JBR–BTR, 2015, 98: 45-47.

OSTEOCHONDROMA OF THE PROXIMAL HUMERUS WITH FRICTIONAL BURSITIS AND SECONDARY SYNOVIAL OSTEOCHONDROMATOSIS

J. De Groote[1,2], B. Geerts[1,2], K. Mermuys[1], K. Verstraete[1,2]

We report a case of multiple hereditary exostosis in a 33-year old patient with clinical symptoms of pain and impression of a growing mass of the left shoulder alerting potential risk of malignant transformation of an osteochondroma. Imaging studies illustrated perilesional bursitis surrounding an osteochondroma of the proximal humerus. Malignant transformation was excluded with MRI. Fragments of the osteochondroma were dislocated in the inflammatory synovial bursa illustrating a case of secondary synovial osteochondromatosis.

Key-word: Osteochondroma.

Case report

A 33-year-old man was referred by his general practitioner to the department of orthopaedic surgery with persisting pain and impression of a growing mass of the left shoulder. The patient had a medical history of osteochondromas of the knee and pelvis in the context of Multiple Hereditary Exostosis (MHE). One lesion has previously been resected because of high risk for malignant transformation. There was no recent history of trauma.

Clinical inspection of the left shoulder girdle illustrated a soft tissue swelling medial from the proximal humeral diaphysis. Clinical examination showed a general painful shoulder mobility and minimal loss of range of motion with active endo- and exorotation.

Conventional imaging of the left shoulder showed a well defined bony lesion extending from the proximal humeral metaphysis to diaphysis with a pattern of chondroid matrix mineralisation suggesting an osteochondroma. Accessory bone fragments were located in the surrounding axillary soft tissues (Fig. 1). Further assessment of the lesion was done by MRI (fig. 2) Illustrating an osteochondroma surrounded by a thin walled fluid collection posteromedial. Cystic wall and surrounding soft tissue enhancement post contrast injection suggested the diagnosis of frictional bursitis. The bone fragments illustrated on radiography were situated in this bursa and showed a similar pattern of chondroid mineralisation suggesting these are primary originating from the osteochondroma.

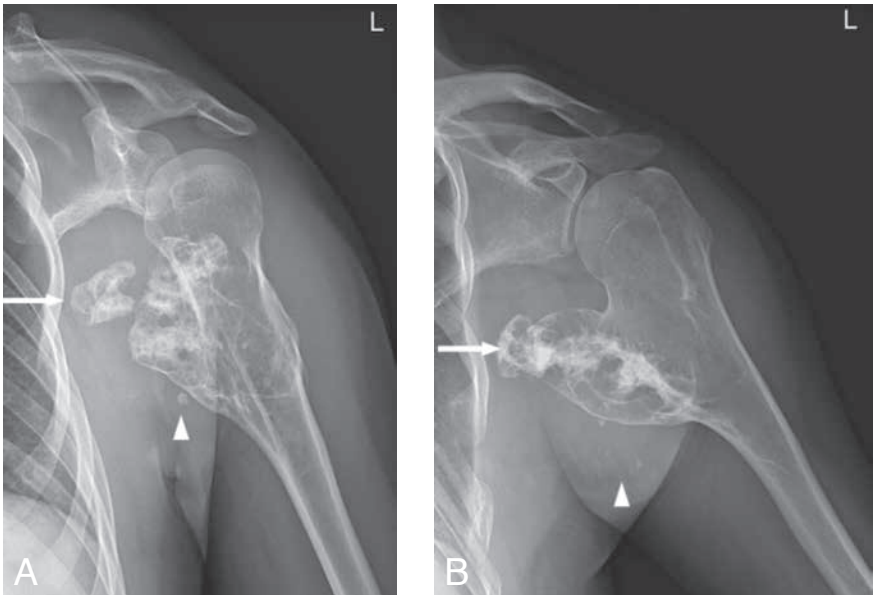

Fig. 1. — Conventional radiography of the left shoulder. A: AP view in neutral position: osteochondroma of the medial side of the proximal humerus. The lesion shows a pattern of rings and arcs to confluent calcifications. An accessory bone fragment (arrow) projecting over the axillary soft tissues associated with a surrounding soft tissue component. A smaller isolated loose fragment is located close to the inferomedial border of the primary lesion (arrowhead). B: AP view in exorotation: superposition of the isolated bone fragment and the superomedial border of the osteochondroma (arrow). Small focal hyperdensities are located inferior to the lesion associated by a surrounding soft tissue mass (arrowhead).

The diagnosis was made of 'exostosis bursata': frictional bursitis secondary to an osteochondroma. Osteochondral fragments of different shape and size became separated from the primary osteochondral lesion and migrated into the bursa resulting in a secondary form of synovial osteochondromatosis.

The patient was successfully treated with bursectomy and resection of the osteochondroma with relief of his discomforts.

Discussion

An osteochondroma is defined as a hyaline cartilage capped lesion of cortical and medullary bone arising on the external surface of a primary or parental bone. Continuity of lesional cortex and medullary canal with the underlying bone is pathognomonic for osteochondromas (1).

