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= Abstract =

A Comparison of Treatment between Plate Fixation and Antegrade Intramedullary Fixation of the Humeral Shaft Fractures

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We compared the clinical and radiographic outcomes between plate fixation and antegrade interlocking intramedullary fixation for humeral shaft fractures requiring operative intervention. Through retrospective, randomized comparative study, a total sixty adult patients have been reviewed. Thirty patients were treated with plate fixation, thirty another patients were treated with antegrade interlocking intramedullary fixation. Average follow-up time was two year and five months (range, one to four years). Average time to union was 16.8 weeks in plate fixation group and 16.9 weeks in intramedullary fixation group. Overall rate of union was 100 % in plate fixation group and 90 % in intramedullary fixation group. According to Stewart and Hundley's functional assessment system, excellent or good results were obtained 29 cases(97%) in plate fixation group, 24 cases(80%) in interlocking intramedullary fixation group. In the plate group, only one fracture had deep infection but in the nail group, nine fractures had complications : three with nonunion, three with shoulder pain and limited ROM, two with intraoperative comminution and one with postoperative radial nerve palsy. There were some technical

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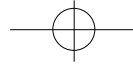
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problems in antegrade intramedullary nailing such as difficulty proximal locking, failed expansion of distal locking, iatrogenic fracture and distraction between fracture fragment. We concluded that the results after plate fixation have been shown to be preferable with respect to clinical and functional outcomes. In our study, the majority of circumstance requiring internal fixation, plate fixation is preferred and antegrade intramedullary fixation must be used in inevitable situation such as multiple trauma patients, fracture with overlying burns, patients with osteoporotic bone, pathologic fractures and segmental fractures.

Key Word : Humerus, Fracture, Plate fixation, Antegrade interlocking intramedullary fixation

, 38.4 , 34.6 . 가 22 (73.3 %), 20 (66.7 %) 가 30 1/3 6 , 1/3 15 , 1/3 9 , 30 2,7). 1/3 10 , 1/3 16 , 1/3 4 (Table 1). 10 , 9 , 5 가 , 6 , 10 , 8 , 5 , 7 (Table 2). 18 (60 %) 5 , 17 (56.6 %) , 8 , , (Table 3). 가 , , Holstein-Lewis , 1994 1 1997 1 11 , 14 . 가 30 , AO/ASIF 30 (Seidel 5 , Russell-Taylor 25) , 2.3 , 가 .

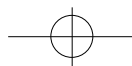
**Table 1.** Level of the fractures

	Plate fixation	Intramedullary fixation
Prox. 1/3	6	10
Mid. 1/3	15	16
Dist. 1/3	9	4
Total	30	30

Table 2. Types of the fractures

	Plate fixation	Intramedullary fixation
Trasverse	10	10
Oblique	9	8
Spiral	5	5
Comminuted	6	7
Total	30	30

Table 3. Associated Injuries

	Plate fixation	Intramedullary fixation
Other Fx.	7	9
Radial nerve palsy	5	0
Brachial plexus injury	1	0
Chest trauma	3	4
Head trauma	1	2
Abdominal trauma	1	2
Total	18	17

Table 4. Clinical results according to Stewart & Hundley criteria

	Plate fixation	Intramedullary fixation
Excellent	22	20
Good	7	4
Fair	0	0
Poor	1	6
Total	30	30

(short deltoid-splitting approach) Russell-Taylor

155 , 151 , 71
3
125 , 13 1

20 , 4 , 6
4 2
2
6 3
40 %
3
(Table 4).

