The Effect of Anterior Support Screw (AS2) for Unstable Femoral Trochanteric Fractures: A Multicenter Randomized Controlled Trial

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Purpose: The importance of reduction is recognized in the treatment of unstable femoral trochanteric fractures. There are many opinions that bony support of the anterior medial part is particularly important. We devised a new technique to add a screw anterior to the nail in order to prevent reduction loss (anterior support screw [AS2]).

Methods: A multicenter, prospective, randomized controlled trial was conducted to verify the effect of this procedure for unstable femoral trochanteric fractures. The subjects of this study were femoral trochanteric fractures with posterior comminution and intramedullary displacement of proximal fragments. The results of previous studies indicate that this study requires 240 cases. Then, 240 patients were enrolled at 15 institutions. All cases were randomly divided into 2 groups, an additional screw group (AS2 group) and a no-additional screw group (control group). Three cases dropped out during the course, resulting in 118 cases in the AS2 group and 119 cases in the control group included in the final analysis. ZNN CM Asia nail (180-mm length) was used in all cases, and 5.0-mm cannulated screw was added to AS2 group. CT scans were taken twice for each case, immediately after surgery and within 3 weeks after surgery (14-21 days after surgery). Medial bony contact in the AP view and anterior bony contact in the lateral view were evaluated, and sliding distance was also measured.

Results: There was no difference in the rate of reduction loss in the AP view between the 2 groups, but there was a significant difference in the lateral view. The rate of reduction loss was 5.5% in the AS2 group and 18.6% in the control group. The average sliding distance was 1.8 mm ± 1.4 mm in the AS2 group and 2.8 mm ± 2.1 mm in the control group. The rate of reduction loss was significantly lower in the AS2 group ($P = 0.003$), and the sliding distance was significantly smaller in the AS2 group ($P<0.0001$).

Conclusion: Our method of adding AS2 to intramedullary nail fixation for unstable femoral trochanteric fractures with posterior comminution was found to be effective in maintaining anterior bony contact in the early postoperative period. The sliding distance was also reduced.