From: 1. Department of Radiology, AZ Sint Jan, Brugge, 2. Department of Radiology, UZ Gent, Ghent, Belgium.
Address for correspondence: Dr J. De Groote, Department of Radiology, UZ Gent, De Pintelaan 185, 9000 Gent, Belgium. E-mail: jeroen.degroote@icloud.com

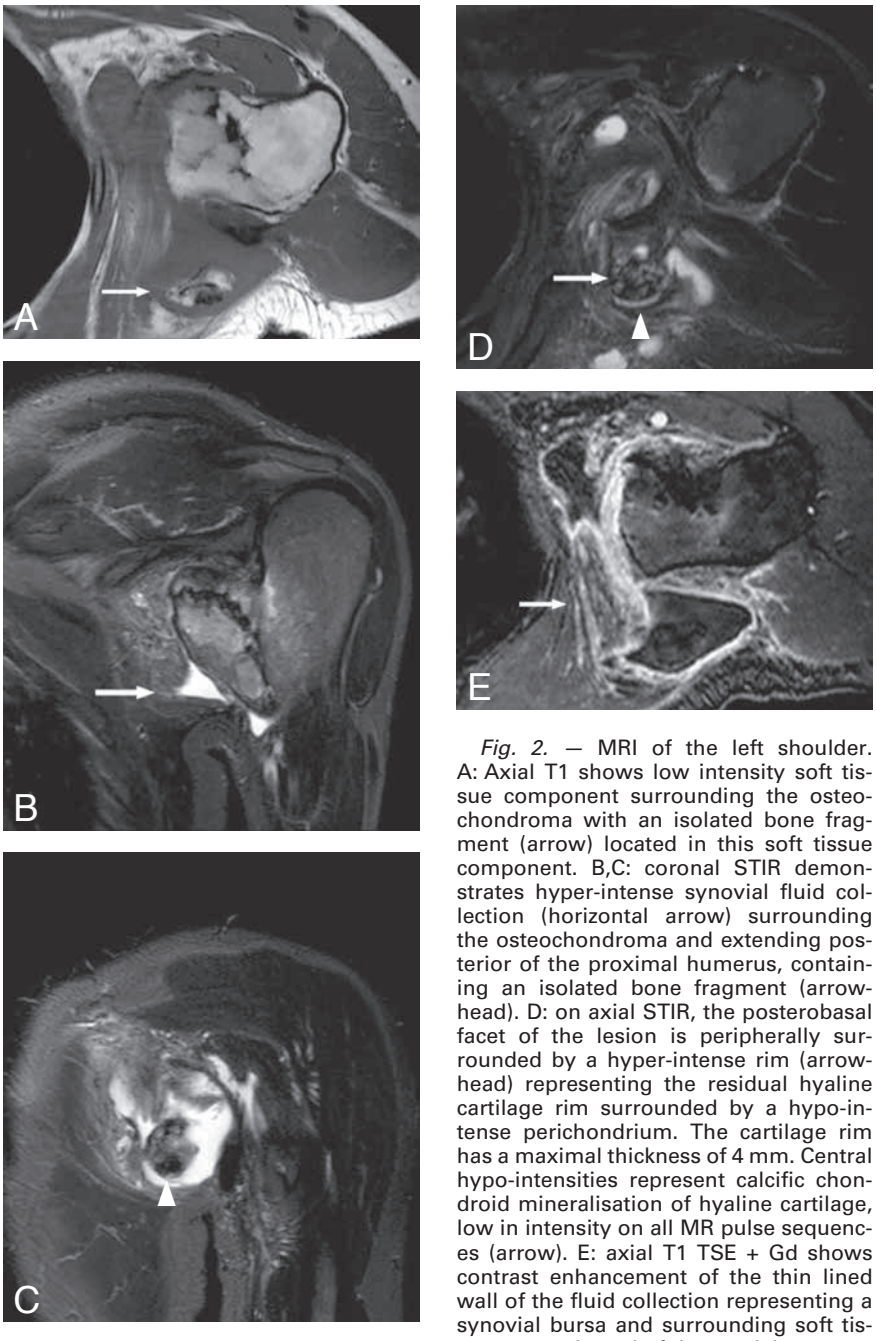

Fig. 2. — MRI of the left shoulder. A: Axial T1 shows low intensity soft tissue component surrounding the osteochondroma with an isolated bone fragment (arrow) located in this soft tissue component. B,C: coronal STIR demonstrates hyper-intense synovial fluid collection (horizontal arrow) surrounding the osteochondroma and extending posterior of the proximal humerus, containing an isolated bone fragment (arrowhead). D: on axial STIR, the posterobasal facet of the lesion is peripherally surrounded by a hyper-intense rim (arrowhead) representing the residual hyaline cartilage rim surrounded by a hypo-intense perichondrium. The cartilage rim has a maximal thickness of 4 mm. Central hypo-intensities represent calcific chondroid mineralisation of hyaline cartilage, low in intensity on all MR pulse sequences (arrow). E: axial T1 TSE + Gd shows contrast enhancement of the thin lined wall of the fluid collection representing a synovial bursa and surrounding soft tissues anterolateral of the cranial segment of the latissimus dorsi muscle (arrow).

