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CORR Insights®: Low Albumin Levels, More Than Morbid Obesity, Are Associated With Complications After TKA

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Where Are We Now?

The current study by Nelson and colleagues tries to bring greater clarity to the debate as to whether morbid obesity and malnutrition actually increase the risk of mortality and major complications

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following elective, primary TKA. These topics are important. As our healthcare system shifts to a quality-based model, providers must accept responsibility for rates of complications, poor outcomes, and total cost per episode of care. Since TKA is one of the most commonly performed surgical procedure in the United States, it is the procedure garnering the most interest. Although the quality indicators that will be used to judge outcomes after TKA are still being developed, it is clear that complications that prolong length of stay and require readmission, reoperation, and even transfer to a rehab or skilled nursing facility, must be avoided because they add substantially to the total cost per episode of care.

The quality-driven system of care forces us to evaluate candidates for elective surgery carefully and obligates us to attempt to prepare them such that all avoidable morbidity and mortality

is prevented. The authors have chosen to focus on two familiar conditions: Morbid obesity (BMI > 40 kg/M²) and malnutrition. Nelson and colleagues question whether these two conditions could be corrected prior to elective surgery. According to the authors, there is little likelihood that morbid obesity can be corrected in any meaningful manner and seem to favor the idea that malnutrition may be a better target for preoperative assessment.

The authors have analyzed data from the National Surgical Quality Improvement Program (NSQIP) database to attempt to answer their research questions. They use the large data sample to perform a multivariate regression analysis in an attempt to define what the impact of these two conditions are on mortality, and major and minor complications. With respect to morbid obesity, their findings reaffirm many other studies. Morbid obesity increases the risk of both superficial and deep infection, but does not appear to increase risk of major cardiac or thromboembolic complications. On the other hand, malnutrition—defined as serum albumin < 3.5gm/dl—does appear to be associated with an increased risk of mortality and major

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complications. There are many other studies that have also found similar results for the morbidly obese patient. The 2014 John Insall award paper by D'Apuzzo and colleagues [1] found similar results using a perhaps more-rigorous approach employing the same database but adding a matched-pair analysis. The study by D'Apuzzo and colleagues reaffirmed the higher infection risk but also found a higher risk of mortality (OR = 3.2). Perhaps more importantly, the authors found a longer length of stay and a more frequent discharge to a facility. Naziri and colleagues [3] studied patients with "superobesity" (BMI > 50 kg/M²) and found the effect even more pronounced in that patient population. Additionally, they found that functional outcomes in the superobese are poor after TKA, questioning whether these patients even benefit beyond pain relief. There are few studies that assess the importance of preoperative low serum albumin for TKA, and the data and analysis of this study are an important indicator that this topic is in dire need of our research effort.

Where Do We Need To Go?

So, we are left with two studies that analyze the same database but reach different conclusions regarding the risk associated with morbid obesity. It

seems fairly certain that morbid obesity adds risk to TKR that is not present in nonobese patients. Does weight loss lower that risk? Is it possible for patients to lose enough weight before surgery to improve this risk? Should bariatric surgery be recommended prior to TKA to lower the risk even if the weight loss is not permanent? Additionally, by addressing malnutrition will we improve upon the findings that a strong association with poor outcomes exists in undernourished patients? These are some of the questions that remain.

Obviously, retrospective review of a database cannot answer these questions. The NSQIP database is a wonderful resource, but the complications addressed are not that specific to TKA. The NSQIP database focuses on complications that are more common in the general surgical experience.

When the data from TKA studies are reviewed, one finds that the risk of mortality and major morbidity, except for thromboembolic events and development of any infection, is extremely low after TKA [1]. The focus in general surgery disciplines is on mortality and major morbidity because they are common in their specialty. Those concerns are very real, but their low incidence in patients undergoing TKA suggests our traditional medical clearance process works in addressing them.

How Do We Get There?

The focus needs to shift to those complications that are common after TKA and cannot be tolerated in a quality-driven system. D'Apuzzo and colleagues applied the Elixhauser Comorbidity Index [2], which may have much better specificity to factors associated with TKA. Large database studies do not allow for long-term followup and controlling for specific patient characteristics are difficult. What are the relevant outcomes? Currently, I would argue they are the minor complications that compromise short and long-term outcomes, adversely affect length of stay, and contribute to overall cost of care per episode rather than the rare occurrence of major morbidity and mortality. Some examples would include catheter related urinary infections, postoperation hyperglycemia, blood loss anemia, postoperation delirium. It is likely that if we can learn to avoid the minor issues, the major issues will also become even more infrequent.

Inevitably, we will need to address the ethics of withholding care for patients who have baseline comorbidities that could be improved before surgery. We need to refine the focus of our studies to the specific issues arthroplasty surgeons face in this rapidly changing environment.

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