CASE REPORT

Osteoblastoma of the coracoid process: an unusual location

Justin Arockiaraj,¹ Gopisankar Balaji G,² Bandikala Vidyasagar,¹ Anand Ashok¹¹Department of Orthopaedics, Christian Medical College, Vellore, Tamil Nadu, India²Department of Orthopaedics, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India**Correspondence to**

Dr Gopisankar Balaji G, drgopi9596@gmail.com

Accepted 9 September 2015

SUMMARY

Bone tumours arising from the coracoid process of the scapula are very rare. We present a case of a 19-year-old man with left shoulder pain for 1 year, with associated infraclavicular swelling for 8 months. Examination revealed a tender, bony, hard swelling measuring 3×4 cm. Imaging revealed an expansile osteolytic lesion arising from the coracoid process with loss of corticomedullary differentiation. MRI showed altered signal in the adjacent soft tissues. The patient underwent en bloc resection of the lesion. Histology was suggestive of osteoblastoma. At the end of 2 years follow-up, the patient had no pain or recurrence of the lesion. We present this case for its rare location and have briefly discussed the difficulties in diagnosis of this condition.

BACKGROUND

Osteoblastomas are osteoid producing benign bone tumours. Their most common location is on the posterior elements of the spine (40%).¹ Other sites are the femur, skull, small bones of hands and feet, humerus, tibia, fibula and pelvis.^{2–3} Coracoid process of the scapula is an unusual location for any bone tumour. We present a rare case of benign osteoblastoma of the coracoid process in a young adult; the case was successfully managed surgically.

CASE PRESENTATION

A 19-year-old man presented to our outpatient department with left shoulder pain for 1 year, with associated gradually progressive swelling in the subclavicular region for 8 months. There was no history of preceding trauma. Examination revealed fullness in the infraclavicular region on the left side and there was a bony, hard, tender, immobile mass measuring 3×4 cm, with irregular margins directly medial to the left shoulder joint. Shoulder range of motion was terminally restricted because of pain; there were no distal neurovascular deficits, nor was there cervical or axillary lymphadenopathy.

INVESTIGATIONS

Routine blood investigations were not significant. Plain radiographs of the left shoulder revealed a 1.5×2 cm expansile osteolytic lesion in the coracoid process of the left scapula (figure 1). Bone scan with technetium-99m methylene diphosphonate demonstrated focally well-defined increased tracer activity in the coracoid process of the left scapula (figure 2). CT of the left shoulder showed expansion and sclerosis of the coracoid process with loss of corticomedullary differentiation. There was a

rounded lucent area measuring approximately 9×8.8 mm with a speck of central hyperdensity seen at the centre measuring 1.8 mm, suggestive of a nidus, with surrounding sclerosis (figure 3).

MRI scan revealed enlargement of the coracoid process, with heterogeneous hyperintense signal in T2 images and hypointense signal in T1 extending up to the base of the coracoid process with associated extension into the glenoid process of the scapula. The mass measured 4×3.4 cm with cortical expansion and irregularity, and loss of the corticomedullary differentiation. There was significant surrounding soft tissue oedema noted in the form of T2 hyperintensity (figure 4).

DIFFERENTIAL DIAGNOSIS

Clinicoradiologically, the differentials were tuberculosis, osteomyelitis and benign bone tumour.

TREATMENT

We planned for excision biopsy of the lesion. The procedure was performed using a deltopectoral approach. After delineating the cephalic vein, the plane of dissection was between the deltoid and pectoralis major. The subscapularis muscle was incised linearly leaving a 1 cm cuff at the attachment at lesser tuberosity. The musculocutaneous nerve was identified and protected. The base of the coracoid process along with the mass was osteotomised after dissecting the soft tissue attachment with the coracoid. The entire mass was removed en

Figure 1 Plain radiograph of the left shoulder showing a large expansile lesion arising from the coracoid process of the left scapula.