Osteochondromas are the most common benign bone tumors (20-50%) or bone tumors in general (10-15%) (1, 2). The majority are solitary, non hereditary (85%) but lesions can also be multifocal in the context of HME, a disorder inherited in an autosomal dominant manner (1, 2).

Development of an osteochondroma results from separation and dislocation of an epiphyseal growth plate fragment with persistent growth of the cartilage fragment and secondary enchondral ossification (maturation). Osteochondromas usually show a growth pattern similar to a normal physeal plate until skeletal maturity (2). Imaging characteristics of an individual osteochondroma in HME is identical to solitary lesions.

An osteochondroma has the typical radiographic appearance of a lesion consisting of cortical and medullary bone continuous with the underlying parental bone.

The lesion is usually located at the metaphysis of a long bone, most frequently in the distal femur but any bone developing from preformed cartilage may be involved (1).

The hyaline cartilage is difficult to assess on conventional radiography but may be suggested by the identification of rings and arcs or flocculent calcifications as the result of chondroid mineralisation (1, 3).

MRI may also demonstrate cortical and medullary continuity and is considered the best imaging modality to evaluate cartilage cap thickness and its surrounding soft tissues.

The high water content of the hyaline cartilage cap creates an intermediate to low signal on T1-weighted sequences and a high signal on T2-weighted sequences. Mineralised portions in the cartilage cap remain low in signal on all MR pulse sequences (2).

Thickness of the hyaline cartilage cap is the most important imaging finding considering the risk of malignant transformation to a secondary chondrosarcoma. Cartilage cap thickness of more than 15 mm in a skeletal mature patient should be considered with great suspicion (1). Other signs of malignant transformation include growth of a previously unchanged osteochondroma in a skeletal mature patient, irregular lesion surface, focal interior radiolucencies, erosion or destruction of adjacent bone and surrounding soft tissue mass formation containing irregular calcifications (1, 2, 4-6).

Osteochondromas usually are asymptomatic but may show complications varying from cosmetic deformity, fracture, vascular or neurogenic compression, bursa formation and malignant transformation (1).

Anatomically an inconsistent bursa is located in the axilla in between the inferior angle of the scapula and the superior fibers of the latissimus dorsi muscle, more posterosuperiorly a bursa is located between the serratus anterior and the subscapularis muscle (5). Bursa neoformation between an osteochondroma and the perilesional soft tissues has been described as “exostosis bursata”, a result of mechanical impingement upon the adjacent muscles and tendons (1, 4). Bursae are lined by synovium and may become symptomatic due to inflammation, infection or haemorrhage. Clinically, bursa formation may present as a painful growing perilesional mass, simulating malignant transformation (1).

In rare cases chondral or fibrin fragments may be dislocated from

the osteochondroma into the bursa resulting in chondro-metaplasia in the synovial lining and secondary formation of multiple chondroid bodies as in primary synovial osteochondromatosis (1, 4).

Secondary synovial osteochondromatosis is a more common finding in which several osteochondral bodies of different shapes and sizes are seen in a synovial fluid collection (3).

Conclusion

Osteochondromas are primary benign bone tumors with low risk of malignant transformation. Impingement of surrounding soft tissues by an osteochondroma can result in frictional bursitis, clinically presenting with symptoms of pain and a growing mass, mimicking malignant transformation. We illustrated a case of exostosis brusata with fragments of the primary osteochondroma dislocated in the surrounding bursa as the result of friction with secondary synovial osteochondromatosis.

References

1. Murphey M.D., et al.: From the Archives of the AFIP: Imaging of Osteochondroma: Variants and Complications with Radiologic-Pathologic Correlation. *RadioGraphics*, 2000, 20: 1407-1434.
2. Kitsoulis P., et al.: Osteochondromas: Review of the Clinical, Radiological and Pathological Features. *In Vivo*, 2008, 22: 633-646.
3. Murphey M.D., et al.: From the Archives of the AFIP: Imaging of Synovial Chondromatosis with Radiologic-Pathologic Correlation. *RadioGraphics*, 2007, 27: 1465-1488.
4. Peh W.C.G., et al.: Osteochondroma and secondary synovial osteochondromatosis. *Skeletal Radiology*, 1999, 28: 169-174.
5. Shackcloth M.J., Page R.D.: Scapular osteochondroma with reactive bursitis presenting as a chest wall tumour. *Eur J Cardiothorac Surg*, 2000, 18: 495-496.
6. Wright J.M., Matayoshi E., Goldstein A.P.: Bursal osteochondromatosis overlying an osteochondroma of a rib. A case report. *J Bone Joint Surg Am*, 1997, 79: 1085-1088.