Case report

The unusual osteochondroma: A case of snapping scapula syndrome and review of the literature


Department of Orthopaedic Surgery, The University Hospital of the West Indies, Mona Campus, Kingston 7, Jamaica

A R T I C L E   I N F O

Article history:
Received 14 October 2016
Accepted 13 January 2017

Keywords:
Snapping scapula
Osteochondroma
Scapula

A B S T R A C T

Snapping scapula syndrome is a rare condition characterized by crepitus of the scapula on motion of the ipsilateral upper extremity. It may be quite painful and disabling. The majority of cases are due to bursal and muscular disorders. Snapping scapula syndrome secondary to an underlying osteochondroma is an even more infrequent phenomenon. The case presented highlights the unusual postpubertal growth of an osteochondroma of the scapula that progressed to develop a snapping scapular syndrome. Review of the literature revealed less than fifty reported cases of this phenomenon secondary to an underlying osteochondroma.

© 2017 Elsevier Masson SAS. All rights reserved.

1. Introduction

An osteochondroma represents an osteocartilagenous aberrant overgrowth of normal epiphyseal growth plates [1]. Common areas of affliction include the distal femur, proximal tibia and proximal humerus, accounting for over ninety percent of osteochondromata [1]. It affects the scapula in only 3–4.6% of cases [2]. When present on the scapula the diagnosis of osteochondroma is not always easily made, as a palpable mass may not be appreciated depending on its location. Ventrally located lesions of the scapula may present with the snapping scapula syndrome and requires a level of awareness and clinical aptitude to make the diagnosis.

Snapping scapula syndrome is a rare condition characterized by an audible, palpable crepitus of the scapula on motion of the ipsilateral upper extremity [3]. It may be quite painful and disabling. The underlying etiology may be due to bursal, muscular or bony pathology interfering with the normal scapulothoracic range of motion. The majority of cases are due to bursal and muscular disorders. When due to a bony pathology, osteochondroma of the scapula represents the most common etiology [3]. In fact, Girard et al. considered the presentation of snapping scapular syndrome with associated pseudo-winging of the scapula to be almost pathognomonic [4].

A case of osteochondroma of the scapula that progressed to develop a snapping scapular syndrome is presented here highlighting its unusual presentation and continued growth after skeletal maturity despite no malignant degeneration. Review of the literature found less than fifty reported cases with a 1.4 M:F ratio (Table 1).

2. Case report

A twenty four year old male, not known to have any chronic medical illnesses, presented with pain and deformity to his left scapula. He was cognizant of the mass for three years prior to presentation but did not seek medical attention. It was reported that the mass was increasing in size for the past four months with associated pain with protraction of the scapula and a snapping sound. There were no constitutional symptoms reported.

Physical examination revealed a healthy looking male with a 4 × 4 centimeter hard mass in the axilla in continuity with the axillary border of the scapula. There was no attachment to the overlying skin. Regional nodes were unremarkable. There were no neurovascular deficits to the ipsilateral upper extremity. Plain radiographs of the left shoulder revealed an exophytic mass on the mid axillary border of the scapula (Fig. 1). Magnetic resonant imaging (MRI) revealed a 9.7 × 7.4 × 5.3 cm mass arising from the scapula with a cartilaginous cap of 0.3 cm in maximal thickness (Fig. 2). The base of the mass was measured to be 1.2 × 0.97 cm and showed cortico-medullary continuity (Fig. 2). A diagnosis of scapula osteochondroma was made based on clinical and radiological findings. A decision was made to perform an excisional biopsy.

Under general anesthesia, the patient was positioned in the right lateral decubitus position and a longitudinal incision on the dorsal trunk in line with base of the lesion was made (Fig. 3). Sharp and blunt dissection was done between infraspinatus and the
Table 1
Case reports of snapping scapula syndrome secondary to an osteochondroma since 1900.

