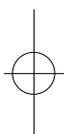


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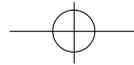
<	>
4-5cm	
가 : 1996 4	1999 2
가 82	가 15
2.8±0.6	5.5±1.6
(p=0.008).	8.5±2.1
가 6	가 9
가 13.5	가 20
5.8±2.5	45.8
가	(p=0.008).
가	



가

2 646-1 (791-052)
 Tel : (054) 288-2121
 Fax : (054) 273-0049
 E-mail : msh@dumc.or.kr
 * 2000





45.8 20 82
 가15 , 가3 .
 가4 , 가
 4 , 가10
 7 가 1
 2 , 3 2 ,
 2 .
 5 , 13 .
 1996 4 1997 11
 ,1997 12 1998 12
 가
 4-5cm (deltoid) 1
 antegrade Russel-Taylor nail, 2 Biomet nail 7
 10 2-3 cm 가
 deltoid-splitting approach
 1996 4 1999 2
 6 가가 가
 9 가
 (Fig. 1). 4-5 cm
 6 9 23 13.5 1 2



Fig 1A-B. Thirty one year old man gets right shoulder pain after driver traffic accident. (A) Preoperative radiograph shows spiral fracture of proximal humeral diaphysis. (B) Postoperative radiograph shows good anatomical reduction and internal fixation by interlocking nail and 2 wires.



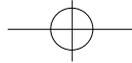


Fig 2. Intraoperative photograph shows wiring after minimal open reduction.

12
 가
 Stewart Hundley
¹¹⁾(Table 1).
 t-test
 1.
 3 40 1 33 , 1
 1 10 3 20 1
 25
 (p=0.12).
 2.
 2.8 ± 0.6 2 4
 2 10 5.8 ± 2.5
 가
 (p=0.008). 5.5 ± 1.6 (4-9)
 8.5 ± 2.1 (4-12) 가
 (p=0.008).
 1

(Fig. 2). 가

2 U-
 (active assistive exercise)

(resistive exercise) 가 가 8

Table 1. Criteria used in assessment of result (by Stewart and Hundley)

Result	Criteria
Excellent	: No pain or impairment of function and no roentgenographic evidence of deformity.
Good	: No pain and impairment of function for ordinary purposes, but with limitation of motion in the elbow or shoulder of 20% or less and with solid bony union and angulation not more than 10 degree.
Fair	: Solid bony union with occasional mild pain, or angulation more than 10 degree, or limitation of motion in adjacent joints of more than 20% but with satisfactory function for light duties.
Poor	: Persistent pain, limitation of motion in adjacent joints of more than 40% and with nonunion or malposition and impairment of function.

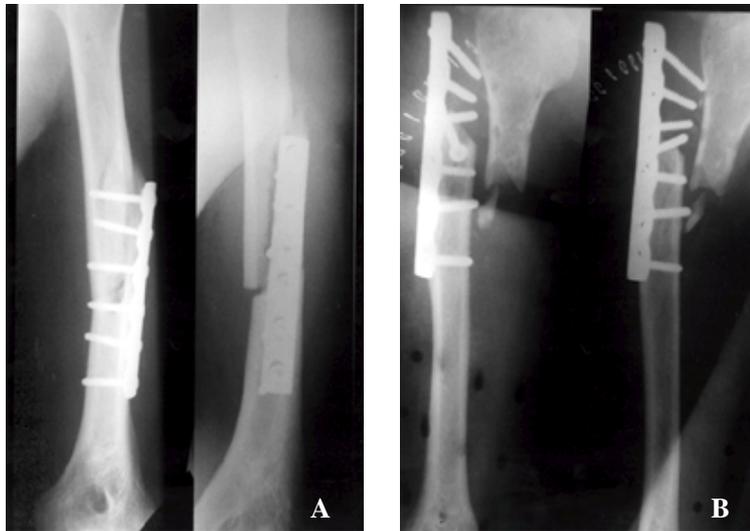
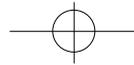


Fig 3A-B. 2 postoperative cases show loss of fixations after open reduction and fixation with plate & screws.

3.



가1 .

80 2

160 122.7 ± 28.5 , 90 (Fig. 3). 1

160 148.3 ± 28.6 1 가

(p=0.07).

90 160 125.0 2

± 26.5 , 70 160 .

