

## 소아 상완골 외과 골절 - 158예의 역학적 분석 -

조철현·송광순·손승원·배기철·이정훈

계명대학교 의과대학 정형외과학교실

**목 적:** 소아 주관절 주위 골절에서 두 번째로 빈도가 높은 소아 상완골 외과 골절의 역학을 조사하여 여러 인자들의 상관 관계를 분석하고자 하였다.

**대상 및 방법:** 1996년 4월부터 2006년 3월까지 소아 상완골 외과 골절로 치료받은 158예를 대상으로 성별, 연령 분포, 계절별 빈도, 원인, 골절 유형, 치료 방법 등을 후향적으로 분석하였다.

**결 과:** 남아가 113예 (72%), 여아가 45예 (28%)였으며, 연령 분포는 최저 1세 3개월, 최고 11세 3개월로 평균 5.4세였다. 계절별로는 봄이 43예 (27%), 여름이 44예 (28%), 가을이 48예 (30%), 겨울이 23예 (15%)로 계절적으로는 옥외 활동이 활발한 계절에 호발하였다. 원인은 놀이터에서의 사고가 39예, 스포츠 활동이 32예, 교통 사고가 17예, 집에서의 실족 사고가 15예, 집에서의 낙상 사고가 14예, 친구와 장난치다 넘어진 경우가 6예, 계단 보행 중 실족이 6예, 2층 이상 높이의 추락 사고가 4예, 정확한 원인을 알 수 없는 경우가 25예였다. 골절의 전위 정도는 Jakob stage에 따라 분류하였으며, I형이 42예, II형이 77예, III형이 39예였다. 치료는 34예에서 석고고정술, 68예에서 도수 정복술 및 경피적 K-강선 고정술, 56예에서 관혈적 정복술 및 K-강선 고정술을 시행하였다. 놀이 기구 및 스포츠 활동 중 사고나 교통 사고가 많은 원인을 차지하며 (56%), 이 경우 골절의 전위가 심하여 수술적 치료를 한 경우가 많았다 (94%).

**결 론:** 옥외 활동이 많은 계절에, 특히 유치원이나 초등학교 저학년의 아동에게 놀이 기구 및 스포츠 활동과 교통 사고로 인한 골절의 예방을 위한 안전 교육이 필요할 것으로 생각된다.

**색인 단어:** 상완골, 외과 골절, 소아, 역학적 분석

## Lateral Condylar Fracture of the Humerus in Children - An Epidemiological Analysis of 158 Cases -

Chul Hyun Cho, M.D., Kwang Soon Song, M.D., Sung Won Sohn, M.D.,  
Ki Chul Bae, M.D., Jung Hoon Lee, M.D.

Department of Orthopedic Surgery, School of Medicine, Keimyung University, Daegu, Korea

**Purpose:** To analyze the correlation of various factors by examining the epidemiology of lateral condylar fracture of the humerus which is the second most fracture among elbow fractures in children.

**Materials and Methods:** Of 158 cases treated for lateral condylar fracture of the humerus in children from April 1996 to March 2006, their age and sex distribution, the seasonal frequency, etiology, type of fracture, method of treatment, etc. were analyzed retrospectively.

**Results:** Boys were 113 cases, girls were 45 cases, and the mean age was 5.4 years. Regarding the seasonal occurrence, spring 43 cases, summer 44 cases, autumn 48 cases, and winter 23 cases had occurred. It occurred preferentially during the season when outdoor activity was most active. As its etiology, the accident in a playground was 39 cases, sports activity was 32 cases, traffic accident was 17 cases, slipping accident at home was 15 cases, falling accident at home was 14 cases, slip while playing with friends was 6 cases, a missing step while walking on stairs was 6 cases, fall from a height more than 2 floors was 4 cases, and the cases with unknown cause were 25 cases. According to the Jakob stage, the stage I was 42 cases, the stage II 77 cases, and the stage III was 39 cases. As treatment, cast immobilization was performed in 34 cases, closed reduction and percutaneous K-wire fixation was performed in 68 cases, and open reduction and K-wire fixation was performed in 56 cases. The prevalent causalities were play devices, accident during sports activity, and traffic accident, and in such cases, the displacement of fracture was severe and thus surgical treatments were performed in many cases (94%).