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Journal</th>
<th>Year</th>
<th>Number of patients in study</th>
<th>Number of patients with osteochondroma with snapping</th>
<th>Age</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicholas A. et al.</td>
<td>Pseudo-winging of the scapula caused by scapular osteochondroma: review of literature and case report</td>
<td>Hand</td>
<td>2015</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>M</td>
</tr>
<tr>
<td>Abat F. et al.</td>
<td>The snapping scapula as a symptom of a tumor in the scapulothoracic region</td>
<td>Rev Esp Cir Ortop Traumatol</td>
<td>2013</td>
<td>33</td>
<td>6</td>
<td>11–28 (only age range given)</td>
<td>4 M; 2 F</td>
</tr>
<tr>
<td>Kwon O.S. and Kelly J.I.</td>
<td>Delayed presentation of osteochondroma on the ventral surface of the scapula</td>
<td>Int J Shoulder Surg</td>
<td>2012</td>
<td>1</td>
<td>1</td>
<td>56</td>
<td>F</td>
</tr>
<tr>
<td>Dharmadhikari R.P.</td>
<td>Painful snapping and pseudo-winging scapula due to a large scapular osteochondroma</td>
<td>Orthop Case Rep</td>
<td>2012</td>
<td>1</td>
<td>1</td>
<td>34</td>
<td>F</td>
</tr>
<tr>
<td>Ermiş M.N. et al.</td>
<td>Snapping scapula syndrome caused by subscapular osteochondroma</td>
<td>Joint Disease and Rel Surg</td>
<td>2012</td>
<td>30</td>
<td>30 patients operated on but only 15 included in study</td>
<td>6–29 (only age range given)</td>
<td>9 M; 6 F</td>
</tr>
<tr>
<td>Alderink K. and Wolf B.</td>
<td>Scapular osteochondroma treated with arthroscopic excision using prone positioning, 2010; 39(2);E11–E14</td>
<td>Am J Orthop</td>
<td>2010</td>
<td>1</td>
<td>1</td>
<td>Mid 20s (exact age not specified)</td>
<td>F</td>
</tr>
<tr>
<td>Okada K. et al.</td>
<td>Large bursa formation associated with osteochondroma of the scapula: a case report and review of the literature</td>
<td>Jap J Clin Oncol</td>
<td>2011</td>
<td>1</td>
<td>1</td>
<td>33</td>
<td>M</td>
</tr>
<tr>
<td>Fukunaga S., Futani H. and Yoshiya S.</td>
<td>Minimally-assisted resection of scapular osteochondroma causing snapping scapula syndrome</td>
<td>World J Surg Oncol</td>
<td>2007</td>
<td>1</td>
<td>1</td>
<td>41</td>
<td>M</td>
</tr>
<tr>
<td>Reit R.P. and Glabbeek E.V.</td>
<td>Arthroscopic resection of a symptomatic snapping subscapular osteochondroma</td>
<td>Acta Orthop Belg</td>
<td>2007</td>
<td>1</td>
<td>1</td>
<td>28</td>
<td>F</td>
</tr>
<tr>
<td>Esenkaya I.</td>
<td>Pseudo-winging of the scapula due to subscapular osteochondroma</td>
<td>Orthopedics</td>
<td>2005</td>
<td>1</td>
<td>1</td>
<td>25</td>
<td>M</td>
</tr>
<tr>
<td>Carlson H.L., Haig A.J. and Stewart D.C.</td>
<td>Snapping scapula syndrome: three case reports and an analysis of the literature</td>
<td>Arch Phys Med Rehabil</td>
<td>1997</td>
<td>3</td>
<td>3</td>
<td>28, 39, 46</td>
<td>2 M; F</td>
</tr>
<tr>
<td>Strizak A.M. and Cowen M.H.</td>
<td>The snapping scapula syndrome, a case report</td>
<td>J Bone Joint Surg Am</td>
<td>1982</td>
<td>1</td>
<td>1</td>
<td>29</td>
<td>F</td>
</tr>
<tr>
<td>Dobelle M.</td>
<td>An unusual location of an osteochondroma: report of a case</td>
<td>J Bone Joint Surg Am</td>
<td>1939</td>
<td>1</td>
<td>1</td>
<td>32</td>
<td>F</td>
</tr>
</tbody>
</table>

3. Discussion

Osteochondromata are the most common benign bone tumors with a predilection for the metaphyseal region of long bones [5]. However only 3–4.6% of all reported cases occur in the scapula as per the index case [6]. Despite this, it is the most common tumor of the scapula [7–9]. When it occurs in the scapula the most common location is the ventral area of the bone unlike the presented case that originated from the axillary border albeit with projection to attachments of teres major and minor muscles. This was followed by careful subperiosteal dissection to expose the base of the mass on the axillary border of the scapula. En bloc excision of the mass was performed utilizing osteotomes. Hemostasis was achieved and the soft tissue closed in layers.

