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ORIGINAL ARTICLE

Inferior paralabral ganglion cyst of the shoulder with labral tear - A rare cause of shoulder pain

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KEYWORDS

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Inferior;
Paralabral ganglion
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Summary

Introduction: Paralabral ganglion cysts of the shoulder are rare, and their pathogenesis is similar to that of meniscal cysts. The paralabral cysts are most frequently reported along the posterior, superior, and anterior aspects of the glenohumeral joint and are uncommon inferiorly to the joint. These cysts rarely become evident clinically, unless they cause compression of surrounding structures, i.e. nerve.

Patients and methods: We report a retrospective series of five patients with inferior paralabral ganglion cysts of the shoulder without compression of the surrounding nerve which were treated during the period from March 2007 to December 2009. All these patients presented with only chronic shoulder pain as their chief complaint, and preoperative MRI showed the cyst over the inferior aspect of a torn glenoid labrum. All patients were treated by arthroscopic cystic decompression with labrum repair. All patients were re-evaluated with MRI performed at an average of 15 months postoperatively. The clinical outcome, including the Constant score, was assessed for all patients at a median of 16 months postoperatively.

Results: All the five patients had remission of pain and were satisfied with the shoulder function. The postoperative MRI in all patients showed no labral cyst recurrence. The median Constant score improved from a preoperative level of 81.5 points to 98.0 points at last follow-up.

Conclusion: This study demonstrates that, in the absence of any nerve compression symptoms around the shoulder joint, inferior paralabral cysts with labral tear also be considered in the differential diagnosis of chronic shoulder pain. Arthroscopic repair of the cyst with repair of the labrum can lead to the disappearance of symptoms. Knowledge of this clinical condition and its imaging features is critical for a correct diagnosis of this uncommon cause of chronic shoulder pain.

Level of evidence: Level IV. Retrospective therapeutic study.

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Introduction

Paralabral ganglion cysts have been noted around the shoulder girdle more often, because magnetic resonance imaging (MRI) has been used with increasing frequency in the evaluation of patients with chronic shoulder complaints. These ganglion cysts are believed to develop when a labral or a capsular tear allows synovial fluid to be forced into the tissues, creating a one-way-valve effect [1–3]. Previous series have shown that labral cysts are most frequent along the posterior, superior, and anterior aspects of the glenohumeral joint and are uncommon inferiorly to the joint [4]. Review of the orthopaedic literature reveals that paralabral ganglion cysts of the shoulder mostly presented with symptoms of entrapment or compression of the nerve, i.e. suprascapular or axillary nerve [1,2,5–9]. In the absence of nerve entrapment or compression symptoms, paralabral ganglion cysts of the shoulder girdle are not often considered in the differential diagnosis of chronic shoulder pain.

The question arises whether these cysts are the cause of chronic shoulder pain or simply incidental findings on MRI. The purpose of this study was to present five patients with paralabral ganglion cysts with labral tear about the shoulder joint that presented with chronic shoulder pain in the absence of any other symptoms, in addition this is the first documented retrospective study presented in the English literature with paralabral ganglion cyst involving inferior labrum associated with chronic shoulder pain. We prefer to use the term “paralabral ganglion cyst” to describe the cystic lesion seen adjacent to the labrum, as this term emphasizes the important anatomic features of the lesion. We elucidate here possible etiopathogenesis, diagnosis and management. Knowledge of this clinical condition and its imaging features is crucial for a correct diagnosis of this uncommon cause of chronic shoulder pain.

Patients and methods

We retrospectively reviewed the medical records and images of five patients with confirmed inferior labral cyst of the shoulder with labral tear treated arthroscopically during the period from March 2007 to December 2009. The mean age of the patients was 33 years old (range 21–46), and all patients were male patients. All five patients had a history of chronic pain in the inferior part of the shoulder, and no patient had atrophy of the muscles around the shoulder. No patients had a history of shoulder trauma before the onset of symptoms, and two patients had shoulder pain with activities of daily living and other two patients without overt trauma had no other associated signs of laxity and had an unknown etiology for MDI with chronic shoulder pain and one remaining patient had a history of chronic shoulder pain, which exacerbated while moving the arm posteriorly (Table 1). On physical examination, two patients (Case 1 and 3) showed positive Sulcus sign.

