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= Abstract =

The Comparative Study of Treatment between the Skeletal Traction and the Operation of the Supracondylar Fracture in Children

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The most common fracture about the elbow joint in children is supracondylar fracture. That treatment has many pitfalls and had written about its method and the prevention of serious complication such as Volkmann ischemic contracture and cubitus varus deformity. The authors analyzed the follow-up results of 58 cases of supracondylar fractures treated by skeletal traction, percutaneous pinning and open reduction in Presbyterian Medical Center from March 1992 to November 1996. The average follow-up was 20 months(12-54 months). The results were as follows.

1. The mean age was 7.8 years, ranged from 1 year to 15 years, and the male and the female ratio was 1.9:1.
2. Seventeen cases were treated with skeletal traction group, thirty cases with closed reduction and percutaneous pinning group, eleven cases with open reduction and internal fixation group.
3. The average duration of admission in skeletal traction group was 23.5 days, 5.2 days in percutaneous pinning group and 14.7 days in open reduction and internal fixation group.
4. The ratio of hospital cost to that in the skeletal group were 0.85 ± 0.18 in the percutaneous

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171-300 (560-250)

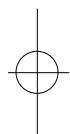
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pinning group, and 1.43 ± 0.21 in the open reduction and internal fixation group.

5. According to the Mitchell and Adams ' criteria, the results of skeletal traction group were excellent in 58.8%, good in 35.3% and poor in 5.9% ; the results of percutaneous pinning group were excellent in 60%, good in 36.7% and poor in 3.3% ; and those of open reduction group were excellent in 54.5%, good in 27.3% and poor in 18.2%, respectively, on mean follow-up of 1 year and 8 month. So, our result indicated that the closed reduction and percutaneous pinning is a simple and cost-effective method for treatment of supracondylar fractures of the humerus in children, but some instances, the skeletal traction might be another treatment method in supracondylar fractures.

Key Words : Humerus, Supracondylar Fracture in Children, Skeletal traction, Percutaneous pinning, Open reduction



84
가 가
가 26 ,
가 , 1 4 6 58 1
가 , 1
Volkmann 8 가 38 , 가 20
12) , 1.9:1 , 7.8 1
15
가 54 (93.1%) , 가 4
13) (6.9%) , 56 (96.5%)
12,17)
9,14) , 1 ,
4 , 3 ,
가 3 ,
1
가 modified Gartland 19)
, II 20
(34.4%), III-a 28 (48.3%), III-b 10
1-8,12,14) (17.3%) III-a 가
17 ,
58
student t-test

Table 1. Treatment method

Type	Skeletal traction pinning	Percutaneous	Open reduction	Total (case)
II	4	14	2	20
III - a	10	12	6	28
III - b	3	4	3	10
Total	17	30	11	58

1992 3 1996 11



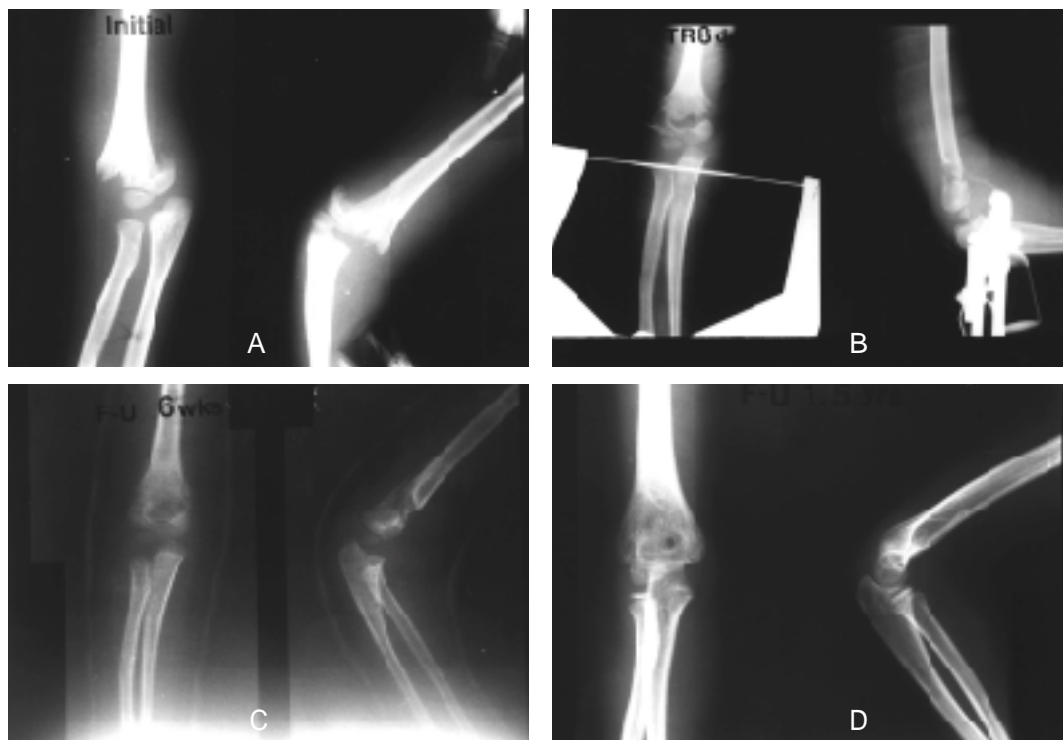
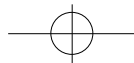


