Scapular Osteochondroma Treated With Arthroscopic Excision Using Prone Positioning

Kristopher Aalderink, MD, and Brian Wolf, MD, MS

Abstract

Osteochondromas, or exostoses, are common benign bone tumors. Most commonly, osteochondromas arise in the metaphyseal regions of long bones (femur, humerus, tibia). Seldom are osteochondromas found on the undersurface of the scapula; these osteochondromas invoke mechanical irritation that leads to bursa formation, snapping, and even winging of the scapula. Many authors have reported performing open surgical excision when these osteochondromas become symptomatic.

In this report, we describe the case of a woman in her mid-20s with painful scapular snapping and winging from an osteochondroma treated with arthroscopic excision using prone positioning.

In this report, we describe the case of a woman in her mid-20s with painful scapular snapping and winging from an osteochondroma treated with arthroscopic excision using prone positioning. The authors have obtained the patient's written informed consent for print and electronic publication of the case report.

Case Report

A woman in her mid-20s presented to the University of Iowa Sports Medicine Clinic with the complaint of pain in the posterior left shoulder. She had sustained a crush injury to the left scapula during wrestling 15 years earlier. Movement of the shoulder had become progressively more painful, with limitations in daily overhead activities. In addition, the patient noticed fullness in the axilla and complained of intermittent paresthesias down the arm, radiating into the ulnar two fingers of the hand.

Physical examination revealed medial winging of the scapula with the arm at the side. A large bursal sac around the medial and inferior borders of the scapula extending into the axilla was tender on palpation. Marked crepitus, both audible and palpable, was produced with active shoulder range of motion (ROM). Sensory testing to light touch and 2-point discrimination was normal and equal to that on the opposite side.

Anteroposterior chest radiograph and scapular-Y view of the shoulder showed a protuberant, sclerotic mass at the medial-inferior aspect of the scapula (Figures 1A, 1B). Magnetic resonance imaging (MRI) of the shoulder

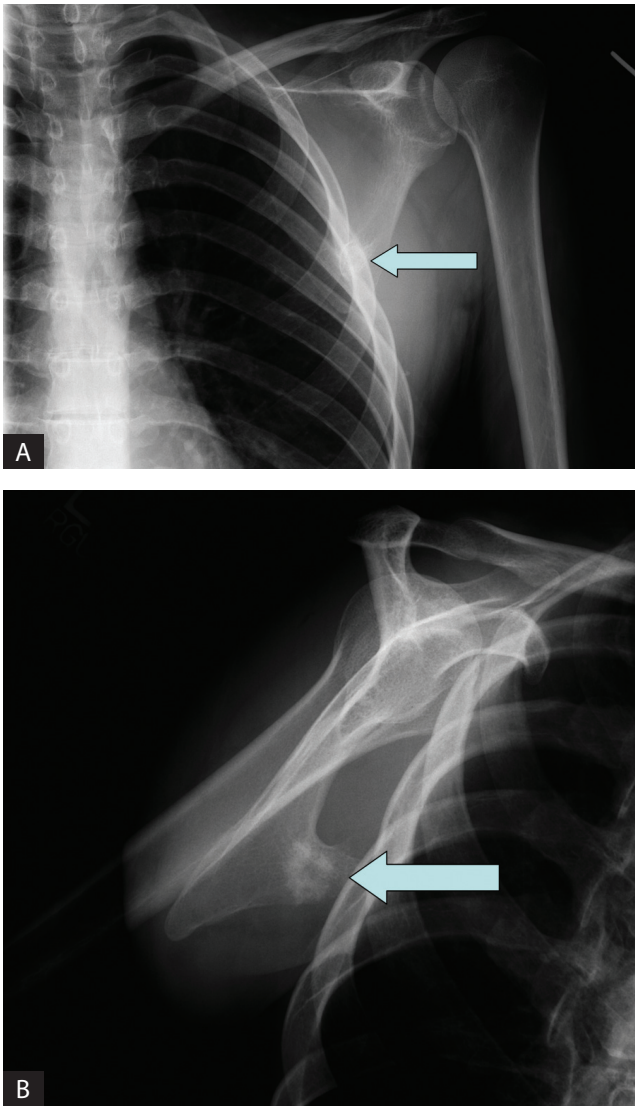

Figure 1. (A) Anteroposterior radiograph of left scapula. (B) Lateral radiograph of left scapula shows large protruding mass (arrow).