The involved side was the right in three patients and the left in two. The mean duration of symptoms before surgical intervention was 6 months (range, 3–30 months). Radiographic studies were done in all patients, including anteroposterior, axillary, and outlet views of the affected shoulder. Based on physical examination and patient symptoms, all the patients were referred for MRI to evaluate the cause of chronic shoulder pain. The standard sequences included oblique coronal T1 and T2-weighted images were taken (Fig. 1A and B). After the MRI examination specified a diagnosis, trial of nonoperative treatment, including physical therapy, activity modification, and rest, over a period of 3 months in all the patients were tried and once these modes of treatments are not responsive, indicated for operative intervention.

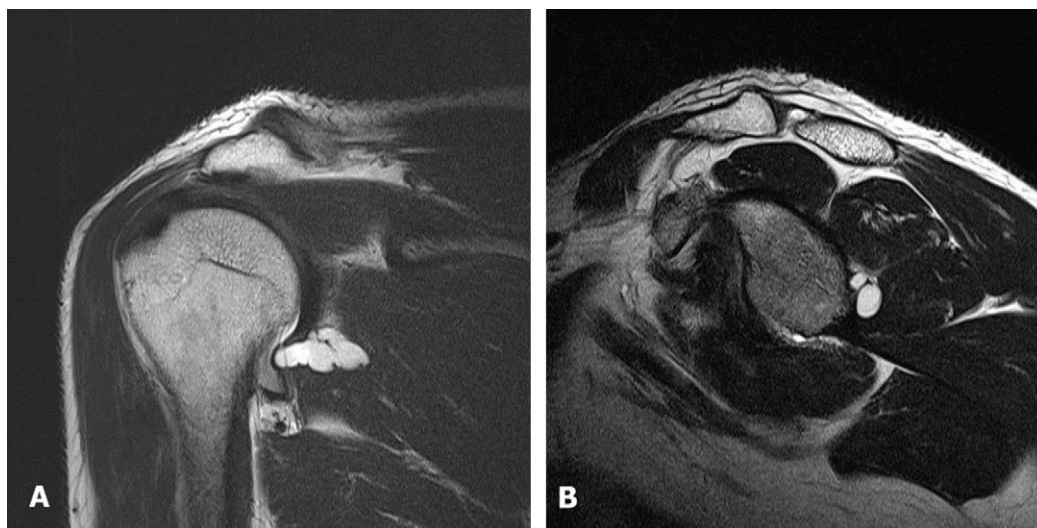


Figure 1 A 20-year old male (Case 1) with MDI with no specific injury. A. Preoperative MRI of the left shoulder with coronal oblique view showing a multiseptate lesion at the inferior aspect of the glenoid neck (Long arrow). B. Sagittal oblique view showing labral tear (Short arrow).

Table 1 Summary of data of five patients presenting with inferior glenoid labral cyst with labral tear.

Case	Age/Sex	Affected side	Clinical presentation	MRI findings	Arthroscopic findings	Final Constant score
1	20/M	Left	Chronic shoulder pain with multidirectional instability	Multiseptate cyst in the inferior aspect of the glenoid neck and labral tear	Enlarged capsule, a positive drive through sign, 2 × 1 cm sized multiloculated cyst on the inferior labrum from 5 o'clock to 6 o'clock position, incomplete detachment of the inferior labrum	95
2	46/M	Right	Chronic shoulder pain increases when the arm extends posteriorly	3 × 1 cm sized multiloculated cyst on the inferior labrum with labral tear	Paralabral cysts associated with inferior labral tear from the 5 o'clock to 7.00 o'clock position	98
3	29/M	Right	Chronic shoulder pain with multidirectional instability	An ovoid mass, 1.3 cm long, with homogeneous fluid-like cyst in the inferior labrum with labral tear	Enlarged capsule, a positive drive through sign, single cyst on the inferior labrum from 5 o'clock to 6 o'clock position, complete tear of inferior labrum	96
4	38/M	Left	Chronic shoulder pain accentuated with activities of daily living (ADL)	2.5 × 1.5 cm sized, cystic lesion in the inferior labrum with labral tear	Paralabral cysts associated with complete inferior labral tear at 6 o'clock position	95
5	45/M	Right	Chronic shoulder pain increases when the arm extends posteriorly and accentuated with ADL	Antero-inferior labral tear with multiseptate cystic lesion at the inferior aspect to inferior glenoid	4 × 2 cm sized multiloculated cyst on the inferior labrum with complete detachment of the inferior labrum	98

