Failures in High-Energy Intertrochanteric (IT) Femur Fractures

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Background/Purpose: Much literature has been published in recent years suggesting that both a screw and side plate (SSP) and an intramedullary nail (IMN) perform well for geriatric IT fractures, with the exception of OTA A3 fractures. However, there is a paucity of evidence about young patients with these fractures as a result of high-energy mechanisms of injury (MOI), and the ideal treatment remains unknown. We sought to better define this cohort of patients, and we hypothesized that there would be no difference in complications between implants.

Methods: We retrospectively reviewed all IT fractures at a single urban Level I trauma center between January 2008 and January 2014. We excluded patients age 65 or older, fractures from a simple fall, pathologic fractures, patients without follow-up to union, and AO-OTA A3 fractures. Patients were grouped according to implant, either SSP or IMN. We compared differences in demographic data, fracture characteristics, measures of surgical quality, and complications. Data were compared using independent *t*-tests and Pearson c^2 tests. *P* values <0.05 were considered significant.

Results: We identified 37 patients with an average age of 45 years, 27 males and 10 females. Despite high-energy MOI, 84% of fractures were A1, and the remaining 16% were A2. The average ISS was 18.8, with 22 of 37 patients (59%) meeting the definition of polytrauma based on an ISS ≥17. We treated 21 patients with SSPs, and 16 with IMNs. There were no differences in age, sex, follow-up, fracture classification, smoking status, body mass index, MOI, or postoperative weight bearing (all $P > 0.05$). Regarding surgical parameters between cohorts, there were no differences in tip-apex distance (TAD), percentage of lag screws placed within 25 mm from the apex, position of the lag screw in the femoral head, or reduction quality. There were no differences in blood loss or surgical time. Only 19% of fractures reduced with traction alone, and the remaining 81% required an open reduction. The rate of major complications requiring revision was 13.5% overall, 19% of SSPs, and 6% of IMNs ($P = 0.36$). Among the SSPs, there were three cases of varus collapse and one periprosthetic fracture. All three cases of varus collapse were A1 fractures and had a TAD ≤25 mm (mean 20.3 mm). Among the IMNs, one patient developed a nonunion, but none developed varus collapse. Medialization of 4 mm or more occurred in 3 SSPs and 0 IMNs, and one SSP sustained an intraoperative lateral wall fracture that healed uneventfully.

Conclusion: Young patients with IT fractures present with a high rate of polytrauma as a result of their mechanism of injury. These fractures most often require an open reduction and are more prone to complications than their geriatric counterparts. In particular, varus collapse occurred at a high rate despite relatively simple fracture patterns, and satisfactory TAD and reduction quality.

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an "off label" use). For full information, refer to page 600.