Clinical Case Report

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Suprascapular nerve entrapment caused by an intraosseous ganglion of the scapula

A case report

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Abstract

Rationale: Suprascapular nerve compression is a rare but important entity that is often missed in clinical practice. Nerve dysfunction caused by an intraosseous ganglion of the glenoid is extremely rare, to the best of our knowledge, only 1 case of suprascapular nerve entrapment due to an intraosseous ganglion cyst has been reported previously in the published literature.

Patient concerns: We report a 61-year-old woman who had complained right shoulder pain that lasted over 3 years which was exacerbated by overhead activities.

Diagnoses: We diagnosed it as suprascapular nerve entrapment at the spinoglenoid notch caused by an intraosseous ganglion of the scapula.

Interventions: Plain X-ray, computed tomography, magnetic resonance imaging (MRI), and electromyography (EMG) of the shoulder.

Outcomes: She undertook surgical excision with curettage of the cyst. The infraspinatus fossa dull pain subsided immediately after surgery. No recurrence of the cystic lesion was noted on follow-up plain radiograph and MRI performed 18 months postoperatively. Shoulder external rotation strength was graded as 5 of 5.

Lessions: Intraosseous ganglion of the glenoid can cause compression of the suprascapular nerve when the lesion is expanded toward the spinoglenoid notch. The EMG study confirmed compression of the suprascapular nerve. The patient showed clinical and radiologic improvement after surgical decompression with no recurrence.

Abbreviations: EMG = electromyography, MRI = magnetic resonance imaging.

Keywords: glenoid, intraosseous ganglion, suprascapular nerve entrapment

1. Introduction

Suprascapular nerve entrapment is a less common cause of shoulder dysfunction, but it often causes pain over the posterior and lateral aspects of the shoulder, as well as weakness of supraspinatus and/or infraspinatus muscles.[1,2] It may occur trauma, repetitive overhead activities, or in the setting of a massive rotator cuff tear due to a traction injury.[3–6] Another reason for injury of the nerve can be compression from a mass lesion such as a paralabral ganglion cyst. Other masses such as synovial sarcoma, Ewing sarcoma, and chondrosarcoma have been reported.[7] However, nerve dysfunction caused by an intraosseous ganglion of the glenoid is extremely rare, to the best of our knowledge, only 1 case of suprascapular nerve entrapment due to an intraosseous ganglion cyst has been reported previously in the published literature.[8]

Here, a case of intraosseous ganglia of the glenoid that presented as suprascapular nerve entrapment at the spinoglenoid notch in a 61-year-old woman was presented. The electromyography (EMG) study confirmed compression of the suprascapular nerve. The patient showed clinical and radiologic improvement after surgical decompression with no recurrence.

2. Consent

The patient signed informed consent for the publication of this case report and any accompanying image. The ethical approval of this study was waived by the ethics committee of Chonbuk National University Hospital, because this study was case report and the number of patients was less than 3.

3. Case report

In May, 2015, a 61-year-old right-handed woman presented at our clinic complaining of dull right posterior pain and intermittent

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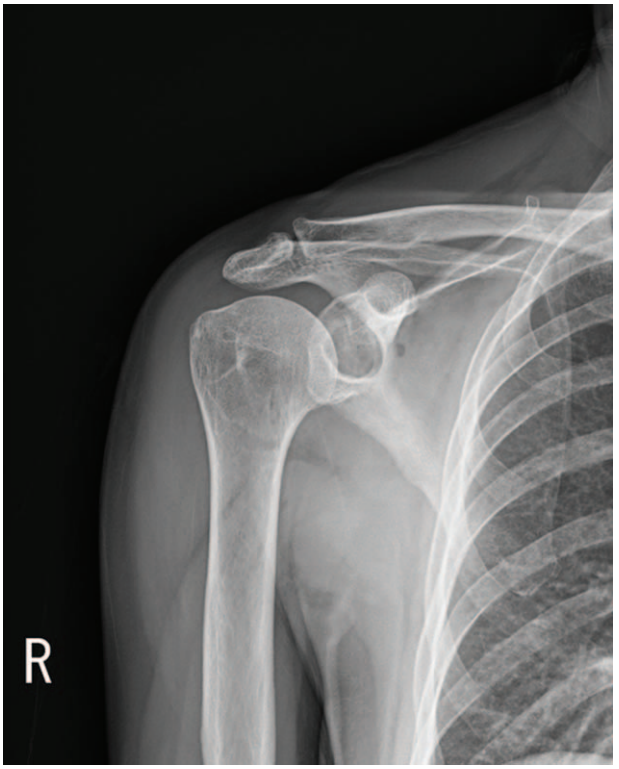

Figure 1. Anteroposterior (AP) radiograph of a 61-year-old woman with right shoulder pain shows an elliptical-shaped area of radiolucency at the mid-portion of the glenoid, well-defined margins, and with sclerosis of the surrounding bone.

