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: 1995 1 1999 4 122, 125,

. 10-point analogue scale, paired T-test

: 38 (12-64), 122 69 (70, 56%)
, (62%, 99 61)
(35%, 26 9) 122
-1.4mm, 69 (70)
1.3mm 42 29 (69%)

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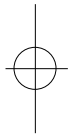
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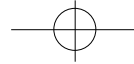
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99 , 26 . , Johner Wruhs⁷⁾ Group A 95 (A1: 46 , A2: 14 , A3: 35) , Group B 30 (B1: 5 , B2: 22 , B3: 3) . 3. 125 112 (89.6%) Russel-Taylor 57 , Gross-Kempf 24 , ZMS 12 , Uniflex 6 , Targon 8 , A-O 3 ACE 2 13 (10.4%) Russel-Taylor unreamed nail 10 , A-O unreamed 3 . 4. 1995 1 1999 4 122 , 125 , 12 , 38 (12 - 64) . 1. 18 74 41 1). (Table 1), 가98 , 가24 . 5. 2. 가94 , 18 , analogue scale 0 10-point , 1-3 5 , 5 , 가3 , , 4-6 , 6

Table 1. Age and anterior knee pain percentage for tibial fracture.

Age distribution	No of patients	No of knee pain patients	Pain patients(%)
11-20	10	4	5.8 %
21-30	25	18	26.1 %
31-40	33	22	31.9 %
41-50	26	15	21.7 %
51-60	14	6	8.7 %
61-70	9	3	4.4 %
71-	5	1	1.4 %

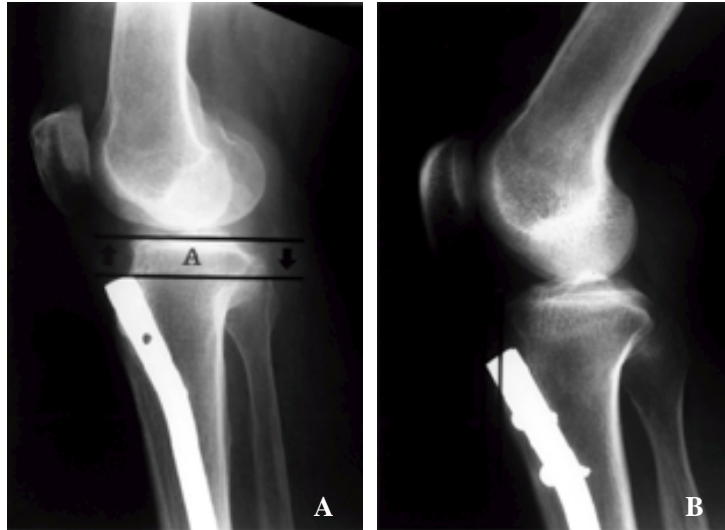


Fig 1A-B. Postoperative lateral radiograph of knee demonstrating technique of measuring (A) Nail plateau distance (B) Extent of nail protrusion beyond anterior tibial cortex.

Table 2. Relationship of development of knee pain to the time of surgery

Time to onset of knee pain postoperatively(months)	No of patients affected
< 2	4
2 - 6	51
6 - 12	9
> 12	5

4). (1.4%) ,31 40
 paired T-test . 가가 (Table
 1).
 3.
 1. 26 9 (35%),
 122 69 (56%; 125 99 61 (62%)
 70) , 55 , (p<0.05).
 (79%) 6
 (Table 2). 4.
 2. 14.6mm,
 69 -1.4mm ,
 20 4 (5.8%), 21-30 18 (26.1%), 31-40
 22 (31.9%), 41-50 15 (21.7%), 51-60 6 11.6mm,
 (8.7%), 61 -70 3 (4.4%), 71 1 1.3mm (Table3). ,

**Table 3.** Difference between nail plateau distance and extend of nail protrusion.

	Nail plateau distance(mm)	Extend of nail protrusion(mm)
Average	14.6	-1.4
Knee pain	11.6	1.3
Distance	3.0	2.7

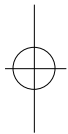
Table 4. Overall incidence and severity of knee pain. (10-point analogue scale)

		Number	Percent(%)
No pain	(0)	55	44.0
Mild pain	(<4)	38	30.4
Moderate pain	(4-6)	23	18.4
Severe pain	(>6)	9	7.2

Table 5. Incidence of pain associated with different activities in the pain group.

Activity	Pain(%)
Kneeling	88
Squatting	82

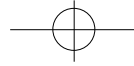
42 14 (33%)
, 15 (36%)



가

가 65 21 1-3,5,6,12,15)
(32%), 60 95%
49 (82%) ,
(p<0.05). 가 14)
, , ,
, , ,
5. , 가
70 38 5,9,10,15)
, 23 , 9
(Table 4). ,
88% , ,
, 가 , 82%
(Table 5).
18 , ,





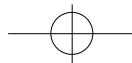
21 40
40 (58%) 가 가 ,
가
가
가 65
42 21 (32%) ,
33% , 36% 6 ,
Keating ⁸⁾ 가
107 61 , 63 , 가
(57%)
, Koval ¹¹⁾ Court-Brown ³⁾ 41%
10 (22%) 65%가
, Keating ⁸⁾
44%가
가 ,
가 2.7mm, 3.0mm
(Table3), 60 ,
82%
가
가
Koval ¹¹⁾
99 62%
가
가 가



가

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Abstract

Knee Pain Analysis After Tibia Intramedullary Nailing

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Purpose : To analyze the incidence and clinical and radiological results of anterior knee pain following tibial intramedullary nailing.

Materials and Methods : From January 1995 to April 1999, we retrospectively analyzed in 122 patients with tibial fracture who were treated by closed intramedullary nailing. All of 125 cases analyzed the age and sex distribution, mechanism of injury, fracture morphology, relationship of nail position on radiographs to knee pain and relationship of knee pain to the incision methods of patella tendon. Anterior knee pain was assessed with a 10-point analogue scale. Statistical analysis was performed using paired T-test.

Results : At a mean follow-up period of thirty-eight months(12-64 months), sixty-nine(56%) patients(70 of 125 knees) had developed anterior knee pain. Insertion of the nail through the patella tendon splitting incision was associated with a higher incidence of knee pain compared to the paratendon site of nail insertion(62% and 35% respectively). According to the radiological analysis, the mean extent of nail protrusion of 122 patients was -1.4mm and the average nail protrusion of 69 patients with knee pain was 1.3mm respectively. Nail removal resolved or improved the symptoms in 69%.

Conclusion : Based on these data, we would recommend a parapatella tendon incision for nail insertion, and nail removal for those patients with a painful knee after bony union.

Key Words : Tibial shaft fracture, Intramedullary nailing, Anterior knee pain

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