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= Abstract =

## Clinical Study on Operative Technique and Management of Tibial Condylar Fractures

Su-Chan Lee, M.D., Beom-Koo Lee, M.D., Do-Hyun Moon, M.D., Jin-Hong  
Ko, M.D.,  
Young-Kyu Kim, M.D., Hong-Ki Park, M.D., Jun-MO Jung, M.D., Hyun-  
Park, M.D.

*Department of Orthopaedic Surgery, Choong Ang Ghil General Hospital, Incheon, Korea*

We reviewed fifteen cases of tibial condylar fractures, especially, Schatzker type treated with hybrid method from January 1995 to May 1997. We attained satisfactory bony union in all cases.

There were not serious complications such as deep wound infection and severe angular deformity, but partial ankylosis. After operation, the patients could do knee motion exercise immediately and had no difficulty in getting maintenance of reduction and fracture healing. In conclusions, the hybrid method is an excellent treatment in soft tissue care, maintenance of reduction, and early ambulation and fracture healing in the cases of tibial condylar fractures.

**KeyWords** : tibial condylar fractures, hybrid method.

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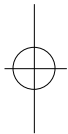
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Tel : 032) 460 - 3380 Fax : 032) 468 - 5437

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1997





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Schatzker type VI  
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Schatzker type VI

1.

1995 1 1997 5

Schatzker type VI

15

Blokker

(Table 7).

Table 6. Complications

Complications	No of case
Infection	
- minor pin tract infection	6
Angular deformity	
- corrected	1
Partial ankylosis	3
Total	10

Table 1. Age and Sex distribution

Age	Male	Female	Total	%
20	2	-	2	13.3
21 30	1	-	1	6.6
31 40	6	-	6	40
41 50	2	-	2	13.3
51 60	2	-	2	13.3
61	1	1	2	13.3
Total	14	1	15	100

Table 2. Type of Fractures

Type	No of case
Closed	11
Open	
Gustilo - I	2
Gustilo - II	2

Table 3. Methods of Fixation

Fixation method	No. of cases
External fixation + T-Plate	8
External fixation + Screw	7
Total	15

Table 4. Time of weight bearing

Time of weight bearing	No. of cases
4 - 5 wks.	10
6 - 8 wks.	3
8 -10 wks.	2
Total	15

Table 5. Radiographic evaluation of pre-op. post-op. and follow-up

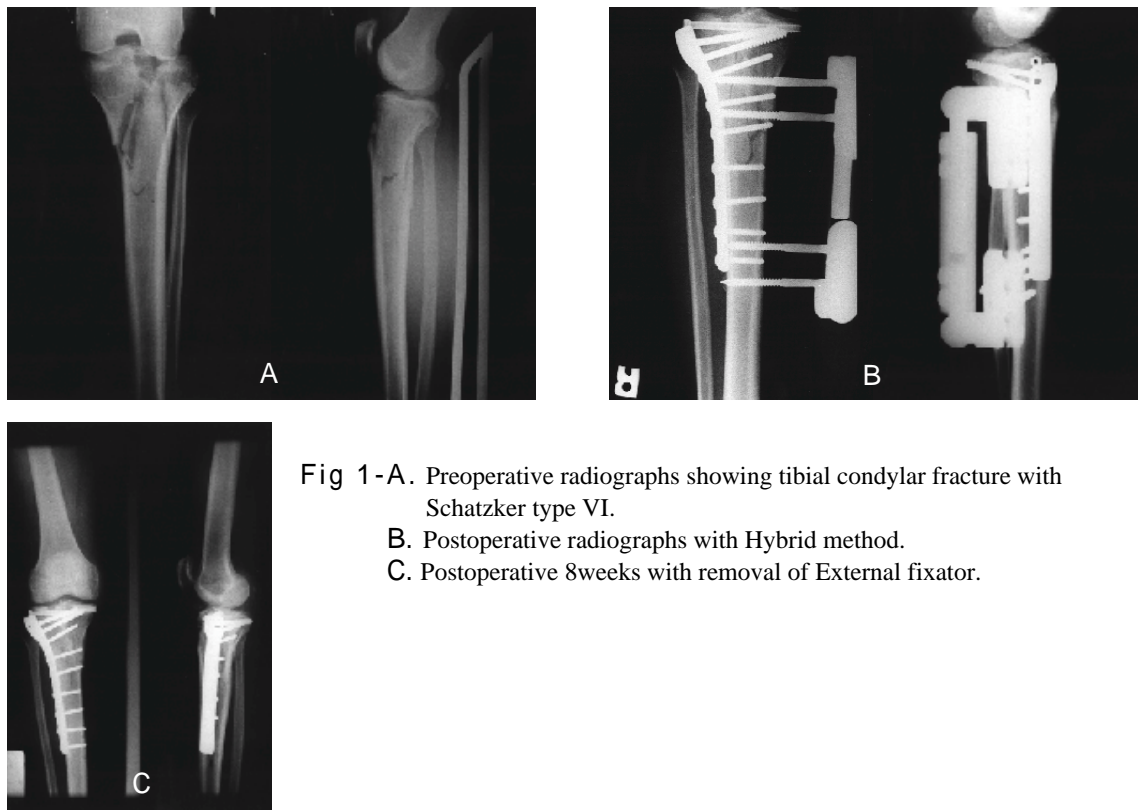
	pre-op.	post-op.	follow-up.
articular diastasis	7mm	2mm	3mm
articular depression	6mm	1mm	2mm
	pre-op	post-op	follow-up
varus	5 °	2 °	3°
valgus	7 °	1 °	3°



