

< >

:

.

: 1992 10 2001 9

14

2 , 1 가 . AO/ASIF 11 , , A2

가 2 , A3 1 , C1 6 , C2가 3 , C3 2 , 가 5 , 가 9 ,

51.6 ( 15 , 88 ) . 4

20.6 , 10.1 . 65 5

T-score가 -3.65 , T-

score가 -2.97 . 16.4 ( 12 , 29 ) . 가

:

Excellent 8 , Good 4 , Fair 2

, Poor 10 , 4 가

1 K- 6

8 , 6 2

1 가 8 K-

1 가

:

가 (devitalization)

가

:

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**Table 1.** Patient Characteristics and results

No.	Sex	Age	AO/ ASIF	Operation time (min)	Ulnar transposition	Olecranon osteotomy	Immobiliza- tion(day)	Consolidation (week)	Range of motion	Pain	Subjective evaluation	Complication
1	F	37	C3	120	-	+	7	8	Excellent	Occasional	Good	Ulnar nerve injury
2	F	52	C1	120	-	-	3	10	Excellent	None	Excellent	
3	F	67	C1	120	+	-	7	10	Excellent	None	Excellent	
4	F	52	C1	75	+	-	3	8	Good	Occasional	Good	
5	M	15	C2	120	+	-	7	8	Excellent	None	Excellent	
6	M	17	C3	120	+	+	7	8	Excellent	None	Excellent	
7	M	28	C2	90	-	-	7	8	Good	None	Good	Ulnar nerve injury
8	F	88	C1	150	+	+	35	12	Good	None	Good	Skin necrosis
9	F	86	C2	120	+	+	42	10	Good	None	Excellent	
10	M	33	C1	150	-	-	35	12	Excellent	None	Excellent	
11	F	59	A3	120	+	-	48	12	Fair	Occasional	Fair	
12	F	85	A2	60	-	-	42	14	Fair	Occasional	Fair	K-wire irritation
13	M	18	A2	60	-	-	3	10	Excellent	None	Excellent	
14	F	85	C1	120	+	-	42	12	Excellent	None	Excellent	

4

K-

가 K-

가 K-

2 K-

가 K-

2-3mm

8

(figure 1).

3

(figure 2).

가

(3-6 )

가

(3 ),

(1 ),

(2

) 4-6

20.6 (3 -48 )

3. 가

가

, Cassebaum rating scale<sup>1)</sup>

Excellent ( 15

, 130 ), Good ( 30

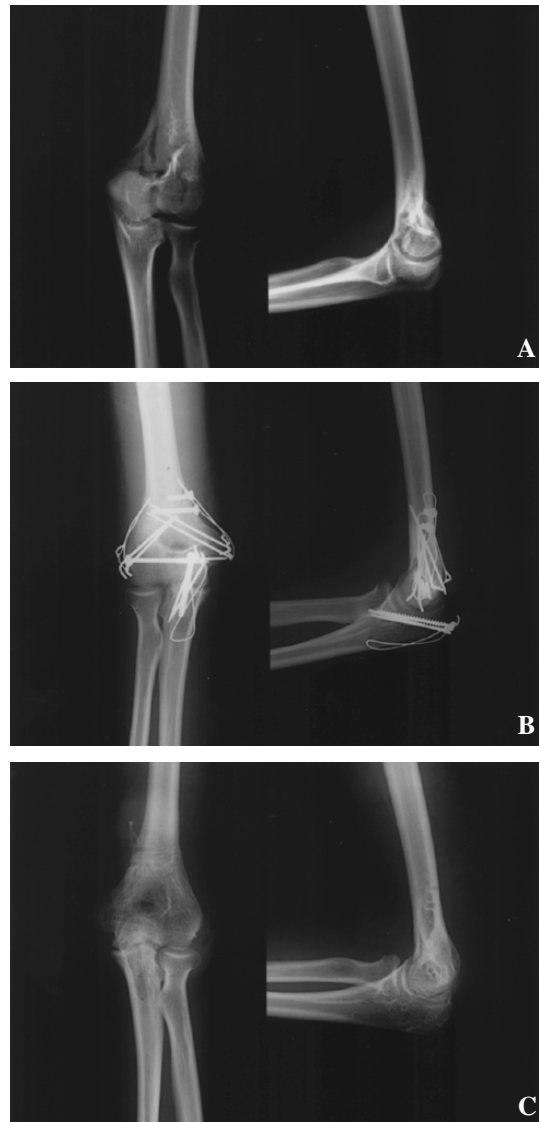
, 120 ), Fair ( 40

, 90 ), Poor ( 40

90 )

