



## Rotator cuff impingement due to enchondroma of the acromion

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**We report the case of a patient with a long standing clinical history of subacromial impingement, in which plain radiographs and CT-scan revealed a well-circumscribed lucent lesion expanding the undersurface of the acromion. MRI showed the subacromial fat to be completely obliterated and the infraspinatus tendon deformed due to compression by a mass localised at the acromion. The acromial lesion was curetted, and histopathologic analysis was consistent with the diagnosis of enchondroma. Tumours located in the coracoacromial arch have been very rarely reported as a cause of subacromial impingement. To the best of our knowledge, this is the first description of subacromial impingement secondary to acromial enchondroma.**

**Key words :** enchondroma ; acromion ; rotator cuff impingement.

without previous trauma. On examination, pain increased with abduction, external rotation, forward elevation over 90°, and in the final degrees of adduction. Palpation of the acromion was painful at its posterolateral edge, and the impingement signs were clearly positive. There was full range of motion and the strength was normal when compared to the opposite shoulder.

Plain radiographs revealed a well-circumscribed lucent lesion with sclerotic bony margins expanding the undersurface of the acromion at its posterolateral edge (fig 1). Computed tomography (CT) scans confirmed these findings, and demonstrated that the lesion was hypodense, suggesting a cystic appearance (fig 2). No internal ossifications could be appreciated. Magnetic resonance imaging (MRI) showed a well-delimited mass with homogeneous hypointense content on spin-echo T1-weighted images, which was hyperintense on

### INTRODUCTION

Rotator cuff impingement symptoms may arise from intrinsic shoulder lesions related to tendon degeneration or from extrinsic factors involving the coracoacromial arch (2). The following case describes an exceptional cause of subacromial impingement, as it resulted from an enchondroma arising from the undersurface of the acromion.

### CASE REPORT

A 39-year-old man presented with a 7-month history of mechanical pain in his right shoulder

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**Fig. 1.** — (A) Anteroposterior and (B) axillary radiographs showing a well-circumscribed osteolytic lesion with sclerotic borders located at the posterolateral acromion and extending inferiorly to the subacromial space.

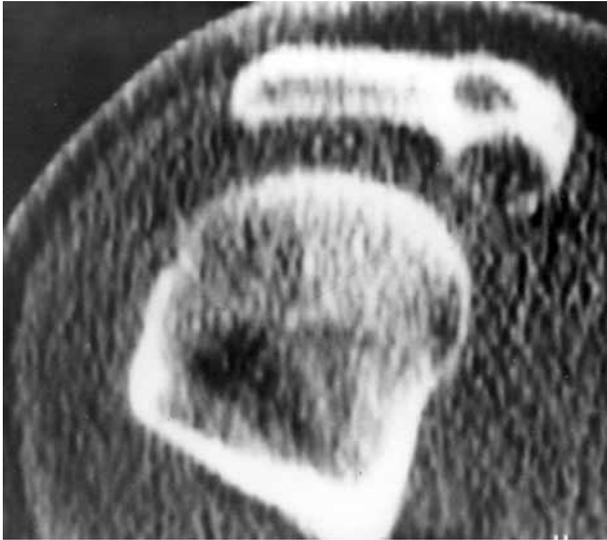
T2-weighted gradient-echo images. The subacromial fat was completely obliterated, and the rotator cuff tendons had normal appearance and intensity, but the acromial surface of the infraspinatus was deformed due to compression (fig 3). The patient was diagnosed of shoulder impingement secondary to extrinsic compression of the rotator cuff by the lesion localised at the acromion, and surgery was scheduled to relieve the infraspinatus tendon excursion by excising the mass.

At surgery, the tumour was approached through a posterior incision. Once the posterolateral fibers of the deltoid were detached, a well-defined mass measuring 3 cm in diameter was easily identified. The lesion expanded the inferior acromial cortex and compressed the infraspinatus tendon, interfering with shoulder abduction and rotation. A small window was performed at the posterior cortex, and intracapsular excision by curettage of the tumour was undertaken. Because the upper and lateral

acromial cortex was well preserved, bone grafting was deemed unnecessary. Histopathologic examination of the material revealed disorganised hyaline cartilage without signs of malignancy, consistent with a diagnosis of enchondroma (fig 4). At five years the patient is pain free and has full passive and active range of motion. Impingement signs are negative.