Figure 2. Preoperative 3-D reconstructed computed tomography (CT) showing a recessed lesion of the glenoid with the posterior cortical defect. It shows signs of multiple small oval-shaped areas in the anterior border of the glenoid.

radiating pain from the shoulder to the anterior aspect of the upper extremity with a 3-year history. She often performed repetitive tasks in the overhead position as an orchard farmer. She complained of difficulty in performing work because of the loss of muscle strength in her right upper limb while working for a prolonged time in the overhead position 6 months prior to visiting our clinic. She was diagnosed as having impingement syndrome at another clinic and was treated with physical therapy, medication, and steroid injection. However, no improvement of the symptom occurred. The patient had no trauma history or evidence of systemic diseases. The range of motion in the involved right shoulder was 180° of active forward flexion, 50° of external rotation, and T7-level internal rotation at the back. The range of motion in the uninvolved left shoulder was 180°, 85°, and T7 level, respectively. The impingement signs I and II were positive, but no signs of instability were found. The Obrien test was positive but other rotator cuff tests were negative.

Plain radiography of the right shoulder showed a radiolucent, elliptical-shaped lesion with a well-defined margins and sclerosis of the surrounding bone (Fig. 1). Cervical spine plain radiographs did not show abnormal findings. Computed tomography of the right glenoid revealed a cystic lesion with sclerotic margins measuring $25 \times 20 \times 20$ mm in diameter in the posterosuperior border of the glenoid, but with no communication between the cyst and the glenohumeral joint (Fig. 2). Magnetic resonance imaging (MRI) of the lesion demonstrated a low signal intensity on T1-weighted spine-echo images and a high signal intensity on T2-weighted spine-echo images within and around the scapular neck. The cystic lesion within the scapular neck was a multilobular lesion and protruded into the spinoglenoid notch. The suprascapular nerve was compressed by the lesion through a cortical defect in the posterosuperior area of the glenoid (Fig. 3). The EMG study confirmed compression of the suprascapular nerve with reduced recruitment in supraspinatus and infraspinatrus muscles (Fig. 4).

We decided on surgical treatment based on clinical symptoms and radiologic findings. First, with the patient under general anesthesia in the lateral decubitus position, diagnostic arthroscopy of the glenohumeral joint was performed. Severe degenerative tearing of biceps tendon was observed in the intertubercular groove portion. Meanwhile, the biceps tendon showed fraying and degeneration of the free edge of the superior labrum without detachment of the biceps anchor from the superior glenoid tubercle upon probing, hence only biceps tenotomy was performed. The glenoid cartilage and capsule in the vicinity of the affected area showed no abnormal findings. As for the intraosseous ganglion, it was considered impossible to approach from the joint and to completely decompress because it was multiply lobulated in the scapular neck. Thus, surgical exploration of the infraspinatus fossa was performed by an incision inferior to the spine of the scapular with partial detachment of the deltoid. Gentle approach through the fibers between the infraspinatus and teres minor muscle revealed a large cyst. The cyst compressed the suprascapular nerve and artery with adhesion in the spinoglenoid notch (Fig. 5A). Cystic lesion of $2.5 \times 2.0 \times 2.0$ cm was removed after gentle detachment and release of the ligament (Fig. 5B). Histological examination revealed an intraosseous ganglion with myxoid change in the wall of the cyst (Fig. 5C). The infraspinatus fossa dull pain subsided immediately after surgery. No recurrence of the cystic lesion was noted on follow-up plain radiograph and MRI performed 18 months postoperatively (Fig. 6). The patient was pain-free during her work activities. Shoulder external rotation strength was graded as 5 of 5.