Surgical technique

All patients underwent general anesthesia with an interscalenic block and were placed on a beanbag in the lateral decubitus position. An axillary roll was placed under the shoulder, and all pressure points were padded. Surgical landmarks were outlined on the skin, and the arthroscopic procedure was initiated via a posterior portal, with the anterior portal established via an inside-out technique. Diagnostic arthroscopy was performed in standard fashion to evaluate the articular surface, glenohumeral ligaments, rotator cuff, biceps tendon, rotator interval, capsule, and labrum.

Starting anterior to the biceps, the labrum was examined and tested circumferentially. All patients had an inferior glenoid labral cyst with labral tear (Fig. 2A). The cyst and its multiloculated sub compartments were thoroughly decompressed under direct vision. At first, on penetrating the cyst with the spinal needle, gelatinous fluid was evacuated.

Afterwards, the cyst's membrane was resected with a whisker shaver. Following the cyst decompression, we debrided the labral tear and then arthroscopic anterior and posterior labroplasty was done with suture anchors (Fig. 2B). In addition, capsular repair (Case 1 and 3) was done using n° 2 Ethibond suture along with inferior capsular plication and rotator interval closure was done with No 2.0 PDS sutures to augment capsular redundancy.

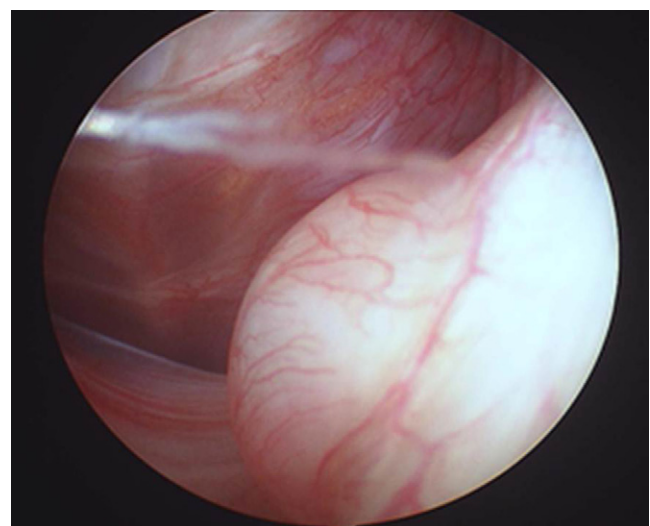


Figure 2 Same patient (Case 1). A. An arthroscopic findings showing a 2 × 1 cm multiloculated cyst at the antero-inferior labrum from 5 o'clock to 6 o'clock position, and the cyst was filled with mucinous fluid. B. The antero-inferior labral repair.

Postoperative management

Postoperatively, the patient's arm was immobilized in a shoulder sling for 4 weeks. During this period, only passive exercises were permitted under the physiotherapist's guidance, including pendulum and non weight-bearing exercises. After 4 weeks, the sling was removed and active assisted range of motion exercises in all planes begins including isometric and dynamic exercises, carefully avoiding provocation of pain. Overhead and internal rotation stretches were allowed regaining full range of motion between a period of 2 and 4 months.

