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= Abstract =

Fracture-Separation of The Distal Humeral Epiphysis

Hak-Yeong Jeong, M.D., Seung-Wook Yang, M.D., Jae-Woong Shim, M.D.,
Seung-Joon Shin, M.D., Jeong-Tae Kim, M.D.

Department of Orthopedic Surgery, Maryknoll General Hospital, Pusan, Korea.

A fracture-separation of the distal humeral epiphysis in children is an extremely rare injury and presents problems in diagnosis, radiographic interpretation and management. From June 1992 to December 1996, Authors experienced the 5 cases of Salter - Harris type II injury of the distal humeral epiphysis at Department of Orthopedic Surgery, Pusan Maryknoll General Hospital. The patient were followed up from one year nine months to three years four months. The two cases were treated by closed reduction and percutaneous K-wire fixation and the three cases by open reduction and internal fixation with K-wires.

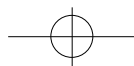
There were 4 cases of complication seldom reported following fracture-separation of the distal humeral epiphysis. This complications consist of 4 dissolutions of trochlea, which is one, frank avascular necrosis of trochlea. In 3 cases with open reduction developed the cubitus varus & dissolution of trochlea. We speculate that this complications results from avascular necrosis of distal end of humerus. Attention to change of carrying angle and radiographic change of distal humeral end are important in detection of complication & evaluation of etiology of dissolution of distal humeral end.

Key Words : Epiphysis, Trochlea, Distal Humerus, Fracture-separation, Dissolution, Avascular necrosis.

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4712 (600-094)

Tel : 051) 461 - 2376 Fax : 051) 463 - 1194



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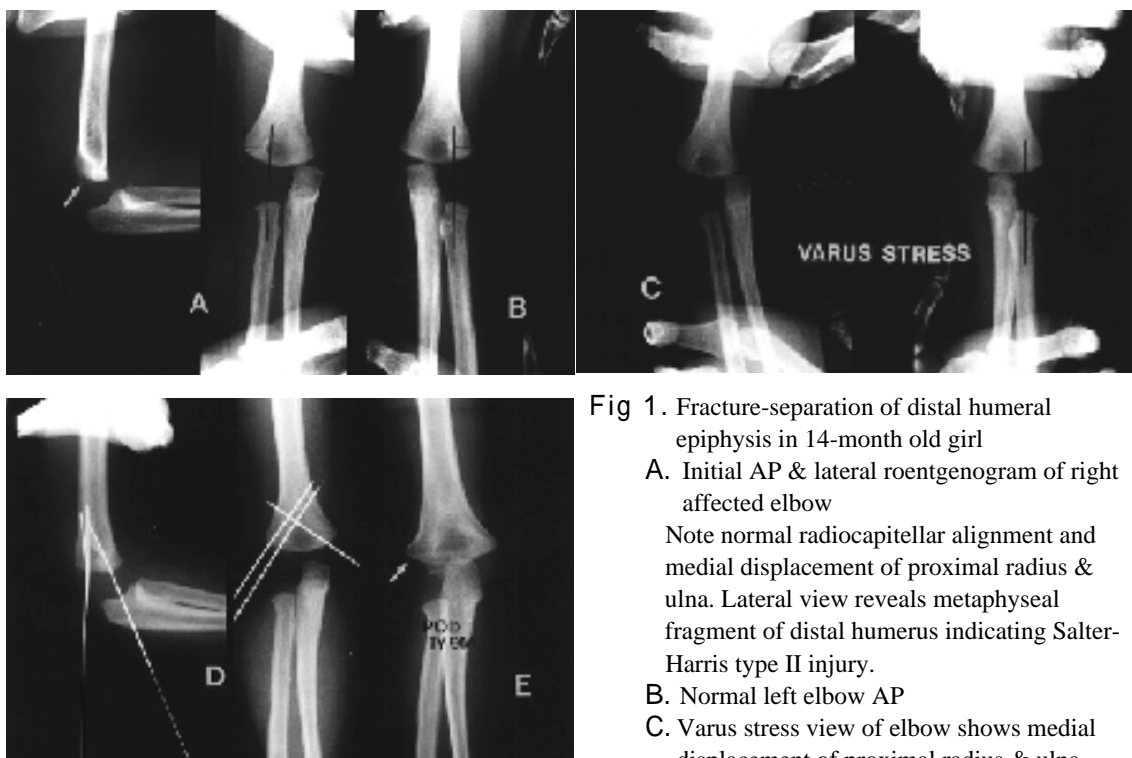


Fig 1. Fracture-separation of distal humeral epiphysis in 14-month old girl

A. Initial AP & lateral roentgenogram of right affected elbow

Note normal radiocapitellar alignment and medial displacement of proximal radius & ulna. Lateral view reveals metaphyseal fragment of distal humerus indicating Salter-Harris type II injury.

