Osteotomy and Intramedullary Nailing for Incomplete Diaphyseal Atypical Femoral Fracture with Increased Anterolateral Bowing

*Chang-Wug Oh, MD; **Kyeong Hyeon Park, MD**; Joon-Woo Kim, MD, PhD*
Kyungpook National University Hospital, Daegu, Korea, Republic of

Purpose: Increased anterolateral bowing is known as the main cause of atypical femoral fractures (AFFs) in the diaphysis, compared to the subtrochanteric region. While prophylactic intramedullary (IM) nailing is a preferred method for incomplete diaphyseal AFFs, increased anterolateral bowing is an obstacle to perform it. We executed the femoral osteotomy and IM nailing, which straightens the exaggerated anterolateral curvature. We hypothesized that this technique may heal the incomplete diaphyseal AFF, eliminating its primary pathology.

Methods: From October 2015 through March 2020, 17 female patients (20 cases; mean age 75.4 years, range 68-86) who underwent a surgical procedure for AFF with anterolateral bowing at our institute were evaluated. The surgical technique consists of minimally invasive osteotomy and reconstruction IM nailing, with or without an additional plate. Preoperative and postoperative values of the radiologic index (anterolateral bowing grade and anterior and lateral bowing angles) were compared. Primary union, the time to union, and complications were evaluated as outcomes.

Results: All the radiologic indices were improved after osteotomy (anterolateral bowing grade: 2.2 to 0.10; $P<0.05$, anterior bowing angle: 17.3° to 11.5°; $P<0.001$, lateral bowing angle: 12.0° to 3.3°; $P<0.001$). 21 of 22 cases achieved the primary union at an average of 24.9 weeks (20 to 36 weeks). There was one case of nonunion, which healed after autogenous bone graft and the plate augmentation.

Conclusion: Osteotomy and IM nailing technique may be appropriate in incomplete diaphyseal AFF with increased anterolateral bowing, not only to resolve the primary pathology and but also to prevent the complete fracture.

PAPER ABSTRACTS