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Seidel

= Abstract =

Nonunions of the Humeral Shaft Fracture after treating by the Seidel Humeral Locking Nail

Young-Bae Pyo, M.D., Dong-Min Shin, M.D. and Pyong Ju, M.D.

Department of Orthopaedic Surgery, College of Medicine, Chosun University.

The authors analyzed 34 cases of humeral shaft fractures in patients who were treated by the Seidel intramedullary nailing from March 1994 to August 1996. Average follow-up period was 18 months (12 months - 26 months).

We experienced nonunions of 5 cases (14.7%). The nonunions were found mostly at the comminuted midshaft fractures. The probable cause of nonunion was distraction of fracture ends due to intramedullary endosteal lysis and failure of fanning within postoperative 3 months. These 4 cases of nonunion were treated with rigid internal fixation and additional bone graft, and 1 case with refanning only.

So we concluded that the Seidel system was insufficient fixation technique because of the distal spreading-fin loosening. Distal screw-locked nailing seemed to be a more useful technique unless there are major modifications to the Seidel nail itself.

Key Words : Humerus, Shaft Fracture, Nonunion, Seidel Nail.

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588 (501-140)

Tel : 062) 220 - 3140 Fax : 062) 226 - 3379

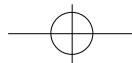
*

1997

23

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1996



1. 1994 3 1996 8 Seidel 34 5 12 , 26 18 .

2. 3,12,17,19) Seidel (Howmedica Co, Rutherford, New Jersey) 2 34 63 54 .

3. (fanning device) 15) 가4 가 , 가1 .

4. 4 가 1 , 1 1 2 3 (Table 1).

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Table 1. Details of the patients.

Age/Sex	Cause of injury	Fracture level	Fracture type	Second operation method
63 / F	Slip down	Midshaft	Oblique	OR & IF* with DCP [†] , B/G [‡]
58 / M	Traffic accident	Midshaft	Comminuted	OR & IF with DCP, B/G
53 / M	Traffic accident	Proximal shaft	Comminuted	OR & IF with DCP, B/G
62 / F	Traffic accident	Midshaft	Comminuted	Refanning
34 / M	Traffic accident	Midshaft	Transverse	OR & IF with DCP, B/G

* : open reduction and internal fixation

[†]: dynamic compression plate[‡]: bone graft



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6.

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Velpeau
(sling)

7.

4

8)

(spreading

screw) (Fig 1),

(olecranon fossa) (Fig 2),

(intramedullary endosteal lysis) (Fig 3)

