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5cm 12 가 가
23 (15 , 8)
, , 1 3 , 4 6
가
:
8.4cm(5.0-13.0) , 1 3
15.9, 10.1, 7.7, 6.8mm
5° 13 19.6° 1 , 3
13.9°, 8.4°, 5.9° , 가 4
13 (56.5%), 6 1 , 1 가
:
180
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8

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가
1 3
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8.4cm(5.0-13.0)
, 1 3
15.9, 10.1, 7.7, 6.8mm
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(Fig. 4).

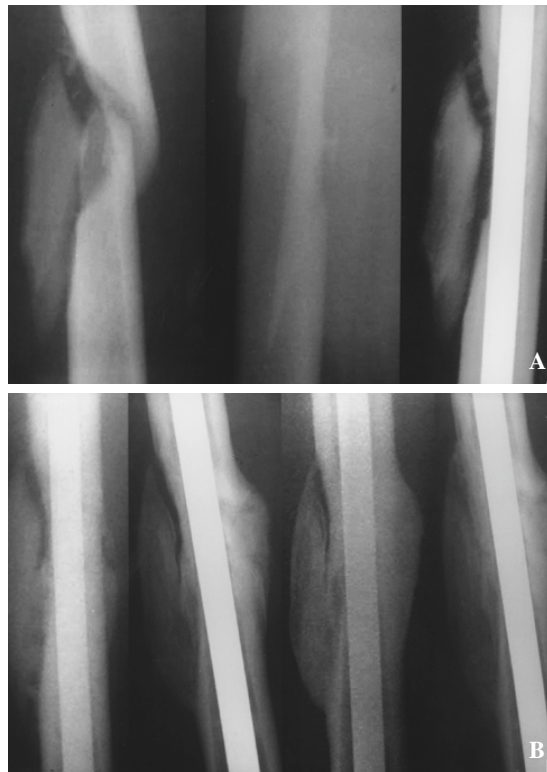


Fig. 2-A : Preoperative radiograph of 20 year-old man shows femoral shaft fracture with 13cm sized rotated large butterfly fragment. The distance between the fragment and shaft is 32mm. After closed interlocking IM nailing, the distance was reduced to 18 mm.

2-B : The follow up roentgenogram shows gradual decrease in distance between the fragment and shaft and the last follow up radiograph shows complete union.

1,3,9,10,11,13,15,16)

Küntscher

1,2,6,9,14-18)

2,4,6,7,17,19)

3-5,8,11,17,18)

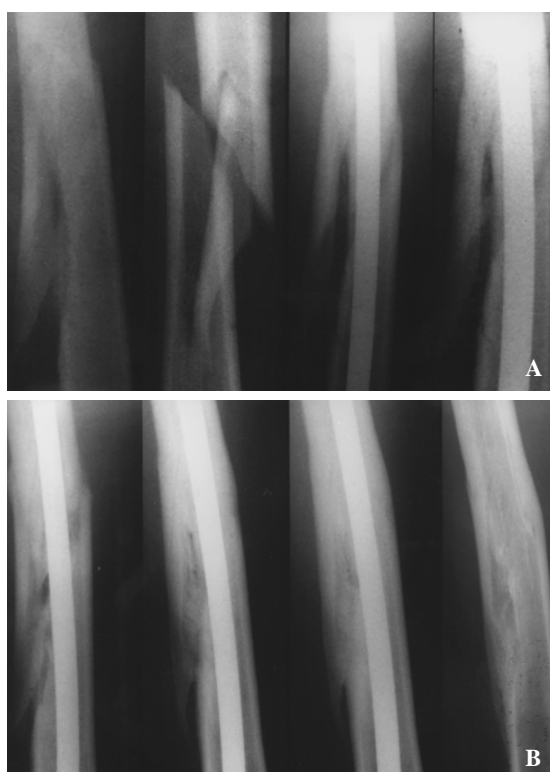


Fig. 3-A : Preoperative radiograph of 23 year-old female shows 13 cm sized large butterfly fragment with 10 degrees of angulation. The post operative 1 month follow up radiograph shows decreased angulation of fragment about 7 degrees.

