Case Report

Arthroscopic Removal of an Osteoid Osteoma of the Shoulder

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Abstract: Two cases of arthroscopic retrieval of intra-articular shoulder pathology are presented. With this technique, areas that are often difficult to expose in an open fashion and those previously deemed inaccessible arthroscopically are localized readily. In the setting of intra-articular pathology, thought should be given to the possibility of arthroscopic retrieval or excision before proceeding with open surgery. **Key Words:** Osteoid osteoma—Arthroscopy–Shoulder.

Osteoid osteoma, first described by Jaffe[1] in 1935, has a predilection for long bones. Occurrence in the flat bones is unusual; involvement of the ilium is seen most frequently.[2] Since 1944, 1,258 cases of osteoid osteoma have been reported.[3-14] Of those documented, only 13 have involved the scapula. Case reports of osteoid osteoma of the scapula discuss treatment regimens that include excisional biopsy under fluoroscopy or open surgery.[10] Arthroscopic removal of osteoid osteomas has been reported for juxta-articular lesions in the talus.[12,14] To our knowledge, the cases in this represent the first description of arthroscopic removal of osteoid osteomas around the shoulder.

CASE REPORT 1

A 30-year-old right-hand–dominant man complained of right shoulder pain of 2 to 3 years' duration. He denied a specific history of trauma but reported pain with overhead activities, during some activities of daily living, and at rest. The patient had been taking nonsteroidal anti-inflammatory drugs (NSAIDs) daily, with temporary relief. On physical examination, he had a positive impingement sign and a positive abduction test. Both external rotation and abduction strength were 4 of 5 with pain. A mild posteroinferior click with no instability was noted. No neurologic deficits were noted.

Radiographs, including initial anterior and posterior views in internal and external rotation and axillary and outlet views, were all negative. Magnetic resonance imaging (MRI) revealed an anterosuperior labral tear and a narrow subacromial space with evidence of scar tissue consistent with impingement syndrome. No other shoulder pathology, including osteoid osteoma, was observed, even when the studies were reviewed retrospectively (Fig 1).

The patient underwent an arthroscopic acromioplasty. Arthroscopy revealed a degenerative lesion on the anterosuperior labrum, which was debrided. Significant scarring in the subacromial space with a type I acromion was noted, but no intraoperative complications occurred.

Postoperatively, the patient continued to have pain that increased with external rotation and that was particularly severe at night. The patient also presented with a mildly positive impingement sign and abduction test. The patient was using NSAIDs, with some

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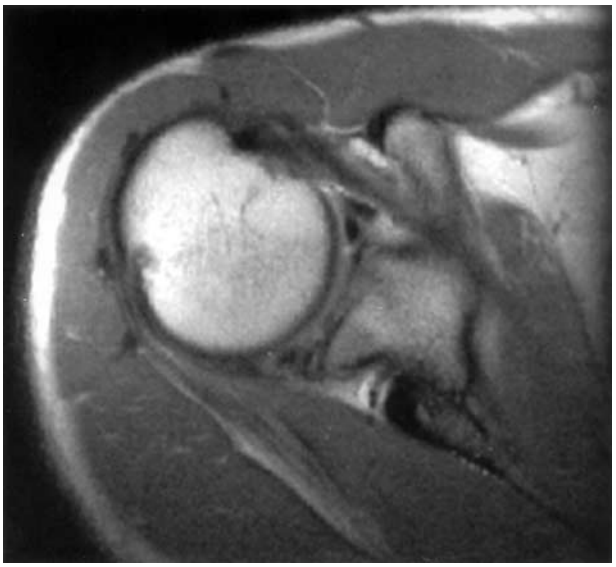

FIGURE 1. Axial fast spin-echo magnetic resonance image discloses a superior labral tear with anterior and posterior components, initially thought to be the cause of the patient's discomfort.

improvement noted. The patient continued on antiinflammatories for 4 months postoperatively. At that time, the patient underwent a subacromial injection with 5 mL lidocaine, 5 mL bupivacaine, and 1 mL methylprednisolone without incident. The injection was tolerated well; however, the symptoms returned within a few days.

