

Outcomes of Vancouver B Periprosthetic Femur Fractures Treated With Open Reduction and Internal Fixation Regardless of Prosthesis Loosening

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Purpose: Treatment of periprosthetic proximal femur fractures is a complex problem. The Vancouver classification has traditionally guided treatment of these fractures. The distinction between B1 and B2 fractures is of particular clinical interest. B1 fractures have a well-fixed stem despite the fracture and are treated with open reduction and internal fixation (ORIF). B2 fractures have a loose stem and are traditionally treated with a more distally fixed revision arthroplasty. Recent literature has begun to suggest that ORIF of B2 fractures may provide adequate stability. The purpose of this study is to investigate short-term outcomes in 2 different treatment methods of B2 fractures.

Methods: Patients treated with Vancouver B periprosthetic proximal femur fractures from 2007 to 2017 at a single institution were queried. Demographic data including age, gender, body mass index (BMI), and Charlson Comorbidity Index (CCI) were collected. Radiographic classification was performed by both an arthroplasty and a trauma-trained surgeon. Interobserver reliability was assessed. Classification, mode of treatment, and treating surgeon specialty was analyzed. Outcomes included reoperation for any reason and satisfaction at final follow-up.

Results: 45 Vancouver B fractures were available for review. 30 cases were classified as Vancouver B2 by either a trauma-trained or arthroplasty-trained surgeon. The trauma-trained surgeon was more likely to classify the fracture as B2 (28 of 30 vs 18 of 30, $P < 0.01$), but trauma-trained surgeons were more likely to perform ORIF without revision arthroplasty (14 of 19 cases) than arthroplasty-trained surgeons (1 of 11 cases) ($P < 0.01$). There were similar rates of revision surgery after these disparate treatments. At average final follow-up of 45 weeks, 1 patient treated with ORIF required revision arthroplasty for aseptic loosening. At average final follow-up of 75 weeks, 2 patients treated with revision arthroplasty required revision for infection. One patient in each group required irrigation and debridement for surgical site infection.

Conclusion: Periprosthetic proximal femur fractures present complex surgical problems. Surgical training appears to significantly bias treatment of these injuries with trauma fellowship-trained surgeons being more likely to perform isolated ORIF, despite high concern for compromise of the implant/bone interface. Arthroplasty-trained surgeons are more comfortable treating Vancouver B2 fractures with revision arthroplasty whereas trauma-trained surgeons are more comfortable with ORIF. Both of these treatment modalities appear to be an effective treatment in the short and mid-term management of Vancouver B2 fractures with similar rates of revision procedures within 1 year.