

\* \* \* \* \*

[ ]

:

: 2000 1 2003 4

15 1

Cincinnati

Knee Rating System Score, Lysholm Score Scale

: Cincinnati Knee Rating System score 80 100

89.9 . Lysholm Scoring Scale score 81 100

90.8 80%

:

: ,

: 682-060, 290-3

: (052) 250-7129, Fax: (052) 235-2823  
e-mail: [ulsanos@uuh.ulsan.kr](mailto:ulsanos@uuh.ulsan.kr)

1. 가 1% 2) 가 2000 1 2003 4

가 1 가 15

27 61

42 30 가 7 (47%)

가 8 (53%), 7

(47%) 36 ,

가 49

가 12

(80%), 가 3 (20%)

7 (47%), 1 (7%) , 3 (20%)

15 32 22.1

K-

20) 가

가

Cincinnati Knee Rating

System score Lysholm Scoring Scale

가 score

2.

1,10,13,17~19)

30°

(shaver) (probe)



**Fig. 1.** An arthroscopic view showing the articular surface after the arthroscopic-assisted reduction of the fracture.



**Fig. 3.** Picture showing full ROM of knee joint after arthroscopic-assisted reduction of patella fracture.



**Fig. 2.** Radiograph showing internal fixation using K-wires and cerclage wiring.

(Fig. 1).

K -

,

14 (spinal needle)

18

,

2 (Fig. 2).

,

1.9)

3.

2

,

2

1

(CPM) 0° 30°

20° 30° 가 ,

6~8

<sup>18)</sup> (Fig. 3). 4

.

1

Cincinnati Knee Rating System score 80

100 89.9 , Lysholm Scoring

Scale score 81 100

90.8

,

34 89

**Table 1.** Interval of follow up, Cincinnati Knee Rating System, Lysholm Scoring Scale, Operation time

No. of Case	Age/Sex	Follow-up pPeriod (month)	Cincinnati*	Lysholm**	Time of Operation (min)
1	37/F	21	88	90	62
2	60/F	19	94	95	51
3	61/F	23	80	81	70
4	27/M	24	95	95	47
5	36/M	29	82	83	82
6	53/M	16	95	95	34
7	54/M	28	90	90	65
8	56/F	15	88	85	72
9	39/F	15	87	90	66
10	38/F	18	89	88	55
11	33/M	17	92	94	48
12	34/M	30	96	99	46
13	42/M	16	85	88	52
14	29/M	29	88	90	89
15	37/M	32	100	100	43

\*Cincinnati Knee Rating System, \*\*Lysholm Scoring Scale

58 (Ta-  
ble 1).

12 (80%)  
, 2 (13.3%) 1 mm 가  
, 1 (6.6%) 2 mm ,  
7 4),  
12 9.8 , 3/4  
2 (13.3%) 가  
7).  
2 , 가  
1 (6.6%) 2 mm  
(Table 2). 8).  
3 2 (13.3%)  
, 1 , 15).  
. 1 (6.6%)

**Table 2.** Radiological evaluation of pre- and post-operative state

No. of Case	Age/Sex	Fracture Classification	Reduction	Bone union (weeks)	Development of Osteoarthritis	Reduction Loss
1	37/F	Comminuted	Anatomical R*	10	(-)	(-)
2	60/F	Transverse	Anatomical R*	10	(-)	(-)
3	61/F	Comminuted	Acceptable (1 mm)	8	(+)	(-)
4	27/M	Comminuted	Anatomical R*	11	(-)	(-)
5	36/M	Transverse	Acceptable (1 mm)	10	(-)	(-)
6	53/M	Comminuted	Anatomical R*	7	(-)	(-)
7	54/M	Transverse	Anatomical R*	7	(-)	(-)
8	56/F	Comminuted	Acceptable (2 mm)	12	(+)	(+)
9	39/F	Transverse	Anatomical R*	10	(-)	(-)
10	38/F	Transverse	Anatomical R*	12	(-)	(-)
11	33/M	Transverse	Anatomical R*	9	(-)	(-)
12	34/M	Comminuted	Anatomical R*	10	(-)	(-)
13	42/M	Transverse	Anatomical R*	9	(-)	(-)
14	29/M	Vertical	Anatomical R*	11	(-)	(-)
15	37/M	Comminuted	Anatomical R*	10	(-)	(-)

\*Reduction

3,14), 10° (femoral condyle) (template)

3 mm 2 mm (femoral condyle) (template)

15), 3 mm, 2 mm

가, 가

15), 1993 Appel Seigel<sup>1)</sup>

1598 Servino가, Suh<sup>17)</sup> 1997

가 10,13,18,19)

Johnson<sup>6)</sup> indirect reduction 가

1,10,13,17~19) .  
 Scapinelli<sup>16)</sup> 가 , 1 가  
 가 , 4  
 25% , 2 mm  
 가 가  
 가 1 1 (CPM)  
 18) 가  
 가  
 가 2000 1 2003 4  
 17) 15 1 ,  
 8 mm 가  
 18) Appel Siegel<sup>1)</sup>  
 17) 가  
 K- 2  
 K-  
 ,

## REFERENCES

- 1) Appel MH and Seigel H: Treatment of transverse fractures of the patella by arthroscopic percutaneous

