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## Modified Tension Band Wiring

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= Abstract =

### Treatment of Patellar Fractures with Modified Tension Band Wiring

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The aim of treatment of patellar fracture is the restoration of knee joint function and quadriceps muscle power. Comminuted and displaced fracture of the patella, which are difficult to reduce accurately and to get stable internal fixation, may lead to traumatic osteoarthritis, chondromalacia, limited ROM of the knee joint. In this series, we treated 29 cases of displaced transverse and comminuted fractures with modified tension band wiring. In severely comminuted fractures, the fragments were indirectly reduced by cerclage wire and then fixed with modified tension band wiring. We could obtain stable fixation and early ROM of the knee joint. There were 5 complications including wire breakage and wire loosening.

In this respect, we concluded that modified tension band wiring was a good method for displaced transverse and comminuted patellar fracture.

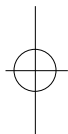
**Key Words** : Patellar fracture, Modified tension band wiring

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**Table 1.** Classification of the Fractures

Type	Male	Female	Total(%)
Transverse	13	3	16(55.2)
Comminuted	10	3	13(44.8)
	2	1	3
a	6	0	6
b	2	2	4
0	0	0	0
Total	23	6	29(100.0)

가가

가 (circumferential

wire fixation),

(tension band wiring),

가

5,6,10,12,16),

modified tension band

wiring

4.

17

2 (6.9%)

16 (55.2%)

가 ,

B stman3)

13 (44.8%)

3 , A 6 B 4 ,  
(Table 1).

5.

2 K-

K-

wire

K-

8

band wiring

5

modified tension

modified tension band wiring

1

4

8

13.6

가가

29

2.

29

가 23 (79.3%),

가6

(20.7%)

가

,

23

73

41.2

, 30-40

가17

(58.6%)

가

.

wiring

2 K-  
modified tension band

3.

가 18 (62.0%) 가

가 10 (34.5%),

1 (3.5%)

6.

2-3



6 가  
가 22 (75.9%), 가 6 (20.7%),  
1 (3.4%) (Table 2).  
7.5  
5-16 ( 10.5 )  
5 2  
1  
1 , 1 , K- 가 1  
1  
(Table 3).  
K-  
6

Wilkinson<sup>20)</sup>  
, (excellent) ,  
, (good)  
, (poor) 가

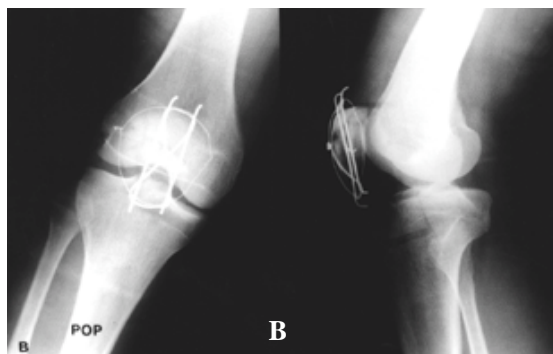
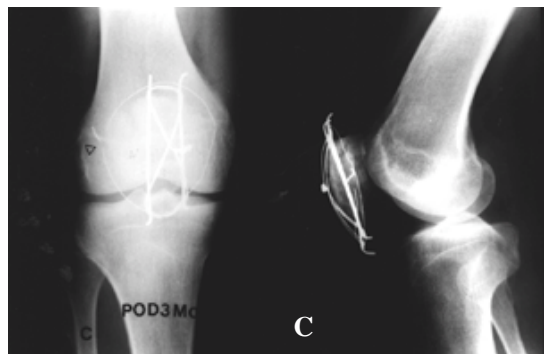
**Table 2.** Clinical results according to Wilkinson 's classification

Results	No. of cases(%)
Excellent	22(75.9)
Good	6 (20.7)
Poor	1 (3.4)
Tatal(%)	29(100)