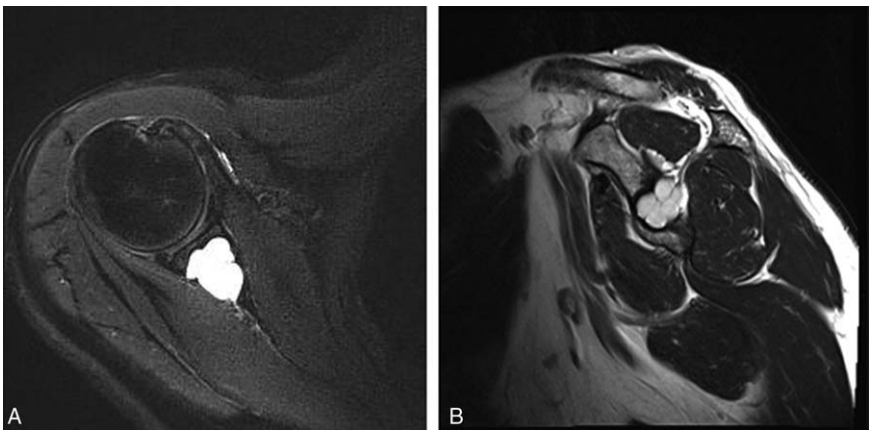

Figure 3. Preoperative magnetic resonance imaging (MRI) of the lesion. (A) The lesion shows high signal intensity on fat-suppressed T2-weighted axial imaging. The suprascapular nerve is compressed by the intraosseous lesion through a cortical defect in the posterosuperior area of the glenoid. (B) The cystic lesion within the glenoid was multilobulated on T2-weighted turbo spin echo sagittal imaging.

4. Discussion

Even though intraosseous ganglion of the glenoid is rare, it can cause an osteoarticular fracture with destruction of the subchondral bone when the glenoid lesion expands, especially in its inferior portion, because mechanical stress and pressure are concentrated more in the infraglenoid region than in the supraglenoid region.[9,10] Meanwhile, the lesion extends to the spinoglenoid notch, the suprascapular nerve passing through the spinoglenoid notch surrounded by tight spinoglenoid ligaments can be compressed.[8] The chief complaint in suprascapular nerve entrapment is the pain, which can be characterized as deep, dull, and diffuse, and is typically located in the posterior and lateral aspect of the shoulder, radiating to the arm. The pain exacerbates during overhead activities and at night when the patient tries to sleep on the affected side.[11] In patients with severe cases of neuropathy, atrophy and weakness of the supraspinatus and infraspinatus may exist. EMG and nerve conduction studies are obtained to confirm and localize the suprascapular nerve compression. This may indicate increased latency, denervation fibrillation potentials, and diminished amplitude in the supraspinatus and/or infraspinatus muscles.[12] However, in the very early stages of entrapment, the results of EMG may be normal. Post and Grinblat[13] suggested that if the clinical feature points to a diagnosis of entrapment by a mass lesion such as a ganglion cyst, lipoma, or other conditions that may mimic nerve entrapment are excluded, even with normal findings of an EMG, surgical treatment may be indicated.

Operative treatment must be performed with complete decompression of the spinoglenoid notch through excision of the intraosseous ganglia. Several treatments have been described for intraosseous ganglion of the glenoid, including open excision and curettage with or without bone grafting,[14,15] arthroscopic debridement and bone grafting,[10] and needling under arthroscopic control.[8] However, Urayama et al[16] reported recurrence following needle aspiration of an intraosseous ganglion of the glenoid. Arthroscopy has been used to treat suprascapular nerve entrapment caused by extraosseous ganglion cysts. This treatment approach, when associated with labral pathology, biceps, or cuff pathology, can be processed with the other associated pathologies at the same time. However, arthroscopic

Muscle	Nerve	Root	Ins Act	Fibs	Psw	Amp	Dur	Poly	Recrt	Int Pat
Abd Poll Brev	Median	C8-T1	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
ABD DigMinimi	Ulnar	C8-T1	Incr	Nml	2+	Nml	Nml	0	Nml	Nml
1stDorInt	Ulnar	C8-T1	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
Flexor carpi ulnaris	Ulnar	C8-T1	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
PronatorTeres	Median	C6-7	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
FlexCarRad	Median	C6-7	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
ExtCarUln	Radial (Post Int)	C7-8	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
ExtCarRad	Radial	C6-7	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
BrachioRad	Radial	C5-6	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
Biceps	Musculocut	C5-6	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
Triceps	Radial	C6-7-8	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
Deltoid	Axillary	C5-6	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
Infraspinatus	SupraScap	C5-6	Incr	Nml	3+	Nml	Nml	0	Reduced	25%
Supraspinatus	SupraScap	C5-6	Incr	Nml	1+	Nml	Nml	0	Reduced	25%
C5 Parasp	Rami	C5	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
C6 Parasp	Rami	C6	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
C7 Parasp	Rami	C7	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml
C8 Parasp	Rami	C8	Nml	Nml	Nml	Nml	Nml	0	Nml	Nml

Figure 4. Needle electromyography (EMG) study of right upper extrimity shows compression of the suprascapular nerve with reduced recruitment in supraspinatus and infraspinatrus muscles. Ins Act, insertional activity; Fibs, fibrillation; Psw, positive sharp wave; Amp, amplitude; Dur, duration; Poly, polyphase; Recrt, recruitment.