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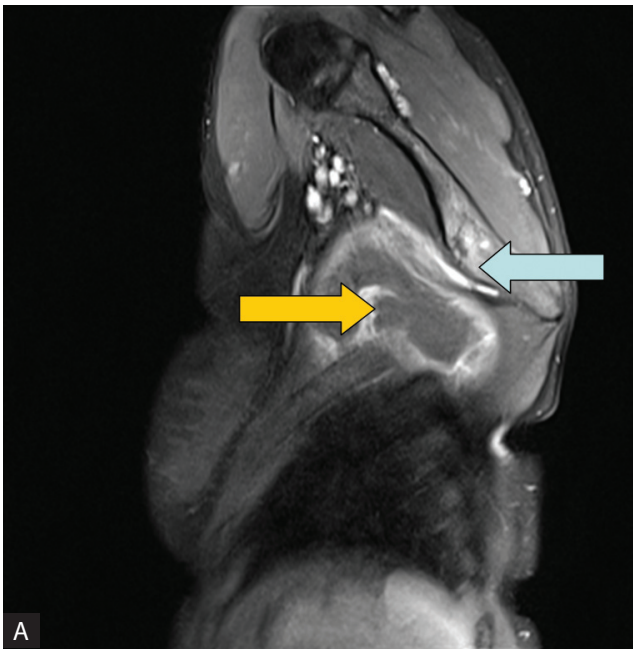

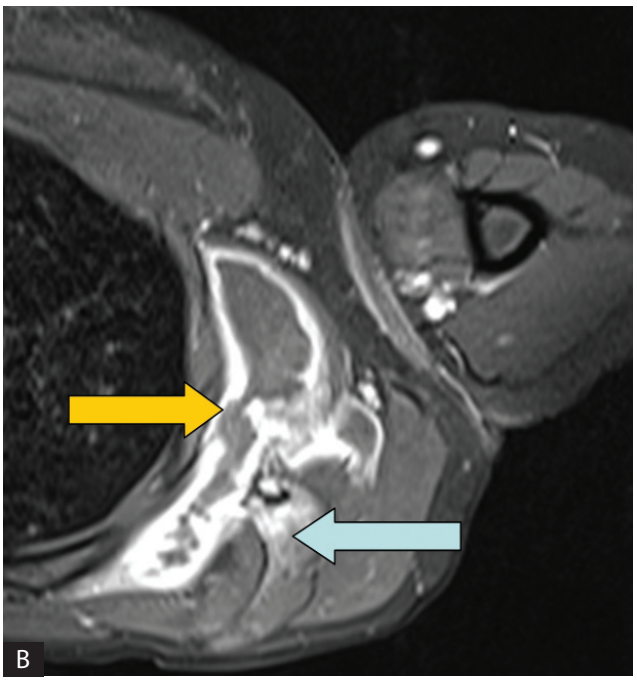

Figure 2. (A) Sagittal cut and (B) axial cut of T_1-weighted magnetic resonance imaging show scapular mass (blue arrows) with associated bursa (yellow arrows).

showed marked distention of the scapulothoracic bursa with peripheral contrast enhancement compatible with bursitis, extending along the second through seventh ribs. A focal osseous protuberance was identified at the lower aspect of the scapula on the ventral surface projecting into the scapulothoracic outlet, compatible with an osteochondroma (Figures 2A, 2B). The patient was offered arthroscopic (vs open) resection of the mass, which she accepted.