**Table 7.** The criteria for a result (by Blokker)

Clinical satisfactory results	Radiological satisfactory results
occasional mild pain or barometric ache with lack of extension of less than 10 ° in addition 90 ° flexion and were able to pursue full activities with no interference in work or at recreational activities	residual depression less than 5mm, condylar widening of less than 5mm and varus or valgus angulation of less than 10 ° on a standing A-P roentgenogram

\* An unsatisfactory result was noted if these standards were not met.



**Fig 1-A.** Preoperative radiographs showing tibial condylar fracture with Schatzker type VI.

**B.** Postoperative radiographs with Hybrid method.

**C.** Postoperative 8weeks with removal of External fixator.

2.

17 , 65 38  
14 (93%), 1 (7%)  
가 , 30 6 ,  
(Table 1).

3.

12 (80%), 3  
(20%) 가 .

4.

, Schatzker type VI



Fig 2-A. Preoperative & post operative radiographs.

B. Postoperative 4 weeks showing well alignment and removal of joint bridging ring fixator.

C. Postoperative 1year showing no angular deformity and well united.

(20.6%) 11 (79.4%) 4 (Ilizarov ring fixator, orthofixR) (Table 3).

(Table 2).

(Fig 2) .

5. (Fig 1).

2

1

4

1

2

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5 (Table 4).  
T- 8.5  
12  
6,8,11,15,16,20,21,24)

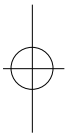
15 12 (80%) Blokker  
가 3 가  
(20%)  
3,8,12,22,26) ilizarov

가 7mm  
2mm, 3mm  
6mm, 1mm,  
2mm 가  
5 ° 2 °  
7 ° 1 °  
3 °  
(Table 5).  
6 , 1 ,  
3  
4,10,14)  
(75% , 가

Ilizarov ring hinge  
(Table 6).

Schatzker type  
Hohl Luck<sup>11)</sup> 4  
Schatzker type

Schatzker type  
가 ,  
Simmonds<sup>23)</sup>, Finsterbush<sup>5)</sup>  
가  
19). Brown Sprague<sup>2)</sup>



cast-brace

가

. Rombold<sup>18)</sup>

2

, Hohl<sup>17)</sup> 4 6

4 6

, Porter<sup>13)</sup> 7

7

가

가 2

5

가 1

1

Blokker<sup>1)</sup>

가

. Jacobson<sup>19)</sup> Rasmussen<sup>17)</sup>Rasmussen<sup>17)</sup>

가      가

가

, Schatzker type VI

Hybrid

## REFERENCES

- 1) **Blokker, C.P., Rorabeck, C. H., and Bourne, R. B.,** : Tibial Plateau Fractures and Analysis of Treatment in 60 Patients. *Clin. Orthop.*, 182:193, 1984.
- 2) **Brown, G.A. and Sprague, B.L.** : Cast brace treatment of plateau and bicondylar fractures of the proximal tibia. *Clin. Orthop.*, 119:184, 1976.
- 3) **Catagni, M.** : Fratures of the Leg(Tibia). In Fractures of the Tibial Plateau. *J. Bone Joint Surg.* 77A:661, 1995.
- 13) **Porter, B.** : Crush fractures of the lateral tibial table. *J. Bone and Joint Surg.*, 52-B:676-687, 19 70.
- 14) **Paley, D.** : Problems, obstacles, and complications of limb lengthening by the ilizarov. *Clin. Orthop.* 250:81:104, 1990.
- 15) **Perry, C.R., Evans, G., Rice, S., Fogarty, J., and**

Maioccki, A. B., and Aronson, J.(eds.) : Operative Principles of Ilizarov, p91. *Baltimore, Williams & Wilkins*, 1991.

