscope (in glenoid labrum and rotator cuff muscles sprint). The amalgamation of all these methods may be recommended [1, 2].

Limitation of the work

The diagnosis was made by the taking history, physical examination beside the ultrasonic examination. The use of EMG and MRI were not available in the first case, while the second one MRI examination was applicated.

CONCLUSIONS

A comprehensive plan of management is needed to label- sufficiently -the dysfunctional challenges that are facing the patient and ameliorate the neurovascular potential hazards. Early management of such nerve entrapment and malfunction is crucial to avoid enduring muscle involvement (hypotrophy and limited movement). Gangliectomy could be recommended in such cases.

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Conflict of Interest

None

Ethical consideration

Consent forms are acquired from both study's participants.

Authors' contribution

The first author contributes in defining the concept and idea, writing of the subject, the second one contributes in reaching the data, the third and fourth contribute in the writing and the linguistic review.

Editorial Disclosure

The author Al Allaf L.I., holds an editorial position with the Annals of the College of Medicine, Mosul. In accordance with best practices, the peer review and editorial decision making for this manuscript were managed independently of the author's role. Safeguards were implemented to ensure that the review process was impartial, unbiased, and consistent with the journal's standard procedures.

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