Intraosseous Ganglion of the Glenoid

Jeffrey E. Wong, BA, Steven A. Aviles, MD, and C. Benjamin Ma, MD

Abstract

Intraosseous ganglions in the glenoid are uncommon. This case report illustrates the management and outcome of this uncommon but symptomatic shoulder problem.

An intraosseous ganglion has been defined as a "benign cystic and often multiloculated lesion made up of fibrous tissue, with extensive mucoid changes, located in the subchondral bone adjacent to a joint."[1] It usually occurs in the epiphyseal region of skeletally mature bones in young and middle-aged adults. Intraosseous ganglia are most commonly found in the femur and tibia, but there have also been literature reports in which they have been found in the fibula, tarsal bones, humerus, ulna, radius, carpal bones, acetabulum, and glenoid.[1,2] Seldom is the glenoid affected; only 12 patients with this condition have been reported.[3-7]

In this article, we report 2 cases of intraosseous ganglion of the glenoid—1 of which was treated surgically using an arthroscopic approach. The authors have obtained both patients' written informed consents to publish their case reports.

Case Reports

Case 1

A woman in her early 50s presented with progressive left shoulder pain that had been present for approximately 3 years. She stated that she never had any other kind of shoulder injury, dislocation, or surgery. She denied any history of inflammatory disease and any history of fever, chills, night sweats, or weight loss. She had received a corticosteroid injection to the affected shoulder, and temporary relief, but whether the injection was intra-articular or subacromial was unclear. She had bilateral range of motion (ROM) of 160° of abduction and forward elevation, 60° of external rotation, and internal rotation to T10. Strength was 5/5 with forward elevation and external and internal rotation at the side. The patient demonstrated a positive Hawkins sign and a positive Jobe sign for pain in the left shoulder (not present in the right shoulder). She also had a positive O'Brien active compression test in the left shoulder. There was no apprehension or relocation sign bilaterally. Radiographs of the left shoulder showed cystic lesions of the inferior glenoid with slight joint space narrowing of the glenohumeral joint. Magnetic resonance imaging (MRI) showed obvious fluid-filled cysts in the posterior inferior aspect of the glenoid encompassing approximately 50% of the overall area of the glenoid (Figures 1A, 1B). These cysts appeared to be homogenously fluid-filled without fluid-fluid levels. There was no surrounding soft-tissue mass.

After detailed consultation regarding risks, benefits, and alternatives to surgical intervention, the decision was made to treat this problem with arthroscopic surgery and arthroscopic bone grafting. The patient received an interscalene block and a laryngeal mask airway for anesthesia. Surgery was performed with the patient in the beach-chair position. Standard posterior and anterior portals were placed, and a diagnostic arthroscopy was performed. Pertinent findings included cartilage degeneration of the glenoid and the humeral head, with focal grade 4 modified Outerbridge classification for cartilage degeneration changes to the inferior humeral head. The labrum had marked degeneration and detachment posteriorly. The anterior labrum and the superior labrum were degenerated but not detached. The rotator cuff was intact.

At this point, the camera was placed into the anterior portal and an arthroscopic liberator was used to lift the posterior labrum from the glenoid. Dissection continued medially to the location of the cyst (Figure 2). The cortex was not breached. A curette was then used to release the septations of the cysts, and the camera was replaced into the posterior portal to visualize within the cyst and confirm proper curettage. For placement of the bone graft, a glenoid anchor sleeve and trocar were placed into the defect. Cancellous allograft bone chips (5 cm^3) were

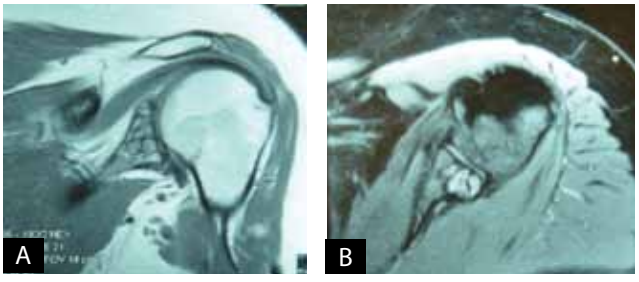

Figure 1. Case 1 magnetic resonance imaging shows fluid-filled cysts in posterior inferior aspect of glenoid. (A) Coronal oblique view. (B) Axial view.

