

CONVERSION TO REVERSE TOTAL SHOULDER ARTHROPLASTY WITH AND WITHOUT HUMERAL STEM RETENTION: MID-TO LONG-TERM RESULTS

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INTRODUCTION

Over the past decade, conversion to reverse total shoulder arthroplasty (RTSA) has become the preferred treatment for revision of an anatomic hemi (HA) or total shoulder arthroplasty (TSA). However, conversion of failed stemmed shoulder arthroplasty to RTSA is still a highly demanding procedure and carries unique technical challenges and risks.

This study aimed to analyze the mid- to long-term results after conversion of failed anatomical shoulder arthroplasty to RTSA and investigate whether preserving the humeral stem offers advantages over revising the humeral stem.

MATERIALS AND METHODS

Between 2005 and 2018, 99 hemiarthroplasties and 62 total shoulder arthroplasties (total = 161 shoulders; 157 patients) were revised to RTSA without (n = 47) or with (n = 114) stem exchange. Complications and revisions were documented from medical and surgical records. Longitudinal pre- and postoperative clinical (Constant-Murley (CS) score, Subjective Shoulder Value (SSV)), and radiographic outcomes were assessed. Complete clinical and radiographic follow-up was available on 80% of shoulders (127 patients; 128 of 161 procedures, 46 without and 82 with stem exchange) at a minimum of 24 months and a mean of 70 months (range, 24–184 months).

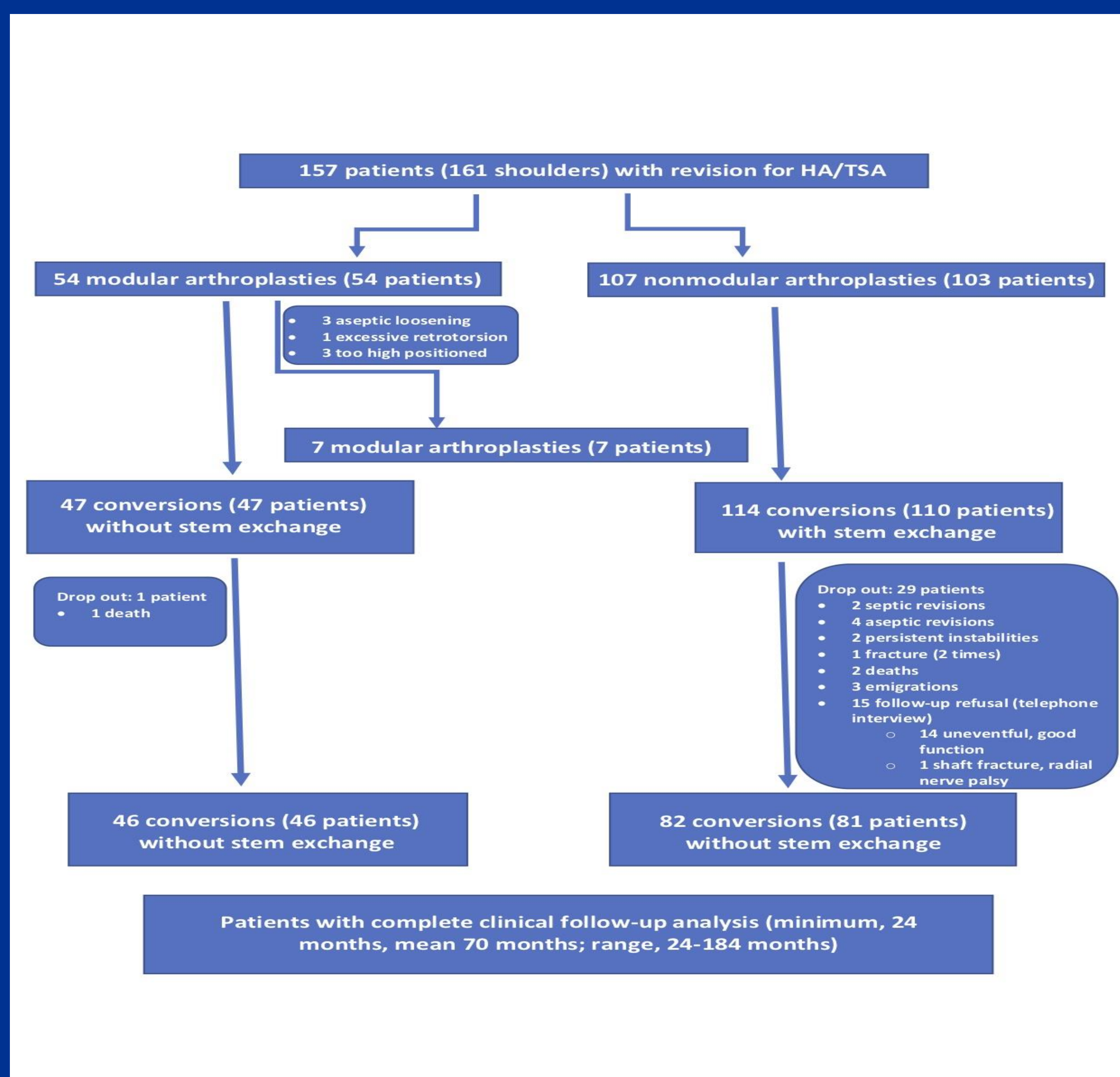


Fig. 1: The flow diagram shows enrollment, dropout, and loss to follow-up of the study cohort. HA = hemiarthroplasty; TSA = total shoulder arthroplasty.