Surgical Technique

The patient was placed prone on the operating table, with her left arm internally rotated so that the dorsum of the hand lay on the lower back (Figure 3). Prone positioning facilitated exposure of and entry into the scapulothoracic articulation. Before establishing portals, we injected normal saline (30 mL) under the scapula from a medial injection site. Standard scapulothoracic arthroscopy portals were created. The first portal was placed 2 cm medial to the medial scapular border at the level of the spine of the scapula. The arthroscope was introduced, and a second portal, 4 cm inferior to the spine, was created under direct visualization with use of a spinal needle. Arthroscopic visualization revealed a large osseous mass protruding through the subscapularis muscle belly with abundant reactive bursal adhesions (Figure 4). Electrocautery was used to delineate the base of the mass from the scapular body (Figure 5). The osteochondroma had herniated through the muscle belly of the subscapularis. The muscle was reflected off the mass circumferentially. The mass was then systematically removed using an arthroscopic pituitary rongeur and a rotating burr (Figure 6). After complete resection of the mass, the base of the lesion measured 3 2.5 cm (Figure 7). Intraoperative fluoroscopy was used to

Figure 3. Prone positioning with left arm internally rotated and placed on lower back.

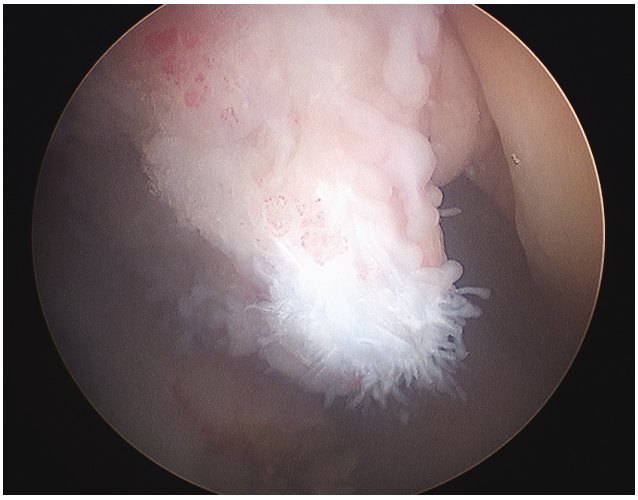

Figure 4. Arthroscopic image shows osteochondroma protruding through subscapularis muscle.

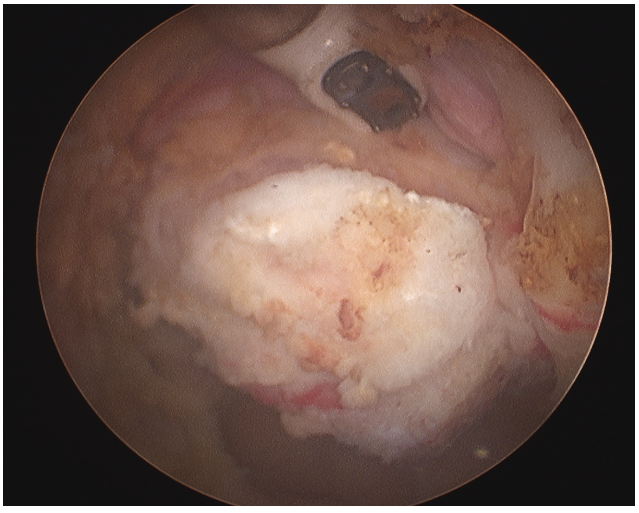

Figure 5. Arthroscopic image shows delineation of base of mass (after biopsy) using electrocautery.