Excellent (100-81 ), Good (80-61 ), Fair (60-41 ),

Poor (40 ) . 65 5



**Fig-2** : Preoperative radiographs (A) of a 70-year-old man with a C2 fracture by AO classification. Postoperative radiographs were taken after triple tension band osteosynthesis with olecranon osteotomy to provide direct visualization of the distal humerus articular surface for exact anatomic reduction (B). One year later, radiographs were taken after removal of hardware and elbow function was completely recovered (C).

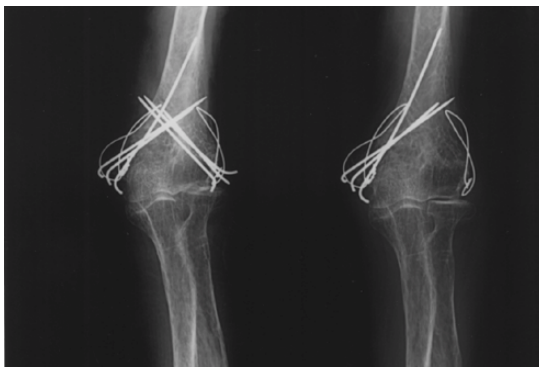
4). 1960

AO

가

14 ) . 10.1 (8 -  
Excellent  
8 (57%), Good 4 (29%), Fair 2  
(14%) , Poor . 10 (71%)  
, 4 (29%) 가  
Excellent 8  
(57%), Good 4 (29%), Fair 2 (14%)  
, Poor . 1 K-  
6  
(Figure3),  
6 2  
, 1 8  
, 1  
. 1

K-



**Fig-3** : In follow-up radiographs of a 85-year-old woman 6months after double tension band osteosynthesis, ulnar nerve irritation of K-wires was deveoloped(A). Early removal of lateral K-wires was performed at 6months (B).

11).

가

. Mueller schatzker

10),

K-

3,2).

. Sodergard

,

5).

가

가

가

가

가

(type A1, A2)

가

가

. Houben

가

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- 가
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## Abstract

## Double Tension Band Osteosynthesis in Supracondylar Fractures of the Humerus

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**PURPOSE** : This study evaluated the clinical result of supracondylar fractures of the humerus treated with double tension band osteosynthesis.

**MATERIALS AND METHODS** : From October 1992 to September 2001, 14 patients with supracondylar fractures of the humerus were treated by method of double tension band osteosynthesis. Eleven fractures were the results of slipped down injury and two traffic accidents and one direct trauma. All fractures were classified according to the AO fracture classification (A2; 2, A3; 1, C1; 6, C2; 3, C3; 2). There were 5 males and 9 females with average age of 51.6 years (range 15 to 88). Olecranon osteotomy was performed in 4 patients with severe comminuted fractures. Postoperative immobilizations were required for an average of 20.6 days and consolidations were noted after an average of 10.1 weeks. Before operation, bone marrow density studies were performed in five fractures above 65 years. Average T-score of the patients were -3.65 on femur neck and -2.97 on lumbar spine. All patients were re-examined after an average of 16.4 months.

**RESULTS** : Union and consolidation was achieved in all 14 patients with no secondary displacement. In range of motion, eight patients judged their results as excellent and four as good. Ten patients had no pain and four had only occasional discomfort. Early removal of K-wires was performed in one patient because irritation of one side K-wires were develop. Sensory change of the ulnar nerve was noted in two patients. Anterior transposition of ulnar nerve was performed in one patient and the other was improved spontaneously. Skin necrosis was developed in one patient but was healed after pin removal and conservative care.

**CONCLUSION** : The advantages of double tension band wiring are an easier and faster procedure, less periosteal and muscle damage, and more symmetrical compression than double plating. Therefore, in the comminuted osteoporotic fracture with poor tolerance for internal fixation with the plate or the simple supracondylar fractures in young age, double tension band osteosynthesis can provide sufficient and secure stability to allow early functional exercise.

**Key word** : supracondylar fractures of the humerus, double tension band osteosynthesis

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