A postoperative MRI revealed evidence of a superior labral tear. No other shoulder pathology, including osteoid osteoma, or any other bony pathology was noted, even when the images were viewed retrospectively.

The patient underwent a second shoulder arthroscopy approximately 8 months after the initial surgery to repair the anterior and posterior superior labral lesion. An examination performed under anesthesia showed no anterior, posterior, or inferior instability. On arthroscopy, the patient was noted to have a large type II hypermobile SLAP lesion of the right shoulder. The lesion was repaired with one 8-mm Suretac device (Smith & Nephew, Andover, MA). No intraoperative complications occurred.

The patient continued to complain of shoulder pain. A refractory impingement-type pain seemed to be the problem. Radiographs were repeated (Fig 2) and were negative. At this point, a bone scan was performed to determine if the pain was of an osseous origin in the glenoid. A focal area of increased signal was noted on the anteroinferior aspect of the right glenoid (Fig 3).

FIGURE 2. Axillary view of glenohumeral joint.

The abnormality was consistent with an osteoid osteoma. Subsequently, a computed tomography (CT) scan and MRI were performed to confirm the diagnosis. The CT scan revealed an osteoid osteoma in the caudal third of the anterior cortex of the glenoid (Fig

FIGURE 3. Technetium-99m–labeled bone scan shows increased uptake in the region of glenoid.

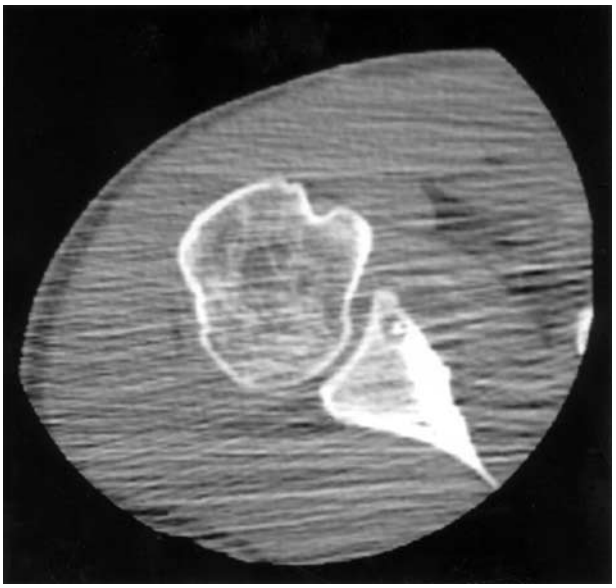

FIGURE 4. Soft-tissue window from an axial noncontrast CT scan shows the tumoral nidus (arrow) surrounded by sclerosis of the adjacent anterior margin of the glenoid.

4). MRI also showed the osteoma in addition to bone marrow edema and secondary synovitis (Fig 5).

An arthroscopic excision of the osteoid osteoma was performed, and the anterior labrum was stabilized: First, diagnostic arthroscopy was performed. A standard posterior portal, an anterolateral portal just

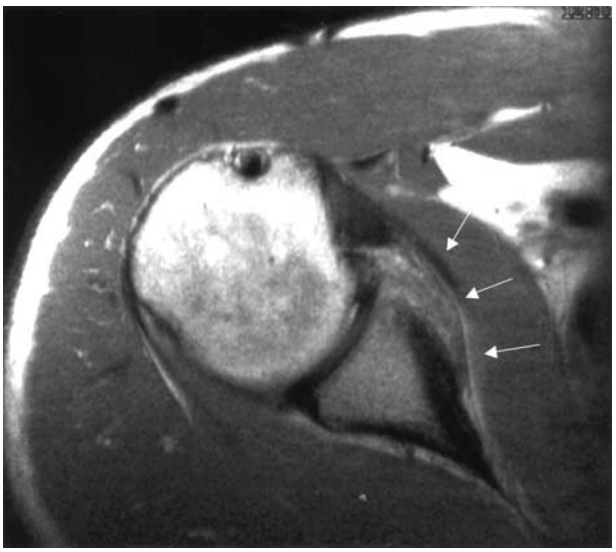

FIGURE 5. Axial MRI shows the nidus with marked cortical thickening, as well as the secondary synovitis with capsular signal hyperintensity and distension (arrows).

