



11, 3, 1998 7

The Journal of the Korean Society of Fractures  
Vol.11, No.3, July, 1998

가

. . . .

= Abstract =

## Ligament Injuries of the Knee Joint Combined with Ipsilateral Femoral Shaft Fracture

Jin Hyung Sung, M.D., Chang Whan Han, M.D., Jae Duk Ryu, M.D.,  
Weon Jin Cha, M.D. and Jin Young Kim, M.D.

*Department of Orthopaedic Surgery, Taejon St. Mary's Hospital  
College of Medicine, Catholic University, Seoul, Korea*

Most fractures of the shaft of the femur are caused by high-energy trauma. It would be expected that in many cases the ipsilateral knee ligaments are subjected to severe stress. In these days, early diagnosis and proper treatment of combined ligament injury in ipsilateral femoral shaft fracture become to be important and are possible by arthroscope and MRI. We retrospectively reviewed a series of 97 patients with 97 fractures of the femoral shaft from March 1995 to December 1997. Demonstrable ipsilateral knee ligament laxity was present in 10(11.3 per cent) of these patients. There were 7 males and 8 left femur fractures. Eight of them were injured by traffic accident. Ten patients were followed for an average months. PCL injuries were five cases and ACL and MCL injuries were two cases each and posterolateral instability was one case. Early diagnosis was possible in MCL and ACL cases but diagnosis was delayed to average 10 months post-accidentally in PCL injuries. MCL injuries and one ACL injuries were

:

2 520 (301-012)

가

Tel : (042) 220-9530 Fax : (042) 221-0429

\*

1998 24





treated conservatively and one ACL and one PCL avulsion fracture were treated with pull-out suture technique and another 4 PCL injuries were treated with reconstruction using bone patella tendon bone. From this study, we advocate careful assessment of the knee, especially PCL injury in all cases of fracture of the femur caused by high-energy trauma.

**Key Words :** Femur, Shaft fracture, ligament injury

가 ,  
가 가  
가  
1958 Ritchey 7)  
1.7%  
17% 48%  
1,5,7,9,12)  
1995 3 1997 12  
97  
10 (11.3%)  
8 37 21  
. 10 가 7 , 가 3  
18 78 39 .

**Table 1.** Case descriptions

Case	Age/sex	Accident	side	Type of fracture	Knee Lig. injury	Associated injury
1	53/M	Motorcycle	L	simple	PCL	None
2	18/F	Motorcycle	L	simple	PCL avulsion	Tibia shaft Fx.
3	20/M	Falling down	L	simple	MCL avulsion	None
4	78/M	Pedestrian	L	comminuted	MCL	MM + fibular Fx.
5	33/F	Passenger	R	comminuted	ACL	None
6	46/M	Motorcycle	R	simple	ACL	None
7	42/M	Driver 's T/A	L	simple	PCL + LCL	None
8	28/M	Pedestrian	L	comminuted	PCL	Ulnar & pelvis Fx.
9	35/M	Driver 's T/A	L	open, comminuted	PCL	R Femur Fx.
10	38/F	Fall from train	L	simple	PCL	R Patellar Fx.

\* Lig. : ligament

F: female

Fx. : fracture

R : right

ACL : anterior cruciate ligament

MCL : medial collateral ligament

M: male

T/A : traffic accident

MM : medial meniscus

L : left

PCL : posterior cruciate ligament

LCL : lateral collateral ligament



가 3 , 가 3 , 가 2 , 가 8 , 4 , 6 , 5 , 9 , 2 , 10mm , 21mm , 16mm , 5 , (Table 1). , 2 , 1 , 1 , ( , ) , 6 , 1 , ( , ) , 5 , 4 , 가 , 1 , 가 , 1 , 가 , (Table 2). 6 , 2 , 1 , (Table 2). 2

