

CASE STUDIES

USE OF CEM-OSTETIC® PUTTY IN THE REPAIR OF METACARPAL BONE DEFECTS

Summary

This report shows results of using Cem-Ostetic® putty in treatment of metacarpal bone nonunion. The clinical trial was performed on six patients with various metacarpal bone defects from January to April, 2004. All patients were treated with implants of Cem-Ostetic® putty. The ages of the patients range from 20 to 32 years old. The bony defects that range from 0.2cm x1cm to 0.5cm x1cm are located on the diaphysis of metacarpal bone. Cem-Ostetic® putty was implanted into the bony defects, after debridement of the fracture site. The maximal dosage of Cem-Ostetic® putty used in our study was 5 cc per case.

The postoperative follow-ups were completed after six months. All patients had unremarkable postoperative courses. No allergic reactions, toxic effects, skin rash or high fever were observed among all six patients. The concentrations of both serum calcium and phosphate were within normal limits. No drainage was observed at incision site. Postoperatively, routine X-rays were performed after 7, 21, 56, 84, 112 and 140 days. On average, X-rays showed clear evidence of resorption of graft materials by day 56. After 90 days, most of the graft materials have been resorbed and incorporated by the host bones. All fractures healed after five months.

Treatment

A 21-year-old male patient had a nonunion of the left second metacarpal (Figure 1). The patient was taken to the operation room for debridement, plate stabilization and grafting. After debridement of the fracture site, a residual defect of 0.5cm diameter was noted. Internal fixation was performed with a 5 hole-plate. Cem-Ostetic® putty was mixed and inserted into the bone defect and then pressed tightly.



Figure 1. Preoperative: AP and lateral view demonstrating nonunion of the second metacarpal.



Figure 2. Postoperative - Stage 1: After stabilizing the fracture with a plate, Cem-Ostetic® putty was placed into the bone defect.

The postoperative course was uneventful. Neither generalized nor local adverse reactions were observed postoperatively. An X-ray image at four months postoperatively showed fracture healing and complete resorption of the bone graft (Figure 3). A good healing result was observed when fixation was removed after six months (Figure 4).

Discussion

In the treatment of metacarpal fractures, adequate stabilization is required for early mobilization to maintain hand function. Inadequate stabilization of the fracture with early motion frequently leads to non unions or delayed unions. Treatment of the non-unions requires debridement, internal fixation and bone grafting. These cases demonstrate the safe and effective use of Cem-Ostetic® putty for grafting metacarpal non-unions at the time of surgical debridement and stabilization.



Figure 3. Postoperative - Stage 2 at four months: AP and lateral views demonstrate excellent graft remodeling and incorporation .



Figure 4. Postoperative - Stage 3 at six months: After removal of the fixation, AP X-ray demonstrates the well-healed fracture with graft incorporation.