Case 1823

Eurorad

Solitary osteochondroma of the fibula

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Section: Musculoskeletal system
Imaging Technique: Digital radiography
Case Type: Clinical Cases
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Patient: 25 years, female

Clinical History:

History of fall.
Imaging Findings:

The patient attended the A & E department following a fall. A radiograph of the left knee, AP and lateral views, was performed. No fracture was seen. However, a well-defined exostosis was noted arising from the proximal fibula, which was directed away from the joint and had a few dense structures at its distal end. The findings were diagnostic for an osteochondroma of the fibula.
Discussion:

Osteochondroma (osteocartilaginous exostosis) is the most common neoplasm. The cartilage capped subperiosteal bone projection accounts for 20-50% of benign bone tumours. They occur most frequently in the first two decades of life with a male to female ratio of 1.5:1. They occur most often in long bones, especially the distal femur and proximal tibia, with 40% of the tumours occurring around the knee.
Osteochondromas are most likely caused by either a congenital defect or trauma of the perichondrium which results in the herniation of a fragment of the epiphyseal growth plate through the periosteal bone. They can either be sessile or pedunculated (stalk-like), with a slender pedicle directed away from the joint, and appear in a juxta-epiphyseal location. They occur only in bones that develop from cartilage (endochondral ossification). They have been reported to occur as a result of radiation therapy in children. There is normally no further growth of the exostosis after epiphyseal fusion.

Clinically, they present either with pain due to mechanical irritation or as a painless mass. A fracture can occur through the stalk of the lesion. Occasionally they are an incidental finding.

Hereditary multiple osteochondromatosis (diaphyseal acalasis) is an autosomal dominant condition with lesions (sessile and pedunculated) occurring on different bones or on the same bone.

Plain films are normally sufficient to diagnose the condition. Sessile lesions cover a wide area and can cause metaphyseal widening. The cartilaginous cap displays irregular areas of calcification.The thickness of the cartilage cap is best delineated on MRI. The cartilage cap ranges from 1mm to 6mm in thickness; over 2cm of cartilage or renewed growth are signs of possible malignant transformation. However,fast enhanced MR imaging will assist in differentiating between benign and malginant cartilaginous tumour.Only when secondary chondrosarcoma is a

possibility dynamic Gd-enhanced MR can be useful because it visualized perfusion and therefore angiogenesis which is a better parameter than the secondary sign of cartilage thickness.

The differential diagnosis includes hereditary multiple osteochondromatosis (diaphyseal acalasis). Chondrosarcomas in areas other than the knee are more likely to undergo malignant transformation. Secondary chondrosarcoma occurs in 0.5-1% of the patients with solitary osteochondromas. Chondrosarcoma transformation is more common in the hereditary form.

Pathologically, on gross examination, an osteochondroma is an irregular bony mass with a bluish-grey cap of cartilage. Opaque yellow cartilage has calcification within the matrix. The base of the lesion has a rim of cortical bone and central cancellous bone. Microscopically, the lesion shows endochondral ossification on the basal surface of hyaline cartilage. The cartilage is more disorganised than normal. The thickness of the cap is usually 1-3mm; greater thickness may imply malignant transformation.

No treatment is necessary for asymptomatic osteochondromas. If the lesion is causing pain or neurological symptoms due to compression it should be excised at the base. The prognosis of solitary exostosis is excellent.

Differential Diagnosis List: Ostoechondroma of the fibula

Final Diagnosis: Ostoechondroma of the fibula

References:

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Figure 1

a

Description: Bony exostosis arising from the proximal fibula. **Origin:**

b

Description: Osteochondroma of the fibula with a cartilaginous cap and pressure on the tibia. **Origin:**