**Conclusion:** It is thought that during the season when outdoor action is active, particularly, for kindergarten children or the lower grade primary school children, safety education is required to prevent the fracture by play devices, sports activity and traffic accident.

**Key Words:** Humerus, Lateral condylar fracture, Children, Epidemiological analysis

통신저자 : 송 광 순

194

Tel : 053-250-7250 • Fax : 053-250-7205  
E-mail : skspos@dsmc.or.kr

Address reprint requests to : Kwang Soon Song, M.D.

Department of Orthopaedic Surgery, Dongsan Medical Center, School of Medicine, Keimyung University, 194, Dongsan-dong, Jung-gu, Daegu 700-712, Korea

Tel : 82-53-250-7250 • Fax : 82-53-250-7205  
E-mail : skspos@dsmc.or.kr



5. 수상 원인

가 39 (25%), 가 32 (20%), 가 15 (9%), 가 6 (4%), 가 2 가 25 (16%) (Table 4).

가 17 (11%), 가 14 (8%), 가 4 (3%), (Table 4).

6 (4%), 95%, 가 97%, 88%, 가 57%, 50%, 2

6. 골절 분류

Milch type I 11 (7%), type II가 147 (93%) type II가 Jakob stage stage I 42 (27%), stage II가 77 (49%), stage III가 39 (24%) (Table 5).

7. 치료 방법

34 (22%), K- , 68 (43%), K- , 56 (35%), K- , 가 97%, 88%, 가 67%, 가 67%, 가 25%, 60% (Table 6).

가 (56%), 가 가

(94%).

고 찰

Table 4. Etiology of fracture

Etiology	No. of cases (%)
Accident in a playground	39 (25%)
Accident during sports activity	32 (20%)
Traffic accident	17 (11%)
Slipping accident at home	15 (9%)
Falling accident at home	14 (8%)
Slip while playing with friends	6 (4%)
Missing step while walking on stairs	6 (4%)
Fall from a heights more than 2 floors	4 (3%)
Unknown	25 (16%)

Table 5. Classification of fracture according to pattern and degree of displacement

Milch type	Jakob stage	No. of cases	Total (%)
Type I	Stage I	2	11 (7%)
	II	8	
	III	1	
Type II	Stage I	40	147 (93%)
	II	69	
	III	38	

Table 6. Method of treatment to correlate etiology

Etiology	Cast immobilization	Closed reduction & percutaneous K-wire fixation	Open reduction & K-wire fixation	Operative treatment (%)
Accident in a playground	2	13	24	37 (95%)
Accident during sports activity	1	19	12	31 (97%)
Traffic accident	2	10	5	15 (88%)
Slipping accident at home	5	6	4	10 (67%)
Falling accident at home	6	4	4	8 (57%)
Slip while playing with friends	2	4	0	4 (67%)
Missing step while walking on stairs	3	1	2	3 (50%)
Fall from a heights more than 2 floors	3	1	0	1 (25%)
Unknown	10	10	5	15 (60%)
Total (%)	34 (22%)	68 (43%)	56 (35%)	

가 , Rockwood<sup>16)</sup>  
16.8%, 54.2%  
 , Blount<sup>2)</sup>  
18.5%  
6~10 , 2~3  
1.5,17,18) , 5.4 , 가  
72% , 4~8  
95 (60%) 가  
가 가 가  
가  
가 , Houshian<sup>7)</sup>  
(27%), (28%), 가 (30%)  
(15%)  
 , 2~17%  
1,9,16,18) 5%  
가  
 , 39  
 , 32 , 가 17  
(56%).  
가  
Milch<sup>13)</sup>  
I  
 , II  
가 가  
I . Jakob  
stage I, II, III  
stage I , stage II, III  
Milch I 11 (7%), Milch II 147  
(93%) Jakob  
stage II가 69 (47%) 가  
8,13) .  
 ,  
2~3 mm 가 가  
4,9,10,12,14,18) .  
가 , 2 mm  
가 K-