- 4) **Fleming B. Paley D. and Kristiansen T** : A biomechanical analysis of the Ilizarov external fixator. *Clin Orthop*, 241:95-105, 1989.
- 5) **Finsterbush, A. and Friedman, B.** : Reversibility of joint changes produced by immobilization in rabbits. *Clin. Orthop.*, 111:290, 1975.
- 6) **Hohl, M. and Luck, J. V.** : Fractures of the tibial Condyle. *J. Bone Joint Surg.* 38A:1001, 1956.
- 7) **Hohl, M.** : Management of tibial condylar fractures. AAOS Symposium on Reconstructive Surgery of the Knee. p95, 1978.
- 8) **Ilizarov, G.A.** : The Treatment of Fractures-Theoretical Consideration. Experimental Studies and Clinical Application of the Apparatus. In Ilizarov, G.A., and Green, S.A. (eds.) : Transosseous Osteosynthesis : Theoretical and Clinical Aspects of the Regeneration and Growth of Tissue, p369. *New York, Springer*, 1992.
- 9) **Jakobsen, A.** : Operative treatment of the lateral tibial Condyle fractures. *Acta Orthop. Scand.*, 23:34-50, 1953.
- 10) **Johnson Wd and Fixcher Da** : Skeletal stabilization with a multiplane external fixation device. *Clin Orthop*, 180:34-43, 1983.
- 11) **Lansinger, O., Bergman, B., Korner, L., and Andersson, G.M.J.** : Tibial Condylar Fractures : A Twenty-Year Follow-Up. *J. Bone Joint Surg.*, 68A:13, 1986.
- 12) **Marsh, J.L., Smith, S.T., and Do, T.T.** : External Fixation and Limited Internal Fixation for Complex Fractures of the Tibial Plateau. *J. Bone Joint Surg.* 77A:661, 1995.
- 13) **Porter, B.** : Crush fractures of the lateral tibial table. *J. Bone and Joint Surg.*, 52-B:676-687, 1970.
- 14) **Paley, D.** : Problems, obstacles, and complications of limb lengthening by the ilizarov. *Clin. Orthop.* 250:81-104, 1990.
- 15) **Perry, C.R., Evans, G., Rice, S., Fogarty, J., and**



- Burdge, R.D.** : New Surgical Approach to Fractures of the Lateral Tibial Plateau. *J. Bone Joint Surg.*, 66A:1236, 1984.
- 16) **Ries, M.D., and Meinhard, B.P.** : Medial External Fixation With Lateral Plateau Internal Fixation in Metaphyseal Tibia Fractures : A Report of Eight Cases Associated With Severe Soft-Tissue Injury. *Clin. Orthop.*, 256:215, 1990.
- 17) **Rasmussen, P.S.** : Tibial condylar fractures. *J. Bone and Joint Surg.*, 55-A:1331-1350, 1973.
- 18) **Rombold, C.** : Depressed fractures of the tibial plateau, *J. Bone Joint Surg.* 42-A:783, 1960.
- 19) **Rockwood, C.A., jr, and Green, D.P.** : Fractures Vol. 2. Philadelphia : J. B. Lippincott, 1996.
- 20) **Schatzker, J. Mcbroom, R. Bruce, D.** : Tibial plateau fracture. *Clin. Orthop.* 138:91, 1979.
- 21) **Schatzker, J.,** : Tibial Plateau Fractures, In Browner, Jupiter, Levine, and Trafton (eds.) : *Skeletal Trauma*, p1745. Philadelphia, W.B. Saunders, 1993.
- 22) **Stamer, D.T., Schenk, R., Staggers, B., Aurori, K., Aurori, B., and Begrens, F.F.** : Bicondylar Tibial Plateau Fractures Treated With a Hybrid Ring External Fixator : A Preliminary Study. *J. Orthop. Trauma*, 8:455, 1994.
- 23) **Salter, R.B. and Simmonds, D.F.** : The effects of continuous passive motion on the healing of articular cartilage defects. *J. Bone Joint Surg.*, 57-A:570, 1975.
- 24) **Tscherne, H., and Lobenhoffer, P.** : Tibial Plateau Fractures Management and Expected Results. *Clin. Orthop.*, 292:87, 1993.
- 25) **Watson, J.T.** : High Energy Fractures of the Tibial Plateau. *Orthop. Clin. North Am.*, 25:723, 1994.
- 26) **Weiner, L.S., Kelley, M., Yang, E., et al** : The Use of Combination Interanal Fixation and Hybrid External Fixation in Severe Proximal Tibial Fractures. *J. Orthop. Trauma*, 9:244, 1995.