Subacromial Osteochondroma

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The most common cause of impingement syndrome is mechanical irritation of the subacromial bursa and rotator cuff by the coracoacromial arch. Offending structures include the undersurface of the anterolateral acromion, coracoacromial ligament, and the undersurface of the distal clavicle. We present a case of impingement syndrome caused by mechanical irritation of the rotator cuff by a subacromial osteochondroma that was successfully treated with arthroscopic resection. Osteochondroma is the second most common benign bone tumor following nonossifying fibroma. These lesions are thought to arise from aberrant growth of normal epiphyseal growth plate cartilage. Ninety percent of osteochondromas arise from the metaphyseal regions of long bones (eg, distal femur, proximal tibia, or proximal humerus). Scapular involvement accounts for 3.0% to 4.6% of all reported osteochondromas. These lesions represent 14.4% of all tumors of the scapula and 49% of benign scapular tumors, making them the most common benign bone tumors of the scapula. Our patient failed nonoperative management of his subacromial osteochondroma. The concern for malignant transformation was low, as the patient’s pain had been consistent for the past 15 years. Although his pain had been largely unchanged for more than a decade, he elected to undergo resection so that he could resume the hobbies that his pain had forced him to abandon. He reported substantial pain relief and restoration of function following arthroscopic resection and subacromial decompression, reinforcing mechanical irritation of the rotator cuff as the source of his shoulder pain and dysfunction. To our knowledge, this is the first report of arthroscopic resection of a subacromial osteochondroma.

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The most common cause of impingement syndrome is mechanical irritation of the subacromial bursa and rotator cuff by the coracoacromial arch. Offending structures include the undersurface of the anterolateral acromion, coracoacromial ligament, and the undersurface of the distal clavicle.1-3 This article presents a case of impingement syndrome caused by mechanical irritation of the rotator cuff by a subacromial osteochondroma.

CASE REPORT

A 53-year-old man presented with 15 years’ duration of moderate left shoulder pain. The pain was insidious in onset with no antecedent trauma. Rigorous activities, such as ice hockey, tennis, and table tennis, exacerbated the pain, prompting him to abandon these hobbies over the past few years. Anti-inflammatories, activity modification, physical therapy, and a subacromial corticosteroid injection all provided transient moderate pain relief. He reported no constitutional symptoms such as fever, weight loss, night sweats, or chills. The nature and quality of his pain was unchanged for the past few years.

Examination of the shoulder revealed no atrophy, deformity, or scapular dyskinesia. There was no focal tenderness to palpation over the acromioclavicular joint or biceps tendon. Range of motion testing revealed 130° forward flexion, 80° abduction, 30° external rotation with the arm at the side, and internal rotation to L5, all with minimal crepitus near the acromioclavicular joint. Evaluation of the rotator cuff and deltoid revealed 5/5 strength. Impingement signs were present with positive Neer and Hawkins maneuvers. Cross-body adduction elicited no pain at the acromioclavicular joint. No abnormal bony prominences or lymphadenopathy were noted on the remainder of the patient’s extremities or axial skeleton.

Radiographic evaluation revealed acromioclavicular joint arthrosis with a prominent spur on the undersurface of the acromion (Figure 1A). Magnetic resonance imaging (MRI) was significant for an osseous projection (1.1 cm AP, 3.8 cm height, 3.8 cm transverse) continuous with the undersurface of the medial acromion, abrading the bursal surface of the supraspinatus muscle belly (Figures 1B-1D). A layer of fluid between the osseous projection and the rotator cuff was visualized. A thin rim of cartilage outlined the undersurface of the projection. This osseous projection had remained stable since an MRI performed 3 years earlier for a similar episode of shoulder pain. The tendons of the rotator cuff were intact. Mild increased signal intensity was seen in the acromioclavicular joint, consistent with minimal arthrosis.

As the patient had failed nonoperative treatment for more than a decade and wished to return to his active lifestyle, he elected to undergo excision of the osteochondroma. The concern for malignant transformation was low due to the chronic, unchanging nature of the patient’s pain, his lack of constitutional symptoms, and lack of suspicious radiographic evidence. The morbidity of an open resection of the osteochondroma (eg, taking down the deltoid, potential axillary nerve injury, increased risk of infection) was avoided by using arthroscopic techniques.

No intra-articular pathology was found. Abundant subacromial bursitis was noted. The bony prominence was seen abrading the supraspinatus muscle belly, creating a rent in the muscle (Figure 2). The rotator cuff tendons were intact. After subacromial bursectomy, the osseous prominence was arthroscopically resected to a level flush with the acromion. Subacromial decompression was then performed using a cutting block technique to even the anterolateral acromion with the posterior acromion.

