Do Different Types of Anesthesia Influence the Complication Rate in Revision Total Hip Arthroplasty?

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INTRODUCTION: Total hip arthroplasty (THA) hip is a safe and effective treatment for patients with osteoarthritis. Due to the great success of THA and the aging population, the number of THA procedures is projected to dramatically rise by the year 2030. This will inherently lead to much more revision THA surgery performed each year. The type of anesthesia utilized for surgery is one controllable risk factor. Studies demonstrated that total costs per case were almost half in the spinal anesthesia cohort. It was concluded that spinal anesthesia could be a practicable option for patients undergoing primary hip and knee replacement, as it was associated with decreased reported pain and lower costs. Previous studies reported better outcomes in revision total knee arthroplasty (TKA) using spinal anesthesia when compared to general anesthesia. However, to date, no study has evaluated the difference in revision THA outcomes with different types of anesthesia. The aim of this study is to evaluate any potential differences in 30-, 60-, and 90- day readmission rates, re-revision rates, and other parameters of outcome following revision THA with general or spinal anesthesia.

METHODS: A total 1829 patients who underwent revision hip surgery was evaluated. Amongst the 1829 patients, 1685 patients underwent general anesthesia, while 144 patients underwent spinal anesthesia. Patient demographics as well as clinical information including revision indications, risk factors, readmission and re-revision rates were evaluated (Table 1). Student's t-test and chi squared analysis were used to establish significant differences between the groups with respect to demographics and outcomes.

RESULTS: Patients were matched for demographics and comorbidities. Patients who underwent spinal anesthesia had significantly less blood loss ($p<0.001$) (Table 1). There were no other significant differences with respect to outcomes. Of patient's who underwent spinal anesthesia, ALTR as an indication for failure was significantly greater ($p<0.001$) when compared to the general anesthesia cohort. Otherwise, there were no significant differences in the use of spinal vs. general anesthesia based on indication of failure.

DISCUSSION: Revision THA requires more time and resources intraoperatively and postoperatively and is a more complex operation when compared to primary THA. As such, revision THA is associated with greater time and needs in the operating room and necessitates increased care post-operatively. In order to improve surgical planning and patient outcomes, it is essential to identify modifiable risk factors in revision THA. No study to date has evaluated the potential discrepancy in outcomes with regards to revision THA and anesthesia type. Our study found the use of spinal anesthesia was associated with significantly less blood loss without compromising patient outcome (Table 1). This suggests that spinal anesthesia for select patients following aseptic revision THA may be a safe and viable option. In addition, spinal anesthesia is more cost effective and may help to alleviate the financial burden of revision THA.

SIGNIFICANCE/CLINICAL RELEVANCE: The findings of this study demonstrate that spinal anesthesia was associated with significantly less blood loss without compromising patient outcome, when compared to general anesthesia, suggesting that spinal anesthesia for select patients following aseptic revision THA may be a safe and viable option.

Table 1: Comparison of failure indications and clinical outcomes between both study cohorts.

Characteristics	Spinal (N=144)	General (N=1685)	p-value
Aseptic loosening	44 (30.6%)	542 (32.2%)	0.694
ALTR	33 (22.9%)	173 (10.3%)	**<0.001**
Infection	16 (11.1%)	254 (15.1%)	0.199
Dislocation	16 (11.1%)	179 (10.6%)	0.854
Wear/osteolysis	19 (13.2%)	193 (11.5%)	0.976
Periprosthetic fracture	10 (6.9%)	221 (13.1%)	0.099
Component failure	2 (1.39%)	35 (2.1%)	0.574
Mechanical failure	1 (0.69%)	11 (0.65%)	0.952
Further degeneration and pain	2 (1.39%)	15 (0.89%)	0.549
30-day readmission	17 (11.8%)	228 (13.5%)	0.560
60-day readmission	22 (15.3%)	279 (16.6%)	0.691
90-readmission	29 (20.1%)	326 (19.3%)	0.818
Re-revision	17 (11.8%)	246 (14.6%)	0.359
Re-revision due to infection (% indication for revision)	3 (2.1%)	63 (3.7%)	0.307
Blood loss (mL)	389.5 ± 747.6	855.6 ± 756.3	**<0.001**
Length of Stay (days)	4.6 ± 4.6	5.24 ± 5.07	0.18