Chondroma

Definition
Benign tumour composed of mature hyaline cartilage. Chondromas that are centrally located within a bone are known as enchondromas; a less common variety that is eccentric and bulges the overlying periosteum is known as a periosteal chondroma.

Multiple chondromas, with a tendency towards unilaterality are known as Ollier's disease, and this is characterised by shortening and bowing of the bones. It is not hereditary.

When multiple chondromas are associated with soft tissue angiomas the process is known as Maffuci syndrome. This also has a tendency towards unilaterality.

Epidemiology
Common
Many are symptomless and are not diagnosed.
Slight female preponderance, but multiple chondroma syndromes have a male predominance.
Occurs throughout the lifespan, although patients with multiple lesions come to attention earlier, in the first and second decades.

Site
Most common location is in the small bones of the hands and feet. The proximal phalanx is most commonly involved.

Aetiology

Clinical
Rarely painful. Pain in an enchondroma should alert one to the possibility of malignancy. Pain may occur due to a fracture. Check that there was no pain prior to the fracture.

Radiology
Typically metaphyseal in location in long bones.
In short tubular bones (e.g. phalanges) the lesion tends to have a central location.
Matrix calcification is common and tends to be fairly uniform; uneven calcification should alert one to the possibility of chondrosarcoma.
Scalloping of the endosteal cortex is another sign of malignancy.

The appearances can be confused with a bone infarct, but in an infarct the calcification tends to be more peripheral.

Periosteal chondromas have a saucer shaped depression of the underlying cortex with a marginal buttress. The margin with the bone is sclerotic and the medulla isn't involved.

MRI: low signal intensity on T1 weighted images, high signal intensity T2, with calcific regions appearing as areas of low intensity.

Differential diagnosis
Chondrosarcoma
Bone infarct – this doesn't expand the bone.

Pathology
Gross
Confluent masses of bluish, translucent hyaline cartilage with a lobular arrangement.

Microscopic
Enchondroma exhibits a bone encasement pattern – this is benign
A permeative pattern is suggestive of an aggressive chondroid lesion.
Don't have an extraosseous soft tissue mass or periosteal reaction.
The lesions in small tubular bones are typically more active than central lesions, and hypercellularity is suspicious in the axial skeleton.

Treatment
If treatment is required, curettage and bone grafting is adequate.

Prognosis
Occasionally lesions recur after curettage; this implies that the original lesion was probably inadequately biopsied.

Malignant transformation is very uncommon in the short tubular bones. It is more common in the long bones.

The rate of malignant transformation in Ollier's disease is around 25%, and higher in Maffuci syndrome – some authorities say up to 100%.