

The Role of Prehabilitation in Abdominal Wall Reconstruction

It Is More Than “Watch and Wait”

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“Prehabilitation” has become a term loosely used in abdominal wall reconstruction (AWR) with significant variation across surgeons as a function of their perspective and perhaps biases. To many, prehabilitation refers to specific action items such as glycemic control or weight loss. To others, prehabilitation is either not implemented or allows surgeons to not operate on patients without the promise for optimization.

What is the true meaning, and what are the potential benefits of prehabilitation? Prehabilitation encompasses a set of best practice strategies leading up to elective surgery to optimize the patient’s health during and after surgery with the potential to positively impact long-term health.¹ It is the sum of the efforts taken in the preoperative period to prepare a patient for a successful surgery and recovery. Systematic review of the literature has shown that smoking cessation and weight loss reduce complications following AWR.² In an optimized subset of patients at a tertiary care hernia center, hernia recurrence was also reduced over threefold in comparison to the total patient population.³ In addition to traditional considerations, prehabilitation can also encompass strategies such as preoperative injection of botulinum toxin for patients with loss of domain, collaboration with other medical and surgical subspecialties such as geriatrics, infectious disease, or bariatrics, and structured physical therapy programs for frail patients.

Recently, literature questioning some of the central tenets of prehabilitation has emerged. One of the first studies contradicting

traditional dogma was conducted by Petro and colleagues⁴ using data from the American Hernia Society Quality Collaborative. In their study, the authors evaluated the effect of smoking in patients undergoing AWR in the clean and clean-contaminated setting. They concluded that there was no clinically significant difference in wound morbidity between active smokers and nonsmokers in a propensity-matched sample of 836 patients. However, despite their conclusion, they acknowledged the risk of surgical site occurrence was 62% higher in the smoking group and significantly different. They also did not account for morbidity beyond 30 days.

Similarly, Liang et al⁵ published results of their randomized controlled trial comparing prehabilitation versus standard counseling for patients with a body mass index (BMI) of 30 to 40 kg/m². Their group showed that, in the short term, prehabilitated patients were more likely to be hernia-free and complication-free at 30 days. However, they published follow-up data at 2 years that stated that there was no difference in these outcomes.⁶ These studies were limited by a small sample size and had low fragility indices, meaning that a change in just a few individual results would have altered the conclusions of the studies. Moreover, patients were deemed “prehabilitated” if they did not have weight gain at 6 months, and these patients were not representative of the super morbidly obese patients often encountered. While we do not question the intention of these studies, we feel that drawing broad-based conclusions about prehabilitation based on these types of data may not be in the best interest of the AWR community.

While there is little data concerning optimal BMI for AWR, there is evidence to suggest that surgeons are frequently not actually practicing prehabilitation. In a study published in *JAMA Open* by Howard et al,⁷ the authors used data from the Michigan Quality Collaborative to determine how commonly patients underwent surgery with “high-risk” comorbidities, which were defined as active smoking, alcohol use, or obesity. Greater than one-third (38.2%) of patients in that study had at least one high-risk comorbidity at the time of operation. Despite this, in a qualitative interview with surgeons in this study, they acknowledged the benefits of optimization.

So why are not surgeons engaging in behaviors to prehabilitate patients? First, although anyone can buy into prehabilitation, it involves work, effort, and patience/coordination. It requires the surgeon to engage in a complete medical and social evaluation of a patient; it could take months to a year or more for these patients to get to the operating room. It requires buy-in from both the patient and surgeon alike. For the surgeon, it means extra time in the clinic to counsel patients, initiating appropriate referrals, and talking with other providers from other specialties. In many ways, the role of the surgeon is much like an athletic coach. Part of the buy-in includes being able to articulate why prehabilitation is important and convey the buy-in of the surgical team. It is our practice to perform set phone visits

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and bring patients back to the clinic for interval follow-up, even when they are not ready for an operation. Within these, we provide encouragement and gauge their progress with their prehabilitation goals. The goals that are set are very specific for patients (eg, a target weight or hemoglobin A1c), so they know exactly what they need to do to be booked for surgery.

The easy thing for a surgeon to do is to operate, and typically it is our bias to do so; booking a patient for the operating room requires less work than investing in a comprehensive evaluation and plan to improve a patient's overall health. Not operating on patients immediately can detract from surgeon productivity, and patients may seek another surgeon to perform the operation. In a healthcare system that has become focused on production rather than value-based care, not operating on patients can impact a surgeon's bottom line. As providers, the impact of a production model on decision-making is complex, and that is a subject that extends far beyond this commentary. Not only might a surgeon's bottom line be affected, but it may hurt future referrals. Surgeons do not want to be perceived as operation averse.

We are sensitive to the fact that not everyone has the resources that are available at a tertiary care center. Moreover, it is important that we focus on all populations equally as prehabilitation efforts have been less effective with historically marginalized groups.⁸ By the time many patients arrive at a tertiary hernia center, they have had multiple operations and are willing to do whatever it takes in order to achieve the best possible outcomes, so there is a degree of selection bias. For patients who are multiply comorbid and have complex abdominal wall anatomy, referral to a tertiary center may very well be appropriate if a patient is in need of aggressive prehabilitation. However, we do believe that many principles of prehabilitation can be applied by the community surgeon as well and be just as impactful if not more.

There are times, however, when prehabilitation may not be appropriate. A patient with a BMI of 37 kg/m² and a 4-cm wide hernia who is repeatedly in the emergency department with hernia-related bowel obstructions is different from a patient with a BMI of 50 kg/m² with loss of domain who has never had obstructive symptoms. The first patient described would benefit from an urgent repair and one that may be attempted with a minimally invasive approach. While the data are not the best, patients with hernia defects of 3 to 8 cm and with a narrow hernia neck are generally at increased risk for developing an acute problem.⁹ Most studies describe a 3% or less incidence of a patient requiring urgent surgery without operation.¹⁰ For patients who are not optimized or require emergent repair, we specifically discuss their perioperative risk and increased risk for morbidity related to their operation along with hernia recurrence. However, if a patient presents with acute strangulation or obstruction, these risks must be accepted—often times a formal hernia repair may be delayed in this setting.

What is the message that we are sending to ourselves, our colleagues, our trainees, and our patients if we do not at least try to prehabilitate appropriate patients? That we are just technicians

who do not want to contribute to the overall health of patients? In reality, the reduction of morbidity of just a few patients can have a tremendous impact on the healthcare system. It is a risky proposition to suggest that patients do not need make changes to benefit their own health. In a population that is becoming increasingly comorbid, we encourage surgeons to accept prehabilitation as part of the AWR package. As surgeons, we have a particularly different “lectern” from which to influence patients, and we can use it to assist them in making changes that can affect the quality and quantity of their lives. To this point, the exact level of sustainability of these preoperative efforts is unknown and is an area for further investigation.

The future of AWR surgery remains bright. As AWR has matured as a specialty, we have seen refined and new surgical techniques. Defining the use of new perioperative adjuncts, such as botulinum toxin, or older techniques, such as preoperative pneumoperitoneum, has led to decreases in the use of component separation thereby reducing the morbidity of muscle-splitting procedures. Medically, glucagon-like peptide agonists and other weight loss drugs are proving their efficacy and are positioned to significantly aid in complex operations in comorbid patients. As AWR surgeons, let us continue to strive for quality improvement for our patients.

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