3-B : The 3 months, 6 months and 12 months follow up radiograph shows gradual decrease in angulation of fragment and at 5 year follow up, the nail is removed.

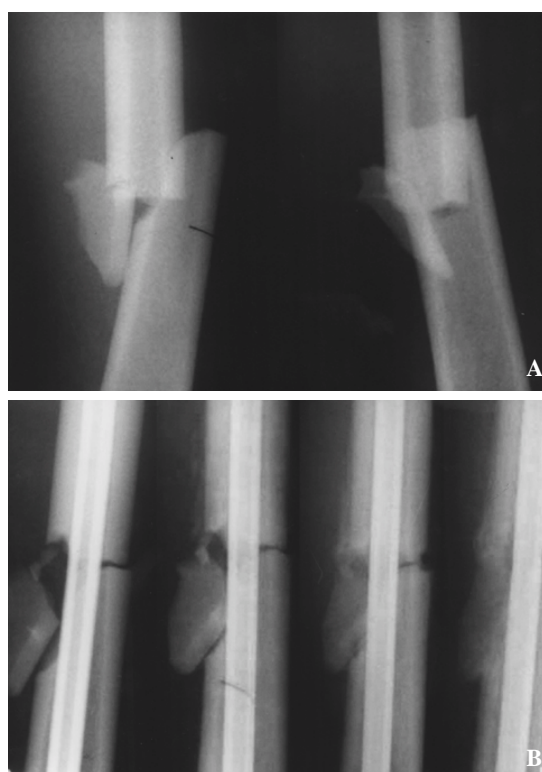


Fig. 4-A : The preoperative radiograph of 23 year-old man shows femoral shaft fracture with inverted fracture fragment.

4-B : But the post operative, 1 month, 3 months and 4 months follow up radiograph shows gradual decrease in distance and angulation of the fragment and 4 months follow up radiograph shows complete bony union.

5,17-19)

5 cm
180°

가 .

가 , 가
가

, 가 18,19)

, Winqvist Hansen¹⁷⁾
가

. Winqvist Hansen¹⁷⁾ III IV

가 , 1 가 180
 Finsen⁵⁾ 3
 Johnson⁸⁾ 가 .
 24 (13.8)
 , 1 1
 ,
 23 22%
 13%
 26%
 가 , Kim¹¹⁾ 180
 가 가
 가 가
 , Choo³⁾ 43 가
 4 1
 가

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Abstract

The Fate of Large Butterfly Fragments in Femoral Shaft Comminuted Fractures Treated with Closed Interlocking Intramedullary Nailing

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Purpose : To evaluate the radiographic changes and union of large butterfly fragments after closed interlocking IM nailing for femoral shaft comminuted fractures.

Materials and Methods : The objects of this study were 23 cases (15 males, 8 females) of femoral shaft comminuted fractures with butterfly fragments larger than 5cm and with the follow up period of 12 months or more from June 1995 to June 2000. We assessed the size, the degrees of displacement and angulation of the large butterfly fragments at preoperatively, one day, one month and three month postoperatively and evaluated the union at four month and six month postoperatively.

Results : The size of the fragments was 8.4cm (5.0-13.0) in average. The distance between the fragment and shaft was 15.9cm preoperatively and 10.1, 7.7, 6.8cm at one day, one month and three month postoperatively. In 13 cases of angulation over 5 degrees, it changed from 19.6 ° preoperatively to 13.9 °, 8.4 °, 5.9 ° at one day, one month and three month postoperatively. There is no increase in angulation. The union was completed at 4 months in 13 cases (56.5%) and at 6 months in all except one case of delayed union, in which we did not do any further procedure until the union was achieved.

Conclusion : In femoral shaft comminuted fractures with displaced large butterfly fragments treated with closed interlocking IM nailing, the distance and angulation of fragments decreased gradually and even the fragments were inverted or largely displaced and angulated the fragments were united. So the caution must be given not to displace the fragments intraoperatively and to keep anatomical position of the fragments by active exercise and hydrostatic pressure of the muscles of thigh postoperatively. Then the open reduction and internal fixations of the fragments will not be necessary.

Key Words : Femoral shaft comminuted fracture, Large butterfly fragment, Closed interlocking IM nailing