



Giant cell reaction of a metatarsal bone : A case report

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A rare, non-neoplastic lesion involving the 1st metatarsal bone in a 5-year-old female is described. Radiographically it presented as a cystic lesion of the whole of the metatarsal. Fine needle aspiration cytology showed it to be a benign giant cell lesion. The tumour was excised en bloc and the metatarsal replaced by a free fibular graft of adequate length. Histopathological examination confirmed the diagnosis as giant cell reaction of bone.

The lesion is said to arise as a local tissue response to bleeding as evidenced by the clustering of giant cells in areas of haemorrhage. The entity should be differentiated from aneurismal bone cyst, brown tumours of hyperparathyroidism giant cell tumour, chondroblastoma, non-ossifying fibroma etc. Treatment usually consists of curettage or excision of the involved bone with or without bone grafting. Recurrences are common in curetted lesions.

Keywords : giant cell reaction ; metatarsal ; giant cell tumour.

INTRODUCTION

Ackerman and Spjut (1) reported in 1962 a previously undescribed, non-neoplastic, solitary proliferation of fibrous tissue with abundant giant cells and osteoid, involving the phalangeal bones. They coined the descriptive term "Giant cell reaction of bone" for this rare lesion.

The exact pathogenesis of the lesion is still not clear, however, it has been speculated that the condition arises as a local response to trauma. The

histological finding that the giant cells, although scattered throughout the lesion tissue, are often clustered in areas of haemorrhage, supports this hypothesis.

CASE REPORT

A 5-year-old female presented in the outpatient department with the complaints of pain and swelling over the medial and dorsal aspect of the left foot for the past three months. On specific inquiry the patient gave a history of a fall of a brick over the dorsum of the foot.

On examination there was marked swelling located over the region of the 1st metatarsal with ill-defined margins, smooth surface, firm to hard consistency and a benign appearance (fig 1).

Radiographs of the foot revealed an expansile cystic lesion involving the whole of the 1st metatarsal with thinning out of the cortex. The soap-bubble appearance was not there (fig 2).

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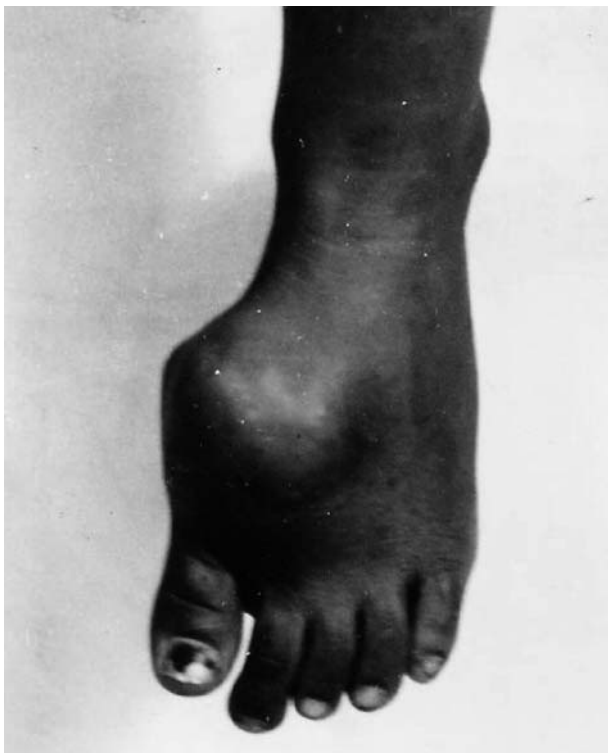


Fig. 1. — Clinical photograph of the patient showing globular swelling on the dorsomedial aspect of the foot.

The patient was admitted and fine needle aspiration cytology (FNAC) of the lesion was done, which was reported as a benign giant cell lesion.

The patient underwent surgery; the 1st metatarsal was excised en bloc and replaced by a free fibular graft of adequate length, fixed with a K-wire (fig 3).

The postoperative period was uneventful and the patient was discharged home with a below-knee plaster of Paris cast. She was regularly followed up in the outpatient department, and by the end of 10 months the graft was incorporated.

DISCUSSION

Giant cell reaction, named by Ackerman and Spjut (1), is a benign non-neoplastic lesion that is clinically characterised by pain and swelling of variable duration. The lesion has been commonly confused with true benign giant cell tumour. It is



Fig. 2. — Radiographs showing an expansile cystic lesion of the first metatarsal.



Fig. 3. — Postoperative radiograph showing replacement of the first metatarsal by a fibular graft fixed with a K-wire.

generally accepted that it is not a neoplasm but rather some peculiar reactive lesion.

Previous reports showed an approximate male to female ratio of 2:1 and age range of 6 to 45 years. The majority of cases have occurred in the 2nd and 3rd decade of life (5).

The lesion consists of proliferating fibroblasts with abundant osteoid tissue (3). The fibrogenic quality of the pathologic tissue is the main feature that differentiates it from true Giant Cell Tumour.

The lesion should be differentiated from such conditions as aneurismal bone cyst, non-ossifying fibroma, infection, enchondroma, chondroblastoma, chondromyxoid fibroma, giant cell tumour (2, 5).

Benign osteoblastoma may pose a difficult differential problem as similar components may be seen in both lesions. The giant cell reaction is, however, predominantly fibrous whereas the benign osteoblastoma is an osteoblastic lesion with a scant fibrous stroma.

The presence of normal levels of serum calcium, phosphorus and alkaline phosphatase should rule out a brown tumour.

Giant cell tumour of tendon sheaths only rarely erodes the bone and radiographically it is an extrinsic lesion, it is basically histiocytic, often containing foam cells, collagen and haemosiderin laden macrophages.

The microscopic features of a fibrous stroma with osteoid formation in a lesion occurring in a young adult should raise the suspicion of osteogenic sarcoma. However, the well-circumscribed lytic lesion without prominent periosteal reaction and the benign appearance of the fibrous stroma and absence of nuclear atypia and mitosis clearly differentiate osteosarcoma from giant cell reaction.

Prior to the review of Lorenzo and Dorfman (6), all the reported patients did well after curettage and bone grafting. Lorenzo and Dorfman (6), however, reported a 50% recurrence rate occurring between 6-8 months after excision. Therefore the treatment of choice is excision of the lesion with bone grafting.

Although it is appreciated that giant cell reactions in a bone can be seen following trauma, especially with concomitant vascular damage, the conspicuous absence of previous trauma in the majority of reported cases does not offer strong support for this hypothesis. Lorenzo and Dorfman (6)

reported a history of trauma in two of their eight cases, both occurring in patients with lesions of the foot. Bertheussen *et al* (4) reported a history of mild trauma to the hand in a patient with a lesion of the proximal phalanx.

Most of the lesions reported to date involve the small bones of the hand. The case described here is at a very rare location.

CONCLUSION

Giant cell reaction of bone is a rare benign, non-neoplastic lesion that might be difficult to differentiate from true giant cell tumour and its variants. The clinical and radiological features may be misleading and the diagnosis is only confirmed on histopathological examination. Histologically the most important differentiating feature is the presence of an abundant fibrogenic stroma with osteoid formation. Treatment of the lesion is excision with or without bone grafting, as recurrence rate is high after curettage.

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