CrossMark

To cite: Arockiaraj J, Balaji G G, Vidyasagar B, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-212070

Figure 2 Bone scan demonstrating intense tracer uptake in the coracoid process of the left scapula.

bloc. The conjoint tendon and the pectoralis minor were attached to the nearby soft tissues. The wound was closed in layers. Postoperatively, patient did not have any deficits; he was advised regular shoulder range of motion exercises. The excised mass was sent for histopathology. Morphologically, the lesion was seen as an ovoid bony mass measuring $3.5 \times 3 \times 2$ cm, the cut section of which showed a central congested nidus 2.1 cm in diameter. Histologically, a sharply delineated nidus of new osteoid and bone formation rimmed by plump osteoblasts and a few osteoclasts with fibrovascular stroma (figure 5) were seen. Sclerotic bony trabeculae were also seen surrounding the nidus, with intervening fibrovascular tissue and dilated blood vessels suggestive of osteoblastoma (figure 6).

Figure 3 (A and B) Axial CT images of left shoulder joint at the level of the coracoid process showing expansion and sclerosis of the coracoid process, with a 9×8.8 mm rounded lucent area (arrow in B) with a 1.8 mm central hyperdense speck (arrow in A), suggesting a nidus.

Figure 4 (A) Axial and (B) oblique sagittal T2 fat suppressed and (C) T1-weighted axial MRI of left shoulder at the level of the coracoid process showing enlargement of the coracoid process with heterogeneous T2 hyperintensity and T1 hypointensity (white arrows) extending up to its base and an adjacent glenoid process of the scapula. Note the significant surrounding soft tissue oedema in the form of T2 hyperintensity (black arrows).

OUTCOME AND FOLLOW-UP

The patient was regularly monitored for shoulder range of movements and recurrence of the tumour. At 24 months follow-up, he did not have pain or recurrence of the swelling.

DISCUSSION

Osteoblastomas are distinct benign bone tumours defined in 1956 by Jaffe⁴ and Lichtenstein.⁵ They account for 3.5% of all benign bone tumours and <1% of all bone tumours.⁶ They are usually seen in adults in the second decade of life. They are osteoid producing tumours resembling osteoid osteoma, and are usually over 1.5 cm in size.⁷ Osteoblastomas have a varied clinical presentation; they may cause a prolonged dull aching pain that does not respond to salicylates. They are aggressive and the lesions increase gradually. However, osteoid osteomas are not aggressive and their growth potential is limited; they seldom exceed 1 cm in diameter. Plain radiographs usually reveal an expansile, less sclerotic lesion with a distinct, thick shell of reactive bone. Histopathologically, they may form a nidus with large vascular spaces, with plump osteoblasts and large giant cells.

Osteoblastomas predominantly appear in the spine (40%), long bones (18%) such as femur, tibia and humerus, small bones of the hands and feet, and flat bones such as the scapula and ribs.¹⁻³ The coracoid process of the scapula is an unusual site for any bone tumour. Very few series have been reported on tumours of the coracoid. Mavrogenis *et al*⁸ recently reported on an osteoblastoma arising from the coracoid process of the

Figure 5 Photomicrograph of surgical specimen showing osteoblastic and osteoclastic rimming of bony trabeculae.

Figure 6 Photomicrograph revealing sclerotic bone trabeculae surrounding fibrovascular stroma and blood vessels.

scapula; that is the only report in the English literature, to the best of our knowledge.

