



A common benign tumor presenting with two rare complications

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Abstract :

Osteochondromas are the most common benign tumors of the bone. Osteochondromas presenting with vascular complication and also showing malignant transformation is very rare. Our patient presented with the combination of these two rare complications (gangrene of foot and a low grade secondary peripheral chondrosarcoma). Literature review shows local recurrences with aggressive behaviour are likely with these low grade tumors if not removed adequately and suggests for en-bloc resection.

Keyword : Osteochondroma, malignant transformation, vascular complication, cartilage cap

Introduction:

Osteochondromas, or exostoses, are the most common form of benign bone tumor, representing about 20–50% of all benign and 10–15% of all bone tumors^{1,2,3}. Most lesions are found during the period of rapid skeletal growth. Patients rarely can develop

vascular complications⁴⁻¹⁰. Arterial damage represents nearly 90% of vascular complications¹⁰. Secondary peripheral chondrosarcoma is the result of malignant transformation of a pre-existing osteochondroma. The mean age of persons with these secondary peripheral chondrosarcoma is 34 years, which is notably younger than the average age of persons with primary conventional chondrosarcoma^{11,12,13}. Most cases of secondary chondrosarcoma are low to intermediate grade and they can recur locally if not treated appropriately. If these tumors recur they can start to behave more aggressively¹⁴. We report a case who presented with a vascular complication of osteochondroma (gangrene of foot and toes) and further patient work up showed that the tumor has gone for malignancy (secondary peripheral chondrosarcoma).

Case report:

Our patient was admitted with the chief complaints of pain and blackish discoloration of her right foot for 4 months. She was also having a

totally asymptomatic swelling over the posterior aspect of her proximal leg (Rt) since adolescence which is not increasing in size. On examination there was a 10 x 10cm non-tender bony hard swelling over posterior aspect U/3rd Rt. leg. Skin over swelling was stretched and shiny with engorged veins over swelling. There was gangrene of first three toes of Rt. foot extending into forefoot.



Plain radiograph showed a pedunculated mass arising from metaphysis of proximal tibia, continuous with parent medullary cavity and its surface was smooth, lobulated with homogeneous matrix mineralization favouring a diagnosis of osteochondroma. 3D-CT and CT Angiogram showed a 7 x 5.5 x 6 cm osteo- cartilagenous lesion with chondroid matrix origin from posteromedial aspect Rt. proximal tibia and cartilaginous cap of 2 cms diagnosing as Osteochondroma with suspected malignant transformation with compression and encasement of popliteal artery, thrombosis of popliteal artery. No evidence of metastasis.

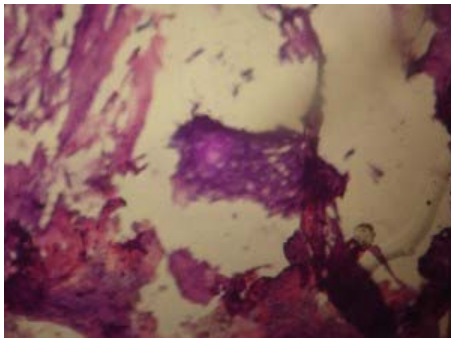


Swelling in posterior aspect of leg with distal gangrene
Osteochondroma in proximal tibia 3-D Reconstruction



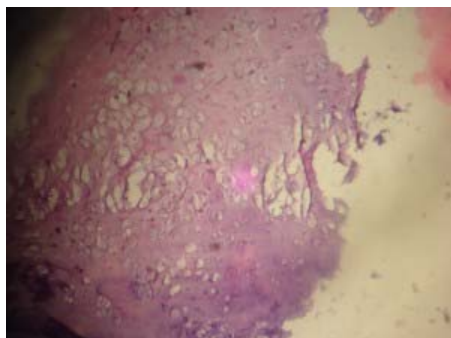
CT showing persistent cap, lysis in calcification of cap and back growth of the cartilaginous cap into the stalk with tumor continuous with medulla.