## DISCUSSION

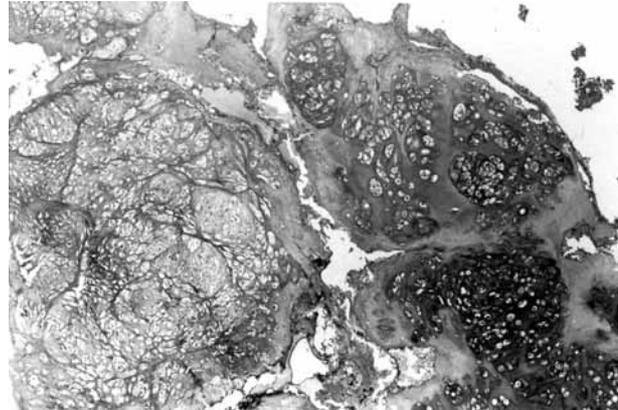
Primary scapular tumours are uncommon, and histopathologically they usually have a cartilaginous origin (10). Osteochondroma is by far the most common primary neoplasm of the scapula, while chondrosarcoma is the most common malignant type. Scapular tumours normally arise in the scapular blade, and very rarely are situated in the acromion-glenoid complex, causing subacromial impingement (1, 5). Craig first described impinge-



**Fig. 2.** — CT-scan confirmed the cystic appearance of the lesion.



**Fig. 3.** — Spin-echo T1-weighted sagittal MRI of the shoulder. The tumour extended inferiorly from the acromion, and occupied the posterior area of the subacromial space, obliterating the fat and deforming the infraspinatus tendon.



**Fig. 4.** — Photomicrograph of the material obtained from surgery demonstrating a cartilaginous hyaline tissue with low cell ratio. The cells had only single nuclei in enlarged lacunae without atypia. A few eosinophilic collagenous bands streak through the tissue. Hematoxylin and eosin, X100.

ment of the rotator cuff due to tendon compression by multiple exostosis localised in the acromion (3). Subsequently, a few reports have pointed out the possibility of subacromial impingement caused by tumours located in the distal clavicle (8), coracoid process (7), or subacromial space (9). However, there are no reports about enchondroma causing subacromial impingement.

Regarding imaging studies, radiographs and CT scans showed the location of the tumour and its benign, cystic appearance, but MRI was especially helpful because it confirmed these findings and demonstrated healthy rotator cuff tendons, with compression of the infraspinatus tendon by the tumour.

As most benign lesions, enchondromas are usually asymptomatic and require no treatment unless there is a risk of fracture or soft tissue compression (6). When they occur adjacent to a joint that can be symptomatic for other reasons, the clinical assessment of bone pain related to enchondroma may be difficult. Although malignant degeneration to a chondrosarcoma is exceptional in solitary enchondromas, intrinsic bone pain may be suggestive of low-grade malignancy, and indicates tumour resection (6). Surgical treatment of enchondroma consists of curettage and bone grafting when necessary (6). Kumar *et al* (4) reported in 1999 the possibility of excising endoscopically scapular

tumours. Due to its location at the inferior acromion, the tumour here described could have been easily approached arthroscopically. However, the possibility of low-grade malignancy could not be fully ruled out. Thus, we performed open surgery in order to enable histologic examination of the whole tumour and to avoid the potential risk of tumour dissemination around the subacromial space.

### REFERENCES

1. **Bigliani LU, Levine WN.** Subacromial impingement syndrome. *J Bone Joint Surg* 1997 ; 79-A : 1854-1868.
2. **Blacksin MF, Benevenia J.** Neoplasms of the scapula. *Am J Roengenol* 2000 ; 174 : 1729-1735.
3. **Craig EV.** Subacromial impingement syndrome in hereditary multiple exostoses. *Clin Orthop* 1986 ; 209 : 182-184.
4. **Kumar N, Ramakrishnan V, Johnson GV, Southern S.** Endoscopically assisted excision of scapular osteochondroma. *Acta Orthop Scand* 1999 ; 70 : 394-396.
5. **López Martín N, Calvo E, Alvarez L.** Tumores de escápula de estirpe cartilaginosa. *Rev Ortop Traumatol* 2002 ; 46 : 259-262.
6. **Marco RA, Gitelis S, Brebacha GT, Healy JH.** Cartilage tumours : evaluation and treatment. *J Am Acad Orthop Surg* 2000 ; 8 : 292-304.
7. **Ogose A, Sim FH, O'Connor MI, Unni KK.** Bone tumours of the coracoid process of the scapula. *Clin Orthop* 1999 ; 358 : 205-214.
8. **Reichmister J, Reeder JD, Gold DL.** Osteochondroma of the distal clavicle : An unusual cause of rotator cuff impingement. *Am J Orthop* 2000 ; 29 : 807-809.
9. **Relwani J, Ogufere W, Orakwe S.** Subacromial lipoma causing impingement syndrome of the shoulder : A case report. *J Shoulder Elbow Surg* 2003 ; 12 : 202-203.
10. **Samilson RL, Morris JM, Thompson RW.** Tumours of the scapula. *Clin Orthop* 1968 ; 58 : 105-115.