Other tumours arising from the coracoid process of the scapula that have been reported in the literature are classical chondrosarcoma, dedifferentiated chondrosarcoma, osteoid osteoma, osteosarcoma, plasmacytoma, lymphoma, giant cell tumour, aneurysmal bone cyst and metastasis.⁹

Osteoblastomas are well-contained lesions, but sometimes extend into the surrounding soft tissue. Malignant lesions should be excluded when soft tissue extension is seen, particularly in osteoblastomas such as osteosarcoma. Histopathologically, osteoblastomas have to be differentiated from osteoid osteomas and osteosarcomas. Immunohistochemistry analysis of cyclooxygenase 2 helps in differentiating osteoblastomas from osteosarcomas.⁶ Sometimes, osteoblastomas behave aggressively and mimic malignant lesions. Dorfman and Weiss¹⁰ termed these osteoblastomas as 'aggressive osteoblastomas'; they represent a borderline between benign osteoblastomas and osteosarcomas. These aggressive osteoblastomas tend to recur but do not metastasise and, microscopically, they demonstrate characteristic epithelioid osteoblasts. It is important for pathologists to correlate the clinical and radiological features before arriving at a final diagnosis.

Surgery is the mainstay management of osteoblastomas. Intralesional curettage is the ideal treatment. However in expendable bones such as the coracoid, wide excision of the tumour is the choice of treatment. Recurrence is 10–15% following incomplete resection. Radiotherapy plays a role only in case of recurrence or incomplete resection. The role of

percutaneous CT-guided radiofrequency ablation is debated and yet to be proven in the treatment of osteoblastoma.

Bone tumours of the coracoid process of the scapula can easily be overlooked and misdiagnosed as a non-tumorous condition. A few of the differentials that present with similar anterior shoulder pain are periarthritis shoulder, rotator cuff disease and frozen shoulder. It is also difficult, using plain radiography, to interpret lesions arising from the coracoid process. Rotational and axillary lateral views should be made available in cases presenting with persistent shoulder pain. Additional imaging including CT scan and MRI should also be considered when the patient does not respond to conservative therapy, to rule out tumour and tumour-like lesions.

Learning points

- ▶ The coracoid process of the scapula is a very rare site of osteoblastoma.
- ▶ Clinicians should have a high index of suspicion for this rare condition when persistent anterior shoulder pain is present.
- ▶ Adequate imaging helps in early diagnosis and treatment.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Marsh BW, Bonfiglio M, Brady LP, *et al.* Benign osteoblastoma: range of manifestations. *J Bone Joint Surg Am* 1975;57:1–9.
- 2 Fechner RE, Mills SE. Tumors of the bones and joints. In: Rosai J, Sobin LH, eds. *Atlas of tumor pathology*. Third series, fasc. 8. Washington DC: Armed Forces Institute of Pathology, 1993;129–44.
- 3 Bettelli G, Capanna R, van Horn JR, *et al.* Osteoid osteoma and osteoblastoma of the pelvis. *Clin Orthop Relat Res* 1989;247:261–71.
- 4 Jaffe HL. Benign osteoblastoma. *Bull Hosp Joint Dis* 1956;17:141–51.
- 5 Lichtenstein L. Benign osteoblastoma; a category of osteoid-and bone-forming tumors other than classical osteoid osteoma, which may be mistaken for giant-cell tumor or osteogenic sarcoma. *Cancer* 1956;9:1044–52.
- 6 Saglik Y, Atalar H, Yildiz Y, *et al.* Surgical treatment of osteoblastoma: a report of 20 cases. *Acta Orthop Belg* 2007;73:747–53.
- 7 McLeod RA, Dahlind DC, Beabout JW. The spectrum of osteoblastoma. *Am J Roentgenol* 1976;126:321–35.
- 8 Mavrogenis AF, Valencia JD, Romagnoli C, *et al.* Tumors of the coracoid process: clinical evaluation of twenty-one patients. *J Shoulder Elbow Surg* 2012;21:1508–15.
- 9 Ogose A, Sim FH, O'Connor MI, *et al.* Bone tumors of the coracoid process of the scapula. *Clin Orthop Relat Res* 1999; 358:205–14.
- 10 Dorfman HD, Weiss SW. Borderline osteoblastic tumors: problems in the differential diagnosis of aggressive osteoblastoma and low-grade osteosarcoma. *Semin Diagn Pathol* 1984;1:215–34.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow