Abstract:
Giant cell tumours are benign, locally aggressive bone tumours of young adults with a high potential for local recurrence. It is a rare and unpredictable lesion and clinical behaviour cannot be predicted based on clinical, radiological and histological features. Management is surgical and it is treated with either intralesional curettage or resection the role of adjuvant therapy is directed at reducing local recurrence. Recurrences are managed with en bloc resection and appropriate reconstruction.

Keyword: Giant cell tumour, bone tumours

Introduction:
Giant cell tumours of the bone were first described by Cooper in 1818 and the microscopic description provided by Lebert in 1845. These tumours account for 5-10% of all bone tumours and 20% of benign bone tumours. There is a slight female preponderance with a female to male ratio of 1.5:1. 70-80% of these tumours occurs in the 20-40 year age group and is rare in skeletally immature individuals. They are slightly more common in the Asian population.

Case report:
We present a 23 year old male who presented with swelling and pain around the left wrist of 3 months duration. On clinical examination, a hard bony lesion involving the distal end of radius was found with restricted extension of the wrist joint. Radiograph revealed an eccentrically placed osteolytic lesion with cortical thinning of the epiphysis of radius. No cortical erosion or periosteal reaction was seen. Core needle biopsy was done which confirmed the clinical diagnosis of giant cell tumour. Patient underwent surgical resection of distal end of radius with reconstruction using fibular strut. Proximal end of fibula was harvested, preserving the peroneal nerve; fibular head was used to recreate the wrist joint by K wire fixation to ulna. Functional result was good with the patient able to use the
wrist and perform daily activities with ease. Final histopathology obtained reported the tumour as giant cell tumour with resection margin free of disease. On follow up, 8 months later, he presented with a soft tissue swelling on the dorsum of wrist and restriction of wrist movements. On clinical examination, the swelling was fluctuant and FNAC was done and 10ml of haemorrhagic fluid was aspirated. Residual soft tissue lesion of 5x6cm was present. Patient underwent excision of the tumour along with overlying skin which was adherent to the tumour. Tumour extension into joint space was excised. There was no tendon involvement or neurovascular involvement present. Resultant surgical defect was reconstructed using a groin flap. Limb was maintained in position by strapping for a period of three weeks after which the pedicle was disconnected. Post op recovery was uneventful. Functional outcome was good with an Enneking score of 22 of a maximum of 30.(Pain-5;Function-4;Emotional acceptance-2;Hand positioning-5;Manual dexterity-3;Lifting ability-3). The patient is on regular follow up and is now disease free at the end of 10 months.

**GCT distal radius treated with resection and fibular strut reconstruction**

![Tumour with line of incision to include biopsy site Preop X ray](image)

![Intraop photograph showing tumour involving distal radius Post excision defect](image)

![Fibular strut being harvested Fixation of reversed fibular strut to remnant radius recreating the wrist joint](image)
Recurrence managed with wide excision and groin flap
Soft tissue recurrence on dorsum of wrist
Post wide excision surgical defect Groin Flap
Discussion:
Over the past 10 years, 112 bone tumours have been treated in our institution. Of these, giant cell tumours accounted for 14 cases (12.5%). Giant cell tumours are benign, locally aggressive tumours which present in the second decade of life. The commonest site is the distal end of femur, with the proximal end of tibia being the next commonest. Distal end of radius is the third commonest site of occurrence. It arises at the epiphyses of long bone and is usually monostotic. Rarely, in <1% of individuals, they may present as polyostotic lesions. They are benign aggressive tumours with a high potential for recurrence with a recurrence rate of 30-50%. Around 3% of benign lesions may present with pulmonary metastases.
Malignant giant cell tumours account for <5% of cases. They are classified as primary tumours: sarcomas that occur within lesions that otherwise are typical of benign giant cell tumours; or secondary: tumours which occur at sites of giant cell tumours that have been treated, usually with radiation. Clinical presentation is pain lasting weeks to months and swelling. Patients may also present with pathologic fracture or with neurologic deficit, especially when the tumour is situated in the spine or sacrum. They may also be an incidental finding detected on routine examination.

Diagnosis: X ray: GCTs are eccentric lytic lesions located at the epiphysis of long bones. Cortex is expanded and thinned, and may have septae producing the characteristic soap bubble appearance. Occasionally cortical breakthrough may be present along with a soft tissue mass. CT scans may help assess integrity of cortical rim. MRI may help determine the extent of lesion within bone and soft tissue. It appears dark on T1 weighted images and bright on T2 weighted images. Bone scan is done when multicentric loci is suspected.

Management: Management is surgical with no role for radiotherapy or chemotherapy. Surgical options include intralesional curettage or resection with appropriate reconstruction. Intralesional curettage is associated with a recurrence rate of 35-42%. Adjuvant therapy with liquid nitrogen, phenol, argon laser or electrocautery may be given to reduce the recurrence rate. Each of these methods has distinct advantages and disadvantages and therapy is individualised according to needs of the patient. Liquid nitrogen used for cryotherapy is administered in three freeze thaw cycles leading to circumferential necrosis, but is associated with soft tissue injury and late fractures. Phenol application is easy to administer, but is associated with higher incidence of pathologic fractures, nerve injury and delayed wound healing and has a 10-20% recurrence rate. Subchondral bone grafting is used around weight bearing joints as it restores biomechanics to the joint surface and prevents future degenerative joint disease. However, the joint must be protected for an extended period of time, and tumour recurrence is difficult to distinguish from graft resorption. Bone cement produces heat kill of tumour cells and also provides immediate structural support. An added advantage is that recurrences are easily detected. Resections are preferred in disease involving expendable long bones, recurrent tumours, in the presence of pathologic fractures and when there is joint involvement. Enbloc resections still have a recurrence rate of 10%.
References:


