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GAINT CELL TUMOR OF THE SECOND METATARSAL

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Abstract: Gaint cell tumor (GCT) is a bening locally aggressive tumor with a tendency for local recurrence. GCT of metatarsal is of rare occurrence with very few cases reported so far. GCT in this location is rare and should be considered in the differential diagnosis of a destructive bony lesion. We report the case of GCT of 2nd metatarsal in a 28 year male and discuss the clinical features and the results of reconstructive surgery with enbloc resection of distal metatarsal and reconstruction with tricortical iliac graft and plate fixatation.

A 28 year old male presented with an insidious onset of pain and swelling over the dorsum of the right foot. On examination there was an ovoid, tender, firm, well defined swelling opposing the 2nd metatarsal. The 2nd toe movements was normal. X-ray showed an expansile osteolytic lesion with soap bubble appearance in the head and neck of the 2nd metatarsal. FNAC confirmed the diagnosis of GCT. Enbloc resection of the tumor, reconstruction with tricortical iliac crest graft and plate fixatation done. On 1 year follow the graft has taken up well, there was no recurrence and normal foot function obtained.

Enbloc resection of the involved metatarsal with autograft and plate fixatation reconstruction is the preferred surgical technique to prevent recurrence and to restore normal foot function.

Keywords: A rare entity, gaint cell tumor, Iliac crest tricortical graft, 2nd metatarsal.

I. INTRODUCTION

Gaint cell tumor (GCT) or osteoclastoma is an osteolytic mostly benign locally aggressive tumor with features of frequent local recurrences and the potential for the metastasis and the malignant transformation. It usually occurs in young adults of 16-35 years in the physial region. The male to female ratio is 3:5. Nearly 85-90% found in long bones, of which 50% occur in the region of knee Other frequent sites are distal radius, proximal humerus and fibula. 4% occur in pelvic bone and spine. Involvement of small bones of hand & foot is very rare . Unni has reported an incidence of 2% in the hand and 1.5% in the foot (phalanges being more involved than metacarpals and metatarsals). We report a case of GCT of 2nd metatarsal of right foot which is a very rare site for such tumor.

II. CASE REPORT

A 28 years old male presented to us with chief complaints of pain in the right foot for 6 months and swelling in the dorsum of the right foot for 1 year. Pain was mild to moderate in intensity, dull aching, continous, relieved by taking medicines and rest, aggravated by activities. Swelling was minimal. There was no history of trauma or constitutional symptoms.

On physical examination there was a small localized oval shaped swelling over the dorsum of the right foot opposing 2nd metatarsal with well defined margins and over lying skin stretched . Swelling was tender on palpation , hard in consistency, and overlying skin was free. Second MTP joint was freely mobile but painful at extreme movements.

X-ray showed an expansile osteolytic lesion of head and neck of 2nd metatarsal bone. There is cortical thinning of 2nd metatarsal head. MTP joint was normal. Since gaint cell tumor was suspected fine needle aspiration cytology was done. The tumor had histological grading 2 according to campanacci

Adjacent metatarsals are normal. The classical soap bubble appearance was present .

Fig. 1: Shows expansile osteolytic lesion in head & neck of second metatarsal

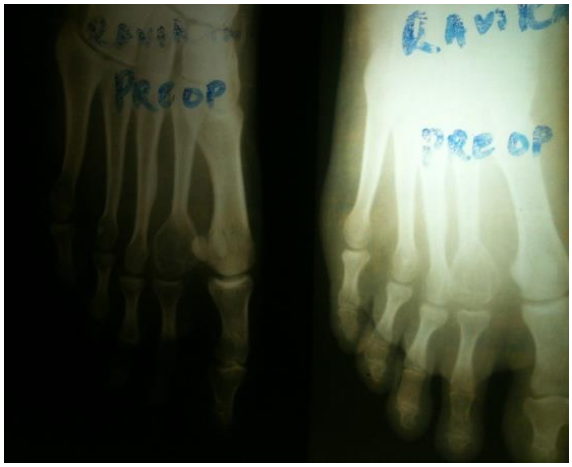
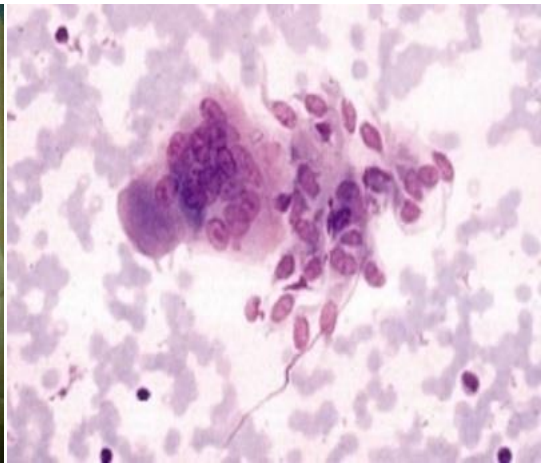