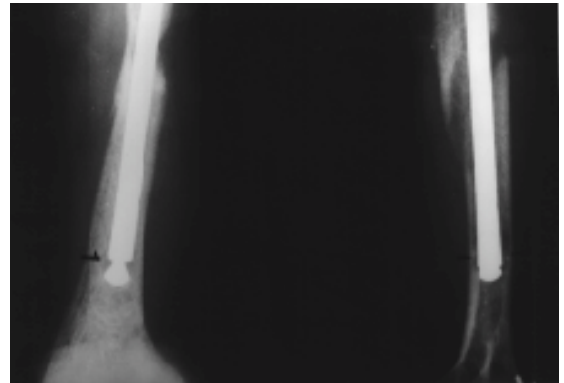


Fig 3. Evidence of the intramedullary endosteal

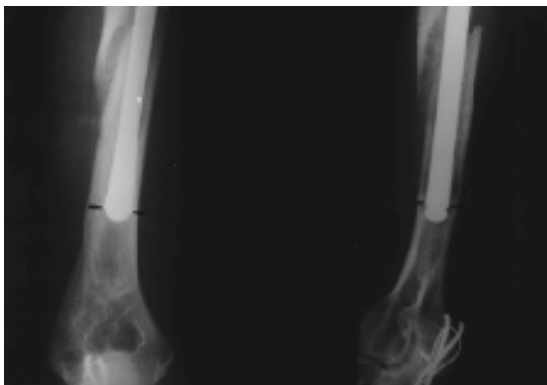


Fig 1. Changes in the diameter of the fanning

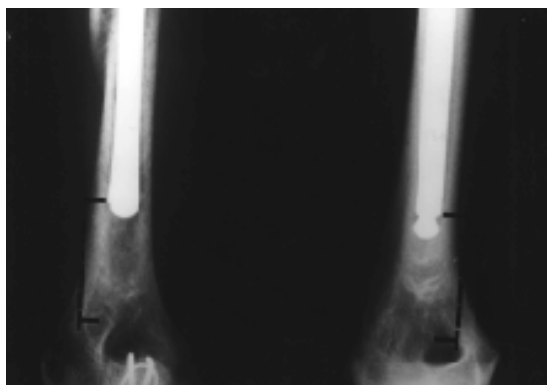


Fig 2. Distances between the distal fin and the olecranon fossa

34 29 (85.3%) 10
 , 24 14
 5 (14.7%)
 1
 가 , 4
 1mm
 1mm

34 31 1mm
 , 5 3

5 3cm 4 3cm 가 1
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 , 1

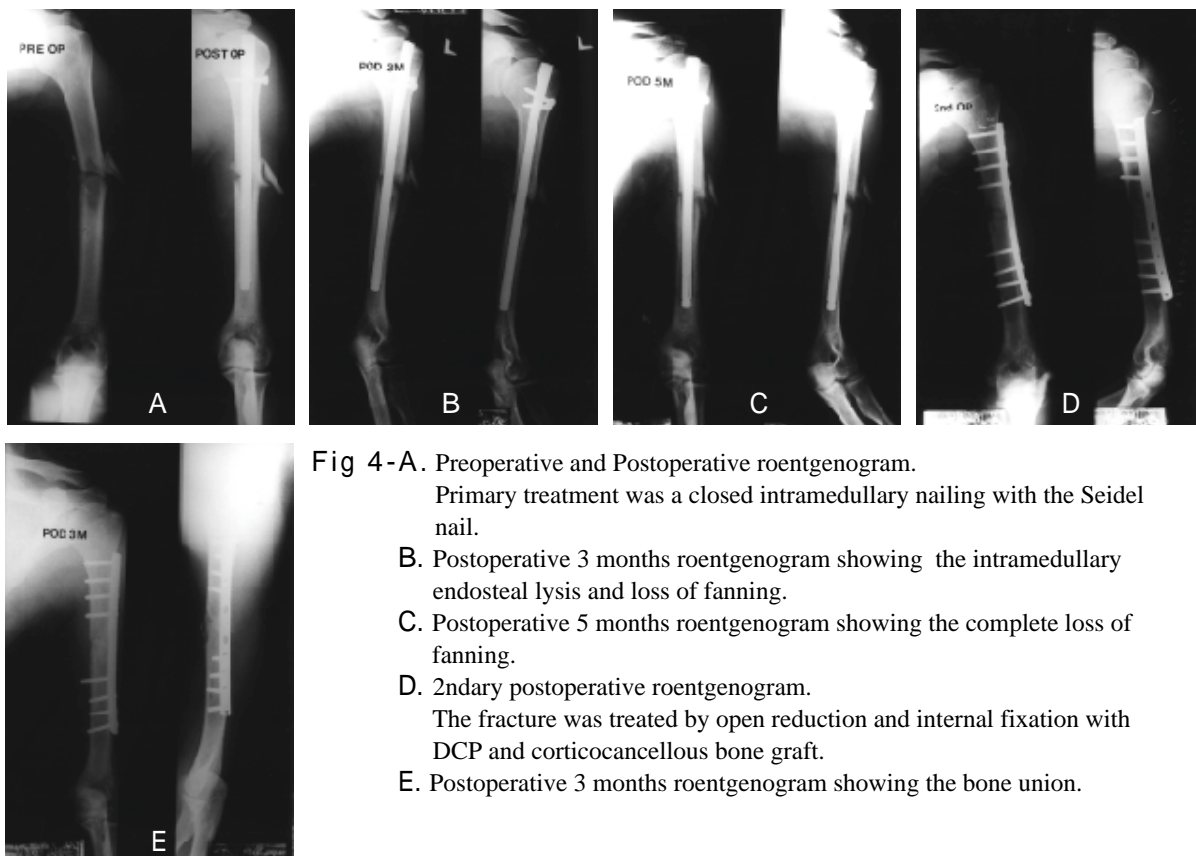
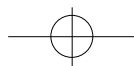


Fig 4-A. Preoperative and Postoperative roentgenogram.

Primary treatment was a closed intramedullary nailing with the Seidel nail.

- B. Postoperative 3 months roentgenogram showing the intramedullary endosteal lysis and loss of fanning.
- C. Postoperative 5 months roentgenogram showing the complete loss of fanning.
- D. 2ndary postoperative roentgenogram.
The fracture was treated by open reduction and internal fixation with DCP and corticocancellous bone graft.
- E. Postoperative 3 months roentgenogram showing the bone union.

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Seidel

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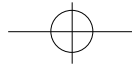
(Fig 4-A,B,C,D,E).

