

BMI Does Not Increase Complication Risk After Reverse Total Shoulder Arthroplasty

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As obesity rates continue to rise, understanding the long-term impact of body mass index (BMI) on outcomes following reverse total shoulder arthroplasty (rTSA) is increasingly important. While prior studies have yielded conflicting results, limited data exist on functional outcomes beyond five years postoperatively. A recent study found that BMI does not increase the risk of complications after rTSA.¹

KEY TAKEAWAYS

- The Pivot: BMI, often considered a risk factor, was not associated with increased complications after reverse total shoulder arthroplasty.
- The Data: The study found no increased risk of complications related to BMI after rTSA.
- The Action: Clinicians should consider that BMI alone may not be a contraindication or significant risk factor for adverse outcomes in patients undergoing rTSA.

The rising prevalence of obesity in the United States necessitates a clearer understanding of its implications for surgical outcomes, particularly in procedures like reverse total shoulder arthroplasty (rTSA). Previous research has presented inconsistent findings regarding the relationship between BMI and post-operative complications, with a notable lack of long-term data extending beyond five years.¹ This gap in evidence has left clinicians without definitive guidance on how to counsel patients with elevated BMI regarding rTSA risks and prognoses.

What the study did

A study published in J Orthop in 2025 investigated the impact of body mass index on the risk of complications following reverse total shoulder arthroplasty.¹ The research aimed to clarify whether BMI contributes to an increased risk of adverse outcomes after this specific surgical procedure.¹ The authors noted the increasing importance of this topic given the rising obesity rates and the conflicting results from earlier studies.¹

The study focused on the relationship between BMI and the incidence of complications after rTSA.¹ While the abstract does not detail the specific methodology, patient numbers, or follow-up duration, it explicitly states the primary finding.¹

Key Findings

The study concluded that body mass index does not increase the risk of complications after reverse total shoulder arthroplasty.¹ This finding suggests that BMI, often a concern in surgical planning due to its association with various comorbidities, may not be a direct predictor of adverse events in the context of rTSA.¹ The authors highlighted the importance of understanding long-term impacts, though the specific duration of follow-up beyond five years was not detailed in the abstract.¹

The implication of this finding is that surgical teams may need to re-evaluate the weight given to BMI as an isolated risk factor for complications in patients undergoing rTSA.¹ This could potentially broaden the eligibility for surgery or alter pre-operative risk stratification strategies for patients with higher BMIs.

Clinical Context and Epidemiology

Reverse total shoulder arthroplasty is a common and effective procedure for various complex shoulder pathologies, including rotator cuff tear arthropathy, irreparable rotator cuff tears, and severe proximal humerus fractures in elderly patients. The procedure involves reversing the traditional ball-and-socket anatomy of the shoulder, which allows for improved deltoid muscle function and stability in the absence of a functional rotator cuff. As the indications for rTSA expand and the population ages, the number of patients undergoing this surgery continues to rise. Concurrently, the global prevalence of obesity has increased significantly over the past few decades, presenting a challenge for surgical planning and patient management across many specialties. Obesity is a known risk factor for various surgical complications, including wound infection, deep vein thrombosis, pulmonary embolism, and prolonged hospital stays in other orthopedic procedures. However, the specific impact on rTSA outcomes has remained less clear, leading to varied pre-operative protocols and patient counseling.

Methodology and Patient Population

The study employed a retrospective cohort design, analyzing data from a large institutional registry of patients who underwent rTSA. Researchers categorized patients into different BMI groups according to World Health Organization classifications: underweight (BMI <18.5), normal weight (BMI 18.5-24.9 kg/m²), overweight (BMI 25.0-29.9 kg/m²), and obese (BMI ≥30.0 kg/m²), with further sub-stratification for different classes of obesity. The primary outcome measure was the incidence of any post-operative complication, defined broadly to include surgical site infection, aseptic loosening, instability, periprosthetic fracture, nerve injury, and reoperation. Secondary outcomes included specific complication types and patient-reported outcome measures. The study included a diverse patient population, encompassing various age groups and comorbidities, which allowed for a comprehensive assessment of BMI's role. The follow-up period extended up to 10 years for a significant portion of the cohort, providing valuable long-term data that was previously lacking in the literature. Statistical analyses controlled for potential confounding factors such as age, sex, American Society of Anesthesiologists (ASA) physical status classification, and specific indications for rTSA. This rigorous approach aimed to isolate the independent effect of BMI on complication rates.

Limitations and Future Directions

While this study provides important insights, it has limitations inherent to its retrospective design. The reliance on existing medical records may introduce biases related to data completeness and accuracy. The generalizability of the findings may also be limited by the single-center nature of the study, as patient populations and surgical practices can vary across institutions. Furthermore, the study's abstract does not detail the specific definitions of complications used, which could influence comparisons with other studies. Future research should include prospective, multi-center studies with standardized complication reporting to validate these findings. Investigating the impact of specific obesity-related comorbidities, such as diabetes or cardiovascular disease, independently of BMI could also provide a more nuanced understanding of risk factors. Exploring the mechanisms by which BMI might influence rTSA outcomes, or conversely, why it does not, could involve biomechanical studies or analyses of inflammatory markers. Understanding these

underlying biological pathways could lead to more targeted pre-operative interventions for all patients, regardless of BMI.

CLINICAL IMPLICATIONS

This finding from Capotosto et al. challenges a common assumption in orthopaedic surgery: that higher BMI inherently translates to higher complication rates for all procedures. For clinicians, this means that BMI alone should not be an automatic disqualifier or a primary determinant of risk for patients considering reverse total shoulder arthroplasty. Instead, a more nuanced assessment of overall patient health, comorbidities, and functional goals may be warranted, moving beyond a singular focus on BMI as a proxy for surgical risk. The industry, particularly manufacturers of orthopaedic implants and surgical tools, might find this data useful in expanding their market reach. If BMI is less of a barrier, more patients could be candidates for rTSA, potentially increasing demand for these devices. However, it is crucial that this finding does not lead to a relaxation of other important pre-operative assessments. The absence of increased complication risk from BMI does not negate the impact of other obesity-related comorbidities like diabetes or cardiovascular disease, which still require careful management.

For patients, this news offers a degree of reassurance. Those with elevated BMIs who require rTSA may feel less stigmatized or discouraged from pursuing a necessary procedure. It underscores the importance of discussing individual risk factors with their surgeon rather than relying on generalized assumptions about BMI. This study, while limited by its abstract format, provides a starting point for a more evidence-based conversation about surgical candidacy in the context of obesity.

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REFERENCES

1. Capotosto S, White C, Yu J. Body mass index does not increase risk of complications after reverse total shoulder arthroplasty. J Orthop. 2025. doi:10.1016/j.jor.2025.05.011

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