

Outcomes After Fixation of Vancouver B-Type Periprosthetic Fractures With Loose Stems

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Purpose: The incidence of periprosthetic fracture in the setting of total hip arthroplasty (THA) is steadily increasing. Vancouver B1 fractures are typically treated with open reduction and internal fixation (ORIF) while Vancouver B2 fractures undergo revision arthroplasty (RA) for management of suspected stem instability. At our institution, any geriatric patient presenting with a periprosthetic Vancouver B variant undergoes ORIF regardless of preoperative assessment of stem stability and only undergoes revision if anatomic ORIF cannot restore stem stability. We propose that in a geriatric population, anatomic reduction of any Vancouver B periprosthetic fracture variant can restore stem stability and provide similar outcomes to RA.

Methods: We identified 176 patients over 65 years of age with Vancouver B fracture variants sustained between 2005 and 2018. Patients were treated by either ORIF or RA with or without fixation. Patients' baseline characteristics, comorbidities, and Charlson Comorbidity Index (CCI) were recorded. Outcomes were time to full weight-bearing after surgery, intraoperative estimated blood loss (EBL), perioperative complications, reoperation, and PROMIS (Patient-Reported Outcomes Measurement Information System) pain and physical function scores.

Results: The treatment group consisted of 150 (85.2%) ORIF patients and 26 (14.8%) RA patients. There were 107 (71.3%) and 15 (57.7%) female patients in the ORIF and RA groups, respectively. ORIF patients had a mean age of 84 years (standard deviation [SD] 7.85) while RA patients' mean age was 80 years (SD, 6.67). Both groups had similar CCI values at 6 (SD 1.97) and 5 (SD 1.58) for ORIF and RA, respectively ($P = 0.56$). Median EBL was less for the ORIF group than the RA group, at 400 mL (interquartile range [IQR] 250-600) and 775 mL (IQR 425-1175), respectively; however, this was not statistically significant. The rate of intraoperative packed red blood cell transfusion in RA group was 1.5 times higher than the ORIF group (65% vs 44% respectively, $P = 0.043$). ORIF patients had less perioperative complications than RA patients (14% vs 19%, $P = 0.49$), but did have a higher rate of return for subsequent surgery than RA patients (8% vs 4%, $P = 0.454$). Both groups had similar rates of postoperative infection requiring debridement ($P = 0.85$). ORIF patients and RA patients returned to full weight-bearing status at similar time points (ORIF, 101 days SD 82.3 vs RA, 89 days SD 148.8, $P = 0.60$). ORIF patients had lower PROMIS physical function scores than RA patients (median 32 vs 36) and had similar PROMIS pain scores (median 54 vs 55; $P = 0.352$ and 0.794 , respectively).

Conclusion: In patients with Vancouver B-type fractures, RA patients have higher EBL and transfusion requirements. ORIF patients appear to have lower general complication rates but higher rates of subsequent surgeries. However, these differences are not statistically significant. Both ORIF and RA have similar times to return to full weight-bearing and PROMIS scores for pain and function.