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= Abstract =

Role of Dynamization in the Interlocking Nailing for Fractures of Femur

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Interlocking screws have extended the use of intramedullary nail into comminuted, unstable fractures, from subtrochanteric to supracondylar region of the femoral fractures. But it is still controversial whether dynamization is necessary in the course of treatment.

Forty-nine femoral fractures treated with interlocked intramedullary nailing were investigated. Static nailing was converted to dynamic one in 33 femurs with removal of the proximal or distal locking screws. The rest were kept in static nailing.

In 19 out of 33 cases with dynamization, there was average 6.0mm of telescoping after dynamization. Average 3.8mm of telescoping was seen in 15 out of 25 cases with removal of the distal locking screws while average 14.3mm in 4 out of 8 cases with removal of the proximal locking screws. There were 4 cases of breakage of distal locking screws without dynamization. Union was achieved in 45 fractures of the 49 cases.

Dynamization improves fracture healing by reducing fracture gap and increasing axial compression. Dynamization is necessary in selected cases, especially fractures with a large fracture gap after static nailing and fractures that failed in filling the fracture gap even after some time postoperatively, and it is even more necessary in order to prevent breakage of locking screws in such cases.

Key Words : Femur, Shaft fracture, Intramedullary nailing, Dynamization, Telescoping

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36 • / 12 1

가35 , 가12 16
63 31.0 .
49 2 .

가 , 1, 25, 21 , 2
Winqvist-Hansen ¹³⁾ 1, 2, 3, 4
24, 8, 5, 10 , 2 1
2 1 , 1
1 .

가34 , 가13
, 2
,

가12 .

1995 1 1997 6
49 1 가가 47 ,
Russell-Taylor nail (Smith and Nephew, Memphis, TN, US) 4 , Universal Femoral nail (Synthes, Switzerland) 1 , Unreamed femoral nail (UFN, Synthes, Switzerland) 7 , Vari-Wall nail (Biomet, Warsaw, IN, US) 22 , ZMS nail (Zimmer, Warsaw, IN, US) 15 .
370.2mm (340-420 mm),
11.1mm (9-15 mm) .



Fig 1. There was a closing of the fracture gap with telescoping of the nail after dynamization.

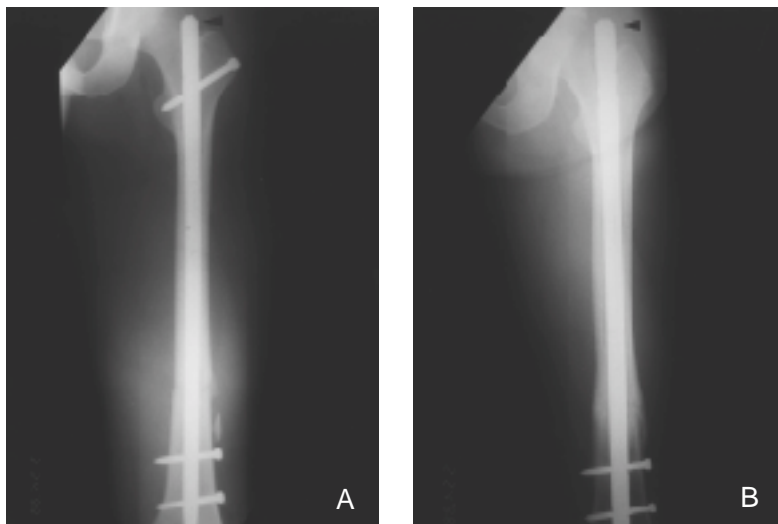
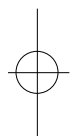


Fig 2. There was a protrusion of the proximal tip of the nail after removal of a proximal locking screw.