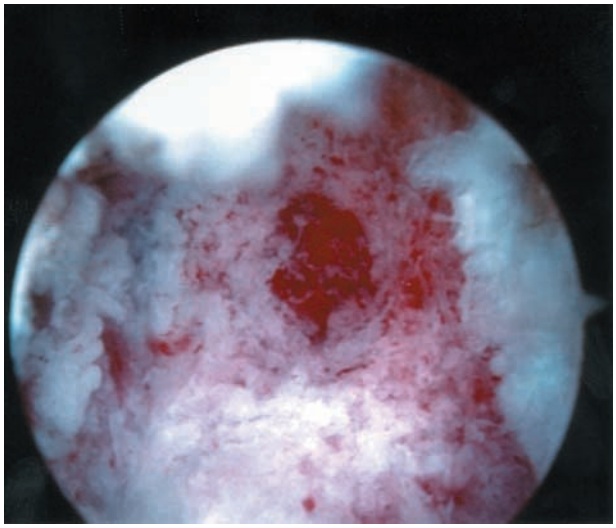

FIGURE 6. Arthroscopic view from a superolateral portal through the anterior capsule of the right shoulder showing the hyperemic region noted after burring of the bony bed.

lateral to the long head of the biceps tendon, and a second anterolateral portal just medial to the biceps tendon were used to access the glenohumeral joint. The anterior portions of the labrum and periosteum were elevated from the anterior glenoid neck. A ridge of bone approximately 1 cm off the anterior glenoid rim and extending approximately from the 1 o'clock position to the 5 o'clock position was noted. This appeared to be reactive ossification secondary to the underlying lesion. A 4.5-mm shaver was used to clear the soft tissue off this bony protuberance. At this point, a small osteotome was used to cleave off the ridge of bone, which measured 7 by 4 mm. No nidus was visible within this specimen. A high-speed shaver was used to debride the bony bed of the glenoid. A hyperemic area approximately 5 by 5 mm in size was noted at the center of the bony bed (Fig 6). A central area of bone surrounded by a softer hyperemic area was revealed, surrounded by significant sclerosis. A curette was then used to remove the central nidus of the osteoid osteoma. Subsequently, the burr in addition to a curette was used to eliminate any remaining hyperemic bone. This intervention allowed a rim of sclerotic bone to persist without any evidence of the nidus or surrounding hyperemic tissue (Fig 7).

After removal of the lesion, the anterior labrum was reattached to its osseous insertion with one 8-mm Suretac device. All debris was removed. Again, no intraoperative complications occurred. The patient was placed in a sling for 4 weeks. The patient reported

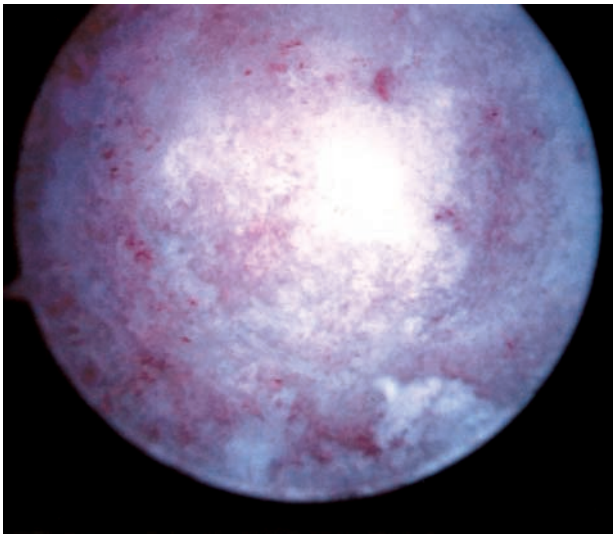

FIGURE 7. Same arthroscopic view as in Fig 6, showing the appearance of the area after excision of the nidus.

attenuation of his pain within 1 week after surgery. Complete and immediate relief of pain was noted at this time, typical for an osteoid osteoma. At follow up 6 months later, the patient remained asymptomatic.