Fig-2



As the lesion has involved the entire distal half of the 2 nd metatarsal leaving only a thin margin of the articular surface of the 2nd metatarsal head and Since 2nd MTP joint was not involved a reconstructive surgery with restoration of the 2nd metatarsaophalangeal joint was planned . Through a dorsal incision over the distal half of the 2nd metatarsal, the tumor was exposed. Enbloc resection of the distal metatarsal containing the tumor was done .The defect was reconstructed with a tricortical iliac crest graft, fashioned like distal end of the metatarsal and fixed with a mini plate. The tumor send for HPE. The patient was given a below knee cast for 6 weeks . The patient was kept under regular follow up. Full weight bearing was allowed after 3 months. After 1 year of follow up, the graft was fully taken up and there was no signs of recurrence both clinically and radiologically. Functionally there was no pain on full weight bearing. Toe movements was normal except slight lateral deviation of the second toe.

Fig. 3: X-ray shows tricortical iliac graft replacing distal half of second metatarsal

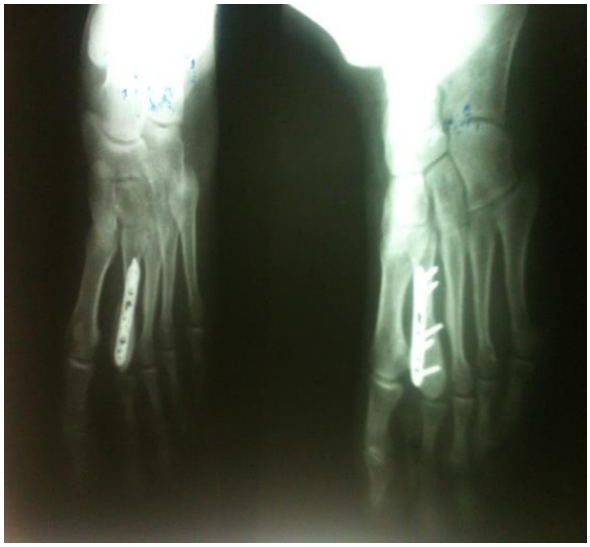
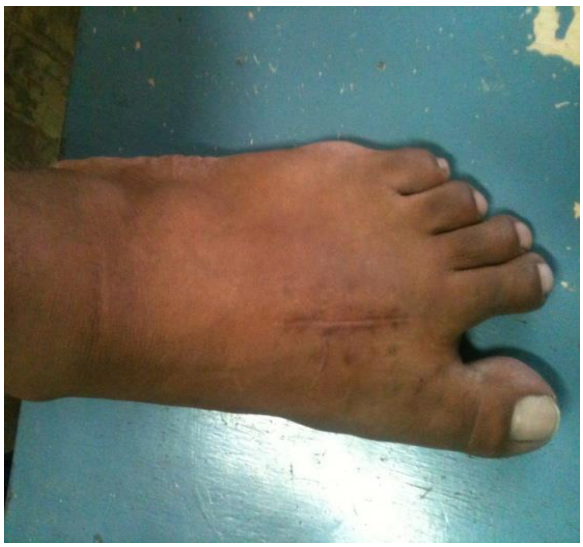


Fig. 4: Post op clinical picture



III. DISCUSSION

Gaint cell tumor was first reported by cooper in the 18th century. Jaffe and Lichtenstein defined gaint cell tumor more strictly to distinguish it from other tumors in 1940. It is relatively a rare tumor. Gaint cell tumors usually occur de novo but may also occur as a rare complication of paget disease of the bone. Gaint cell tumor arises from the epiphysis and metaphyseal involvement may occur in skeletally immature patients.

Gaint cell tumor occurs in age group of 20-40 years. Peak incidence is 20-30 years. Gaint cell tumors are much less common in children; the rate is 5.7per in skeletally immature patients. There is a distinct female predominance in the ratio of 1.5.

