

11, 3, 1998 7

The Journal of the Korean Society of Fractures
Vol.11, No.3, July, 1998

= Abstract =

Treatment of Supracondylar or Intercondylar Fracture of Humerus in Adult

Byung-Ho Lee, M.D., Sang-Ho Ha, M.D. and Sun-Jin Choi, M.D.

*Department of Orthopaedic Surgery, College of Medicine,
Chosun University Hospital, Kwang Ju, Korea*

Distal humerus fracture, particularly those that involve the articular surface, in adult has remained one of the most difficult of all fractures to manage. The goal of this study is to analyze clinical result according to fracture pattern and method of treatments and to recognize complicating factor affecting prognosis. Nonoperatively managed intraarticular fractures are likely to have compromised functional outcome. Open anatomic reduction and stable fixation secure enough to permit early functional, pain-free motion of the elbow showed best result. Stable fixation of fracture is achieved with use of single or dual plates with additional lag screws depending on the fracture pattern. When there is segmental articular fragments, interfragmentary bipolar threaded screw (Herbert screw) may be useful. Autogenous cancellous bone grafting is sometimes advisable when the diaphyseal portion of the fracture is comminuted. Transolecranon approach affords excellent surgical exposure of the joint surface for fracture with comminuted intra-articular component and there was no postoperative complication.

Key Words : Humerus, supra-intercondylar fracture.

:

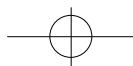
588 (501-140)

Tel : 062) 220 - 3147 Fax : 062) 226 - 3379

*

1997 23





666 • / 11 3

4. AO
8 (25%) , A2 4 , A3
4 24 (75%) C1 4
, C2 13 , C3 7 . 5
(15.6%) C1 1 , C2 3 , C3 1 .

가 , , , 가 .
5. C1 1 , C2
1 , C3 1 3
, 1-2
.29

5
24 5
19 Campbell
C3 6 C2 2
C1 1 , A3 1 10
K-
13 , 16
Y
8 , (single plate) 4 , (dual
plate) 4 (lag screw)
(Table 1).
(segmented articular fragment) C3
Herbert
19 84 45
가20 , 가12 .
2. 가17 (53.1%) 가 8
(25.0%), 5 (15.6%) 가
2 (6.3%) .
3. 19 (59.3%)
5 , 3 , 2 ,
2 , 2 , 2
3 .

6.2 , K- 7.7
, 2.8 .

Table 1. Method of treatment.

Type/Method	Conservative	K-wire/screw	Plate	Total
A2		2	2	4
A3			4	4
C1	1	2	1	4
C2	1	6	6	13
C3	1	3	3	7
Total	3	13	16	32

8
K-
가 C2 C3
(Table 3).
가 K- 가
140°(140°/0°), 120°(130°/-10°), 80°(105°/-
50°(90°/-40°), K- 4 , 3 , 2 , 1
25°), 113°(123°/-10°)
10
가

Jupiter ¹³⁾

, K-
11 8 1.
10 7 67
(Table 2).

Table 2. Functional result according to treatment method

	No. of cases			
	Excellent	Good	Fair	PoorTotal
Supracondylar				
K-wire/screw	1	1		2
Plate	5	1		6
Intercondylar				
Conservative				3 3
K-wire/screw		3	4	4 11
Plate	4	3	2	1 10
Total	10	8	6	8 32

Table 3. Functional result according to fracture pattern.

	No. of cases			
	Excellent	Good	Fair	PoorTotal
A2	3	1		4
A3	3	1		4
C1	1	1	1	1 4
C2	2	3	3	5 13
C3	1	2	2	2 7
Total	10	8	6	8 32

AO
(Fig 1-A).
가 가

1
.7
13 , 4

90°/-50°
(Fig 1-B). 가



Fig 1-A. Initial AP and lateral view film of 67 years old woman showed the AO type C3 intercondylar fracture with associated comminuted olecranon fracture.