CASE REPORT 2

A 12-year-old, right-hand–dominant boy complained of persistent right shoulder pain over 6 months. The patient complained of pain, weakness, and a history of a tremor. The patient had a family history of diabetes and gout, but his medical history was otherwise unremarkable. Before presentation, the patient had a neurologic evaluation that was reported as negative. An MRI performed 6 months prior to presentation revealed increased signal intensity in the superior aspect of the glenoid and a joint effusion.

Physical examination revealed full and painless neck motion. A Sperling's test result was negative. The patient had a nontender acromioclavicular joint and full range of motion without tenderness. Impingement signs were negative. The patient had weakness in the rotator cuff muscles, with strength graded a 3 of 5 for external rotation, and 4 of 5 for supraspinatus. An active compression test[15] was positive, with pain and clicking. No instability of the right shoulder was noted.

A normal complete blood-cell count was noted with laboratory testing. Repeat MRI demonstrated a nidus measuring 5 mm at the base of the coracoid, with a halo of resorbed bone surrounded by marrow edema (Fig 8). A large joint effusion was evident with conspicuous debris. Increased signal was noted in the surrounding soft tissue. Oblique coronal and sagittal MRI views confirmed these findings. No other intra-articular pathology was noted.

The patient's history and clinical presentation and the radiographic appearance of the right shoulder indicated an osteoid osteoma at the base of the coracoid. Therefore, an arthroscopic excision of the lesion was performed. Three portals (standard posterior, superolateral, and anterior) were made. A diagnostic arthroscopy was performed to evaluate the glenohumeral joint. The lesion was accessed superiorly to the subscapularis tendon and medially to the anterosuperior labrum. The base of the coracoid was localized via a spinal needle and visualized via the superolateral portal. Subsequently, a burr-down technique was used at the base of the coracoid at the junction of the middle and inferior thirds.

A pink, circular lesion surrounded by sclerotic bone was noted at the base of the coracoid (Fig 9). The location was consistent with that of an osteoid osteoma as seen on MRI. Burring of the superficial sclerotic area revealed a hyperemic core consistent with osteoid osteoma (Fig 10). The lesion was excised using an arthroscopic shaver, burr, and curette. The hyperemic area was completely excised, leaving a

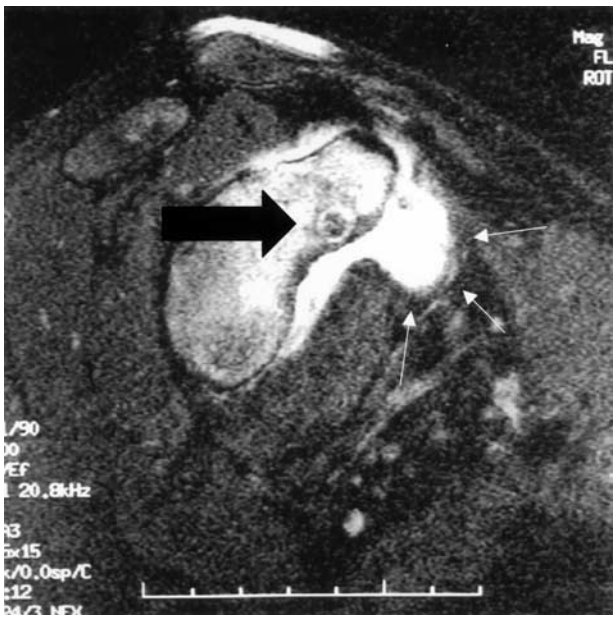

FIGURE 8. An oblique sagittal fat-suppressed image shows the nidus of the osteoid osteoma (black arrow) with striking marrow edema. Of note, the tumor has incited a significant secondary synovitis of the glenohumeral joint (small arrows).