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가
4.9)

95-98%,

75%



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¹⁰⁾, Seidel Seidel¹⁵⁾ Seidel 가
 20 100% , ,
 Riemer¹³⁾ 36 81%
 34 85.3% .
 가3cm 3
 가
 가
 18),
 가 (impact)
 Laing¹¹⁾,
 Sever¹⁶⁾ .
 , Carrol⁵⁾ ,
 .
 4 가
 .
 Charles⁶⁾ 가
 , Seidel 34 5 (14.7%)
 , 3
 (transfixing screw) ,
 (fin or wing) 가 , 5
 , 2 (wing) 1 , 4
 Brooker-Willis
 1/2 ²⁾, Seidel
 (triflanged fin) Seidel ,
 Seidel 가
 .
 Bain¹⁾, Robinson¹⁴⁾ Seidel .
 가
 80% 가

REFERENCES

- 1) **Bain G and Sandow N** : Treatment of humeral shaft fractures with the Seidel intramedullary nail. *J Bone Joint Surg*, 74B:Supp 1.39-40, 1992.
- 2) **Bankston AB, Keating EM, Saha S, Engelhardt JA** : Biomechanical evaluation of intramedullary

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- rods used in distal femoral shaft fractures. *Orthop Trans*, 10:389, 1986.
- 3) **Bell MJ, Beachamp CG, Kellam JK and McMurtry RY** : The results of plating humeral shaft fractures in patients with multiple injuries : The Sunnybrook experience. *J Bone Joint Surg*, 67B:293-296, 1985.
 - 4) **Brumback RJ** : Intramedullary stabilization of humeral shaft fracture in patient with multiple trauma. *J Bone Joint Surg*, 68-A: 558-969, 1986.
 - 5) **Carroll, S.E.** : A study of the nutrient foramina of the humeral diaphysis. *J. Bone and Joint Surg*, 45B: 176, 1963.
 - 6) **Charles A. Rockwood Jr.** : Fractures of shaft of humerus, Fractures, Rockwood and Green 's, 4th ed. Vol 2:1031-1037,1996.
 - 7) **Eid AM** : A simple method of the treatment of fractures of the shaft of the humerus. *Arch Orthop and TraumatSurg*, 94:194-204, 1979.
 - 8) **Foster, R.J., Dixon, G.L., Bach, A.W., Appleyard, R.W., and Green, T.M.** : Internal fixation of fractures and non-unions of the humeral shaft : Indications and results in a multi-center study. *J Bone Joint Surg*, 67A:857-864, 1985.
 - 9) **Hall RF Jr** : Closed intramedullary fixation of humeral shaft fracture. *Instructional Course Lecture*, 36: 349-358, 1987.
 - 10) **Holm CL** : Management of humeral shaft fractures. Fundamental nonoperative technics. *Clin Orthop*, 71:132, 1970.
 - 11) **Laing, P.G.** : The arterial supply of the adult humerus. *J. Bone and Joint Surg*, 38A: 1105, 1956.
 - 12) **Pritchett JW** : Delayed union of humeral shaft fractures treated by closed flexible intramedullary nailing. *J Bone Joint Surg*, 67B:715-718, 1985.
 - 13) **Rierner BL, Foglesong ME, Burke III CJ and Butterfield SL** : Complications of Seidel intramedullary nailing of narrow diameter humeral diaphyseal fractures. *Orthopedics*, 17:19-29, 1994.
 - 14) **Robinson CM, Bell KM, Court-Brown CM and McQueen MM** : Locked nailing of humeral shaft fractures : Experience in Edinburgh over a two-year period. *J Bone Joint Surg*, 74B:558-562, 1992.
 - 15) **Seidel H : Humeral locking nail** : A preliminary report. *Orthopedics*, 12:219-22, 1989.
 - 16) **Sever** : Nonunion in fractures of the shaft of the humerus, Reports of 5 cases. *M.A.M.A.*, 104: 382, 1956
 - 17) **Stern PJ, Mattingly DA, Pomeroy DL, Zenni EJ Jr and Krieg JK** : Intramedullary fixation of humeral shaft fractures. *J Bone Joint Surg*, 66A:639-646, 1984.
 - 18) **Urist, M.R., Mazet, R., and McLean, F.C.** : The pathogenesis and treatment of delayed union and non-union. *J Bone Joint Surg*, 36A:931, 1954.
 - 19) **Vander Griend R, Tomasin J and Ward EF** : Open reduction and internal fixation of humeral shaft fractures : Results using AO plating techniques. *J Bone Joint Surg*, 68A:430-433, 1986.
 - 20) **Watanabe RS** : Intramedullary fixation of complicated fractures of the humeral shaft. *Clin Orthop*, 292:255-263, 1993.