30
16.8 , 27
(90%) 16.9

($P > 0.1$, unpaired t-test).
Hundly¹⁸⁾

22 , 7 , 1
7

Stewart

4

, 1 Russel-Taylor
2 , 1

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1

3 , 7
1

Seidel
(Fig 1),

3

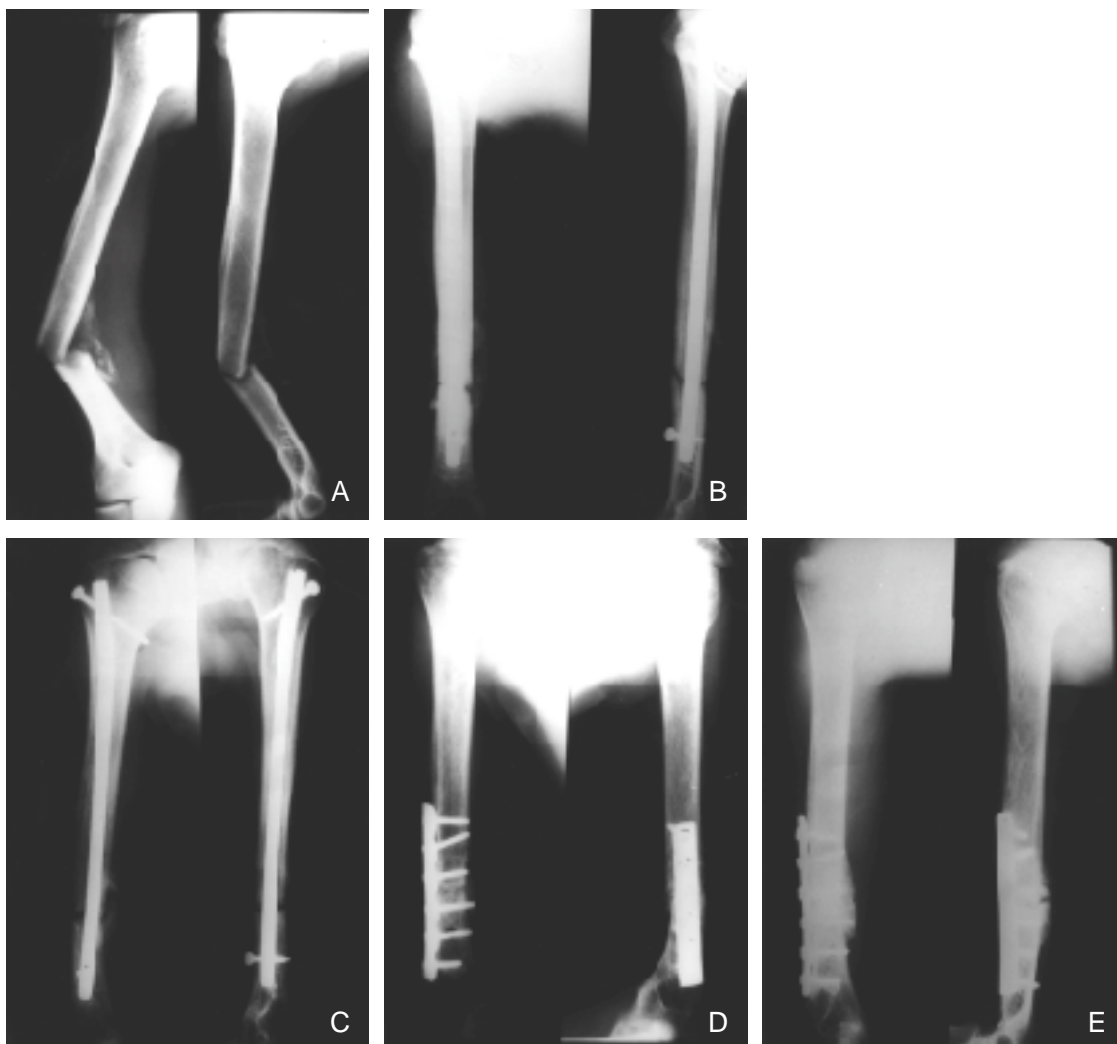


Fig 1. A 51 years old male was sustained comminuted fractures of both tibia and right humerus fracture by traffic accident. Surgery was delayed because of his poor general condition.

A. Preoperative roentgenogram showing abundant callus formation around fracture site.

B. Postoperative roentgenogram after antegrade interlocking intramedullary nailing.

C. Postoperative 6 month roentgenogram showing a non-union.

D. Secondary postoperative roentgenogram after removal of the intramedullary nail, and osteosynthesis with plating and autogenous iliac cancellous bone graft.

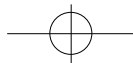
E. 4 month after plating and bone graft, union was obtained.

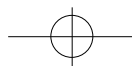
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5

, 5

(neurapraxia)





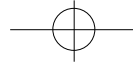
Seidel

, Russell-Taylor

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