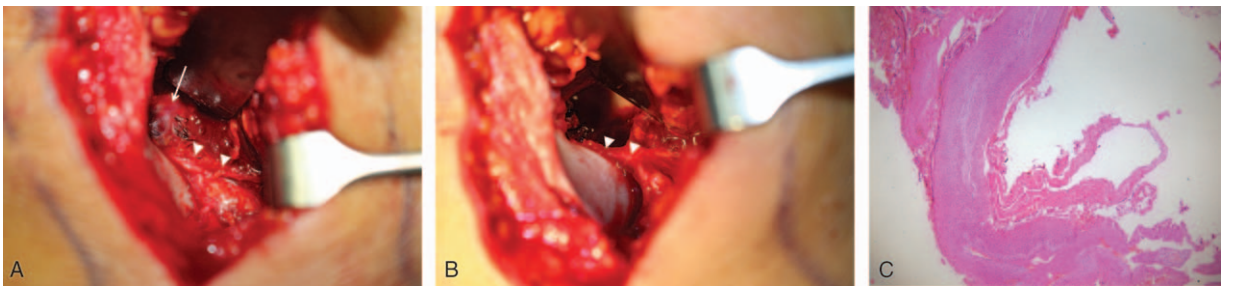

Figure 5. Surgical and histological findings of the cystic lesion in the glenoid. (A) Intraoperative finding shows that the cyst (arrow) compressed the suprascapular nerve (arrow head) and artery with adhesion in the spinoglenoid notch. (B) A 2.5 × 2.0 × 2.0 cm cystic lesion was removed after gentle detachment and release of the ligament. (C) Hematoxylin and eosin-stained sections revealed fibrous tissue with myxoid change in the wall of the cyst (×40).

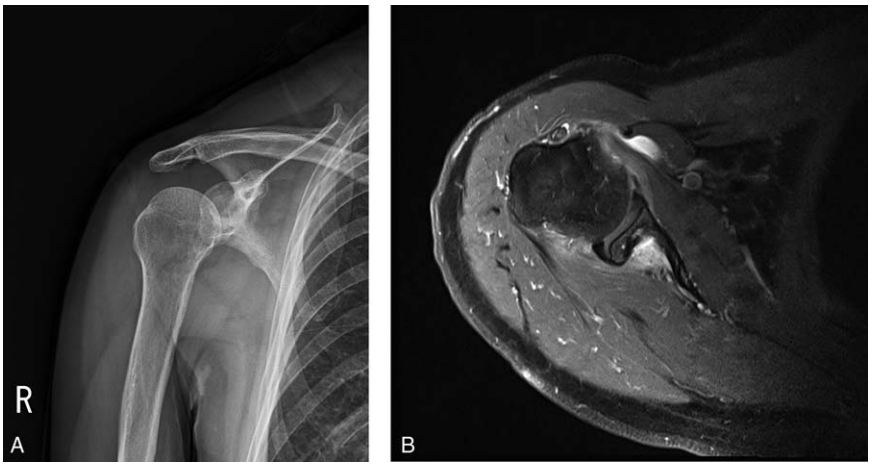

Figure 6. Follow-up radiograph and magnetic resonance imaging (MRI) obtained 18 months after excision. Plain radiograph and fat-suppressed T2-weighted axial imaging show complete decompression of the cystic lesion with no recurrence.

decompression of the entire intraosseous ganglion cyst may be almost impossible because intraosseous ganglions are often multiloculated. Techniques in which the cyst is decompressed through a superior labrum anterior to posterior or posterior labral tear aim to decompress the cyst with an indirect approach and can fail if the cyst is not found or if it is multiloculated. In the present case, because the space-occupying cyst that compressed the suprascapular nerve originated in the subchondral bone of the glenoid and was multiloculated, we performed open excision and curettage of the cyst with release of the spinoglenoid ligament. Because the bony margin of the glenoid was firm and sclerotic, additional bone graft was not performed. The infraspinatus fossa dull pain subsided immediately after surgery, and the patient became symptom free during early follow-up. No recurrence of the cystic lesion was noted on follow-up MRI performed 18 months postoperatively.

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