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## Severely Diminished Serum Albumin is Associated with Mechanical Complications in Patients Undergoing Total Shoulder Arthroplasty

Introduction: Serum albumin is a low-cost nutritional status and organ function marker. Prior studies have identified its role in predicting adverse surgical outcomes. This study assessed the relationship between preoperative serum albumin levels and mechanical complications in total shoulder arthroplasty (TSA).
Methods: A retrospective cohort study was conducted using the National Surgical Quality Improvement Program (NSQIP) database (2012-2021). Adults (□18 years) were categorized into four cohorts based on preoperative albumin: severe hypoalbuminemia (<3 mg/dL), mild hypoalbuminemia (3-3.49 mg/dL), normal albumin (3.5-4.49 mg/dL) or hyperalbuminemia (□4.5 mg/dL). The primary outcome was postoperative mechanical complications, including prosthesis loosening/dislocation/breakage, periprosthetic fracture/osteolysis, articular surface wear, and other unspecified failures. Confounders included demographics (age, sex, race, ethnicity), baseline health (functional status, ASA classification, BMI, smoking, diabetes, immunosuppression), and procedure characteristics (admission origin, surgical setting, anesthesia, transfusion, emergency status). Univariate and multivariable regression analyses were performed.
Results: Among 18,044 TSA cases, 13,744 had normal albumin, 1,055 mild hypoalbuminemia, 248 severe hypoalbuminemia, and 2,997 hyperalbuminemia. Most in the hypoalbuminemia and normal albumin groups were aged 70–79 years, female, White, non-Hispanic, ASA class 3, and functionally independent. The hyperalbuminemia group had more males, ASA class <3, and was younger (60–69 years) [Table 1]. On multivariable regression, those with severe hypoalbuminemia had 3.90 times higher odds (95% CI 1.28–9.64; p=0.007) of mechanical complications compared to normal albumin [Table 2].
Conclusion: Severe hypoalbuminemia increased the risk of mechanical complications in TSA. Optimizing albumin levels preoperatively and implementing perioperative support strategies may improve outcomes.