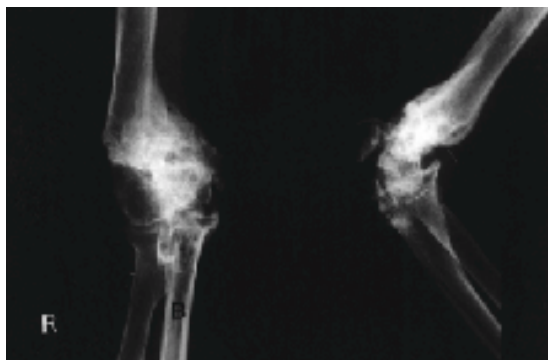
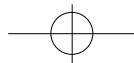


Fig 1-B. Follow-up at 13 months after conservative treatment. Complete union was seen but functional result was poor.



Fig 2-A. Preoperative AP & lateral view film of 41 years old woman showed AO type C2 fracture.

B. Follow up at 1 year after treatment by open reduction and internal fixation using screws and K-wire. Result was fair.

2. B). 2 3

41 AO C2 (Fig 2-A). 30 (Fig 3-C),

K- 110°/-10° 가

(Fig 3-D).

4 100°/-15°

1 가 (Fig 2-B).

3. 가

29 AO C3 가 (Fig 3-A).

가

5 Herbert Watson-Jones¹⁷⁾

Evans⁹⁾ 가

(Fig 3- 7,14-16)

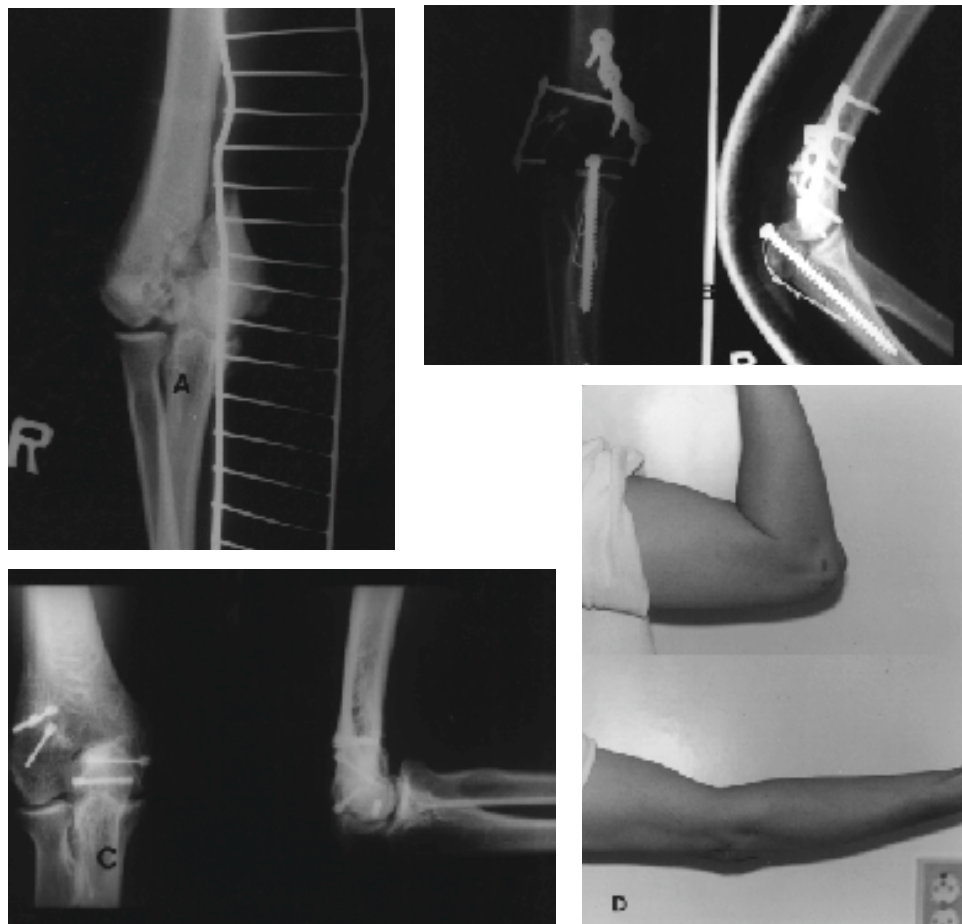
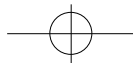


Fig 3-A. Preoperative AP view film of 29 years old man showed the AO type C3 fractures.
 B. Postoperative X-ray film showed interfragmentary Herbert screw fixation for segmental articular fragments and dual plate fixation.
 C. At postoperative 30 months, we removed the plates but leave countersunk Herbert screws.
 D. R.O.M. of elbow joint showed 100 extension lag and 110° flexion at last follow up.