Gaint cell tumor predominate in the long bones(85-90%) especially the femur(30%), tibia(25%), radius(10%) and humerus(6%). The spine and innominate bones are involved occasionally(4%) gaint cell tumors of the hand bones are rare accounting for only 2per of cases and here too phalangeal location is more common than metacarpals.GCT of the foot is even rarer than GCT of the hand. GCT of the hand and foot seems to represent a different lesion than conventional GCT in the rest of the skeleton . Gaint cell tumors are mostly solitary. There is an 18per incidence of multicentricfoci indicating that a bone scan should be a part of routine workup of these tumors. They also have a shorter duration of symptoms averaging 6 months or less before a diagnosis is made.

In most patients ,gaint cell tumors have an indolent course, but they can recur locally in as many as 50% of cases. GCT is malignant in less than 5% of patients. They may be either primary occurring from the lesion or may be secondary following treatment particularly radiotherapy.

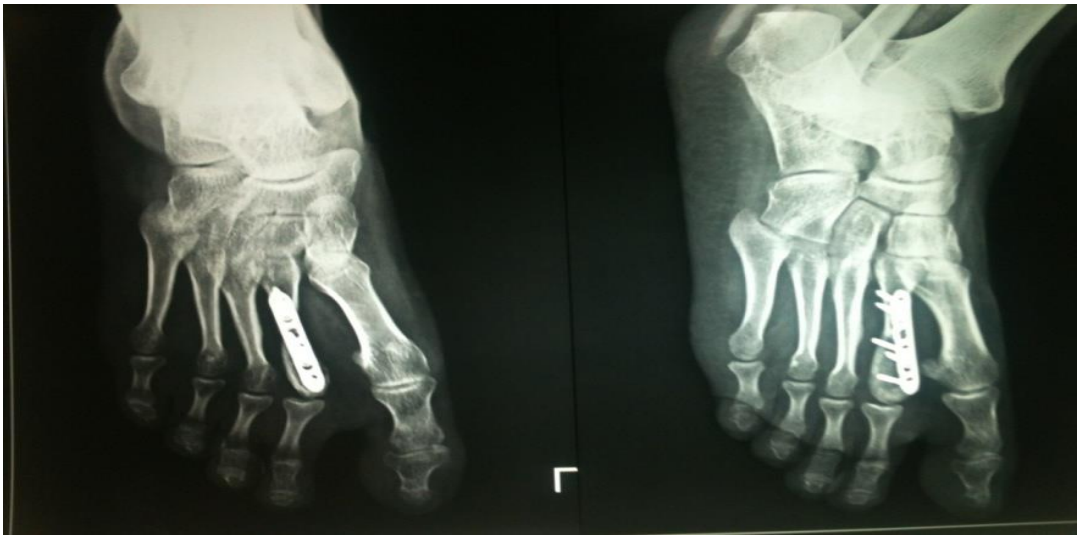
X-rays are diagnostic, the lesion is purely lytic, expansile, soap bubble in appearance and eccentric located in the epiphysis of the long bones. Periosteal reaction is seen in cases of pathological fracture .CT-scan helps to determine exact amount of cortical destruction, joint surface involvement, and determine the optimal location of the cortical window. MRI determines the extent of lesion in the bone and in soft tissues.

Microscopically GCT is composed of multinucleated gaint cells,40-60 nuclei per cell in a sea of mononuclear stroml cells.

The various treatment modalities descriped in the literature are simple curettage, curettage with bone grafting, enbloc resection with reconstruction of joint surface using silastic prosthetic implants, arthrodesis, amputation, radiotherapy, chemotherapy & embolization. The use of intraoperative cryogenic agents has reduced the recurrence rate upto 10per.

The metatarsophalangael joint reconstruction can be achieved by metatarsal substitution with a combined iliac crest graft, nonvascularised fibular graft, silastic prosthetic replacement.In our case we performed a local enbloc resection followed by reconstruction using full thickness tricortical iliac crest graft.The graft is fashioned to match the configuration of the distal end of the metatarsal and fixed with a mini plate. The graft being corticocancellous provides adequate fixation strength as well as osteogenesis. The graft was well taken up and satisfactory restoration of foot function and weight bearing was obtained.

Fig.5: 1yr post op – graft has taken up well, joint restored



IV. CONCLUSION

Local resection of the involved metatarsal with autograft or allograft reconstruction is the preferred surgical treatment for several reasons. First , no correlation has been found between the grade of gaint cell tumor and the rate of recurrence. Therefore all gaint cell tumors of foot should be considered locally aggressive. Curettage with or without bone grafts has

resulted in recurrence rates of about 90%. In addition curettage with bone graft in metatarsal the graft strength is questionable. Second although radical resection or amputation may prevent recurrence , it is cosmetically deforming and decreases the function of the foot.

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