## Not All Vancouver AG Fractures Are The Same: A Proposed Classification Scheme

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INTRODUCTION: Greater trochanteric (GT) fractures are uncommon periprosthetic fractures occurring after total hip arthroplasties (THAs) frequently managed conservatively except in cases with significant displacement or dysfunction. There is a paucity of literature describing the indications and results of operative vs non-operative management.

METHODS: 89 post-operative, non-lytic, trochanteric fractures occurring after primary THAs performed from 1984-2020 were reviewed. Mean age at fracture was 67-years, with 76% being female. Mean follow-up was 5.8-years. Mean time to fracture was 2.3-years, with 67 (76%) occurring within 3-months. Mean fracture displacement was 15mm, with 51% greater than 10mm and 20% greater than 2 cm. Fractures were classified by location as; Tip (tip of greater trochanter to shoulder of implant), Waist (shoulder of implant to 1cm proximal to vastus ridge), Base (1cm proximal to vastus ridge to middle of lesser trochanter).

RESULTS: Eighty-two fractures (92%) were treated non-operatively and seven fractures (8 %) underwent ORIF for pain and/or associated patient reported instability. There was no difference in initial displacement (12mm vs 12.4mm, p=0.91) or final displacement (6mm vs 14mm, p=0.24) between operative and nonoperative treated fractures respectively. Trochanteric union rate was 45% in the non-operative group, and 57% in the operative group (p=0.38). Non-operative union rates based on fracture location; Tip 9/41(22%), Waist 9/20(45%), Base 19/21(90%) (p< 0.01). Union following fixation; Tip 0/1(0%), Waist 0/1(0%), Base 4/5(80%) (p=0.09).

DISCUSSION AND CONCLUSION: Not all Vancouver Ag fractures are the same, and the subclassification presented here can guide decision making for management. Trochanteric tip fractures are the least likely to unite, followed by waist fractures. Trochanteric base fractures have a reliable high union rate and can be managed non-operatively. All patients had improvement of function at final follow-up regardless of treatment modality. Vancouver AG fracture can be classified into three subtypes, with subtype dependent union rates.