## 결론

## 참 고 문 헌

- 1) **Badelon O, Bensahel H, Mazda K and Vie P:** Lateral humeral condylar fractures in children: a report of 47 cases. *J Pediatr Orthop*, **8:** 31-34, 1988.
- 2) **Blount WP, Schulz I and Cassidy RH:** Fractures of the elbow in children. *J Am Med Assoc*, **146:** 699-704, 1951.
- 3) **Cheng JC, Lam TP and Maffulli N:** Epidemiological features of supracondylar fractures of the humerus in Chinese children. *J Pediatr Orthop B*, **10:** 63-67, 2001.
- 4) **Conner AN and Smith MG:** Displaced fractures of lateral humeral condyle in children. *J Bone Joint Surg*, **52-B:** 460-464, 1970.
- 5) **Foster DE, Sullivan JA and Gross RH:** Lateral humeral condylar fractures in children. *J Pediatr Orthop*, **5:** 16-22, 1985.
- 6) **Hardacre JA, Nahigian SH, Froimson AI and Brown JE:** Fractures of the lateral condyle of the humerus in children. *J Bone Joint Surg*, **53-A:** 1083-1095, 1971.
- 7) **Houshian S, Mehdi B and Larsen MS:** The epidemiology of elbow fracture in children: analysis of 355 fractures, with special reference to supracondylar humerus fractures. *J Orthop Sci*, **6:** 312-315, 2001.
- 8) **Jakob R, Fowles JV, Rang M and Kassab MT:** Observation concerning fractures of the lateral humeral condyle in children.

- J Bone Joint Surg, **57-B**: 430-436, 1975.
- 9) **Kim HS, Hong KD, Ha SS and Kim BS**: A clinical study of the lateral humeral condyle fractures in children. J Korean Fracture Soc, **11**: 994-1000, 1998.
  - 10) **Kim KC, Choi JY, Kim JS and Choi AS**: The type and treatment of elbow fracture in children. J Korean Fracture Soc, **7**: 37-42, 1994.
  - 11) **Landin LA and Danielsson LG**: Elbow fractures in children. An epidemiological analysis of 589 cases. Acta Orthop Scand, **57**: 309-312, 1986.
  - 12) **McLearie M and Merson RD**: Injuries to the lateral condyle epiphysis of the humerus in children. J Bone Joint Surg, **36-B**: 84-89, 1954.
  - 13) **Milch H**: Fractures of the external humeral condyle. J Am Med Assoc, **160**: 641-646, 1956.
  - 14) **Mirsky EC, Karas EH and Weiner LS**: Lateral condyle fractures in children: evaluation of classification and treatment. J Orthop Trauma, **11**: 117-120, 1997.
  - 15) **Park SW, Han SY and Byun YS**: Clinical study for lateral condyle fracture of humerus in children. J Korean Orthop Assoc, **26**: 403-411, 1991.
  - 16) **Rockwood CA, Willkins KE, Beaty JH and Kasser JR**: Fractures in children. 6th ed. Philadelphia, Lippincott Co: 592-610, 2005.
  - 17) **Rutherford A**: Fractures of the lateral humeral condyle in children. J Bone Joint Surg, **67-A**: 851-856, 1985.
  - 18) **Yoo CI, Suh JT, Suh KT, Kim YJ, Kim HT and Park WW**: A clinical study of the lateral condyle fractures of the humerus in children. J Korean Orthop Assoc, **28**: 781-792, 1993.
-