Functional and anatomical assessment

In all, the patient's shoulder functional assessment was performed using Constant and Murley's [10] method both pre and post operatively. This score is based on a total of 100 points divided into the section for pain (15 points), activity of daily living (20 points), range of movement (40 points) and strength (25 points). In order to evaluate the cystic recurrence, postoperatively MRI was performed at a median of 15 months (range, 6 months to 26 months) in all patients.

Results

Radiographic assessment of all the patients are within normal limits. MR imaging depicted cystic masses ranging in size from 3 mm to 40 mm (mean, 11 mm). All cysts exhibited decreased signal intensity on T1-weighted images and increased signal intensity on T2-weighted images. The cysts were multilocular, rounded or oval shaped, and variably lobulated, and in all five patients, the area of abnormal signal intensity in the labrum was in contact with or connected to a portion of the cyst were noted. No denervation edema or any muscle atrophy was appreciated.

An arthroscopic examination confirmed the MRI findings and showed multiloculated cysts in the inferior labrum, mostly between 5 o'clock to 7 o'clock positions with labral tear. In two patients (Case 1 and 3) along with labral cysts with tear, showed, enlarged capsule and positive drive through sign. One patient had cartilage damage and osteoarthritis in an early stage. There were no immediate postoperative complications or infections recorded. No patient developed deltoid muscle atrophy after the surgery. A stiff shoulder developed in one patient postoperatively, and it was treated effectively with a single cortisone injection into the glenohumeral joint, and the patient ultimately had an excellent result.

The mean follow-up was 16 months (range, 12 to 26 months). 2 patients who showed MDI preoperatively had the negative sulcus sign. The mean Constant score improved from preoperative (81.5) to postoperative (98.0). The cyst was absent on the final MRI in all the patients (Fig. 3).

Discussion

Paralabral cyst of the shoulder joint can be observed in 2–4% of the general population, particularly in men during the

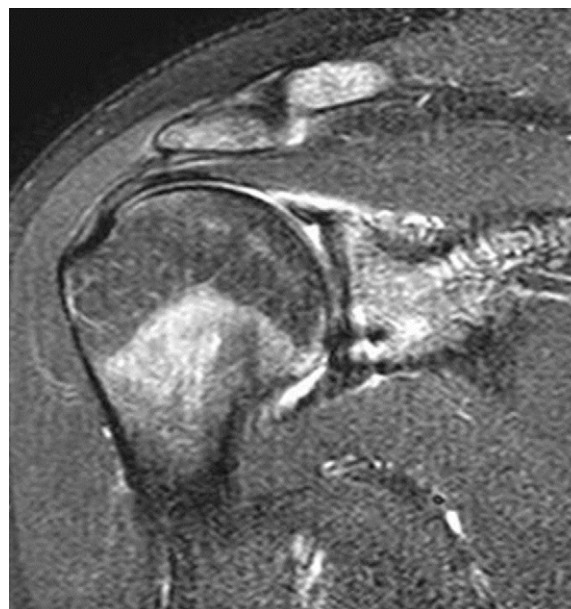


Figure 3 Postoperative coronal oblique proton-density fat saturation-weighted image reveals complete resolution of the cyst.

third and fourth decade. On average, this cyst measures 10–20 mm in diameter and are located preferentially on the posterosuperior aspect of the glenoid, and only rarely occur anteriorly and are uncommon inferiorly to the joint [11]. Ganglion cysts of the shoulder are a relatively rare cause of shoulder pain [12]. The routine use of MRI for shoulder complaints has resulted in identification of ganglion cysts of the shoulder in symptomatic and asymptomatic patients.

