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## Ender

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= Abstract =

### Treatment of Two-part, Displaced Surgical Neck Fracture of the Proximal Humerus with Modified Ender Nail and Tension Band Technique

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Operative treatment of two-part, displaced surgical neck fractures of the proximal humerus is used when satisfactory closed reduction cannot be achieved or maintained. Recently, we modified the Ender nails by making an additional hole above the slot for wire incorporation. The purpose of this study was to assess the effects of stabilization of displaced and unstable surgical neck fractures of the humerus by Ender nailing and tension band technique. We reviewed the data of fourteen consecutive patients (10 women and 4 men) who had been treated with Ender nailing and tension band wiring between from Aug 1996 and Oct 1997 at Eulji Medical College Hospital. The average age of patients was 54 years (range, 38 to 79 years), and the average follow-up period was 18 months (range, 12 to 24 months). Bone union was observed at 6.3 weeks (range, 5.5 to 10 weeks), except one case of delayed union. There were no infections and nonunions. The average ranges of shoulder elevation and abduction were 140°(100° to 170°) and

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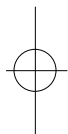




126°(100° to 160°), respectively. The median value of the thumb to vertebral distance was L1, with a range of T6 to L5 for internal rotation, external rotation was 48° (30° to 70°). Radiography revealed one case of medial shift greater than 5mm, and 4 cases of lateral shift greater than 5mm of the humeral shaft. The average varus angulation of the humeral neck was 8.5°(0° to 34°). Four patients (28.6%) were excellent (34 to 35), six patients (42.8%) were good (28 to 33), four patients (28.6%) were fair (21 to 27) in UCLA shoulder rating scale. In conclusion, Ender nailing and incorporation of the tension band wire loops provided additionally rotational and longitudinal stability in two-part displaced surgical neck fracture of the proximal humerus associated with osteoporosis.

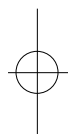
**Key Words** : Proximal humerus, Two-part fracture, Ender nailing and tension band technique

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**Table 1.** Data of patients with two-part, displaced fractures of the proximal humerus

Case	Age (years)	Sex	Active shoulder ROM		Postoperative radiographic figures		UCLA shoulder rating scale	Comments
			Foward Elevation	Ext. rotation	shift of distal fragment(cm)	Angulation varus		
1	38	F	160	50	0.5	0	30	Good
2	41	F	170	50	0	0	34	Excellent
3	79	F	170	55	0	22	34	Excellent
4	67	F	165	55	0.9	0	34	Excellent
5	40	M	150	60	0.5	0	33	Good
6	47	M	170	70	0	0	35	Excellent
7	38	F	120	40	0.5	22	23	Fair
8	68	M	130	50	0	20	28	Good
9	48	F	130	45	0	0	32	Good
10	47	M	160	50	0	0	33	Good
11	50	F	130	30	0.8	34	26	Fair
12	70	F	100	30	0	0	21	Fair
13	51	F	110	40	0	20	22	Fair
14	69	F	100	45	0	0	25	Good



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(Table 1).

140°(100° 170°)

126°(100° 160°)

(Correlation Analysis)

L1(T6 L5),

48°(30° 70°)

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가 UCLA  
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가 3)

가1 ,

가4

8.5°(0° 34°)

. UCLA

가

가

가4 (28.6%),

가6 (42.8%),

4 (28.6%)

(Fig. 2-A, B, C). UCLA

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6.3 (5.5 10)

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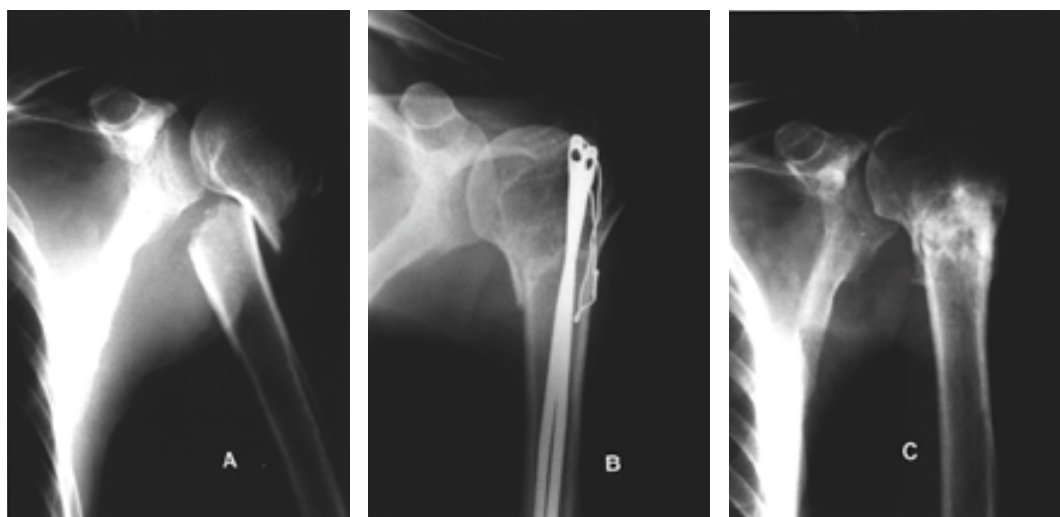
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**Fig. 1.** Modified Ender nails with an additional hole above slot.



**Fig. 2-A.** A 68-year-old man with two-part, displaced surgical neck fracture of the proximal humerus.

**B.** Postoperative radiograph showing stable reduction of the fracture with Ender nailing and tension band technique.

**C.** The radiograph shows good union of the fracture 1 year and 6 months after the operation. He was graded as good according to the HSS shoulder rating scale.

,  $> 0.05$ ),

$r = -0.1329$

( $P > 0.05$ ).

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$r = -0.209$

( $P$

$r = -0.3043$   
( $P > 0.05$ ).



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Kristiansen<sup>13)</sup> Kofoed<sup>14,15)</sup> 가10,19,21,22,23) . 1970 Neer<sup>18)</sup> , Jaberg<sup>10)</sup>

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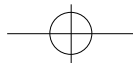
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