Osteochondroma

Osteochondromas are the most common benign bone tumor, and are most commonly seen in boys under the age of 25. They consist of cartilage- capped bony spurs that project out from the surface of the bone and most commonly arise from the metaphases of long-bones such as the knees or proximal humerus. They typically present as a painless mass near a joint and are visualized on radiograph as a polypoid mass projecting from the surface of the bone. Most osteochondromas do not require active treatment, as they are benign and do not typically cause complications. A small percentage of osteochondromas may become chondrosarcoma however, and if there is concern indicated by certain specific changes seen on radiograph, surgical excision is warranted. Additionally, surgical management may be indicated if a chondrosarcoma has grown enough to cause pain or discomfort with normal activities.



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Characteristics

Most Common Benign Bone Tumor

Number 1 Foam-finger Benign-bunny

Osteochondroma is the most common benign tumor of the bone, representing approximately 30% of benign bone tumors. Other benign bone tumors include osteoid osteomas, aneurysmal bone cysts and nonossifying fibromas.

Males Under 25

Male Less-than-sign 25-cent-quarter

Osteochondromas most commonly occur in young males under 25. In this age group among males in particular, the growth plates at the metaphysis of the long-bones are at their most active state of growth and metabolism. Given that osteochondromas arise from the tissue of the growth plate, this is likely a contributing factor in the predilection for this demographic.

Cartilage-capped Spurs

Cowboy-spurs in Cartilage-cart with Cap

Osteochondromas consist of polypoid bony outgrowths called spurs that occur at the metaphasis of long bones. They may appear as pedunculating, meaning having a stalk, or sessile, with a broad-base and no stalk. They are capped with a layer of cartilage.

Metaphysis of Long Bones

Metal-fist on Long-bone

Osteochondromas most commonly occur at the metaphysis, or the growth plate, of long bones. In normal bone growth, new tissue forms at the metaphasis with the long-axis of the bone. An osteochondroma occurs when tissue instead grows out in a direction perpendicular to the axis of the bone. The most common location is the distal femur near the knee, followed by the proximal humerus near the shoulder. In rare cases they can also affect the vertebrae or the bones of the skull.

Small Risk of Chondrosarcoma

Condiment-shark-comb

Osteochondromas are generally benign but can rarely transform into malignant chondrosarcomas. The patients most at risk for this are those who have a genetic predisposition to form osteochondromas. Potential signs of malignant transformation include growth of an osteochondroma after skeletal maturity and new onset of symptoms such as pain or limited motion. Malignant transformation is an indication for surgical resection.

Clinical Features

Painless Mass near Joint

No-pain-sign sticking out of joint

One of the most common clinical presentations of osteochondroma is a painless mass near a joint, most commonly the distal femur near the knee or the proximal humerus near the shoulder. This is somewhat dependent on the exact location however, as osteochondromas that impinge on nerves or muscle may cause pain despite their small size. The size of the mass should not change once skeletal maturity has been reached, and change in size or new-onset pain after this point may be concerning for malignant transformation.

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Painful if Growing or Malignant

Pain-bolts on Growing Malignant-man

While most patients with osteochondroma will report a painless mass, the new onset of pain may be concerning for either growth or malignant transformation of the tumor. Suspicion can be guided by the patients age, as osteochondromas may continue to grow in patients whose skeletons have not yet matured, whereas new pain in fully-matured patients is more concerning for malignancy.

Workup

X-Ray

X-ray

Most cases of osteochondroma can be diagnosed with plain radiograph of the affected bone. Imaging will demonstrate an osseous spur arising near the metaphasis of the bone and projecting outward, with the cortex of the osteochondroma being continuous with the cortex of the rest of the bone.

MRI if Concern for Malignancy or Functional Limitation

MRI next to malignant-man shaking cane

In patients for whom there is either concern for malignancy or functional limitations due to pain or tissue impingement causing restricted range-of-motion, MRI may be useful in further characterizing the mass to assess for malignancy and in delineating any impingement of surrounding anatomic structures. If MRI further raises concern for malignancy, a biopsy may be performed.

Management

Monitoring

Monitor

Most cases of osteochondroma can be managed with regular follow up and monitoring for new symptoms of pain or functional limitation. Repeat testing is generally not indicated unless new symptoms arise.

Surgery

Surgeon fighting malignant-man with cane

In patients in whom there is confirmed malignancy or local irritation causing functional impairment, surgical resection may be indicated. For patients who are not fully developed and do not have malignancy (ie., whose indication is functional impairment), the mass may recur following surgery as their growth plates have not sealed. For this reason, it may be decided to delay surgery as long as possible or until skeletal maturity is reached.

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