Superomedial angle osteochondroma of the scapula as a cause of snapping scapula

Suresh SS

Abstract

Osteochondroma is a benign tumour of bone located mainly in the metaphysis of long bones with more than 35% of cases affecting the bones around the knee. They are not uncommon to occur in the scapula. On the ventral surface of the scapula, they can produce various manifestations due to mass effect. Authors report a rare presentation of osteochondroma on the ventral superomedial aspect of the scapula in a 10-year-old girl, successfully managed by open excision. The girl had no evidence of recurrence at the time of 11 month follow-up.

Keywords: Scapula, Osteochondroma, Snapping scapula, Pseudo winging.

Introduction

Osteochondroma is the most common benign tumour of Scapula. A ventral osteochondroma may lead to snapping of the scapula, painful crepitus, pseudo-winging and mass formation due to bursa formation (1-3). The crepitus may be painful and or palpable during scapulo-thoracic movements. Osteochondroma usually occur in the metaphyseal region of long bones (3,4). Many of the scapular osteochondromas may be asymptomatic, however if present on the ventral surface can result in disability. The clinical effect of osteochondroma is related to the size and location of the mass.

There are only few reports of osteochondroma on the superomedial angle of the ventral surface of the Scapula (5-9). Wide, open excision is the treatment of choice; however there are recent reports of arthroscopic excision (3,5). The patient’s parents provided consent for the case to be published.

Case report

A 10 year old right hand dominant school student presented in the Orthopaedic clinic complaining of painful crepitus of the left shoulder. She noticed this audible and palpable grating sensation 3 months prior to her presentation. On this occasion her mother noticed asymmetry of her shoulder and brought her to our clinic. There was no antecedent history of trauma. Other siblings were normal.

She had grating over the left Scapula on passive range of movements. The left scapula was found at a slightly higher level with fullness over the superomedial angle. There was mild winging of the scapula on shoulder abduction. A bony mass was felt over the supero medial angle of the left scapula, which was minimally tender and corresponded to the area from where the crepitus arose (Figure. 1a, 1b).

An antero posterior view of the left shoulder showed a pedunculated mass arising from the supero medial angle of the scapula. Standard Y lateral view of the scapula could not demonstrate the mass clearly as the exostosis was obscured by the head of the Humerus. Hence the projection was modified with...
the arm maximally abducted. The mass was found arising from the ventral aspect of the supero medial aspect of the scapula (Figure 2a, 2b). CT scan showed a mushroom shaped exostosis over the superior angle of scapula (Figure 3a, 3b). A diagnosis of ventral osteochondroma of the superomedial angle of the scapula was made and she was offered surgical excision.

Procedure was performed under general anesthesia and in prone position. The shoulder was rotated internally, thereby lifting the medial border

---

**Figure 1a & 1b.** Clinical photographs showing the “pseudo winging” of the scapula and fullness over the supero medial angle of scapula [white arrow heads].

**Figure 2a.** Antero posterior radiograph showing the mass over the supero medial angle of the scapula [white arrow].

**Figure 2b.** Modified Y scapular view showing the mass [black arrow].
Suresh SS.: Superomedial angle osteochondroma of the scapula as a cause of snapping scapula

**Figure 3a,3b.** 3-D reconstruction of the CT scan showing the mushroom shaped mass.

The approach was dorsally based parallel to the medial border of the scapula. Trapezius muscle was split in line with its fibers. The rhomboideus minor and Levator scapulae muscles were detached with a cuff and the mass was subperiosteally exposed. The mass was excised with the help of a small osteotome (Figure 4). The excised mass measured 5 X 4 X 3 cm. Macroscopically it was a pearly white nodular hard mass with the cut surface revealing spongy bone with lobulated cartilaginous cap measuring 0.6 cm.

Microscopy showed a neoplasm composed of bony trabeculae intervened mostly by fatty tissue and bone marrow. The chondrocytes revealed columnar disposition with minimal pleomorphism. Endochondral ossification was seen in the bony trabeculae apposed to the cartilaginous cap (Figure 5a & 5b).

