CASE REPORT

Non-vascularized fibular graft after excision of giant cell tumor of the distal radius

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Abstract

Giant cell tumour of the bone is not a common bone tumour. It is a slowly growing bone tumour. Giant cell tumour, although benign, can be locally aggressive. Giant cell tumour is more common in females and typically occurs in the epiphysis has closed. We present a case report of a 30 years old gentleman who presented with giant cell tumour of left distal radius. The giant cell tumour was treated by wide excision and non vascularized fibular graft.

Keywords: Giant cell tumour, wide local excision, locally aggressive.

Case Report

Giant cell tumor of distal end of radius is treated by wide resection. The various modalities for the defect created are vascularized/non-vascularized bone graft, osteoarticular allografts and custom-made prosthesis. We report outcome of wide resection and non-vascularized fibular grafting in biopsy-proven giant cell tumor.

A 30-year-old right-handed gentleman with no comorbids was referred for treatment of a giant cell tumour of the left distal radius. He had suffered with gradually worsening wrist pain and swelling for approximately three months after a trivial history of trauma. Symptoms were worse at night and function was poor. He was otherwise fit and well with no other complaints with no history of jaundice, chest problem, anorexia or weight loss.

On examination, a firm, diffuse swelling was present on the dorsal and volar aspects of the distal forearm (Figure 1) and all movements of the left wrist were reduced secondary to pain. Wrist flexion and extension were limited to 15^{O} each while radial deviation was absent and ulnar deviation was reduced to 10^{O}. Pronation and supination were reduced to 30^{O} and 20^{O}, respectively, from neutral. In comparison to the contralateral side, clinically, grip strength of the affected limb was significantly decreased. No neurovascular deficit was present. Radiographs of the forearm and wrist demonstrated a large expansile lytic lesion of the distal radius, suggestive of a giant cell tumour of bone (Figure 2). This was confirmed following biopsy and a chest radiograph, whole body bone scan and revealed no other lesion. Biopsy reported an actively growing giant cell tumor.

It was decided that, in view of the size of the lesion and the patient's age, resection of the tumour and subsequent reconstruction of the defect were to be performed using ipsilateral non-vascularized fibular graft which articulated with the carpus.

Informed consent was taken. The tumor was excised enbloc with 2 cm safety margin (Figure 3). On histopathology report the tumor was invading the attached skeletal muscle and was 0.4 cm away from the resection margin of the muscle and 2 cm away from resected bony margin. The defect, thus created in the radius was bridged by ipsilateral proximal non-vascularised fibula graft.(Figure 4).

Host graft junction was fixed with a dynamic compression plate (DCP) (Figure 5). Wrist ligament reconstruction and fixation of the head

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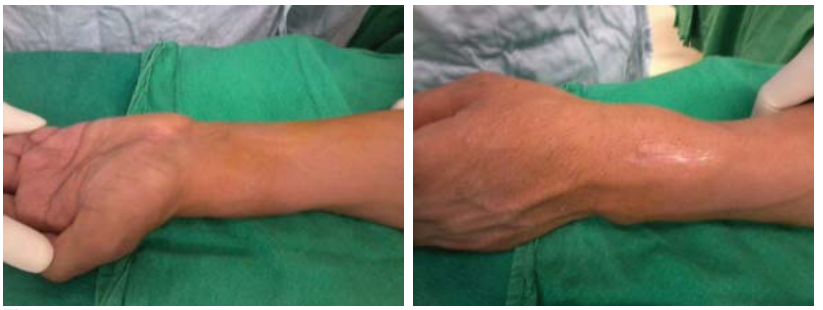