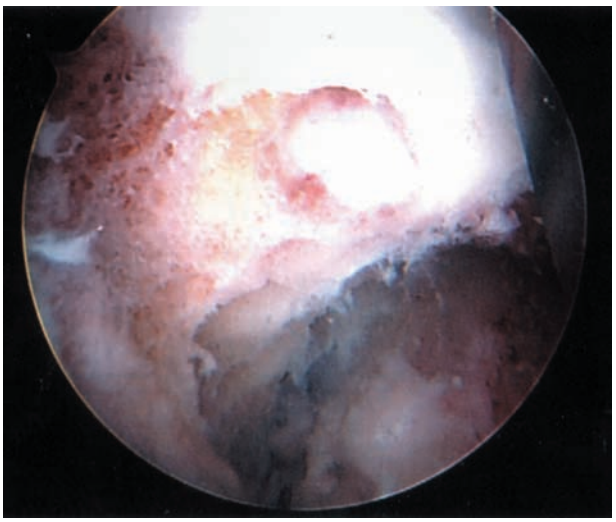

FIGURE 9. An arthroscopic view of the right shoulder from the superolateral portal through the anterior capsule shows the appearance of the area after superficial burring.

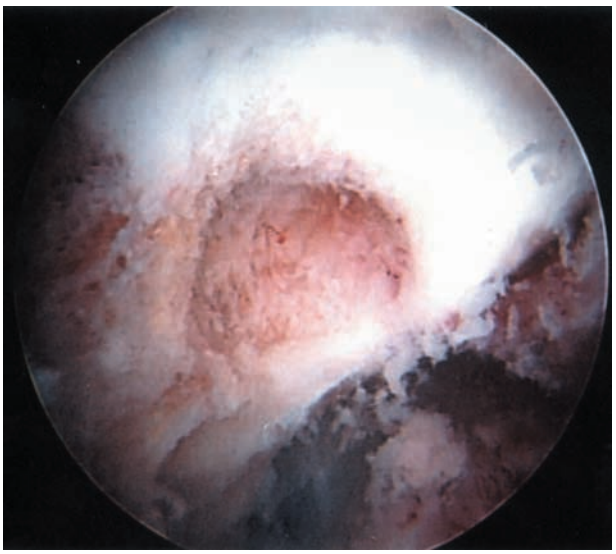

FIGURE 11. The appearance of the area after excision of the nidus is shown.

normal bony bed (Fig 11). No intraoperative complications occurred.

One week postoperatively, the patient reported that his pain had entirely subsided. At follow-up 3 months after surgery, the patient reported complete resolution of his shoulder symptoms.

DISCUSSION

Because the scapula is a rare site for osteoid osteoma, it is not often included in the differential diagnosis of chronic shoulder pain. The night pain seen is often attributed to rotator cuff pathology. However, the age range of the patients in these cases would make rotator cuff pathology less likely. In fact, osteoid osteoma typically occurs in adolescence, whereas rotator cuff pathology would be unusual in that population. In particular, juxta-articular osteoid osteoma often presents a diagnostic dilemma secondary to referred pain, neurologic deficits, and global extremity weakness. The sensitivity of soft tissue radiographic techniques for the shoulder can also be problematic. Lesions in the labrum may be identified but may not be the cause of the patient's symptoms.

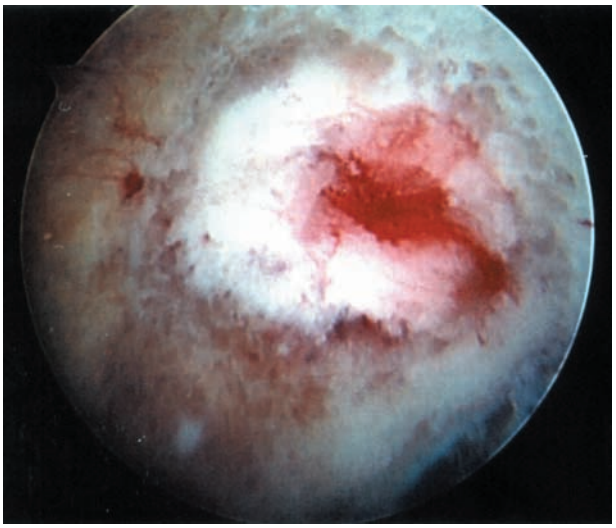

FIGURE 10. The same arthroscopic view as in Fig 9 shows the hyperemic region noted after further burring.