- pinning. *Arthroscopy*, 9-1: 119-121, 1993.
- 2) **Bostrom A**: Fracture of the patella. *Acta Orthop Scand*, 143: 1-80, 1972.
  - 3) **Braun W, Weidemann M, Ruter A, et al**: Indications and results of nonoperative treatment of patella fractures. *Clin Orthop*, 289: 197-201, 1993
  - 4) **Carpenter JE, Kasman R and Matthews LS**: Fractures of patella. *J Bone Joint Surg*, 75-A: 1550-1560, 1993.
  - 5) **Grisword AS**: Fracture of the patella. *Clin Orthop*, 4: 444-56, 1954.
  - 6) **Johnson EE**: Rockwood and Green's Fractures in adults. 4<sup>th</sup> ed. Philadelphia, Lippincott Raven: 1966-1972, 1996.
  - 7) **Kaufer H**: Mechanical function of the patella. *J Bone Joint Surg*, 53-A: 1551-1560, 1971.
  - 8) **Kaufer H**: Patellar biomechanics. *Clin Orthop*, 144: 51-54, 1979.
  - 9) **Kurzweil PR**: Master technique in orthopaedic surgery. In: Jackson DW ed. *Reconstructive knee surgery*. New York, Raven press Ltd: 229-234, 1995.
  - 10) **Lee BK, Lee SC, Jang YH and Kang KY**: The operative treatment of patellar fracture using indirect reduction. *J of Korean Knee Society*, 10-2: 236-242, 1998.
  - 11) **Levack B, Flannagan JP and Hobbs S**: Results of surgical treatment of patella fractures. *J Bone Joint Surg*, 67-B: 416-419, 1985.
  - 12) **Lobenhoffer P and Tscherne H**: Fractures patella, Knee Surgery. 1<sup>st</sup> ed. Baltimore. Maryland, Williams & Wilkins, 1051-1058, 1994.
  - 13) **Makino A, Aponte-Tinao L, Muscolo DL, Puigdevall M and Costa-Paz M**: Arthroscopic-assisted surgical technique for treating patella fractures. *Arthroscopy*, 18-6: 671-675, 2002.
  - 14) **Nummi J**: Fracture of the patella: a clinical study of 707 patellar fractures. *Ann Chir Gynaecol Fenn*, 179: 1-85, 1971.
  - 15) **Robert M Harris**: Rockwood and Green's Fractures in adults. 5<sup>th</sup> ed. Philadelphia, Lippincott Williams & Wilkins: 1775-1799, 2001.
  - 16) **Scapinelli R**: Blood supply of the patella. *J Bone Joint Surg*, 49-B: 563-579, 1967.
  - 17) **Suh JT, Yun PJ and Yoo CI**: Arthroscopy-guided fixation of patella fractures. *J of Korean Knee Society*, 9-1: 103-107, 1997.
  - 18) **Tandogan RN, Demirors H, Tuncay CI, Cesur N and Hersekli M**: Arthroscopic-assisted percutaneous screw fixation of select patellar fractures. *Arthroscopy*, 18-2: 156-162, 2002.
  - 19) **Turgut A, Gunal I, Acar S, Seber S and Gokturk E**: Arthroscopic-assisted percutaneous stabilization of patellar fractures. *Clin Orthop*, 389: 57-61, 2001.
  - 20) **Weber MJ**: Efficacy of various forms fixation of fractures of the patella. *J Bone Joint Surg*, 62-A: 215-220, 1980.

**Abstract****Arthroscopic-Assisted Reduction and Internal Fixation of Patella Fractures**

**Sang-Hun Ko, M.D.,\* Sung-Do Cho, M.D.,\* Hwa-Yeop Na, M.D., Woo-Suk Kim, M.D.,  
You-Young Jeong, M.D., Chang-Yeul Kwag, M.D.,\* Bum-Soo Kim, M.D.\***

*Department of Orthopedic Surgery, Ulsan University Hospital, College of Medicine,  
University of Ulsan\*, DaeJin Medical Center, Kyungki-Do, Korea*

**Purpose:** The aim of this study is to report the clinical effectiveness of arthroscopic-assisted reduction and internal fixation of patella fractures.

**Materials and Methods:** We analyzed fifteen patella fractures, which had been operated by using an arthroscopic-assisted technique from January, 2000 to April, 2003 at our hospital. After clinical follow-ups for at least 1 year, clinical analyses had been done by using the Cincinnati Knee Rating System Score, Lysholm Score Scale, and radiological findings.

**Results:** In our study group, the Cincinnati Knee Rating System scores were from 80 to 100, with a mean of 89.9. The Lysholm Scoring Scale scores ranged from 81 to 100 with a mean of 90.8 for the same group. Radiologically, we obtained complete anatomical reduction of articular surfaces in 80 percent of cases. Arthroscopic-assisted reduction for patella fractures brought clinically satisfactory results that are accurate articular surface reduction, early recovery of motion range, knee joint stability and minimal soft tissue damage, etc.

**Conclusion:** The operative treatment for patella fractures using arthroscopic-assisted reduction is an effective alternative method to open reduction.

**Key Words:** Patella fracture, Arthroscopy

**Address reprint requests to** \_\_\_\_\_

Bum-Soo Kim

682-060, 290-3, Dong-Gu, JeonHa-Dong, Ulsan-Metropolitan City

Ulsan University Hospital

Tel : 052-250-7129, Fax : 052-235-2823

E-mail : ulsanos@uuh.ulsan.kr