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placed into the sleeve and impacted into the defect using the trocar for impaction (Figure 3). On completion, the labrum was repaired using a metal suture anchor.

After surgery, the patient was immobilized in a sling for 6 weeks and allowed progressive motion afterward. At the 1-year postoperative visit, she had full ROM and 5/5 rotator cuff strength. She had no impingement symptoms and only occasional aches in the shoulder—in short, significant improvement. Follow-up radiographs also illustrated consolidation of bone grafts.

Case 2

A man in his early 40s presented with left shoulder discomfort that had become more painful over the past 5 years. The patient reported that he might have had a shoulder dislocation 16 years earlier that spontaneously reduced. There was no history of any prior shoulder treatment or surgery. The patient also denied any history of inflammatory disease, fever, chills, weight loss, or night sweats. He had symmetric ROM of both shoulders with 180° of forward flexion and abduction, 80° of external rotation, and internal rotation to T6. He experienced pain with abduction of the arm. Strength was 5/5 with forward elevation and external and internal rotation bilaterally. The left shoulder was significant for 3+ anterior drawer, 1+ posterior drawer, and 1+ sulcus sign on stability examination. The patient demonstrated apprehension and relocation in the abducted, externally rotated position. The contralateral shoulder demonstrated 2+ anterior drawer, 1+ posterior drawer, and 1+ sulcus sign on stability examination. There were no signs of apprehension on the right side. There were no impingement signs, and the O'Brien active compression test was negative bilaterally. An anteroposterior view of the glenohumeral joint, an outlet view, and an axillary lateral radiograph of the left shoulder showed a large multilobulated glenoid cyst that involved the entire inferior part of the glenoid (Figures 4A, 4B). MRI (Figure 5) and computed tomography (CT) confirmed a large cyst involving nearly all the glenoid inferior to the equator. The labrum also showed fraying anteriorly and posteriorly, with possible detachment anteriorly.

Figure 2. Arthroscopic view of intraosseous ganglion within glenoid before curettage.

Diagnostic arthroscopy was used to ensure that no intra-articular pathology was present that would have led to the bony lesion. The glenohumeral articulation was intact. There was no true Bankart lesion or humeral avulsion of the glenohumeral ligaments lesion. The rotator cuff was also intact, but the anterior labrum was detached. The glenoid was examined for any fractures or penetrations along the glenoid that would have led to the lesion; no signs of fractures or penetrations were found. After a standard deltopectoral incision, the subscapularis was detached, leaving a 1-cm cuff of tissue on the lesser tuberosity. The location of the lesion was identified, and a burr was used to create an 8-mm hole over the anterior aspect of the glenoid. This hole was placed at the 9:30 position of the glenoid, away from both the articular margin and the anterior labrum. The intraglenoid material was curetted, and the area was irrigated well. Cancellous allograft bone chips (10 cm^3) were placed into the glenoid, which showed good fill. A standard T-capsulorrhaphy was then performed to correct the instability.

After surgery, the patient was immobilized in a sling for 6 weeks and allowed progressive motion afterward. At 1-year follow-up, she had full ROM, no signs of instability, and no pain with work. He returned to full duty and remained symptom-free.

Discussion

The etiology of intraosseous ganglia remains unknown. Schajowicz and colleagues[1] proposed that it can either originate by penetration of an extraosseous ganglion into the underlying bone or be idiopathic. In idiopathic cases, different authors have suggested that an intraosseous ganglion develops because of mucoid degeneration of intraosseous connective tissue,[8,9] possibly preceded by osteonecrosis or focal ischemia,[2] or intramedullary metaplasia and proliferation of fibroblastic elements.[1] It is interesting that this condition has been found more often in males than females. The youngest patient reported in the literature was 18, and the oldest patient was 86, but most patients are middle-aged.[10]

Lesions are usually solitary, but 2 bones have been involved in some cases. The usual site is the subchondral epiphyseal end of long tubular bones, and patients usually

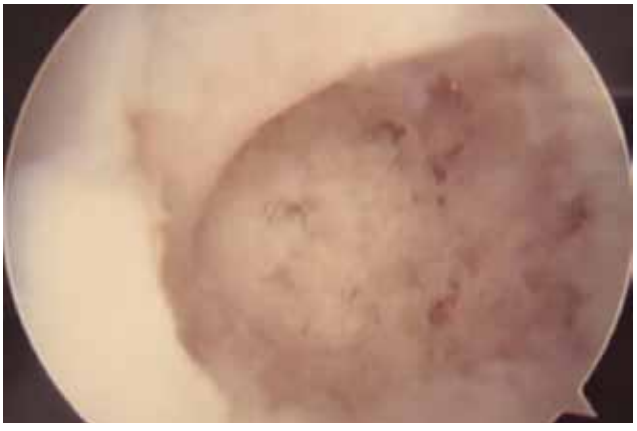

Figure 3. Arthroscopic view of glenoid after curettage and bone grafting.