Figure 1: *The swelling of the distal end of the radius*

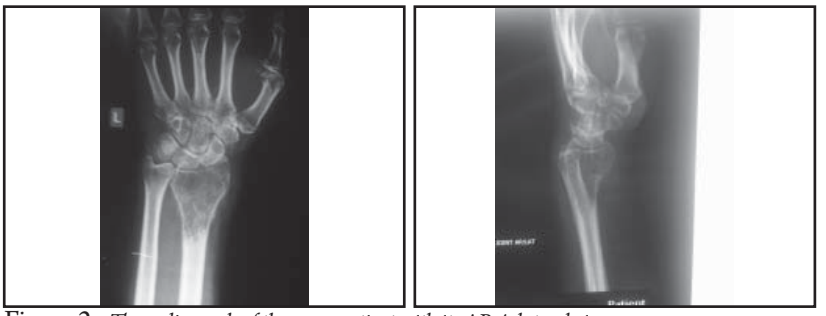

Figure 2: *The radiograph of the same patient with its AP & lateral view*

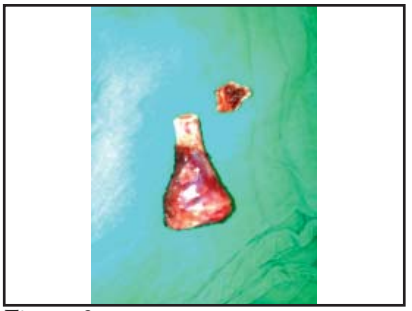

Figure 3: *Excised tumour specimen of distal radius with clear margins*

Figure 4: *Graft from proximal ipsilateral fibula*

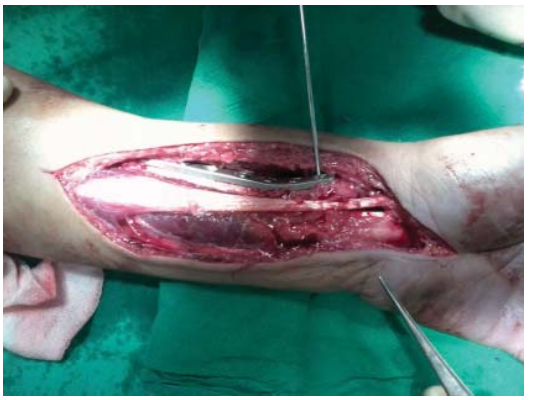

Figure 5: *Host graft fixed with a dynamic compression plate*

of fibula with lower end of ulna was performed using K-wire (Figure 6). No tumor invaded the wrist joint so as to excise any carpal bone. Postoperatively, an above elbow cast immobilization was given.

Discussion:

The primary aim of treatment of a giant cell tumor is to completely remove the tumor, avoid recurrence, and retain maximum possible function of the affected limb,[1,2] particularly the larger and more progressive lesions those which have penetrated the cortex and the periosteum necessitate excision en bloc.[3,4]

The use of autograft from various sites, with or without wrist arthrodesis, for the reconstruction of the resulting distal radial defect has been reported with varying success. Vascularised and non-vascularised iliac crest, proximal tibia, proximal fibula, and distal ulna grafts have been utilized to fuse the wrist joint following tumor resection.[5,6] Alternatively, successful arthroplasty of the wrist joint allows preservation of wrist movement and this has been performed with proximal fibular autografts,[7] cadaveric allografts, and prosthetic replacements.[8]

Distal radius reconstruction and radiocarpal fusion with autograft aims for secure union of the radius-graft and graft-carpus junctions, restricting movement at the wrist and elbow but yet maintaining satisfactory function.[9] Nevertheless, such operations can be prolonged, particularly with vascularised grafts, and complications including nonunion, graft or junctional fractures, and donor-site morbidity are well reported. In addition, disruption of the extensor mechanism may occur.[1]

Conclusion:

Non vascularised proximal fibular graft is reasonably congruous with distal radius. Its incorporation as an autograft is more rapid and predictable. Moreover, it is easily accessible without significant donor site morbidity.[10] Wrist functions are clinically acceptable.

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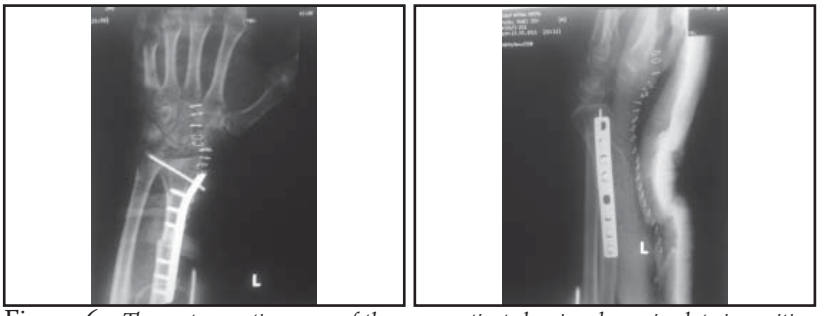

Figure 6: *The post-operative x-ray of the same patient showing dynamic plate in position with K-wire*

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