< 1>

39

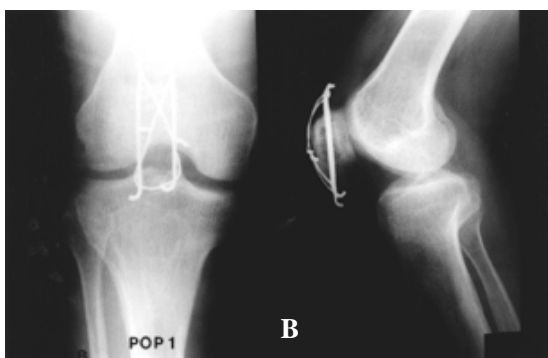
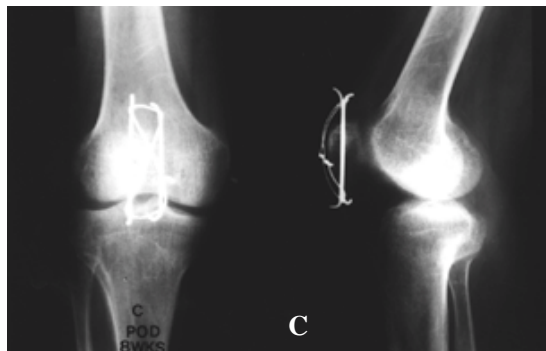
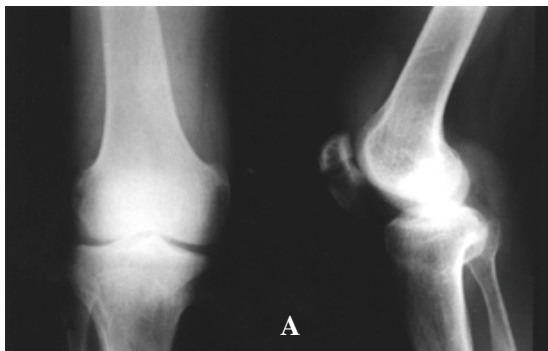
가



**Fig 1-A.** Roentgenogram of 39-year-old male with comminuted fracture of the patella

**1-B.** Comminuted fracture was fixed with modified tension band wire after indirect reduction by cerclage wire

**1-C.** Roentgenogram obtained 3 months after the initial operation showed breakage of the wire



**Fig 2-A.** Roentgenogram of 37-year-old male with transverse fracture of the patella

**2-B.** Transverse fracture was fixed with modified tension band wiring

**2-C.** The K\_wire was loosened and twisted at 8 weeks follow-up after the operation

**Table 3.** Complications

Complications	No. of cases
Superficial infection	1
Joint stiffness	1
Patellofemoral joint arthritis	1
Wire breakage	1
Wire loosening	1
Total	5

(Type IIB)

(Figure 1-A).

2

modified tension band wiring

(Figure 1-B).

3

(Figure 1-C),

가

< 2>

37

(Figure 2-A).

5

modified

tension band wiring

(Figure 2-B).

2

가

8

K-

K-

(Figure 2-C).

2

6

K-

tension band

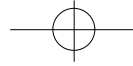
wire

muscle)

가

가

(vastus



876 • / 12 4

modified tension band wiring  
(longitudinal wire fixation),

1,4,14,19)

lever arm

가

가

,

,

Brooke<sup>5)</sup>

14)

Haxton<sup>10)</sup>Griswold<sup>9)</sup>Scott<sup>15)</sup>

가

(tangential force)

,

Smillie<sup>16)</sup>Sutton<sup>18)</sup>

,

가

,

Bostr

가

가

m<sup>4)</sup>Insall<sup>11)</sup>

가

가

6,14)

29

modified tension band wiring

,

5

,

13)

2 K-

modified tension band wiring

가

가

가

2-3

(retinaculum)

,

7.5 가

3,7,8,11), 4mm

가

, 3mm

가

Wilkinson<sup>20)</sup>

가

가

Bostr m<sup>4)</sup>

,

22

,

6

,

1

96.6%

가 가

가

, Muller<sup>12)</sup>, Smillie<sup>16)</sup>가

,

,

,

,

, AO

6,8,11,17)

,

,

1

,

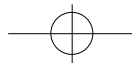
12) Weber<sup>19)</sup>

2 K-

2mm

8

8



tension band wire

K-

1

2 K-

K- tension band

wire

1992 1 1997 6

tension band wiring

가

modified tension

band wiring

가 22 , 6 ,

1 96.6% 가

5 가

, K- tension band

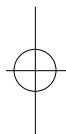
. Modified

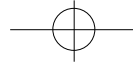
tension band wiring

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