Figure 4. Case 2 radiographs show large multilobulated cyst within inferior part of glenoid. (A) Anteroposterior view. (B) Axillary lateral view.

complain of mild, localized, and intermittent pain that has persisted for a significant period. Moreover, the condition usually does not present with a history of trauma, and these types of cysts are not related to or caused by arthritis.[2,10] The lesion can appear as a unilocular or multilocular cystic structure with a fibrous lining, and it is usually filled with white or yellow gelatinous material.[10]

In the 12 cases of intraosseous ganglion of the glenoid reported in the literature, the most common location was within the subchondral portion of the inferior glenoid.[3] Both of the patients that we have presented would fit most of the criteria attributed to an intraosseous ganglion within the glenoid. The lesions were multilobulated and filled with gelatinous material. Both patients had the ganglion cyst located in the inferior portion of the glenoid, and both were middle-aged individuals who dealt with mild, localized pain in the affected shoulder. In both patients, treatment of the glenoid cyst involved surgical curettage and bone grafting. However, in case 1, the patient also presented with osteoarthritis and impingement syndrome in the same shoulder containing the glenoid cyst. Although intraosseous ganglia are usually not associated with arthritis, her situation may suggest that this may not be true in all cases. Her case is also unique because this was the first time that an intraosseous ganglion of the glenoid was surgically removed and bone was grafted using an arthroscopic approach. This provides an alternative to the open approach for patients who present with this condition. It also seems to be equally effective in terms of treatment and patient satisfaction after surgery.

In case 2, the patient presented with left shoulder instability and the glenoid cyst. His case was unique because he had a prior history of trauma (shoulder dislocation). This might suggest that shoulder trauma could possibly lead to development of an intraosseous ganglion within the glenoid. Trauma could cause a series of events to occur within the shoulder and could be the trigger that results in problems such as osteonecrosis, focal ischemia, or mucoid degeneration of connective tissue, which have been described in idiopathic cases.

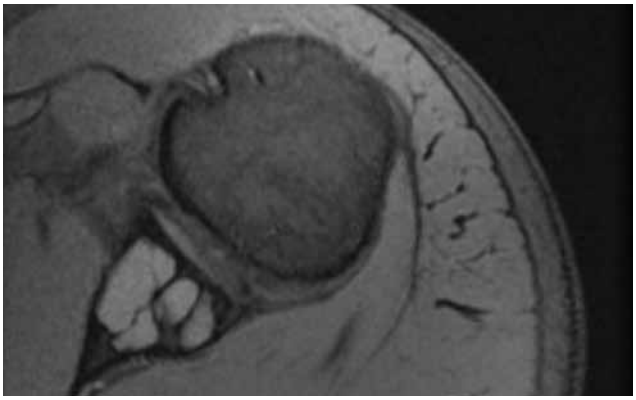

Figure 5. Case 2 axial magnetic resonance imaging confirms presence of large cyst involving nearly entire portion of inferior

Clinical workup for patients with intraosseous ganglion of the glenoid should consist of a thorough history and a physical examination to determine muscle strength, ROM, and signs of shoulder instability or impingement. Plain radiographs and MRI are also very helpful in diagnosing this condition. Plain radiographs should reveal a radiolucent, intraosseous lesion, and MRI can help in delineating the intrinsic structure of the ganglion. A bone scan should be performed if MRI findings suggest malignancy. Treatment depends on symptomatology. Asymptomatic patients can be observed. Symptomatic patients, who usually complain of shoulder-localized chronic pain associated with activity, should be treated. Treatment of choice, surgical curettage and bone grafting, seems to be the most effective and preferred method because it provides pain relief. It also decreases lesion size progression, which could eventually lead to a fracture.[4]

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

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