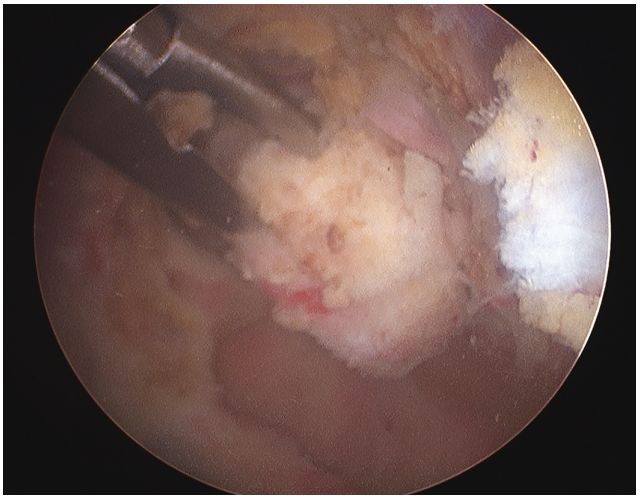

Figure 6. Further arthroscopic resection using pituitary rongeur.

confirm complete resection of the osteochondroma (Figures 8A, 8B). Fragments sent to Pathology confirmed the diagnosis of an osteochondroma.

The patient was given a sling for postoperative comfort but was instructed on daily out-of-sling shoulder ROM exercises. Evaluation 6 weeks after surgery revealed full, painless shoulder ROM; improved strength; and absence of scapular winging. The crepitus had resolved, and the axillary fullness was no longer appreciated. The patient was back to normal activities without pain.

Discussion

The first description of the snapping scapula is credited to Boinet,[1] who in 1867 presented the case of a 19-year-old man with discomfort on scapular movements. Since then, case reports of painful scapular osteochondromas associated with large bursa formation have been sporadic.[2-5] Under normal circumstances, the scapula glides over the thoracic wall, cushioned by the serratus anterior and subscapularis muscles. However, the superior and inferior

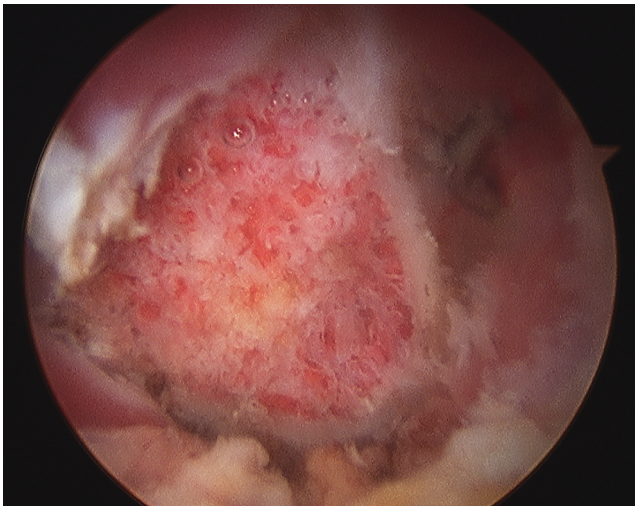

Figure 7. Completed arthroscopic resection of mass.

angles and the medial border are poorly cushioned, and osteochondromas in these locations can lead to bursal irritation from repeated mechanical abrasion with active shoulder motion. Large bursa formation associated with osteochondromas was termed *exostosis bursata,* coined by Orlow[6] in 1891.

Use of scapulothoracic arthroscopy in the treatment of snapping scapula is well documented for bursectomy and resection of the superomedial angle of the scapula.[7] In the treatment of bony malformations, most surgical techniques have involved open excision of the exostoses through a parascapular incision. Van Riet and Van Glabbeek[8] described use of scapulothoracic arthroscopy for resection of an osteochondroma through an inferior portal. They also noted restoration of full, painless function of the affected shoulder within 2 weeks of surgery.

