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. . . .

< >

가
: 1995 3 1999 12 24 ,
19 , 13 ,
가
VAS(visual analogue scale) 가
ASES (American shoulder and elbow surgeons ' score) 가
가 가
: 가
: , , 가

가 가 .

Rush

, Ender
Kuntscher³⁾.

가 ,

:

1 280-1

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가
가
가
1995 3 1999 12
15
127
3cm
3cm
80
가36
가24
가18
(Dall-Miles)
가2
20
가
2
1
1
10
56
가19
가13
가28
가
28
40.1
가48.3
가23
가
21

Table 1. Locations of Fractures

	Plate	IMN	EF
proximal 1/3	7	6	3
middle 1/3	9	9	8
distal 1/3	8	4	2
Total	24	19	13

Plate : plate and screws IMN : intramedullary nailing EF : external fixator

Table 2. Types of Fractures

	Plate	IMN	EF
transverse	2	2	0
oblique	4	4	3
spiral	4	3	4
comminuted	14	10	6
Total	24	19	13



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1/3 가 7 , 1/3 가 9 , 1/3 가 8 . 가
 , 6 , 9 , 4 ,
 3 , 8 , 2 (Table 1).
 2 , 4 ,
 4 , 14 , 2 ,
 , 4 , 3 , 10 ,
 3 , 4 , 6
 가 (Table 2).
 2 , 1 , 10 ,
 , 가 가 ,
 .
 , 가 6 ,
 가 1 .
 가 20 가
 1/3 8 4
 .
 (short deltoid splitting approach)
 (antegrade nailing)
 (LCDCP) 1
 (DCP)
 Russel-Taylor 9 , Polarus 7 , Uniflex 2 1 39 , 2 12 ,
 , ACE 1 . 2 2 14
 , 1 가 .
 627ml,
 (Tutoplast) . 2 355ml, 555ml .
 가 , 12 24 22
 Orthofix 1 Ilizarov 91.6% , 2
 . 13 7 , 4 1
 3 가 12 , 1
 . 11
 , 2,3 19 18 94.7%

Table 3. Details of the American Shoulder and Elbow Surgeons '(ASES) Score

(4 = normal; 3 = mild compromise; 2 = difficulty; 1 = with aid; 0 = unable; NA = not available)

Back pocket	Perineal care
Wash opposite axilla	Eat with utensil
Comb hair	Use arm at shoulder level
Carry 10lb at side	Dress
Sleep on affected side	Pull
Use hand overhead	Throw
Lift	



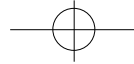
13 12 , 3 ± 4 , 141 ± 7
 92.3% , 7 ± 10 , 141 ± 16
 1 16 가 .
 13.2 , 11.3 , (VAS) 0 3
 10.8 , 0.77 ,
 (Table 4). 0 5 1.50 ,
 0 2 0.67 .
 12.0 , 12.9 , 14.6 ,
 10.8 , 11.5 , 11.5 ,
 9.8 , 11.0 , 11.5 .
 VAS
 12.6 , 12.8 , 13.1 , 가 (p=0.004).
 13.4 , 9.8
 , 9.5 , 9.6 , 12.8 ASES 37
 , 11.2 , 8.1 52 47.5 , 52,
 , 12.4 . 31 43.5 , 51,
 35 46.2 . ASES
 174 ± 7 , 가 (p=0.024, Table 5).
 69 ± 11 , 53 ± 8 4
 , 167 ± 12 , 66 ± 8 , 가
 47 ± 8 , 163 ± 14 , 61 ± 1 , 1
 11 , 44 ± 6 . 가
 가 1 . 가 1
 가 , 3
 , 4 ± 4 , 145 ± 4 .

Table 4. Average union rates and union time

	Plate	IMN	EF
Union rate	91.6%	94.7%	92.3%
Union time	13.2wk	11.3wk	10.8wk

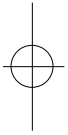
Table 5. Functional assessments

	Plate	IMN	EF
Range of Motion ± Mean SD(degree)			
Forward elevation	174 ± 7	167 ± 12	163 ± 14
E/R at 90 abduction	69 ± 11	66 ± 8	62 ± 11
I/R at 90 abduction	53 ± 8	47 ± 8	44 ± 6
Pain(VAS)	0.77	1.50	0.67
ASES score	47.5	43.5	46.2



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2 , 1 가 , 4
3 6 (shoulder impingement)
McCormack¹³⁾
.
.
.
가 가 , Ikpeme⁶⁾ 1cm
가 ,
2,4,9,11,12,13) 가 ,
(countersinking)
Linn¹²⁾ 93 ,
68 가 Flinkkila⁵⁾ 126
.
가 ,
가 , 가
.
가 ,
Jensen⁷⁾ 6 가
, Rommens¹⁹⁾ (loosening)
13.7
, Robinson¹⁷⁾ 가 ,
18
Linn¹²⁾ 9.2 ,
8.6 Chapman²⁾
가
가 , 가 ,
.
가 ,
McCormack¹³⁾ 가 Linn¹²⁾
가 VAS ,
ASES , Tae²³⁾
Hawkins 6 가 , (antegrade nailing)
, 가 , (retrograde nailing)
ASES 가
Simple shoulder test
, Flinkkila⁵⁾ L Insalata
, Jensen⁷⁾ Neer
McCormack 가
Jensen⁷⁾ 14 가





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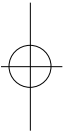
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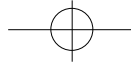
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Abstract

Postoperative Functional Assessments in Adult Humerus Shaft Fractures -Comparison Among Plates and Screws, Intramedullary Nail and External Fixator-

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Purpose : To assess postoperative functional outcomes among plates, intramedullary nails and external fixators in adult humeral shaft fractures, including limitation of motion in shoulder and elbow, pain in activities of daily living.

Material and Methods : 24 cases treated with plates and screws, 19 cases with antegrade intramedullary nails and 13 cases with external fixators were analyzed in terms of limitation of motion, postoperative pain and activities in daily living.

Results : There was no statistical difference in the range of motion of shoulder and elbow among three groups. VAS(visual analogue scale) which expressed postoperative pain in the affected site was lowest in the group treated with plates and screws. ASES score(American shoulder and elbow surgeons 'score) which expressed the activities of daily living was investigated the highest in the group treated with plates and screws, and the differences of VAS and ASES score among three groups have statistical significances.

Conclusion : The most satisfactory results were obtained in the group treated with plates and screws.

Key words : Humerus shaft, Fracture, Functional assessment

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