# Practice Patterns and Outcomes in the Vancouver B Periprosthetic Femur Fractures: A Little Help from my Friends.

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INTRODUCTION: As the number of total hip arthroplasties (THA) performed annually increases, so are periprosthetic femur fractures. Identifying “well fixed” femoral implants and optimal management of “loose” femoral implants is debated. We aimed to describe treatment patterns and compare open reduction internal fixation (ORIF) vs. revision THA (rTHA) for Vancouver B periprosthetic femur fractures.

METHODS: We conducted a retrospective review of 116 patients between 2004 and 2024 who underwent surgical management of Vancouver B periprosthetic femur fractures. Patient demographics, surgical details, and outcomes were collected. There were 46 rTHA and 70 ORIF. Mean age was 69 years and 55% were female. Median follow up was 6 months. Our institutional practice is for the on-call trauma and arthroplasty attendings to jointly decide on ORIF vs rTHA in these cases.

RESULTS: Comparing ORIF and rTHA, there was no difference in patient age, but females were more common in the rTHA cohort (p<0.04). Patients undergoing rTHA had significantly more delays to OR, longer operating times, and more blood transfusions (all p<0.02). Intraoperatively, 4 of 70 (4.7%) fractures treated with ORIF were classified as “loose”, while 2 of 46 (4.3%) fractures treated with rTHA were classified as “well-fixed”. There was no difference between ORIF and rTHA for early postoperative complications (dislocation, reoperation, or revision) or 1 year mortality. 48% of all Vancouver B cases were treated by an arthroplasty surgeon, and 32% of those cases completed by an arthroplasty surgeon underwent ORIF.

DISCUSSION AND CONCLUSION: At our institution, while being a more invasive surgery, ORIF shows similar early outcomes to rTHA in appropriately selected patients. A shared-care model between trauma and arthroplasty surgeons leads to correctly identifying stem stability in >90% of cases. rTHA remains the gold standard for “loose” femoral stems, but certain clinical scenarios may require fixation of a “loose” stem.

