

## Case Series

# Exploration of radial nerve in patients with humerus shaft fracture with radial nerve palsy, is it necessary?

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### ABSTRACT

Fractures in the distal third of the humerus shaft usually are associated with complete or incomplete radial nerve lesions which may be caused due to traction, entrapment or compression between bony fragments. We managed these patients by bridge plating using minimally invasive percutaneous plate osteosynthesis. A total of 5 patients were operated on and all showed full functional recovery of radial nerve. Fracture united in all cases and no patient developed any complication.

**Keywords:** Humerus, MIPO, Radial nerve

## INTRODUCTION

Minimally invasive percutaneous plate osteosynthesis (MIPPO) has been used with good success for the treatment of diaphyseal humerus fractures without radial nerve palsy.<sup>1-3</sup> Fractures in the distal third of the humerus shaft may be associated with radial nerve palsy due to contusion, laceration or entrapment of radial nerve at the fracture site.<sup>4</sup>

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Operative technique: Procedure was done in supine position with the fractured arm resting on a side arm rest which was attached to the operating table. Initially distal incision about 2-3 cm in length was given. After retracting the biceps towards the medial side musculo-cutaneous nerve was visible. Access to the humerus was gained by splitting the brachialis muscle. Musculo-cutaneous nerve was retracted along the medial half of brachialis and radial nerve along the lateral half. For proximal incision, interval between lateral border of the proximal part of the biceps and the medial border of the deltoid were palpated. A 2-3 cm proximal incision was made approximately 5 cm distal

to the anterior part of the acromion process and the dissection was carried down to the humerus. A sub muscular tunnel was created from the distal to the proximal incision using a tunneling instrument. Plate was attached to tunneling instrument at the proximal site and drawn from proximal to distal incision. The forearm was positioned in supination, pronation brings the radial nerve closer to plate.<sup>5</sup> Reduction of the fracture was achieved by manual manipulation. Traction was used to restore the length and to correct angulation. Finally, the fixation was completed with at least two screws in each fragment.

**Table 1: Clinical details of five patients.**

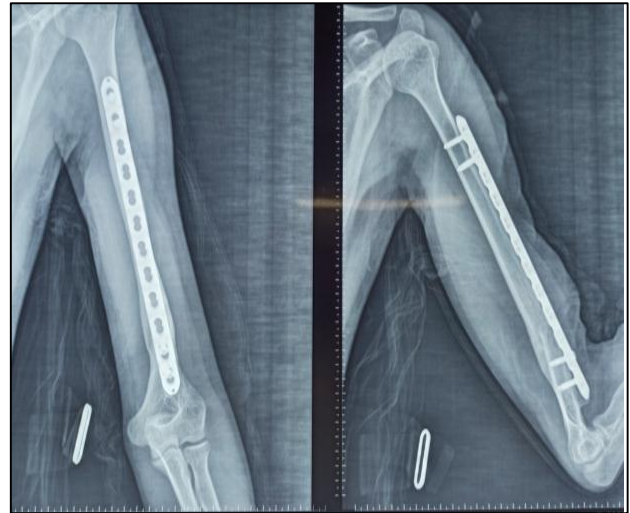
Case	Gender	Age (Years)	Time interval, trauma to nerve palsy	Time interval, trauma to surgery (days)
1	M	26	Immediate	3
2	F	33	Immediate	5
3	M	31	Immediate	4
4	M	38	Immediate	4
5	M	29	Immediate	5



**Figure 1: Pre operative radiograph of fracture.**



**Figure 2: Immediate post operative radiograph.**



**Figure 3: Final radiograph at 3 months.**

In this case series, five patients were operated and all showed full functional recovery. No exploration of radial nerve was done in any of our patients. Fracture healing occurred at a mean of 3.4 months and complete neurological recovery occurred at a mean of 3 months. Normal range of motion in shoulder and elbow was seen in all patients at final follow up. No patient developed any post operative complication.

**Table 2: Details of results in the five patients.**

Case	Follow up (months)	Union (months)	Recovery time from nerve palsy (months)	Elbow (Flexion)	Elbow (extension)	Valgus carrying angle	Complications
1	6	3	3	130	10	7	None
2	6	3.5	4	130	5	8	None
3	6	3.5	1.5	130	0	8	None
4	6	4	3	130	0	8	None
5	6	3	3.5	130	0	8	None

**DISCUSSION**

Increasing traffic accidents and sports activities resulted in the increased incidence of humeral fractures, about 30%-50% of which are humeral shaft fractures.<sup>6</sup> In the distal third spiral and oblique fractures are common and in middle third transverse fracture morphology is mostly seen.<sup>7</sup> In about 1.8% to 18% of cases with a mean of 11% radial nerve palsy occur following humerus fracture.<sup>3,4,7</sup> The function usually recovers spontaneously in 80% of cases after conservative treatment that is why some recommend conservative treatment of these fractures.<sup>8</sup> However, some authors recommend urgent exploration of nerve with open reduction and plating of these fractures. Lesions of radial nerve in middle third of humerus are due to Neuropraxia and resolve spontaneously.<sup>9</sup> The nerve is fixed by lateral intermuscular septum in the distal third of humerus. Lesion of radial nerve at this area are due to entrapment or contusion of the nerve. Oblique or spiral fractures have an increased tendency towards causing this

type of nerve lesion, making spontaneous reclamation unpredictable.<sup>4,7,9,10</sup> In patients with partial lesions of nerve the rate of recovery of nerve is greater than in those patients with both motor and sensory loss.

**CONCLUSION**

We concluded that most of the nerve palsies associated with humerus shaft fractures are due to Neuropraxia and resolve spontaneously without the need for exploration of radial nerve.

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