RESULTS

Humeral stem retention was associated with a significantly reduced surgical time (193 minutes vs 227 minutes, $p=0.001$), less blood loss (591 mL vs 753 mL, $p=0.037$), less intraoperative complications (13% versus 19%; odds ratio (OR), 1.4, $p=0.32$) and fewer subsequent reinterventions (19% versus 28%; OR, 2.3, $p=0.06$). The complication/revision rate leading to drop out from the study was considerable in the stem revision group (ten patients; ten of 114 shoulders (9%)), but there were no complication-related dropouts in the stem-retaining group.

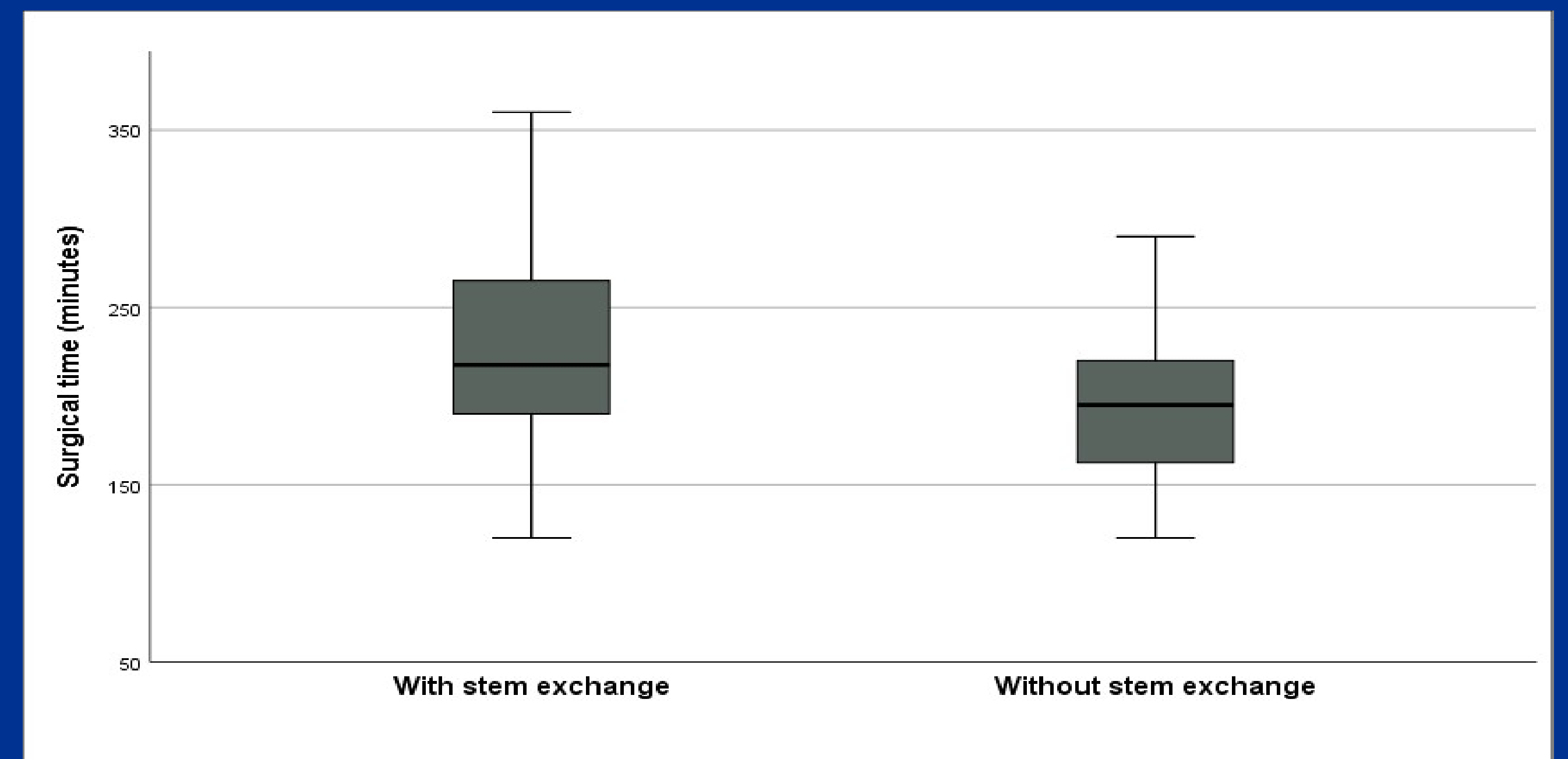


Fig. 2: The mean blood loss was reduced ($p = 0.037$) in patients without stem exchange (mean, 591 mL; range, 100–1300 mL; SD, 316 mL) compared with the group with stem exchange (mean, 753 mL; range, 100–2600 mL; SD, 488 mL).

