

## **Have We Gotten Better Over Time Mitigating Complications in Obese Patients Undergoing Total Hip Arthroplasty?**

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**INTRODUCTION:** The prevalence of obesity in the United States is increasing substantially and is considered an epidemic. Elevated BMI increases the risk of complications following total hip arthroplasty (THA). We sought to evaluate trends in BMI and complication rates of obese patients undergoing primary THA over the last 30 years.

**METHODS:** Through our institutional total joint registry, we identified 15,455 primary THAs performed for osteoarthritis from 1990-2019. Patients were categorized according to the World Health Organization (WHO) obesity classification and groups were trended over time. Cox proportional hazards regression analysis controlling for confounders was used to investigate the association between year of surgery and 2-year risk of any reoperation, any revision, dislocation, and periprosthetic joint infection (PJI). Regression was stratified by 3 separate groups: non-obese; WHO class I and class II (BMI 30-39 kg/m<sup>2</sup>); and WHO class III patients (BMI  $\geq$  40 kg/m<sup>2</sup>). Mean follow up was 8 years.

**RESULTS:** There was an increase in the proportion of all obesity classes from 1990-2019 with a 167% increase in Class II (5% to 14%; $p<0.001$ ) and a 420% increase in Class III (2% to 8%; $p<0.001$ ). There was a corresponding decrease in the proportion of non-obese patients over time (68% to 52%; $p<0.001$ ). BMI values within each WHO Class significantly increased over time. Risk of any reoperation did not change significantly over time among non-obese or WHO Class I/II patients. Risk of any reoperation increased significantly over time for WHO Class III patients (HR 1.04;  $p=0.044$ ). Risk of any revision did not change significantly over time for any group. Risk of dislocation decreased significantly over time for non-obese (HR 0.96; $p<0.001$ ) and WHO Class I/II (HR 0.96; $p=0.002$ ) patients, but did not change over time for WHO Class III (HR 0.94; $p=0.073$ ) patients. Risk of PJI did not change significantly over time for any group.

**DISCUSSION AND CONCLUSION:** At our institution, the annual proportion of patients undergoing THA who are obese has increased by 50% over the last 30 years. Despite BMI values increasing within all WHO classes over time, the risks of any reoperation, any revision and PJI have remained stable in WHO Class I/II patients, and the risk of dislocation has decreased. Among WHO Class III patients, the risk of dislocation has not decreased over time and the risk of any reoperation has increased. Continued efforts directed toward preoperative optimization, operative technique, and implant design will be required to mitigate risks in the heaviest patients.