CT Angiogram showing vascular encasement by tumor

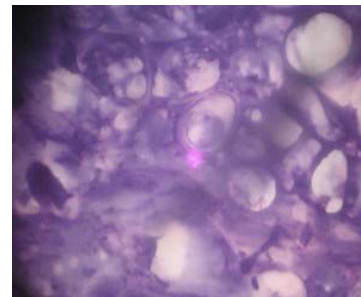


Mature bony trabeculae permeated by island of cartilage from cartilaginous cap

Biopsy report was bony tumor covered with thick cartilaginous cap of 2 cm and consisting chondrocytes with mild variation in size, shape of nucleoli and underlying bony mass showing mature bony trabeculae permeated by island of cartilage from cartilaginous cap giving the impression of Osteochondroma with low grade chondrosarcoma gr I.



Tumor with thick cartilaginous cap



Cartilaginous cap

Chondrocytes hyperchromatic nuclei

Considering the poor vascular status of the limb with established gangrene of foot and the nature of the malignancy patient was opted for radical procedure and an above knee amputation with wide clearance was done. Preoperatively popliteal vessels were in a stretched, lacerated and thrombosed state. Histopathology again confirmed the malignant nature of the tumor. Post-op period was uneventful and patient was given an above knee prosthesis.

Discussion:

Osteochondromas are the most common benign tumors of the bone, observed in 1–2% of the population⁵. In literature only few cases of osteochondromas have presented with vascular symptom. Arterial damage represents nearly 90% of vascular complications of which false aneurysm constitutes 60%. Our patient had sought the hospital because of the pain and blackish discoloration in foot. She is having an asymptomatic posterior proximal leg swelling too since adolescence. When evaluated the limb was in a non-salvageable condition.

Patient's symptoms depend on the type of vascular injury. The most common being hard swelling for a long time¹⁰. High degree of suspicion by the treating surgeon can prevent such worst complications.

Malignant transformation of an osteochondroma is rare (<1% for solitary osteochondroma). New onset pain in a pre-existing osteochondroma should alert the physician to the possibility of enlargement of cartilaginous cap¹⁵. This patient had a non-tender hard swelling which was asymptomatic. Radiology showed an osteochondroma arising from proximal tibia.

With 2 cm used as a cut off for distinguishing benign osteochondromas from chondrosarcomas, the sensitivities and specificities were 100% and 98% for MR imaging and 100% and 95% for CT, respectively¹⁶. Though our CT showed a cap thickness of just 2 cm, there were additional findings of areas with lysis in calcification of cap and back growth of the cartilaginous cap into the stalk favouring a secondary peripheral chondrosarcoma. As all the best currently available means of distinguishing benign from malignant cartilaginous lesions and low-grade from high-grade malignant cartilaginous lesions in long bones have low reliability¹⁷, subsequently biopsy was done which gave a cap thickness of 2 cms (in adults it is often only a few millimeters thick or entirely absent, leaving a surface composed of eburnated bone^{1,18-23}) with chondrocytes showing mild variation in size and shape of nucleoli with underlying bony mass showing mature bone trabeculae permeated by island of cartilage from cartilaginous cap giving a diagnosis of low grade secondary peripheral chondrosarcoma. High inter observer's variability in distinguishing low grade and high grade tumors, characteristic high local recurrence of this low grade chondrosarcoma¹⁴ with associated danger of dedifferentiation and aggressive behaviour²⁴

, and poor vascular status of the limb made us to perform an above knee amputation. Tissues sent for histopathological examination showed grade I secondary peripheral chondrosarcoma.

Conclusion:

Osteochondroma, especially those near popliteal fossa can cause vascular problems. Secondary peripheral chondrosarcoma is the malignancy arising from it (<1% in solitary osteochondromas). These are generally of low grade nature, but with local recurrence they can behave aggressively. High clinical suspicion along with necessary investigations and proper treatment can avoid the worst complications of this benign tumor osteochondroma.

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