Despite an improved recognition of labral cysts, however, the diagnosis of these lesions remains difficult. The clinical diagnosis is challenging because of the nonspecific history and physical examination as well as the constellation of potentially confounding conditions that are often present, such as rotator cuff disease, SLAP lesions, impingement syndrome and occult instability [1]. Typically, shoulder symptoms in the glenoid labral cysts have been attributed to SLAP lesions and compression of nerve [1–3,5–9]. When the labral cysts of the shoulder presented without any specific symptoms like in our cases, clinicians have often empirically pursued a treatment strategy of rest and activity modification to address these symptoms. Even in the setting of refractory pain, the differential diagnosis has historically included an evaluation for osteoarthritis, rheumatoid arthritis, osteomyelitis, malignant neoplasms, or benign bone lesions [13]. To date, however, paralabral cysts have not been documented as a potential cause of refractory pain in the shoulder in adults.

The pathogenesis of this condition is uncertain. It is believed that trauma results in tearing of the capsulo-labral complex. Tirman et al. [14] have shown an association between ganglion cysts and glenoid labrocapsular tears on MRI, as seen in our case series. We suppose in cases 1 and 3 that repeated motion abnormalities accompanied by subtle glenohumeral instability, and a labral tear to impose mechanical stress toward the labrum, leading to

degeneration of the labrum and development of this ganglion. It is possible that in remaining cases an unrecognized trauma or multiple minor events could be the cause of the labral tear with cysts. Tirman et al. [14] reported that labral cysts may be an indicator of labrocapsular injury and instability, and so taking a careful history and a thorough physical examination to detect instability should be considered. Many patients with occult shoulder instability will present with pain associated with overhead activities, but there is the absence to brief pain in each episode of dislocation or at rest. In our cases, patient noticed the pain, which started after the strenuous exercise, which gradually intensified and was continuously present even at rest. MRI is very helpful in establishing the correct diagnosis in these patients with chronic shoulder pain and a confusing clinical picture.

The treatment of this condition is dependent upon the extent of pain and the loss of function. In the absence of pain, shoulder rehabilitation to maximize the function is usually the only intervention necessary, as the functional deficit is usually mild. However, in the presence of persistent or severe pain, as in our case study, surgery is required. In the treatment of ganglion cysts, labral repair has been reported to reduce the recurrence and to significantly improve the condition of patients. Iannotti [1] described three patients treated arthroscopically with a posterior–superior capsulotomy. At 1 year, there was no recurrences by MRI, and all the patients had complete relief of pain and return of external rotation strength. On the other hand, Youm et al. [15] reported that repair of a labral tear, without cyst excision, resulted in successful outcomes for all ten patients who had spinoglenoid cysts associated with superior labral tears. They advocated that the treatment given for intra-articular disease was the key component of the surgical management. In our cases, there was a communication between the joint and the cyst in terms of a labral tear was detected both MRI and arthroscopic examination, so we repaired the labral tear following excision of labral cysts in order to prevent the recurrence. Extra caution is required when performing arthroscopic inferior labral cyst excision with labral tear repair; the axillary nerve may be at risk when manipulating tissue at the inferior aspect of the glenoid rim. The axillary nerve is closest to the glenoid rim at the 6 o'clock position, and it lays about 12 mm from the inferior glenoid rim and is adjacent to the capsule [16]. In order to avoid the axillary nerve injury, suture anchors should not be placed in 6 o'clock position. In our study, none of the patients showed postoperatively deltoid muscle atrophy.

Even though our numbers are small, we recommend that, in the absence of any specific symptom, i.e. nerve compression, the presence of a ganglion about the shoulder is not an absolute indication for surgery. In those patients with a more common shoulder diagnosis, ganglion cysts should be considered incidental findings until the more common diagnosis has been treated. However, in the absence of other more clearly identifiable shoulder pathologic conditions like in our case study, surgical resection of these cysts and labral repair should be considered in those patients who fit a specific profile. The profile includes patients with symptoms of pain on

elevation, pain at rest, an absence of any muscle atrophy around the shoulder, specific MRI findings and failure of conservative measures.

Conclusion

In conclusion, it is imperative for clinicians to maintain an index of suspicion for inferior labral cyst with labral tear in chronic refractory shoulder pain in adults. Prompt recognition and treatment of these lesions can facilitate a successful clinical outcome and avoid the potential morbidity associated with missed, chronic lesions.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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