Fig 1. 4 years old boy with an extension type supracondylar fracture of the left humerus.

- A. Initial anteroposterior and lateral roentgenograms of the left elbow showing posteromedial displacement.
 B. At 8 days after traction.
 C. At follow-up 6weeks, anteroposterior and lateral roentgenogram of the left elbow show union.
 D. After postoperative 1.5 year, roentgenogram show good remodeling and excellent result.

30 , 11 ,
 (Table 1).

가 Volkman
 90°90°
 , , , 가 K- 4-6
 , K-
 ROM Mitchell and Adams
 , Volkman
 3-4
 , 90°
 , 2-3 ,

(Fig 1). (carrying angle) 가 5
 10
 K- , , 가 5 15

(Fig 2).
 16)

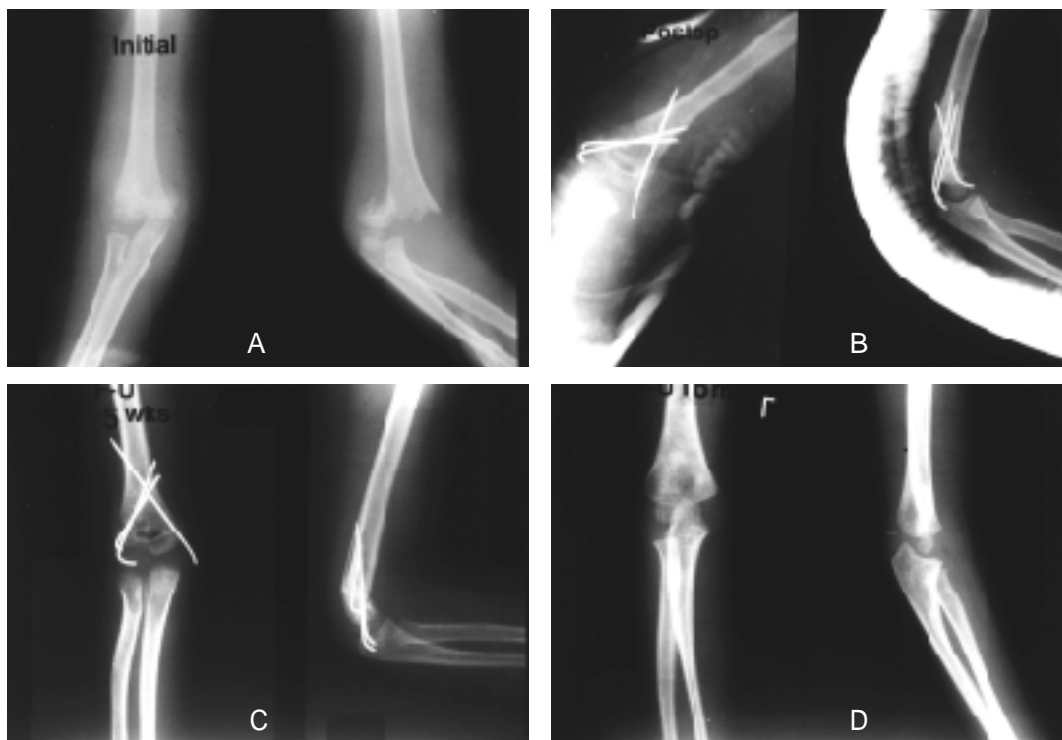


Fig 2. An 8 year old girl with an extension type supracondylar fracture of the right humerus.
 A. Anteroposterior and lateral roentgenograms of the right elbow show posteromedial displacement.
 B. Postoperative roentgenogram after closed reduction and K-wire fixation.
 C. At 5 weeks postoperative, roentgenograms show union.
 D. After postoperative 16 months, roentgenograms show remodeling and excellent result.

10-20 5.2 , 14.7
 가 15
 20
 ,
 , 1 1.00
 4 , 0.85(±0.18) ,
 가 (CT, MRI) , 92 1.43(±0.21) .
 96 3.4%(0-6.9%)
 (P<0.05).
 2.
 1. 5.8
 , , 6.6 ,
 23.5 , 6.5



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(P<0.05), 2 3 5.

(P>0.1, Table 2).

Table 2. Time to bony union (wks)

	Skeletal traction	Percutaneous pinning	Open reduction
II	5.5	6.2	6.4
IIIa	5.9	7.1	7.2
IIIb	6	7.4	6.5
