The Impact of Hospital Volume on Clinical and Economic Outcomes in Ventral Hernia Repair: An Analysis with National Policy Implications

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INTRODUCTION: There is a growing interest in identifying provider and hospital characteristics associated with improved patient outcomes for surgical procedures. Increased operative volume has been associated with benefits in patient centric and economic outcomes for a variety of surgical procedures. In ventral hernia repair, however, there has been a paucity of studies assessing the association between procedure volume and patient outcomes. The objectives of this study are to evaluate the associations between elective hospital ventral hernia repair procedure volume and patient outcomes, including both clinical and economic outcomes.

METHODS: The 2014 National Inpatient Sample was queried for patients who underwent elective, open ventral (incisional) hernia repair with or without mesh. Outcomes included occurrence of major or wound-based in-hospital complications, extended length of stay (>4 days), and increased costs (>12,816). High-volume hospitals were defined as the 90th percentile of case volume or higher (>60 cases/year). Multivariate regression was performed to access the outcomes associated with high-volume hospitals.

RESULTS: 54075 patients at 2049 hospitals were retrieved. 41.4 percent of patients were treated at high-volume hospitals. There were significant differences in mesh use (67.2 percent vs 63.8 percent; p<0.001), smokers (30.4 percent vs 27.9 percent; p<0.001), unadjusted major complications (9.5 percent vs 8.6 percent; p<0.001), and unadjusted wound-based complications (6.2 percent vs 5.0 percent; p<0.001) between HV and non-HV. After adjustments for clinical and hospital characteristics, patients treated at high-volume hospitals were less likely to experience a major complication (OR, 0.882; 95 percent CI, 0.815 to 0.955; p=0.002) or wound-based complication (OR, 0.838; 95 percent CI, 0.763 to 0.920; p<0.001). However, in terms of resource utilization, patients treated at high-volume hospitals were more likely to experience an extended length of stay (OR, 1.143; 95 percent CI, 1.090 to 1.199; p<0.001) and an increase in costs (OR, 1.225; 95 percent CI, 1.166 to 1.287; p<0.001).

CONCLUSION: Hospitals that perform a larger number of ventral hernia repairs may provide better patient outcomes than lower-volume hospitals. However, these same high volume centers demonstrate an extended length of stay and increased costs thus conflicting with the idea that concentration of resources in high volume centers generates cost-savings. Further research is needed to understand the reason for this gap in proper resource utilization in high volume ventral hernia repair centers.

A Retrospective Comparison of Robot-Assisted Ventral Hernia Repair with Conventional Techniques

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INTRODUCTION: Although robot-assisted surgery is no longer considered to be a “novel” technology, its application to hernia repair remains relatively new. As a result, there is limited data available in the literature regarding robot-assisted
ventral hernia repair. The purported benefits of robot-assisted surgery include high definition three-dimensional visualization, improved surgeon ergonomics, and 6-degrees of freedom with range of motion. The cited potential drawbacks include increased expense and longer operative/anesthesia times, but these have not been definitively proven. We therefore seek to compare operative details and patient outcome data among patients undergoing open, laparoscopic, robot-assisted ventral hernia repairs.

METHODS: Institutional Review Board approval was obtained (Study Number: 16-00011). A retrospective study was performed of all patients who underwent elective open, laparoscopic, and robot-assisted ventral hernia repair at a single institution in 2015. Procedure-related details such as anesthesia and operative times, length of stay, use of mesh, primary closure of the fascia, and post-operative complications were compared between groups. Those patients undergoing emergent procedures or a separate procedure simultaneous with ventral hernia repair were excluded.

RESULTS: 160 patients were included in the study. Mean age was 56.7 years. Mean BMI was 30.1 kg/m². 138 patients (81%) had a history of previous intra-abdominal surgery. Hernia was recurrent in 32 (20%) of the cohort. Twenty seven patients (16.9%) underwent laparoscopic hernia repair, 110 (68.7%) underwent open repair, and 23 (14.4%) patients underwent robot-assisted repair. Robot-assisted repairs were associated with significantly increased anesthesia and operative times (p<0.0001). There was no significant difference in length of hospital stay, complications (which included seromas, hematomas, abscesses, pneumonia, dehiscence, small bowel obstruction, and mesh infections), or hernia recurrence between robot-assisted procedures and laparoscopic or open repairs.

CONCLUSION: These preliminary data suggest that although robot-assisted ventral hernia repairs are associated with increased anesthesia and operative times, the outcomes with regard to length of hospital stay, safety profile, and risk of recurrence are comparable to those of more traditional hernia repair methods. Therefore application of robotic technology to ventral hernia repair is both safe and feasible, although larger, prospective, multi-center studies are necessary before definitive conclusions regarding this novel application are drawn.

“Please Turn Over (PTO) Perforator Flap”: A New Technique to Reconstruct Perineal Defects Following Extralevator Abdominoperineal Excision (ELAPE)

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INTRODUCTION: Locally advanced low rectal cancer is now increasingly treated with an extralevator abdominoperineal excision (ELAPE) as ELAPE has been deemed to provide superior oncological clearance than traditional abdominoperineal excision (APE).1 However, the extended perineal dissection performed in ELAPE creates a perineal wound that is more demanding in terms of reconstruction. This is because a larger perineal cavity and potential dead space is created and less gluteal skin is excised when compared to standard APE.1 These two characteristics along with the neo-adjuvant chemo-radiation effects on wound healing have been associated with increased perineal wound morbidity, making uneventful perineal reconstruction post-ELAPE challenging to plastic surgeons whose assistance is sought in 67% of ELAPE cases. We present a new technique for perineal reconstruction post-ELAPE, using a perforator, islanded, turn over, de-epithelialized local flap (PTO – Perineal Turn Over perforator flap).

METHODS: The PTO flap is raised based on perforators from internal pudendal artery. In the current literature perineal perforator based flaps have been described for vulva reconstruction but not for perineal reconstruction after ELAPE.2 The concept of the flap is based on two components: a) the thick gluteal dermis acts as an autologous dermal vascularised substitute for the excised pelvic floor muscles providing a tension free repair that prevents perineal hernia formation b) the gluteal subcutaneous fat obliterates the dead space reducing fluid collections and preventing infections.