B. Normal left elbow AP

C. Varus stress view of elbow shows medial displacement of proximal radius & ulna.

D. AP & lateral roentgenogram after close reduction & percutaneous K-wire fixation.

E. At follow-up 1 year 9 months after operation

AP & lat. roentgenogram show overgrowth of lateral condyle

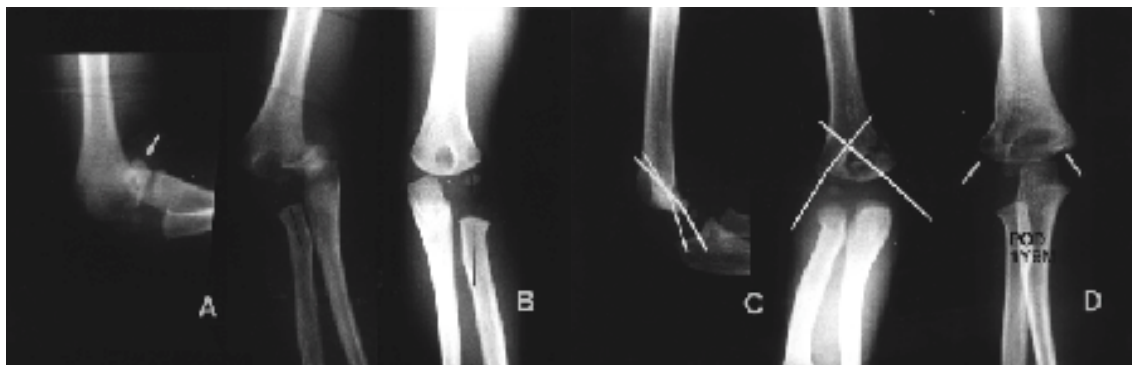
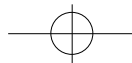


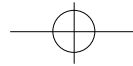
Fig 2. Fracture-separation of distal humeral epiphysis in 2 year old boy

- A. Initial AP & lateral roentgenogram of right affected elbow
Note normal radiocapitellar alignment & medial displacement of proximal radius & ulna.
Lateral view show large metaphyseal fragment of distal humerus indicating Salter-Harris type II injury
- B. Normal left elbow AP
- C. AP & lateral roentgenogram after close reduction & percutaneous K-wire fixation
- D. At follow-up 1 year 9 months after operation
AP & lateral roentgenogram show dissolution of medial side of distal humeral end and overgrowth of lateral condyle



Fig 3. Fracture-separation of distal humeral epiphysis in 3 year 3 month old boy

- A. Normal right elbow AP
- B. Initial AP & lateral roentgenogram of left affected elbow
Note radiocapitellar alignment & medial displacement of proximal radius & ulna.
Lateral view show metaphyseal fragment of distal humerus indicating Salter-Harris type II injury
- C. AP & lateral roentgenogram after open reduction and internal fixation
- D. At follow up 3 year 2 months after operation
AP & lateral roentgenogram show defect of medial condyle and 25° varus deformity

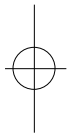


Analysis of Cases

Case	Sex/Age	Cause of Trauma	Displacement	F/U	Treatment	ROM	Carrying Angle	Complication
1	F/1Y 2Mo	Slip down	Medial	1Y 9Mo	C/R & Percutaneous pinning	Full	Normal (7° valgus)	Overgrowth of Lat. condyle
2	M/2Y	Slip down	Medial	1Y 9Mo	C/R & Percutaneous pinning	Full	Normal (5° valgus)	1. Overgrowth of Lat. condyle 2. Dissolution of Trochlea
3	M/3Y 3Mo	Slip down	Medial	3Y 2Mo	O/R & I/F	0° ~ 100°	25° Varus	1. AVN of Trochlea 2. Overgrowth of Lat. condyle
4	M/6Y 6Mo	Slip down	Posteromedial	1Y 9Mo	O/R & I/F	Full	5° Varus	1. Dissolution of Trochlea 2. Overgrowth of Lat. condyle
5	M/5Y 8Mo	Slip down	Posteromedial	3Y 4Mo	O/R & I/F	0° ~ 110°	5° Varus	1. Dissolution of Trochlea 2. Overgrowth of Lat. condyle

* C/R : Close reduction, O/R & I/F : Open reduction and internal fixation

Lat. : lateral, AVN : Avascular necrosis



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Salter-Harris II (Fig 1-C).

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(Fig 1-E).

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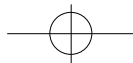
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Salter-Harris II

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(Fig 3-C).

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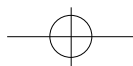
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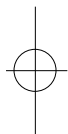
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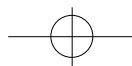
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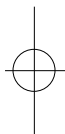


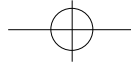
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