



ANTERIOR BRIDGE PLATING OF HUMERUS- A PROMISING TREATMENT

Orthopaedics

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ABSTRACT

Functional bracing of humerus consistently gives acceptable functional result as well as radiological union in humerus shaft fracture. However many patients complains of pain and disability during the healing phase and many have residual stiffness of joint at the end of the treatment. Traditional open reduction with DCP though gives acceptable results, it can result in non-union, iatrogenic radial nerve palsy etc as its complications. Non union and plate failure following traditional plating of humerus is extremely difficult to manage. Nailing of humerus fracture is not popular like in other long bones of the body because it produces significant shoulder complaints due to impingement. Here we present our experience of anterior bridge plating in shaft of humerus fracture. It is a retrospective analysis of 30 patients who had undergone anterior bridge plating with a minimum follow-up of one year.

KEYWORDS:

Anterior bridge plating, Fracture of shaft of humerus, MIPPO

Introduction.

Humerus fracture is a relatively common fracture being treated by orthopaedic surgeons world over. Its treatment varied from hanging arm cast to surgical fixation with plate and screws or nails. Each is having its own merits and demerits. The present concept of surgical fixation of bone is to restore the anatomy with minimal violation of biology, 'biologic plating'. Due to the tremendous amount of movements possible at the shoulder joint, malunion of humerus is well tolerated by the patients to a certain degree. This fact is well proven by Sarmiento in his classical work. Now Sarmiento's method of functional bracing of humerus is considered to be the gold standard in the conservative treatment of humerus fracture. Here we present our results of anterior bridge plating of humerus.

Aim

To assess the radiological Union following this modality of treatment
To assess the functional results

Materials and Methods.

We retrospectively assessed the data of patients who had undergone anterior bridge plating of humerus at Calicut medical college between the period January 2015 to January 2016 so as to get a minimum follow up of 1 year. The case records and x-rays were verified to assess the mode of injury, type of fracture, level of fracture and any associated complications. Surgical notes are verified. Postoperative X-rays were reviewed. Their follow-up records are also assessed to note the fracture union and the status of complications if any. These patients were contacted through mail and were asked to review in outpatient department to assess the functional results.

Functional results are assessed by the UCLA score³

Results

We had a total of 34 patients who had undergone anterior bridge plating of humerus during this period. Out of that 4 were type 1 open fractures which were excluded from this study.

This paper is the analysis of those thirty patients. There were a total of 22 males. Average age was 38 years with a range of 18-65 years. Twenty patients had fracture of right humerus. Road traffic accident was the predominant mode of injury with 18 patients sustaining injury due to road traffic accident. 12 patients sustained injury following a simple fall. 16 patients had middle third fracture and 14 patients had lower third fracture. 16 patients had comminuted fracture, 8 had transverse fracture and 6 had oblique fracture. Three patients had radial nerve palsy prior to surgery.

Mde of injury	Level of fracture	Type of fracture
RTA 18	U/3 0	C 16
Fall 12	M/3 16	T 8
	L/3 14	O 6

RTA=Road traffic accident, U/3=Upper third M/3= Middle third L/3=Lower third

C=Comminuted T=Transverse O=Oblique

All patients had a minimum follow up of 1 year. All fractures united radiologically within that period. Average time for union was 4.4 months, with a range of 2.5 months to 7 months. All nerve injuries recovered completely. There was no iatrogenic radial nerve.



Preop X-ray Fig 1



Preop 3D CT Scan Fig 2



Postop AP Fig 3



Postop Lat Fig 4

Only 16 patients responded to mail and attended the outpatient department voluntarily. All of those 16 patients had excellent or good result as per the UCLA score.



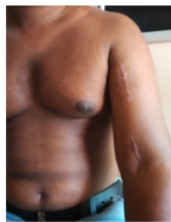
AP x-ray at fracture union
Fig 5



Lat X-ray at Fracture union
Fig 6



Shoulder Function
Fig 7



Healed Wound
Fig 8

Discussion

Traditionally humerus fractures were treated by conservative methods like hanging arm cast, Coaptation splints or functional bracing¹. Now functional bracing is considered to be the gold standard of conservative treatment of humerus fracture¹. Fracture union rates are usually reported over 90 percent by various studies⁴. However it has got various disadvantages like skin break down, functional disability during healing phase, pain during healing stage, residual deformity, and stiffness of joints⁴. Though surgical treatment of humerus fracture is still not convincingly proven to offer any superior results compared to functional bracing, patient satisfaction with surgical fixation is better in the initial period⁴. At the same time open reduction of humerus with internal fixation with plate and screws requires wide dissection of muscle and stripping of periosteum which can result in non union and failure of plate fixation not infrequently. As per Sarmiento, even an aggressive surgeon won't operate upon humerus who have long recognised that complications from surgery are likely to occur and their satisfactory resolution is difficult to achieve.⁷ Present concept of humerus surgery is to attain biological fixation. One method of biological fixation is nailing. But unlike in other long bone fractures this frequently results in rotator cuff damage which ultimately affects the shoulder function of the patient⁶. Most of the recent studies confirms to the fact that surgically plated humerus fracture patients fares better functionally than surgically nailed patients^{7,8,9}. Nailing frequently results in shoulder impingement resulting in implant removal⁸. Recently anterior bridge plating of humerus by MIPPO technique has become a popular method of treatment because it avoids most of the complications mentioned above. Like in our study many studies shown excellent union rates and functional results^{7,8,9,10,11}. In their analysis of 16 RCTs comparing conventional plating, intramedullary nailing and Mippo plating for humerus fracture (comparing between any of two methods) Zhao JG et al concluded that compared with nailing and conventional plating, MIPPO technique is the preferred treatment method for humeral shaft fractures¹². Since it was a retrospective study we could only report the functional outcome of few patients. In all of them UCLA shoulder score was consistently high. From our experience we believe that this is a 'surgical method of functional bracing' since biology is disturbed sparingly and fracture union occurs by external callus, which is considered to be the natural method of bone healing. Since it is technically not a demanding procedure and produces excellent results with minimal complications we believe it should be considered as the treatment of choice in majority of humerus fractures.

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