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**Early Operative Treatment  
of Radial Nerve Palsy  
Complicating Fracture of  
the Shaft of the Humerus**

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**Summary**

*A series of eighty patients with radial nerve palsy complicating fracture of the shaft of the humerus were studied from January, 1985 to December, 1987. These patients were studied in two groups, conservative versus operative. In the operative group every case was explored for radial nerve and the fracture was rigidly fixed. In conservative group, every case was managed by closed reduction and cast. In this group of 19 cases (47.5%), the nerve was explored later on. The results of both groups were evaluated. Average time of recovery was 12.6 weeks in the operative group and 29.6 weeks in the conservative group. We found in this series that the functional recovery of the limb in the operative group was better than in the conservative group in our circumstances.*

**Introduction**

Early operative treatment of fracture of the shaft of the humerus associated with radial nerve palsy is still a controversial issue.

Some authors<sup>1,6,10</sup> have recommended early exploration.

Other authors<sup>2,3,5,7,13,14</sup> have recommended the conservative treatment hoping for spontaneous recovery. In case of no recovery between 6 weeks to 6 months after injury, they also recommended exploration. The

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purpose of our study is to compare the findings and the results of conservative versus operative treatment.

### Material and Methods

The present series consisted of 80 cases admitted to Orthopaedic Unit of the Postgraduate Medical Institute, Lady Reading Hospital, Peshawar with complete radial nerve palsy complicating fracture of the shaft of the humerus during the period January, 1985 - December 1987. There was no associated median or ulnar nerve or brachial artery injury.

All the patients were randomised into two groups for the management: operative and conservative.

In the operative group, which consisted of 40 patients, the mean age was 32 years (range 22-50 years).

The male/female ratio was 4:1. There were 28 fractures on the right side and 12 fractures on the left side. Incidence of the type of injury is shown in Table-1:

TABLE-I  
INCIDENCE OF TYPE OF INJURY  
(OPERATIVE GROUP)

Cause	Simple	Compound	Total
R.T.A.*	20	8	28(70%)
Fall	8	-	8(20%)
F.A.I.**	-	4	4(10%)
Total	28(70%)	12(30%)	40

\* Road traffic accident

\*\* Fire-arm injury

The incidence of the site of fracture is shown in Table-II:

**TABLE-II  
INCIDENCE OF SITE OF FRACTURE  
(OPERATIVE GROUP)**

Cause	Middle 1/3	Lower 1/3	Total
R.T.A.	10	18	28
Fall	1	7	8
F.A.I.	3	1	4
Total	14(35%)	26(65%)	40

In the conservative group, which consisted of 40 patients, the mean age was 38 years (range 18-65 years).

The male/female ratio was 3:1. There were 25 fractures on the right side and 15 fractures on the left side.

The incidence of the type of injury is shown in Table-III:

**TABLE-III  
INCIDENCE OF TYPE OF INJURY  
(CONSERVATIVE GROUP)**

Cause	Simple	Compund	Total
R.T.A.	14	7	21(52.5%)
Fall	9	1	10(25%)
F.A.I.	-	9	9(22.5%)
Total	23(57.5%)	17(42.5%)	40

The incidence of the site of fracture is shown in Table-IV:

**TABLE-IV**  
**INCIDENCE OF SITE OF FRACTURE**  
**(CONSERVATIVE GROUP)**

Cause	Middle 1/3	Lower 1/3	Total
R.T.A.	9	12	21
Fall	2	8	10
F.A.I.	6	3	9
Total	17(42.4%)	23(57.5%)	40

In the operative group, all simple fractures were immediately explored for radial nerve and fractures were fixed on A.O. principle. The compound fractures were explored and fixed when the wound was completely healed.

In the conservative group, closed reduction was done and a long arm cast with a cock up splint applied till the fracture was united. In compound fractures, the management was performed with an external fixator till the fracture was united. In this group 16 patients were later explored for radial nerve with a mean duration of 4½ months (range 3-6 months).

### **Follow up**

The mean duration of follow up of the patients was 18 months. Two patients of the operative group and 6 patients of the conservative group did not turn up for follow up.

### **Results**

In the operative group at exploration in 28 cases (70%), the nerve was entrapped but found intact when released between the fracture fragments. In 8 cases (20%) the nerve was partially damaged and repair was

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performed. In 4 cases (10%) the nerve was completely cut and was repaired.

All fractures united. 4 cases developed post-operative infection; 3 had superficial infection and 1 had deep infection. They were managed accordingly with appropriate antibiotics.

In the conservative group. 15 patients (37%) showed spontaneous recovery. 6 patients (15%) did not turn up for follow up and 19 patients (47.5%) were operated. Out of these 19 cases, in 9 cases (22.5%) the nerve was entrapped in callus and was released; 8 cases (20%) required repair of the nerve and in 2 cases (5%) triple tendon transfer was performed.

Two cases out of 15 cases who recovered spontaneously (conservative group) required plating and bone grafting for non-union.

Two cases out of 19 patients who were later operated for radial nerve required plating and bone grafting for non-union.

Table-V shows the percentage recovery and time-period between accident and recovery.

**TABLE-V**  
**RECOVERY AND TIME-PERIOD**

	Recovered None	Useful	Time from accident to complete recovery: mean and range in weeks
<b>I. Operative Group</b>			
a. Neurolysis	-	28(100%)	8(3-12)
b. Partial repair	2(25%)	6(75%)	12(8-18)
c. Complete repair	2(50%)	2(50%)	18(8-24)
<b>II. Conservative Group</b>			
a. Spontaneous recovery	-	15(100%)	14(8-20)
b. Delayed Exploration Neurolysis	1(25%)	8(75%)	35(28-48)
c. Complete repair	7(87.5%)	1(12.5%)	40(36-52)

### Discussion

Fracture of the shaft of the humerus is a fairly common injury in this part of the world. This is due to the fact that Fire-arm injuries are common and so are the road traffic accidents as road safety is not observed properly.

Radial nerve palsy is also common in cases of Fire-arm injuries causing fracture of the humerus at midshaft or distal level and in the distal spiral type fracture due to indirect violence.

The aim of our study in the present series was to evaluate the results of operative versus conservative management to our circumstances.

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The results in the operative group were encouraging for the following reasons:-

1. On exploration we got good information regarding nerve injury and managed accordingly.

2. The fracture was also fixed to prevent further damage to the nerve and prevent non-union.

3. Time factor for recovery was less in operative group as compared to conservative group (Table-V).

4. The result of complete repair was good (50%) in operative group as compared to conservative group (12.5%) (Table-V).

5. In the operative group early mobilisation was possible because the fracture was rigidly fixed.

We recommend early operative exploration of radial nerve under our circumstances because firstly the results of exploration in our series were encouraging and secondly in this part of the world the patients do not rigidly come for follow up and physiotherapy with the result that they come late with flexion contracture of the wrist and fingers if treated conservatively for a long duration.

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