Research Paper

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Management of Fracture Shaft of Humerus With Open Reduction and Plate Fixation

Medical Science

KEYWORDS : Diaphyseal humeral fractures, plate osteosynthesis, Rommen's et al series.

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ABSTRACT

INTRODUCTION: Fractures of the shaft of the humerus account for 1% to 3% of all fractures. With the formation of the AO group in 1958, internalfixation of bone and joint injuries secured scientific outlook. Despite the numerous surgical techniques, Plate Osteosynthesis remains the gold standard for fixation of humeral shaft fractures.The present study reemphasizes the effectiveness of plate osteosynthesis in the management of humeral shaft fractures so as to restore the patient structurally and functionally to near normal status.

MATERIALS AND METHODS: This is a prospective study of 35adult patients with diaphyseal Humeral fractures treated with plate osteosynthesis. After a thorough pre-operative assessment cases were taken up for surgery. All the patients were assessed radiologically and clinically for fracture union at regular intervals of 6 weeks, 12 weeks and 18weeks by using ROMMEN'S ET AL series grading..

RESULTS: : The functional outcome was excellent in 32cases, good in 2 cases, and poor in 1 case. All the patients completed the study period.

CONCLUSION: From this sample study, we conclude that plate osteosynthesis is one of the best option for the treatment of Humeral shaft fractures, with optimal reduction of the fracture and good positioning of the plate.

INTRODUCTION:

The upper limb in Human body is highly functional and mobile for positioning the hand in space. As the upper extremity functions with a long lever arm and highly exposed to external forces, it is predisposed to injuries frequently. Fractures of the shaft of the humerus account for 1% to 3% of all fractures. The emphasis has changed from splinting and prolonged immobilization, to internal fixation discarding external immobilization, with return to normal function as early as possible. The main modalities of internal fixation in humerus shaft fractures are Plate osteosynthesis and intramedullary nailing. Despite the numerous surgical techniques, Plate Osteosynthesis remains the gold standard for fixation of humeral shaft fractures.

The present study emphasizes the effectiveness of plate osteosynthesis in the management of humeral shaft fractures so as to restore the patient structurally and functionally to near normal status.

MATERIALS AND METHODS:

The present study consists of the patients admitted to orthopaedic department of ASRAM Hospital between **May 2011** and **September 2013**. A total of **1336** fracture cases were treated in Department of Orthopaedics, Alluri Sitarama Raju Academy of Medical Sciences, Eluru during this period. Of these **382** were upper limb fractures. The Humeral bone fractures were **89(23.2%)** and Humeral shaft fractures were **45.**After excluding the patients who come under exclusion criteria, **35** patients were selected for detailed study. Among the 35 patients,**28(72%)** were males and **7(28%)** were females. The mean age of presentation was **34.7** years. The most common mechanism of injury was Road traffic accidents **(88%)**. AO type A3 fracture pattern was the most common type seen. Right sided Humeral fractures were more compared to left side.

All patients on admission were clinically assessed and stabilizedhemodynamically. Radiographs of arm including shoulder and elbow joints were taken in two planes, namely anterioposterior and lateral views. Preliminary J-Slab was applied to the fractured limb and immobilized till surgery. Patients were operated as early as possible after obtaining fitness for surgery and anaesthesia.All the patients were operated using anterolateral approach(Henry's approach).

Routine antibiotics and anti inflammatory drugs were given after surgery. Post operatively J-Slab was applied. Patients were discharged following suture removal after 10 days. Check X-Rays were taken on the 2ndpost operative day. Patients were followed at an interval of 4 months to 1 year for the recovery index. Clinical and radiological union results were evaluated by ROMMEN'S ET AL series grading.

RESULTS: On an average all fractures showed acceptable radiological union by 16 weeks. 32 out of 35 cases in our study had excellent results. 2 cases had good results and one had poor result.

