

## **Does Body Mass Index Affect the Success of Two-Stage Management of Periprosthetic Joint Infection?**

Samuel Gus Raney, Humam Shahare, Jeffrey Benjamin Stambough<sup>1</sup>, Simon Mears, Benjamin M Stronach<sup>1</sup>, Eric Siegel<sup>2</sup>, George John Haidukewych, Matthew Williamson, Patrick Douglas Brooks<sup>3</sup>

<sup>1</sup>University of Arkansas For Medical Sciences, <sup>2</sup>Univ. Arkansas Medical Sciences, <sup>3</sup>Orlando Health

### **INTRODUCTION:**

As total joint arthroplasty (TJA) surgery grows, the incidence of periprosthetic joint infection (PJI) also increases. Obesity is associated with poor postoperative outcomes, but there is a lack of understanding regarding the influence of obesity on reinfection. We sought to assess if body mass index (BMI) was predictive for infection recurrence after two-stage revision TJA for PJI.

### **METHODS:**

A retrospective cohort analysis was conducted between two academic medical centers on a total of 335 patients who underwent two-stage revision knee or revision hip arthroplasty for PJI with initial antibiotic spacer placement between 07/2015 and 01/2021. Patient demographic, comorbidities, and surgical data was collected from each institution's electronic medical record and managed via software. Patient outcomes were documented for an average of five years. Patients were grouped by BMI <30, 30-40, and ≥40 as non-obese, obese, and morbidly obese, respectively, then tested for trends with obesity level in rates of prosthetic joint reinfection.

### **RESULTS:**

Following two-stage revision, reinfection rates increased steadily from 11.5% in non-obese to 19.0% in obese and 25.9% in morbidly obese patients ( $p=0.011$ ). Reinfection rates for knee PJI alone also increased steadily from 10.8% in non-obese to 20.6% in obese to 26.5% in morbidly obese patients ( $p=0.033$ ). As BMI increased from non-obese to obese and morbidly obese, 90-day readmission rates increased from 8.6% to 19.7% and 16.7%, respectively ( $p=0.042$ ). Under 5 years' maximum follow up, the average time to reinfection decreased steadily with obesity level (restricted-mean times of 4.52, 4.19, and 3.81 years with non-obese, obese, and morbidly obese, respectively;  $p=0.036$ ).

### **DISCUSSION AND CONCLUSION:**

The success rate of two-stage management for PJI is significantly impacted by patient BMI, with the morbidly obese faring the worst. BMI thresholds for primary TJA surgery may mitigate the development of PJI given the limited success of a two-stage approach in the morbidly obese.