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Resection-reconstruction by Self-grafting by iliac crest for giant cell tumor of distal radius: One case and review literature

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ABSTRACT

Giant cell tumor (GCT) of the distal radius poses problems for reconstruction after resection. Several reconstructive procedures like vascularized and non-vascularized fibular graft, osteo-articular allograft, ceramic prosthesis and megaprosthesis are in use for substitution of the defect in the distal radius following resection. Most authors advocate wrist arthrodesis following resection of distal radius and non vascularized fibular graft. Here we have used a self-grafting by iliac crest the results are very satisfactory

Introduction

Giant cell tumor (GCT) of bone is a benign but locally aggressive tumor with tendency for local recurrence. (1)Absence of absolute clinical, radiological or histological parameters renders the tendency of any lesion to recur or metastasize. Distal radius is the third most commonly involved site of skeletal GCTs (10% cases) next to distal femur and proximal tibia(2.3)Many methods have been advocated for the management of distal radial GCTs. Goals of treatment are to achieve satisfactory removal of the tumor, lessen the chance of local recurrence and to preserve as much wrist function as possible. The treatment consists of either curettage or en-bloc resection of the lesion with subsequent reconstructions(1;4;5;6) Though curettage and bone grafting can preserve joint functions, it has been associated with high local recurrence rate of 27% to 54%. [7],[8],[9],[10] Walthar (1911) was the first to describe the use of a free non vascular proximal fibular graft to replace the resected distal radius. [11] Most of the authors have reported various success rates with the procedure. [11],[12],[13],[14],[15],[16],[17] The use of self-grafting by iliac crest has produced encouraging results.

Case report

32 years old Moroccan women, labor was admitted with a six-month history of soft tissue swelling in the left wrist. He initially noticed a small swelling on the left wrist which eventually increased in size.

On review of symptoms, the patient reported a dysesthesias of the left second and third finger which had gradually worsened. He denied any trauma to the site, associated fevers, or chills. No other acute symptoms were reported by the patient.

The radiological examination showed a lytic image blowing the cortical without wrist invasion(figure 1)

The biopsy was done and who objectivated a cell tumor grade 3 of campanacci

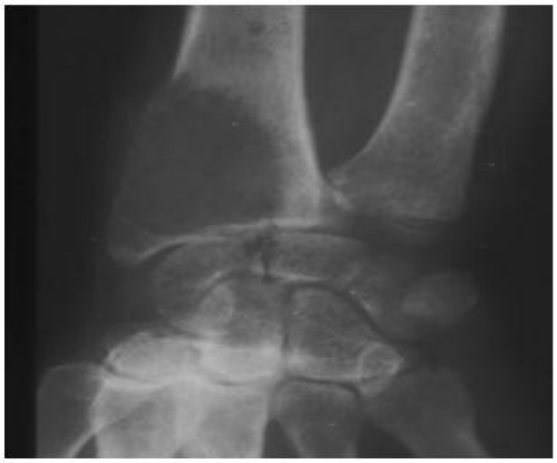

Figure 1 . Xray of the frontal wrist showing a lytic tumor of the wrist blowing the external cortical without wrist invasion.

A tumor resection-reconstruction of the tumor was done with filling by cortical self-grafting from the iliac crest. The fixing was done by a screwed plate (figure 2)

Figure 2. Peroperative image showing tumor resection.

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After a 6 month follow-up, a good consolidation (figure3); No stiffness with very good wrist mobility.

Figure 3.Xray of frontal wrist and profile showing consolidation after 3 months.

Discussion

Giant cell tumor is a challenge for the surgeons both for cure and rehabilitation. Most patients with GCT are young with normal life expectancy. The aim of treatment is to remove the tumor, reduce the chances of recurrence and preserve the joint function. The defect created by the excision of the distal radius can be filled by non-vascularized autogenous proximal fibular graft, [13],[14],[15],[16],[17]vascularized fibula, [18],[19] or vascularized pedicle graft of the ulna. [20],[21] Local recurrence and loss of joint function are still major problems following surgery. Bone grafting or bone cementing after intralesional curettage of the tumor has high local recurrence rate. Many authors reported that GCT of distal radius is particularly aggressive and has a high rate of local recurrence. [8],[10],[22],[23] Eckardt et al. recommended en-bloc resection for most grade III lesions. [1] Wide resection of the distal radius has been recommended to treat Grade III GCT when the tumor breaks through the cortex on dorsal and volar sides, when tumor invades the wrist joint or more than 50% of the surrounding metaphysis has been destroyed. [23],[24] In our patient also, we have followed this recommendation.

Resection of distal radius and reconstruction with Self-grafting by iliac crest offers several advantages like more congruency of carpal joint, rapid incorporation as autograft and easy accessibility without significant donor site morbidity. Structural change is also minimal. Moreover, immunogenic reactions are absent and bone banking facilities or graft matching procedures are not required.. Our patient has no subluxation thereafter which gives our technique more value.In a series of 6 patients, Cheng et al. reported two patients with diastasis of the distal fibulo-ulnar joint. [23] Dhammi et al. reported 10 cases (n=16) of wrist subluxation. [25]Lackman et al. reported one case each of volar displacement and radial deviation (n=12). [26] Saraf et al. reported significant subluxation of wrist in two cases out of 15 treated with plate fixation resulting in significant pain, deformity and loss of function. [27] .

At 6 months of follow-up Our patient had no local or remote recurrence. The lesion was treated with wide excision of the soft tissue mass. Murray et al. reported recurrences in 5 patients (n=18) of which 3 involved soft tissues only. [16] There was no local recurrence reported by Cheng et al. [23]

The possible reason for this absence of recurrence was very few patients (n=6) and too short a follow-up to rule out late recurrences. [23]

Five cases of nonunions at the host graft junction were reported by Murray et al. in their series of 18 cases of distal radius GCT. [16] This was attributed to inadequate fixation of the grafted fibula. Dhammi et al. reported five nonunions (n=16), while Lackman et al. reported 2 nonunions (n=12), all of which required secondary procedures. [25],[26] There were five cases of nonunions (n=15) in the series of Saraf et al. of which in two cases the limb was amputated due to recurrence. [27] . The consolidation was obtained in our patient at 6 months

Twelve cortices' fixation at the host-graft junction with a small DCP permits rigid fixation. The fixation of the graft was obtained by a simple screwed plate which allowed our patient to start the rehabilitation very quickly.There were graft fracture in 3 cases (n=18) in the Murray et al. series. [16] We had graft fracture in only one case (4.2%). Cheng et al. did not report any graft fracture. [23] Murray et al. had found donor site morbidity to be frequent like pain, weakness, lateral instability and transient peroneal nerve palsy. [16]

Conclusion

Resection of distal radius and reconstruction with Self-grafting by iliac crest is useful to preserve the functional movement and stability with normal appearance of the wrist. Further, this procedure eliminates the need for microvascular surgery. Our results showing satisfactory range of movements and sufficient grip strength with good functional results justify this procedure of reconstruction arthroplasty in case of Giant cell tumors of distal radius

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