가

Crenshaw⁸⁾

sparing

Bryan triceps

campbell

. Campbell

U

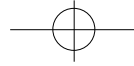
가

2,3,5)

가

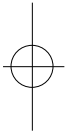
3

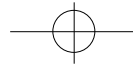
campbell



670 • / 11 3

,
 10) Jupiter 13) (dual plate)
 80%
 Henley 11) Holdsworth
 Mossad¹²⁾
 가 10)
 2)
 29 Y-anatomical
 10 plate
 19
 29 13 K-
 Campbell
 AO C3 6 16
 C2 13 2 C1 1
 A3 1 Jupiter
 13) 8 Y A2, A3, C1 C2 1
 V C2
 6.5mm (single plate) C2
 (tension band wire) 18-Gauge 2 K-
 10 1 (lag screw)
 . Campbell C3
 19 11 Herbert screw
 2.8
 가 C3 가 A2 A3
 C
 K- 800,
 1130
 . Aitkin Rombeck⁶⁾
 가 가4 , 3 , 2
 Gabel 10) 2 , 2 ,
 1
 가 A3 Y Y
 1,2,4,10-13)
 1), 4) K-
 Gabel





- 1996.
- 1992 1 4) , , , :
1996 6 32 15 , 18:869-873, 1983.
- 5) , , , :
1. , 10:104-111, 1997.
2. Y-
가
3. K-
4.
Cannulated screw (lag screw)
5. (segmented articular fragment)
C3
Herbert
가
6. C3
- 6) **Aitken GK and Rorabeck CH** : Distal humeral fractures in the adult. *Clin Orthop*, 207:191-197, 1986.
- 7) **Brown RF and Morgan RG** : Intercondylar T-shaped fracture of the humerus. *J Bone Joint Surg*, 53-B:425-428, 1971.
- 8) **Crenshaw AH** : *Campbell's operative orthopaedics*. 8th ed pp 1016-1022, The C.V. Mosby Co, 1992.
- 9) **Evans EM** : Supracondylar Y-fracture of the humerus. *J Bone Joint Surg*, 35-B:381-385, 1953.
- 10) **Gabel GT, Hanson G, Bennett HB, Noble PC and Tullos HS** : Intraarticular fracture of the distal humerus in the adult. *Clin Orthop*, 216:99-108, 1987.
- 11) **Henley MB** : Intraarticular distal humeral fracture in adults. *Orthop Clin N Am*, 18:11-23, 1987.
- 12) **Holdsworth BJ and Mossad MM** : Fractures of the adult distal humerus. Elbow function after internal fixation. *J Bone Joint Surg*, 72-B:362-365, 1990.
- 13) **Jupiter JB, Neff U, Holzach P and Allgower M** : Intercondylar fractures of the humerus. *J Bone Joint Surg*, 67-A:256-239, 1985.
- 14) **Miller WE** : Comminuted fracture of the distal end of the humerus in the adult. *J Bone Joint Surg*, 46-A:644-657, 1964.
- 15) **Riseborough EJ and Radin EL** : Intercondylar T-fracture of the humerus in the adult. *J Bone Joint Surg*, 51-A:130-141, 1969.
- 16) **Wadwirth TG** : A modified posterolateral approach to the elbow and proximal radio-ulnar joint. *Clin Orthop*, 144:151-158, 1979.
- 17) **Watson-Jones R** : *Fracture and joint injuries*. 6th ed pp 609-615, Churchill Livingstone Co, 1982.

REFERENCES

- 1) , , , :
, 19:373-381, 1984.
- 2) , , :
, 5:426-432, 1992.
- 3) , , , :
L- Y-
, 9:1118-1124,