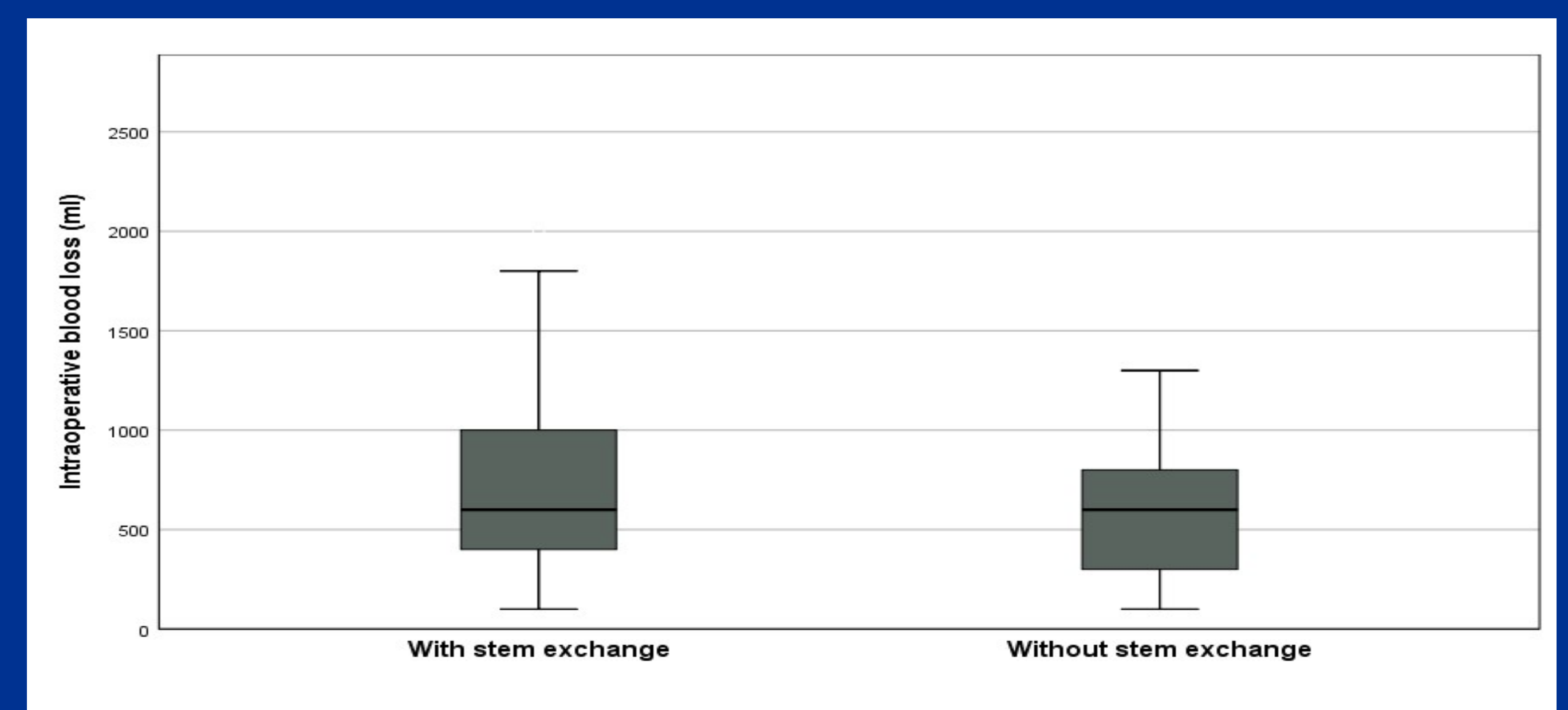


Fig. 3: The surgical time could be decreased to 193 minutes (range, 75–290 minutes; SD, 44 minutes) when the stem could be left in place, which spared, on average, 34 minutes surgical time ($p < 0.0001$) compared with cases in which the stem had to be exchanged (mean, 227 minutes; range, 120–360 minutes; SD, 49 minutes).



Fig. 3: A 55-year-old woman presented with a severe pseudoparalysis and malunion of greater and lesser tubercles of her left arm 7 months after a hemiarthroplasty as a result of a four-part humeral head fracture. Pre- (A) and postoperative (B) range of motion at ten years after conversion to a reverse total shoulder arthroplasty.

CONCLUSIONS

Our findings suggest that humeral stem revision is associated with decreased surgical time, less blood loss, less intra- and postoperative complications, and a lower revision rate compared to humeral stem retention. Based on these findings, a shoulder arthroplasty system modularity offers substantial benefit if conversion to reverse total shoulder arthroplasty becomes necessary.