

PLATE AND CEMENT V/S NAIL AND CEMENT FOR PATHOLOGICAL FRACTURES OF THE HUMERUS. A COMPARATIVE STUDY OF CLINICAL RESULTS.

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BACKGROUND: Pathological or impending fractures of the humerus due to metastases or myeloma are conditions associated with pain, loss of function and decreased quality of life. Surgery is an effective means for management of this complication. Several methods have been reported, mostly as case series. However, complications such as hardware failure can occur, due to poor bone quality and progression of local disease. Plating and intramedullary nailing with the addition of cement are among the most popular methods for fixation. We retrospectively compared the clinical results and complications of these two treatment methods in patients from two different institutions.

PATIENTS AND METHODS: Fifty-six patients with impending or present pathological fractures of the humeral diaphysis due to metastases or myeloma were included. Thirty-three patients with thirty-eight impending or present fractures (five patients with bilateral lesions) were treated utilizing plates and cement (University of Chile, group A). Twenty-three were treated with intramedullary nailing and cement (Mount Sinai Hospital from New York, group B). The primary diagnosis was similar for both groups. Average age in group A was 59 (from 45 to 86) and for group B was 63 (from 21 to 88). In group A, an extensile anterolateral approach was performed, allowing ample exposure of the humeral diaphysis. Curettage of the bone lesion and filling of the bone canal proximally and distally with cement was performed. A long plate protecting the entire diaphysis was applied and secured with screws after hardening of the cement. Double plating and a cement spacer was utilized in four patients with segmental defects. A drain was used in all cases. In group B, curettage of the lesion and medullary canal was done from the proximal approach for antegrade nailing, followed by filling of the bone canal with cement. A standard tibial nail of the tibia was then inserted, with the cement still in a doughy phase. Immediate postoperative motion of the limb was encouraged promptly in both groups. Average follow up was 35 months for group A, and 50 month for group B. Clinical evaluation included pain and function according to the MSTs functional scale, and presence of complications requiring surgery (infection, hardware failure and tumor recurrence).

RESULTS: At follow up, all fifty-six patients finally recovered function for normal daily life activities and had complete pain relief. There were no statistically significant differences between both groups in terms of pain and function, neither in the incidence of complications ($p: 0.64$). Two patients in group A had hardware failure. One with multiple myeloma that had a cement spacer and a single plate that failed 60 months after the index procedure. She was revised with double plating and a new spacer. The other had metastatic lung cancer and had loosening of a distal screw one month after surgery. This was replaced percutaneously. One patient with kidney cancer had a soft tissue tumor recurrence that was resected. One patient in group B had a deep infection, that undergone multiple debridement and hardware and cement removal. Plating was performed as final fixation.

CONCLUSIONS: Surgical treatment of impending or present pathological fractures of the humeral diaphysis can provide swift functional recovery and pain relief. However, any given method should avoid local progression of the disease, because failure of the reconstruction is highly undesirable for patients with limited life span. In our study, both techniques provided good results in terms of pain relief, return to function and local control of the disease, with no significant differences regarding the incidence of complications. We believe that the use of intramedullary cement –regardless of the method of fixation- is key in achieving local control of the disease and therefore preventing hardware failure.