**Table 2.** Time of diagnosis, types, treatments and results of ipsilateral injured ligament

Case	Knee Lig. injury	Duration of Acc. to Dx.	Tx. of Lig. Injury	Result
1	PCL	15M	Reconstruction	Stable
2	PCL avulsion	1wk	Pull-out suture	Stable
3	MCL avulsion	1wk	Conservative	Stable
4	MCL	2wk	Conservative	Stable
5	ACL	2wk	Conservative	Stable
6	ACL	1wk	Pull-out suture	Stable
7	PCL + LCL	4M	Reconstruction	Stable
8	PCL	6M	Reconstruction	GI instability
9	PCL	14M	Reconstruction	Stable
10	PCL	6M		

\* Lig. : ligament

Acc. : accident

M : month

ACL : anterior cruciate ligament

MCL : medial collateral ligament

GI : grade I instability

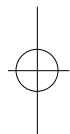
Tx. : treatment

Dx. : diagnosis

wk : week

PCL : posterior cruciate ligament

LCL : lateral collateral ligament





512 • / 11 3

60%

가

1958 Ritchey <sup>7)</sup> 30 5

(17%) 가

<sup>11)</sup> Rowntree 5 <sup>10)</sup>

Getty<sup>8)</sup> 85 가 가 45%

가 가가

Harvey <sup>2)</sup>

“the floating distal 가 가

femur ” , Walker

Kennedy<sup>12)</sup> 54 48% 6

16 가

(30%) 1 5

가 11.3%

5.3% 48%

1,5,7,9,12) Moore <sup>5)</sup>

가

4,10)

5)

40%

. Walker Kennedy<sup>12)</sup>

54 48% 1995 3 1997 12

가 97

50% 가 10 가 6 가

Walling <sup>13)</sup> 24

8

6 가 가 6

Pedersen Serra<sup>6)</sup> 5 가

Lakshman Scotland<sup>3)</sup> 21

11 가



가

.

## REFERENCES

- 1) **Coppola AJ Jr and Anzel SH** : Use of the Hoffman external fixator in the treatment of femoral fractures. *Clin Orthop*, 180:78-82, 1983.
- 2) **Harvey JP, Moore TM and Patzakis MJ** : Ipsilateral diaphyseal femoral fracture and knee ligament injury. *Orthop Trans*, 6:321, 1982.
- 3) **Lakshman K and Scotland TR** : The incidence of knee ligament injuries in 105 patients with lower limb fractures. *J Bone Joint Surg*, 67B:151-154, 1985.
- 4) **Meyers MH, Moore TM and Harvey JP** : Traumatic dislocation of the knee joint. *J Bone Joint Surg*, 57A:430-433, 1975.
- 5) **Moore TM, Patzakis MJ and Harvey JP** : Ipsilateral diaphyseal femur fractures and knee ligament injuries. *Clin Orthop*, 232:182-189, 1988.
- 6) **Pederson HE and Serra JB** : Injury to the collateral ligaments of the knee associated with femoral shaft fractures. *Clin Orthop*, 60:119-121, 1968.
- 7) **Ritchey SJ, Schonholtz GJ and Thompson MS** : The dashboard femoral fracture pathomechanics, treatment, and prevention. *J Bone Joint Surg*, 40A:1347-1350, 1958.
- 8) **Rowntree M and Getty CJM** : The knee after midshaft femoral fracture treatment: A comparison of three methods. *Injury*, 13:125-130, 1981.
- 9) **Shelton ML, Neer CS and Grantham SA** : Occult knee ligament ruptures associated with fractures. *Trauma*, 11:853-856, 1971.
- 10) **Szalay MJ, Hosking OR and Annear P** : Injury of knee ligament associated with ipsilateral femoral shaft fractures and with ipsilateral femoral and tibial shaft fractures. *Injury*, 21:198-400, 1990.
- 11) **Veith RG, Winkquist RA and Hansen ST** : Ipsilateral fractures of the femur and tibia. *J Bone Joint Surg*, 66A: 991-1002, 1984.
- 12) **Walker DM and Kennedy JC** : Occult knee ligament injuries associated with femoral shaft fractures. *Am J Sports Med*, 8:172-174, 1980.
- 13) **Walling AK, Seradge H and Spiegel PG** : Injuries to the knee ligaments with fractures of the femur. *J Bone Joint Surg*, 64A:1324-1327, 1982.