

Anteromedial Plating of Humerus—An Easier and Effective Approach

L. Senthil, N. Jambu, B. Samuel Chittranjan

Department of Orthopaedics, Sri Ramachandra University, Chennai, India
Email: lsenthil_dr@yahoo.co.in

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Abstract

Plate osteosynthesis of humeral shaft fractures is an established surgical procedure. Iatrogenic radial nerve palsy appears to be common complication in treating these fractures. A case series of 20 fracture shafts of humerus were treated with anteromedial plating through anterolateral approach. There was no radial nerve palsy in any of the cases and all achieved fracture union.

Keywords

Anteromedial Plating, Antero Lateral Approach, Humerus Shaft Fractures, Radial Nerve Palsy

1. Introduction

Shafts of humerus fractures account for 1.2% of the total cases seen in the casualty [1]. Humeral shaft extends from major pectoralis insertion to supracondylar ridge. Attachments from major pectoralis deltoid, rotator cuff muscles influence the degree of displacement of fractures. Uncomplicated cases of shafts of humerus fractures are treated conservatively [2]. Plate osteosynthesis remains the gold standard of surgical treatment. Plate fixation results in high union rates but requires extensive dissection and soft tissue stripping [3]-[5]. The most commonly used approaches for treating these fractures are posterior and anterolateral [6]-[10]. The incidence of radial nerve palsy through posterior approach is 11% and anterolateral plating is 5.4% [6].

2. Materials and Methods

This is a prospective study done in Sri Ramachandra medical college and research institute. Twenty patients with shaft of humerus fractures were treated with medial plating through anterolateral approach. These patients were followed for a period of one year. Road traffic accidents accounted for 90% of the cases and 10% being slip and fall at home. One case had an associated mastoid process fracture with facial nerve palsy. Patients with preoperative radial nerve palsy were excluded from the study. Within five days of injury, surgery was per-

formed.

3. Surgical Procedure

Patient was anaesthetized and placed in supine position. The lateral border of biceps tendon was palpated and the skin incision made along the lateral border of biceps. The plane was between biceps and brachialis muscle (shown in **Figure 1**). The brachialis muscle was elevated from humerus and retracted laterally to expose the fracture site. The medial border of humerus was exposed subperiosteally. After reducing the fracture, locking compression plates (8 patients) (shown in **Figure 2**) and dynamic compression plates (12 patients) were fixed with appropriate screws and wound closed in layers.

Shoulder range of motion and elbow exercises were started on first postoperative day. Radiographs were assessed at 6 weeks, 12 weeks, 3 months and 6 months for fracture union.

Few radiographs of patients treated are added for clarity. **Figure 3** shows preoperative radiograph of patient 1, **Figure 4** shows immediate postoperative and **Figure 5** shows postoperative after 6 months of the same patient. Preoperative radiograph of patient 2 can be seen in **Figure 6** and immediate postoperative radiograph in **Figure 7**.



Figure 1. Shows the interval between biceps and brachialis.

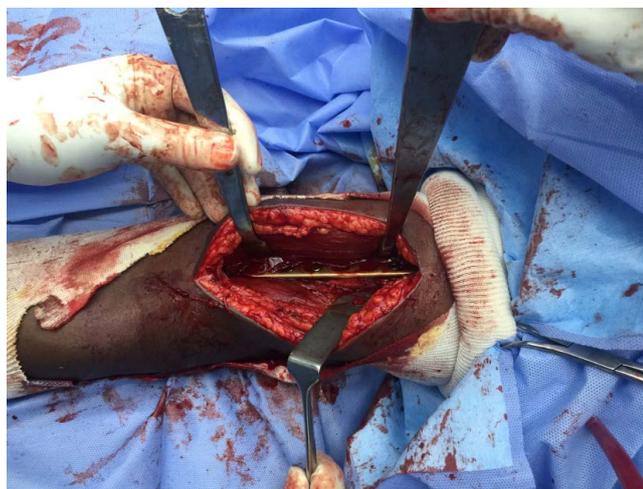


Figure 2. Plate applied on medial surface.



Figure 3. Preoperative radiograph patient 1.



Figure 4. Immediate postoperative radiograph patient 1.



Figure 5. Postoperative radiograph after 6 months patient 1.



Figure 6. Preoperative radiograph patient 2.



Figure 7. Immediate postoperative radiograph patient 2.

4. Results

A total of 20 patients with fracture shaft of humerus were treated with anteromedial plating. Fourteen patients were male and six patients were female. None of the patients had preoperative radial nerve palsy. There was no requirement for blood transfusion for any of the patients. Radial nerve palsy was not observed in any of the case immediately after surgery. Evidence of healing was seen between six to twelve weeks. Callus formation and cortical union were observed on radiographs as evidence of radiological union. There was no radial nerve palsy in the present study. One patient developed superficial infection which healed with antibiotic therapy.

5. Discussion

There is an increasing trend of shaft of humerus fractures being treated operatively [1]. Denies [3] in his study compared conventional plating with intramedullary interlocking nail in 91 patients. He reported high complication rate with intramedullary nail and suggested plating as primary treatment for humeral shaft fractures. In most instances dynamic compression plating is preferred [2] [6] [8]. The most commonly used approach are the posterior and anterolateral approaches [4] [7]. Oh [7] in his study compared open reduction with internal fixation and minimally invasive plate osteosynthesis in humeral shaft fractures he reported no difference in fracture union however radiation hazard was high with mippo technique. Boschi [4] in his study concluded subbrachial approach as practical and effective and the loss of muscle strength was significantly less with subbrachial approach. In our study medial plating was done through anterolateral approach without splitting the brachialis, the brachialis was elevated and retracted laterally

The advantages of medial plating over posterior plating are supine position of the patient which makes anesthesia easier, no handling of radial nerve and less soft tissue dissection. Incidence of radial nerve palsy in posterior plating has been reported to be 11.14%. [6] In our study we did not have any radial nerve palsy.

Ivan kirin in his study compared anterolateral plating and anteromedial plating and reported 5.4% of radial nerve palsy when the plate was applied on the lateral surface he did not have any radial nerve palsy when plating was done on anteromedial surface. Anterolateral plating frequently involves plate contouring and erasing deltoid

on lateral surface. In our patients plate contouring was not done because of relatively flat medial surface which decreases the operating time. In our study we did not have any radial nerve palsy.

Anteromedial plating avoids radial nerve visualization and dissection, protecting neurovascular structures.

6. Conclusion

In our study we performed anteromedial plating through anterolateral approach and there was no radial nerve palsy. Hence, we recommend anteromedial plating for treating humeral shaft fractures.

Conflict of Interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article. No funds were received in support of this study. The authors confirm that this article content has no conflicts of interest.

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