The postoperative period was uneventful. Histology confirmed the diagnosis of osteochondroma and revealed no features of sarcomatous degeneration in the cartilaginous cap (Fig. 4).
Fig. 1. Plain radiographs of the left shoulder (transcapsular and anterior-posterior views) showing osteochondroma.

Fig. 2. MRI axial and sagittal views of left shoulder showing dimensions of cartilaginous cap and cortico-medullary continuity.

Fig. 3. Intraoperative clinical photograph showing osteochondroma.

Fig. 4. Postoperative plain radiographs of the left shoulder.

the ventral surface. Peak incidence is within the second decade of life, with a slight male predilection 1.5:1 (M:F) [5].

The lesion is often painless and patients usually present for cosmetic reasons including “pseudo-winging” of the scapula [10–14]. Mechanical symptoms and complications of the lesion including fractures are other presenting features of this condition. Mechanical symptoms are usually present on scapulothoracic movements and include painful or painless crepitus, pain secondary to the
formation of painful reactive bursitis and the snapping scapular syndrome as in this case [15].

Snapping scapular syndrome is a rare syndrome characterized by an audible, palpable crepitus of the scapula. The first description of this condition was by Boinet in 1867 [16]. In 1904, Maulaire stratified the produced clinical sounds into “froissement, frottement or craquement” i.e. a rustling, rubbing or loud cracking sound respectively [17]. In our case the patient’s clinical sound was akin to “frottement”. Snapping scapular syndrome is usually seen in young patients who perform repetitive overhead or throwing activities. The disorder is often overlooked but can be a cause of chronic shoulder pain and morbidity [18].

The syndrome arises due to disruption of the normal scapulothoracic mechanics resulting in grating of the scapular pathology on the underlying ribs, the acoustics of which, is amplified by the underlying air filled thoracic cavity [19]. The underlying cause maybe due to muscular, bursal and bony abnormalities. Muscular and bursal abnormalities account for majority of the causes. When due to a bony abnormality, osteochondroma of the scapula and ribs account for the majority of causes. Carlson et al. [3] from 1867 to 1989 found osteochondroma of the scapula to be responsible for sixteen percent of the overall cases of snapping scapula syndrome. Other osseous causes include abnormally large tubercles of lushka, malunited ribs and enchondromata [20]. In most instances, the bony culprit is located on the medial border of the scapula where it is less cushioned [21]. In the presented case however the bony culprit was atypically located on the lateral border. One explanation for this is the development of a reactive bursa due to frictional forces between the mass and the underlying muscle [22,23].

Regardless of the location, the natural history of osteochondroma is continuous growth until skeletal maturity is reached. Once skeletal maturity is attained there is usually no further clinical increase in size. Continued growth after skeletal maturity as in the presented case raises the suspicion of malignant transformation. There have however been, case reports that have shown continued growth post skeletal maturity with no malignant transformation [24–26]. Lange et al. also demonstrated evidence of active growth after skeletal maturity in their study [27]. Malignant transformation is however the most sinister reason for continued growth after physeal closure and must be borne in mind. The risk of malignant transformation in the literature is reported to be 1–2% of all osteochondroma lesions and this increases in certain cases as in multiple osteochondromata lesions, which may or may not be associated with hereditary conditions. In our case, the risk due to cartilage cap assessment on magnetic resonance imaging was considered low risk with a thickness of less than one centimeter. Therefore, the removal of the lesion was mainly for mechanical reasons and secondarily for pathologic assessment.

4. Conclusion

Osteochondroma of the scapula remains a rare entity. Location in the scapulothoracic interval may present with the snapping scapula syndrome, once the lesion has obtained sufficient mass to alter scapulothoracic mechanics. The natural history is for continuous growth until skeletal maturation. There have been reports of non-sarcomatous growth beyond skeletal maturity and the prevalence maybe more frequent than previously thought. However, malignant transformation remains the most sinister reason for continued growth and has to be ruled out.

Disclosure of interest

The authors declare that they have no competing interest.

References

8:544–5.
[27] Lange RH, Lange TA, Rao BK. Correlative radiographic, scintigraphic, and histo