Mean	5.8	6.7	6.6

6 (35.3%), 가 2
 (11.8%), 1 (5.6%) ,
 2 (6.7%), 1
 (3.3%), 2 (6.7%), 가 1
 (3.3%) , Volkmann
 2 (18.2%), 1 (9.1%),
 1 (9.1%), 1 (9.1%) .
 Volkmann 2 1
 , 1
 가 , 27

3.

10 , 6 , 1 ,
 18 , 11 , 1 ,
 6 , 3

, 2 ,

2 (18.2%)

(Table 3).

가 5 3
 1 가 1
 4 , 6

Table 3. Results of treatment (%)

Method of treatment	Excellent	Good	Poor	Total
Skeletal traction	10(58.8)	6(35.3)	1(5.9)	17(100)
Percutaneous pinning	18(60)	11(36.7)	1(3.3)	30(100)
Open reduction	6(54.5)	3(27.3)	2(18.2)	11(100)

2)
 6.8 , 8) 7.6 , D 'Ambrosia¹⁰⁾ 7 , McGraw¹⁵⁾
 7.12
 54 (93.1%) , 4 (6.9%)
 가 . 4 9
 가 36 (62%) , 7.8 .

4. K-

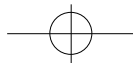
18
 , 11 , 7 , 12
 7 , 4 , 1 .
 가 7 4 ,
 2 , 1 , 4 2
 , 1 , 1 ,
 1 (3.85%),
 2 (12.5%)

(P<0.05).

3) 5.4%,
 6) 1.6% , Rockwood¹⁹⁾ 2.5%,
 Tachdjian²¹⁾ Depalma¹¹⁾ 5% ,
 2 (3.4%) . 2



Modified Gartland II 20 , III-a 11 2 (18.2%)가 . Jones²²⁾
 28 , III-b 10 , (48%) 가
 가 . , Smith²⁰⁾
 Flynn¹²⁾ Nacht¹⁷⁾ 가
 , 7) Flynn¹²⁾ .
 97.3% 3) , 3)
 100%, 80% , 3)
 . 3-4 . 5
 100%, 가 3-8 6 .
 91.7% 가 85.7%, Volkman
 75% 가 가 2 , 1
 . , 1
 Danielsson⁹⁾ 가 , 27
 , Kekomaki¹⁴⁾ 10 , 14
 .
 96.7%
 93.7%, 81.8%
 ,
 가 1992 3 1996 11
 가 . 17 41
 가 III 30 , 11
 9 (82%) 16 (53%), .
 13 (76%) , 1. 5.8
 6.6 6.5
 1
 가 .
 2. Mitchell &
 가 Adams , 16 (94.1%),
 29 (96.7%) , 9
 Prietto¹⁸⁾ Dunlop (81.8%) .
 3. 5.2
 33%, 23.5 , 14.7 ,
 5%가 .
 17 4.
 1 (6%) , K-



가
 , 가
 , 가
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