Our case report also illustrates use of arthroscopy for excision of a subscapular osteochondroma. Although others have used a lateral decubitus position, we elected to position the patient prone with the affected arm internally rotated onto the lumbar spine—exaggerating the protraction and medial winging of the scapula and affording easy arthroscopic maneuvering of the scapulothoracic articulation. Prone positioning also allows for easy conversion to open excision by way of a medial parascapular arthrotomy, if needed. Intraoperative fluoroscopy was helpful in confirming adequate resection, as the base of the lesion was surrounded by subscapularis muscle.

Arthroscopic removal of malignant neoplasms risks seeding the entire joint, potentially prohibiting limb preservation. So, when arthroscopic excision of an intra-articular osteochondroma is being considered, it is imperative to ensure that the exostosis is benign. Rapid bursal expansion around an osteochondroma can be indicative of a secondary malignant transformation.[6] Computed tomography and MRI have proved useful in making the distinction.[9,10] If doubt remains after radiographic examination, open en bloc excision remains the safest surgical option.

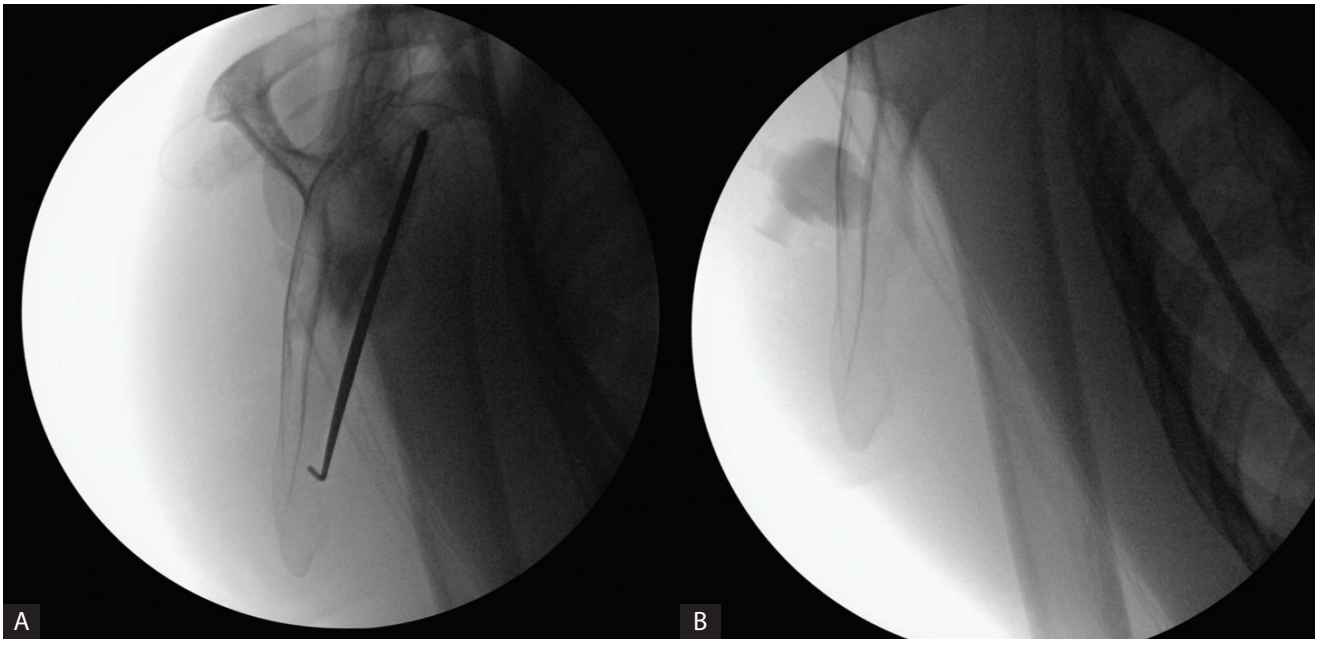

Figure 8. Intraoperative fluoroscopy images show complete resection of scapular mass: (A) arthroscopic probe showing where resection was done and (B) zoomed-in view without probe.

Authors' Disclosure Statement

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

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