The first case reported shows the need to include osteoid osteoma on the differential diagnosis if soft tissue procedures do not resolve symptoms. Pain recurrence in young adults should lead physicians to reassess for bony pathology. MRI will disclose bone marrow edema surrounding the nidus, and a conspicuous synovitis is typically noted within the joint. It is important to request fat suppression techniques when bone pathology is considered, because these will "rescale" the contrast range and make the marrow edema more conspicuous.

In both of these cases, the arthroscopic removal was performed with standard portals and without localization of the osteoid osteoma other than by direct visualization. The nidus could be seen easily as a hyperemic area surrounded by sclerotic bone. Arthroscopic removal is an appropriate intervention for intra- and juxta-articular osteoid osteomas around the shoulder.

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REFERENCES

1. Jaffe HL. Osteoid osteoma of bone. *Radiology* 1935;45:319.
2. Freiberger RH, Loitman BS, Helpern M, Thompson TC. Osteoid osteoma: A report on 80 cases. *Am J Radiol* 1959;82:194-205.
3. Chamberlain BC, Mosher JF, Levinsohn EM, Greenberg JA. Subperiosteal osteoid osteoma of the hamate: A case report. *J Hand Surg [Am]* 1992;17:462-465.
4. Contreras A, Isasi C, Silveira J, et al. Intraarticular osteoid osteoma. *J Rheumatol* 2000;27:1560-1561.
5. Foucher G, Lemarechal P, Citron N, Merle M. Osteoid osteoma of the distal phalanx: A report of four cases and review of the literature. *J Hand Surg [Br]* 1987;12:382-386.
6. Heybeli N, Babacan M. Intraarticular osteoid osteoma of the distal humerus. *J Shoulder Elbow Surg* 1997;6:311-313.
7. Kaempffe FA. Osteoid osteoma of the coracoid process: Excision by posterior approach. A case report. *Clin Orthop* 1994;122:260-262.
8. Khurana JS, Mayo-Smith W, Kattapuram SV. Subtalar arthralgia caused by juxtaarticular osteoid osteoma. *Clin Orthop* 1990;252:205-208.
9. Lafforgue P, Senbel E, Boucraut J, et al. Elbow synovitis related to an intraarticular osteoid osteoma of the humerus, with immunologic and histochemical studies. *J Rheumatol* 1992;19:633-636.
10. Mosheiff R, Liebergall M, Ziv I, et al. Osteoid osteoma of the scapula: A case report and review of the literature. *Clin Orthop* 1991;121:129-131.
11. Otsuka NY, Hastings DE, Fornasier VL. Osteoid osteoma of the elbow: A report of six cases. *J Hand Surg [Am]* 1992;17: 458-461.
12. Resnick RB, Jarolem KL, Sheskier SC, et al. Arthroscopic removal of an osteoid osteoma of the talus: A case report. *Foot Ankle Int* 1995;16:212-215.
13. Shaffrey CI, Moskal JT, Shaffrey ME. Osteoid osteoma of the clavicle. *J Shoulder Elbow Surg* 1997;6:396-399.
14. Tuzuner S, Aydin AT. Arthroscopic removal of an osteoid osteoma at the talar neck. *Arthroscopy* 1998;14:405-409.
15. O'Brien SJ, Pagnani MJ, Fealy S, et al. The active compression test: A new and effective test for diagnosing labral tears and acromioclavicular joint abnormality. *Am J Sports Med* 1998;26:610-613.