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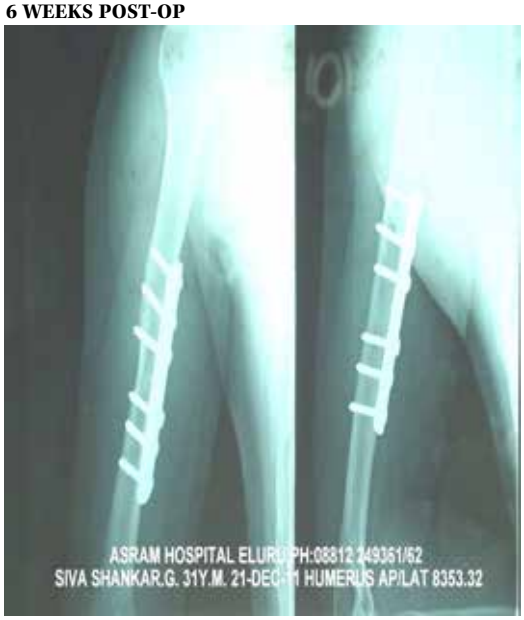
PRE-OPEARTIVE X-RAY

POST-OP X-RAY

6 WEEKS POST-OP



FINAL FOLLOW-UP

DISCUSSION:

Diaphyseal fractures of Humerus are usually a result of high energy trauma. In the by gone years orthopaedic clinicians labeled the Humeral shaft fractures as benign fractures. Irrespective of the method used, union was not a problem but malunion and cosmetic unacceptability was the real concern. It was reflected aptly in Sarmiento's observations in his text book. Patients of fractures of the Humerus are prone for economic and social burden to their families if the recovery is not satisfactory. Plate osteosynthesis remain the gold standard in the surgical management of the humeral shaft fractures.

The incidence of Humeral shaft fractures is 1% to 3% of all fractures in our institution. During the period of May 2011 to September 2013,over 45 diaphyseal fractures of Humerus were treated in orthopaedic department at ASRAM Hospital, ELURU. After excluding the fractures which come under exclusion criteria, 35 patients were selected for the detailed study. Most of our patients were of young and middle aged, 30 out of 35 patients (80%), the average age being 34.7 years, which correlate with the fact that younger population is at increased risk of Humeral shaft fractures and it is lower compared to **McCormacket al 29** series(49 years) and **Hee et al 30** series(37 years). In our study,significant male dominance 72% (28 out of 35) was seen as compared to 65.2% in **Mc Cormack et al series29** and 74.2% in **Hee et al 30**series. Regarding side of fracture, right side involvement is more (18 out of 25(72%)) in our study, but in the study of **Hee et al30**, left side involvement is more(54%) and in **Kiran singisetti et al31** series no obvious sex predilection was noted. In 30 out of 35 patients (80%) fractures are due to road traffic accidents ,where as in **Hee et al30** and **Mc**

Cormack et al29series, it is 54.2% and 78.2% respectively. The level of fracture is dominated by middle 1/3rd 88% (32 out of 35 cases). This figure ranged from 66.6% and 60% in **Mohandas et al21** series and **Hee et al30** series respectively. Fracture pattern in our study was transverse fracture in 26 out of 35 patients(64%) compared to 77.14% in **Hee et al30**series. Pre-operatively radial nerve palsy was noted in none of our cases but in **Hee et al30** and **Kiran singisetti et al31** series it was 5 and 4 cases respectively. In all our cases Henry's Antero-lateral approach was used. The reduction of fracture was satisfactory intra operatively in all our cases. No intra-operative complications were noted in our study. The mean duration of hospital stay in our series was 15 days which was high compared to **Hee et al-30**series(10 days).The duration of follow up in our study ranged from 6 to 12 months where as it was 6 to 33 months in **Mc Cormack et al29** series and 10 to 24 months in **Kiran singisetti et al31** series.

The average time for radiological union in our series is 16 weeks(4 months) compared to 5.3 months in **Heeet al30** series and 16 weeks in

Kiran Singisetti et al31 series.One of our case developed non-union compared to one case in **Mc Cormack et al29** series and no case of non-union in **Mohandas et al21**series. Shoulder/ Elbow stiffness reported in one of the 35 cases in our patients compared to 20% in **Hee et al30**series and 0% in **Mohandas et al21** series. Post operatively none of our cases developed any radial nerve palsy but **Kiran singisetti et al31**series noted one such complication.All the patients in this study had no problems relating to malalignment, pain, iatrogenic radial nerve palsy. Final outcome was excellent in 32 out of 35 cases(88%) in our study compared to 89% in **Hee et al30** series and 100% in **Mohandas et al21** series.

CONCLUSION:

From this sample study, we conclude that plate osteosynthesis is

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the best for the treatment of Humeral shaft fractures, with optimal reduction of the fracture and good positioning of the plate and screws.

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