145.0 ± 36.7 .

(p=0.14).

4.

Stewart Hundley 5%

가3 , 20%

가4 , 2

5 , 3 , 1 , 가

5.

가2 1 가

1 가 (Fig. 4).

9 (22.5%) 1) 19 4 (21.1%), 6) 40 2) 13



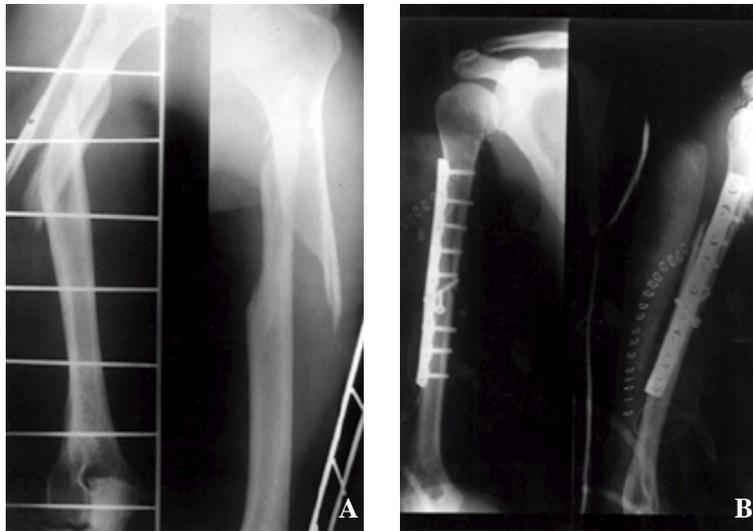
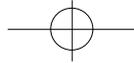
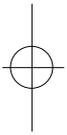


Fig 4A-B. Twenty one year old man gets right shoulder pain after passenger traffic accident. (A) Preoperative radiograph shows spiral fracture of humeral diaphysis. (B) Postoperative radiograph shows internal fixation by plate and screws but long skin incision by many skin staples.

6 (46.1%)

가



가

가

2.8 , 5.5

가

가

1)

6.5

7.5

, Crolla 3)

9

가

stress shielding

(tolerance)

1,4,7,8)

(interobserver bias)가

2

1) 가

3/4

Crolla 3)

가

가

8).

가 (bridging callus)가

가

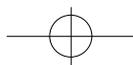
Crolla 3)

가 가

12).

가





가
 7)
 가
 122.7 ± 28.5
 125.0 ± 26.5
 Robinson¹⁰⁾
 28%
 2cm
 Robinson¹⁰⁾ 30 98
 , 86
 가 Habernek⁴⁾ 6
 가
 가 1
 Ikpeme⁵⁾가
 가
 Riemer⁹⁾ 가
 가 (additional operative treatment)

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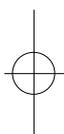
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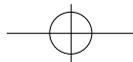
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Abstract

A Comparison of Interlocking Nail with Wiring versus Plate Fixation in Long Oblique or Spiral Fractures of Humeral Shaft

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Purpose : To compare functional results between interlocking intramedullary nail with wiring and plate for treating long oblique or spiral diaphyseal fractures of humerus.

Materials and Methods : From April 1996 to February 1999, 9 long oblique or spiral fractures were treated with antegrade humeral locked nails and wiring after minimal open reduction, and another 9 fractures were fixed with plate and screws. Average age of patients was 45.8 years and average follow-up was 13.5 months.

Results : Nail group showed earlier clinical and radiologic union than plate and screw group. All patients with plate and screw group(plate fixation) had clinical union within 5.8 ± 2.5 weeks and radiologic union within 8.5 ± 2.1 weeks. But, all patients with wiring had clinical union within 2.8 ± 0.6 weeks and radiologic union within 5.5 ± 1.6 weeks. At last follow-up, average range of shoulder motion in plate group was larger than nailing group, but that was statically insignificant. Plate fixations had more complications than nailing, for example, deep infection, non-union, implant failure and radial nerve injury.

Conclusion : Interlocking intramedullary nail with wiring has the advantages of minimal tissue trauma and scar formation, sufficient reduction and fixation, early union and fewer complication. So it can be a worthy alternative for the treatment of long oblique or spiral fractures of humerus.

Key Words : Humerus, Long oblique or spiral fracture, Interlocking nail with wiring, Plate

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