| | All Patients | | Revised | | Fixed | | |
|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | P-Value* |
| **Number of Patients** | 116 | 100% | 46 | 39.7% | 70 | 60.3% | |
| **Age (years; mean, SD)** | 69.4 | 16.8 | 71.2 | 15.0 | 68.3 | 18.0 | 0.563 |
| **Sex** | | | | | | | 0.037 |
| Male | 52 | 44.8% | 15 | 32.6% | 37 | 52.9% | |
| Female | 64 | 55.2% | 31 | 67.4% | 33 | 47.1% | |
| **Pre-Op Ambulatory Status** | | | | | | | 0.323 |
| Independent ambulator | 69 | 59.5% | 27 | 58.7% | 42 | 60.0% | |
| Crutches/Cane/Walking Stick | 15 | 12.9% | 3 | 6.5% | 12 | 17.1% | |
| Walker | 27 | 23.3% | 14 | 30.4% | 13 | 18.6% | |
| Wheelchair | 3 | 2.6% | 1 | 2.2% | 2 | 2.9% | |
| Non-Ambulatory/Bed-bound | 2 | 1.7% | 1 | 2.2% | 1 | 1.4% | |
| **Pre-Op Hospital Days (mean, SD)** | 1.6 | 1.6 | 2.1 | 1.5 | 1.4 | 1.6 | 0.003 |
| **Mechanism of Injury** | | | | | | | 0.058 |
| High-Energy | 16 | 13.8% | 3 | 6.5% | 13 | 18.6% | |
| Low-Energy | 100 | 86.2% | 43 | 93.5% | 57 | 81.4% | |
| **Concomitant Injuries** | | | | | | | |
| Pelvis Fracture | 4 | 3.4% | 1 | 2.2% | 3 | 4.3% | >0.999 |
| Blunt Chest Trauma | 5 | 4.3% | 0 | 0.0% | 5 | 7.1% | 0.155 |
| TBI | 5 | 4.3% | 0 | 0.0% | 5 | 7.1% | 0.155 |
| Other orthopedic injuries NOT requiring surgery | 13 | 11.2% | 5 | 10.9% | 8 | 11.4% | >0.999 |
| Other orthopedic injuries requiring surgery | 7 | 6.0% | 1 | 2.2% | 6 | 8.6% | 0.241 |
| Other NON-ortho injuries NOT requiring surgery | 11 | 9.5% | 3 | 6.5% | 8 | 11.4% | 0.523 |
| Other NON-ortho injuries requiring surgery | 2 | 1.7% | 1 | 2.2% | 1 | 1.4% | >0.999 |
| **Surgeon Disipline** | | | | | | | <0.0001 |
| Trauma | 60 | 51.7% | 8 | 17.4% | 52 | 74.3% | |
| Arthroplasty | 56 | 48.3% | 38 | 82.6% | 18 | 25.7% | |
| **Operative Time (minutes; mean, SD)** | 202 | 85 | 222 | 89 | 189 | 97 | 0.014 |
| **Estimated Blood Loss (ml; mean, SD)** | 687 | 575 | 1016 | 681 | 462 | 345 | <0.0001 |
| **Required Peri-operative Blood Transfusion** | 73 | 62.9% | 36 | 78.3% | 37 | 52.9% | 0.006 |
| **Units of pRBCs Transfused (mean, SD)** | 3.2 | 3.1 | 3.4 | 2.3 | 3.1 | 3.7 | 0.056 |
| **Hardware** | | | | | | | |
| Plate(s) | 73 | 62.9% | 13 | 28.3% | 60 | 85.7% | <0.0001 |
| Cable(s) | 100 | 86.2% | 42 | 91.3% | 58 | 82.9% | 0.273 |
| Independent Lag Screw(s) | 21 | 18.1% | 1 | 2.2% | 20 | 28.6% | <0.0001 |
| Any kind of bone graft | 7 | 6.0% | 1 | 2.2% | 6 | 8.6% | 0.241 |
| **Post-Op Hospital Days (mean, SD)** | 5.0 | 4.6 | 6.3 | 5.0 | 5.4 | 3.5 | 0.422 |
| **Discharge Location** | | | | | | | 0.026 |
| Home | 29 | 25.0% | 12 | 26.1% | 17 | 24.3% | |
| Non-Home (SNF, IPR, psych hospital, jail, morgue, etc) | 86 | 74.1% | 33 | 71.7% | 53 | 75.7% | |
| **Post-Op Weight Bearing Restrictions** | | | | | | | 0.009 |
| Weight Bearing as Tolerated | 11 | 9.5% | 8 | 17.4% | 3 | 4.3% | |
| Partial Weight Bearing | 3 | 2.6% | 2 | 4.3% | 1 | 1.4% | |
| Toe-Touch Weight Bearing | 54 | 46.6% | 23 | 50.0% | 31 | 44.3% | |
| Non-Weight Bearing | 45 | 38.8% | 11 | 23.9% | 34 | 48.6% | |
| **Did the patient ever achieve WBAT?** | 103 | 88.8% | 39 | 84.8% | 64 | 91.4% | 0.747 |
| **Time to WBAT (days; mean, SD)** | 70 | 43 | 60 | 36 | 76 | 45 | 0.069 |
| **Highest Post-Op Ambulatory Status** | | | | | | | 0.994 |
| Independent ambulator | 60 | 51.7% | 24 | 52.2% | 36 | 51.4% | |
| Crutches/Cane/Walking Stick | 22 | 19.0% | 8 | 17.4% | 14 | 20.0% | |
| Walker | 23 | 19.8% | 9 | 19.6% | 14 | 20.0% | |
| Wheelchair | 5 | 4.3% | 2 | 4.3% | 3 | 4.3% | |
| Non-Ambulatory/Bed-bound | 2 | 1.7% | 1 | 2.2% | 1 | 1.4% | |
| **Dislocation** | 7 | 6.0% | 4 | 8.7% | 3 | 4.3% | 0.434 |
| **Nerve/Artery Injury** | 4 | 3.4% | 1 | 2.2% | 3 | 4.3% | >0.999 |
| **Non-Union** | 4 | 3.4% | 2 | 4.3% | 2 | 2.9% | >0.999 |
| **Non-Revision Reoperation** | 8 | 6.9% | 4 | 8.7% | 4 | 5.7% | 0.711 |
| **Revision Surgery** | 9 | 7.8% | 4 | 8.7% | 5 | 7.1% | >0.999 |