The patient began immediate physical therapy. He resumed full activity, including tennis and ice hockey, with no restriction or pain within 1 month after surgery. Postoperative range of motion testing revealed symmetric motion to the contralateral limb with 160° forward flexion, 90° abduction, 90° external rotation with the arm at the side, and internal rotation to L1. He maintained 5/5 strength of the deltoid and rotator cuff postoperatively.

He is currently doing well and is satisfied with his outcome thus far, nearly 1 year postoperatively. Repeat postoperative imaging studies have revealed no recurrence. He has resumed playing tennis and ice hockey.

DISCUSSION

Osteochondroma is the second most common benign bone tumor following nonossifying fibroma.4 These lesions are thought to arise from aberrant growth of normal epiphyseal growth plate cartilage.5,6 At birth, the body and spine of the scapula have ossified, but not the glenoid, acromion, coracoid process, inferior angle, and vertebral border.5 Ninety percent of osteochondromas arise from the metaphyseal regions of long bones (eg, distal femur, proximal tibia, or proximal humerus).5,6 Scapular involvement accounts for 3% to 4.6% of all reported osteochondromas.5,7,8 These lesions represent 14.4% of all tumors of the scapula and 49% of benign scapular tumors, making them the most common benign bone tumors of the scapula.5,7,8

Osteochondromas are often asymptomatic unless associated with a painful bursitis, cosmetic deformity, mechanical irritation during joint motion, impingement on neurovascular structures, or malignant transformation to chondrosarcoma.4,5,7,9 Malignant transformation occurs in 1% to
2% of solitary osteochondromas and 5% to 25% of cases of multiple hereditary exostoses.\(^2\)\(^-\)\(^6\) This transformation is typically accompanied by new onset pain and continued growth of the osteochondroma.\(^2\)\(^-\)\(^6\) Our patient reported moderate, albeit temporary, pain relief from a subacromial steroid injection, reinforcing the hypothesis of mechanical irritation as the source of his shoulder pain (as opposed to malignant transformation).

The literature surrounding osteochondromas of the scapula is comprised of small case series.\(^7\)\(^-\)\(^9\) Even fewer reports discuss the implications of an osteochondroma arising from the undersurface of the acromion.\(^2\)\(^,\)\(^5\) The vast majority of scapular osteochondromas appear on the ventral surface of the scapula, often resulting in a painful bursitis, snapping of the scapula, or pseudowinging.\(^4\)\(^,\)\(^5\)\(^,\)\(^7\)\(^-\)\(^9\) When symptomatic scapular osteochondromas fail nonoperative treatment, they often respond favorably to resection to reduce snapping and restore function.\(^2\)\(^,\)\(^4\)\(^,\)\(^5\)\(^,\)\(^7\)\(^-\)\(^9\) To our knowledge, arthroscopic resection of a subacromial osteochondroma has never been reported.

A retrospective review of 8 scapular osteochondromas excised over a 13-year period yielded only 1 osteochondroma arising from the undersurface of the acromion.\(^2\) All patients underwent open resection using one of two dorsal incisions. There was one recurrence. Four patients reported their post-resection function as excellent, 2 as good, 1 as average/good, and one as average/poor. Six patients reported feeling very satisfied with their results, 1 reported feeling satisfied, and 1 reported feeling unsatisfied. No significant difference was identified in range of motion comparing the operative extremity to the contralateral side.

Craig\(^2\) described a case of multiple hereditary exostoses with numerous osteochondromas arising from the distal clavicle and undersurface of the acromion resulting in mechanical impingement. The patient was treated with open excision of the numerous osteochondromas, acromioplasty, and distal clavicle excision. The patient recovered full, painless motion following surgery. There were no recurrences of the osteochondromas.

Our patient failed nonoperative management of his subacromial osteochondroma. The concern for malignant transformation was low as the patient’s pain had been consistent for 15 years. Although his pain had been largely unchanged for more than a decade, he elected to undergo resection so that he could resume the hobbies that his pain had forced him to abandon. He reported substantial pain relief and restoration of function following arthroscopic resection and subacromial decompression, reinforcing mechanical irritation of the rotator cuff as the source of his shoulder pain and dysfunction.

Osteochondromas arising from the undersurface of the acromion can cause mechanical irritation of the rotator cuff, leading to impingement syndrome. Arthroscopic resection of the osteochondroma and reactive bursitis is a viable method for eliminating the mechanical irritant, thereby restoring function and providing pain relief.

References