The arm was immobilized in a sling for 4 weeks.
**Discussion**

Scapula glides over the thoracic wall cushioned by the serratus anterior and subscapularis muscles. Since the superior angle of the scapula is poorly cushioned, an osteochondroma in this location may lead to bursa formation, painful crepitus or winging due to mass effect. When the mass pushes the scapula away during which period only pendulum exercises were permitted. After 4 weeks she was sent for a rehabilitation programme to improve her shoulder range of movements. Her symptoms resolved dramatically in the immediate post operative period and she felt no abnormal movements of the shoulder at 6 weeks follow up. At the time of 11 month follow up her shoulder deformity was significantly reduced (Figures 6a and 6b).
from the thoracic cage, pseudo winging results. Snapping occurs when the normal smooth gliding of the concave portion of the anterior scapula over the convex thorax is disrupted (10,11). Scapulo thoracic crepitus may also be produced by an abnormal shape of the scapula which interferes with scapulo-thoracic motion (11,12). Around 6% of scapulae may show hook-shaped prominence known as “Luschka tubercle” at the superomedial angle (2), which if enlarged may articulate with the thoracic cage producing crepitus.

Causes of snapping scapula syndrome have been classified as due to abnormalities of bone, muscle or bursa involved in the scapulo thoracic motion (9). The crepitus may be painful, audible and or palpable during shoulder movements.

Winged scapula [Scapula alata] is by definition prominence of the medial border of the scapula during scapulo thoracic motion. Swellings which arise from the ventral surface produce painful limitation of shoulder abduction and winging, which has been typically described as “pseudo winging” (1,6,12). An osteochondroma over the ventral surface of the scapula may act as a space occupying lesion and present with grating sensation of the scapula, known as the snapping scapula syndrome or pseudo winging (1,6) Ventral osteochondroma may produce mechanical problems due to mass effects also (11,13,14).

In the report of 3 cases by Danielsson and el-Haddad, winging of the scapula was the reason the children sought medical advise (1). Out of the 5 cases of ventral osteochondroma reported by Frost et al, one case presented with pseudo-winging and another had snapping scapula on presentation (15).

Osteochondroma is the most common neoplasm of the scapula with an incidence of around 3-8% (5,12,15,16). Osteochondroma are usually asymptomatic but may become painful with fracture of the bony stalk, nerve impingement syndromes, malignant transformation and mass effects. Clinical manifestations depend on the size and location of the mass. The commonest site of osteochondroma of the scapula is over the dorsal surface and is of cosmetic concern. However once it appears over the ventral surface it interferes with normal scapulo-thoracic rhythm due to mass effects. There are only few reports of osteochondroma of the superior angle of the scapula (5-9).

The mass over the ventral aspect of the scapula is usually picked up by the Y view of the scapula, but lesions over the superomedial angle may be obscured by the head and proximal humerus (2-10). In our case in the Y scapular view the head of humerus was obscuring the view of the mass, hence we maximally abducted the arm, while positioning for the radiographs. A cineradiography may also be helpful in better visualisation of the mass (2). A CT scan is useful in the pre operative planning and to define the pattern of mineralisation.

In osteochondroma on the ventral surface of the scapula, bursa formation is a reported complication and has been named ‘exostosis bursata’ by Orlow as early as 1891 (3,11,17). This is thought to be due to repeated mechanical stress from active movement of the shoulder between the osteochondroma and the ribs. Rapid enlargement of the bursa may cause confusion in the diagnosis as often this is misinterpreted as malignant transformation. If the ventral mass is left alone, a reactive bursitis may form due to constant friction during arm movements (3,14,16). An exostosis over the ventral surface of the scapula has been reported to have locked with the chest wall preventing scapulo-thoracic motion (18).

In solitary osteochondroma there is a risk of malignant transformation in 1-2 % of cases, which increases to 5-25% in multiple hereditary exostosis (14,17). A cartilage cap of over 2 cm generally indicates malignant transformation (1,17).

Open surgical excision is a safe and definitive procedure. However proponents of arthroscopic excision claim that there is slow functional recovery and cosmetic disadvantage due to the larger incision (4). Many authors have advocated arthroscopic excision for ventral mass (3-5). In spite of many recent reports on the advantages of arthroscopic excision, a more appropriate resection of the mass can be performed through an open approach (2).
References