(reconstruction mode)

가 1

가

가

Winquist-Hansen

3, 4

가

16

33

97.2

가 25

가 8

telescoping

(Fig 1),

(Fig 2).

telescoping

6.0mm

33

19

(57.6%)

(collapse)

가

14

25

15

3.8mm

telescoping

(Fig 1),

8

4

14.3mm telescoping

(Fig 2).

telescoping

Winquist-Hansen

1

2

24

15

(62.5%)

4.3mm

telescoping

telescoping

(50%)

13.3mm

17

4

,

1

2

1

가

4

3

3.0mm

telescoping

49

45

4



38 • / 12 1

1 가 Russell-Taylor nail .
Vari-Wall nail Russell-Taylor nail
5mm , ZMS nail
가 4.5mm 가

9,10,12)

4,5,8)

telescoping

95%

가

telescoping

1-4.11)

, 가 가 , tapering 가
가
telescoping

가

telescoping

가

4

(stiffness)

(maximum torque)

가

가

가

87.6

6,7)

166.5

2

Winquist-

Hansen

3

가

, 1

가 .

가

가

1 Winquist-Hansen

1

6mm

가

174

3

33

19

6.0mm telescoping

가

17 4

3.0mm telescoping

가

4

telescoping

3 가 Vari-Wall nail

가

,





telescoping

가

, ,

가

가

14).

가

가

REFERENCES

- 1) , , , , , : , 8:533-537, 1995.
- 2) **Brumback RJ, Ellison TS, Poka A, Bathon GH and Burgess AR** : Intramedullary nailing of femoral shaft fractures: part III. J Bone Joint Surg, 74-A:106-112, 1992.
- 3) **Brumback RJ, Lakatos RP, Poka A, Howard BG and Burgess AR** : Intramedullary nailing of femoral shaft fractures: part II. J Bone Joint Surg, 70-A:1453-1462, 1988.
- 4) **Brumback RJ, Reilly JP, Poka A, Lakatos RP, Bathon GH and Burgess AR** : Intramedullary nailing of femoral shaft fractures: part I. J Bone Joint Surg, 70-A:1441-1452, 1988.
- 5) **Bucholz RW and Jones A** : Current concepts review: Fractures of the shaft of the femur. J Bone Joint Surg, 73-A:1561-1566, 1991.
- 6) **Egger EL, Gottsauner-Wolf F, Palmer J, Aro HT and Chao EY** : Effects of axial dynamization on bone healing. J Trauma, 34:2, 185-192, 1993.
- 7) **Georgiadis GM, Minster GJ and Moed BR** : Effects of dynamization after interlocking tibial nailing: an experimental study in dogs. J Orthop Trauma, 4:3, 323-30, 1990.
- 8) **Hajek PD, Bicknell HR, Bronson WE, Albright JA and Saha S** : The use of one compared with two distal screws in the treatment of femoral shaft fractures with interlocking intramedullary nailing. J Bone Joint Surg, 75-A:519-525, 1993.
- 9) **Harper MC** : Fractures of the femur treated by open and closed intramedullary nailing using the fluted rod. J Bone Joint Surg, 67-A:699-708, 1985.
- 10) **Johnson KD, Joston DWC and Parker B** : Comminuted femoral-shaft fractures: Treatment by roller traction, circlage wires and an intramedullary nail, or an interlocking intramedullary nail. J Bone Joint Surg, 66-A:1222-1235, 1984.
- 11) **Kempe I, Grosse A and Beck G** : Closed locked intramedullary nailing. J Bone Joint Surg, 67-A:709-719, 1985.
- 12) **Rothwell AG** : Closed Kuntscher nailing for comminuted femoral shaft fractures. J Bone Joint Surg, 64-B:12-16, 1982.
- 13) **Winkquist RA, Hansen SI and Clawson K** : Closed intramedullary nailing of femoral fractures. J Bone Joint Surg, 66-A:529-539, 1984.
- 14) **Wiss DA, Fleming CH, Matta JM and Clark D** : Comminuted and rotationally unstable fractures of the femur treated with an interlocking nail. Clin Orthop. 212:35-47, 1986.