SUMMARY OF THE DOCTORAL THESIS

Reconstruction of the abdominal wall in complex incisional hernias

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Introduction

Incisional hernia is a condition marked by a defect in a poorly healed incision line, allowing peritoneal contents to protrude under the skin.

General Objectives:

This study focuses on complex incisional hernias, both preoperatively and postoperatively, following abdominal wall reconstruction using component separation techniques. We aim to achieve specific, quantifiable objectives through a rigorous scientific approach.

Study 1:

Incisional hernia (IH) is a postoperative defect in the abdominal wall, allowing peritoneal cavity contents to protrude beneath the skin in a peritoneal sac. IH varies in anatomical complexity, associated comorbidities, and surgical history. As IH enlarges, complications arise, forming part of its natural history. This study aims to review the impact of loss of domain on the abdominal wall before and after reconstruction.

The absence of a functional linea alba leads to muscular disturbances, chronic respiratory and gastrointestinal issues, and psychosocial impacts, exacerbated by decreased intra-abdominal pressure (IAP). Repairing IH involves the sudden reintroduction of viscera into an unprepared cavity, causing a rapid increase in cavity volume and IAP, with significant pathophysiological consequences.

For optimal repair, preoperative augmentation of the abdominal wall is essential, focusing on reducing sac volume, optimizing compliance, and enlarging the cavity. Key considerations include enhancing knowledge of systemic and local changes, performing CT evaluations, and monitoring IAP, plateau pressure (PP), and Positive End Expiratory Pressure (PEEP).

In conclusion, achieving these goals necessitates a multidisciplinary approach, employing Preoperative Progressive Pneumoperitoneum (PPP) and/or botulinum toxin (BTX), alongside abdominal wall reconstruction using a mesh with an augmented component separation technique.

Study 2:

Complex incisional hernia remains a contentious issue, with rising incidence and increased local and systemic postoperative morbidity and mortality. The size of the defect is a significant risk factor for challenging closure and 30-day readmission due to complications. The primary approach to closing such defects is the mesh-augmented component separation technique. This study aimed to evaluate 30-day wound events and general complications, including 90-day mortality.

We conducted a retrospective analysis of patients from two university hospitals who underwent open incisional hernia repair using anterior or posterior component separation between January 2015 and December 2021. Inclusion criteria comprised non-contaminated adult patients (over 18 years) with primary or recurrent median abdominal wall defects larger than 6 cm and complete fascial closure. Data collected included demographics (age, gender, Body Mass Index—BMI, American Society of Anesthesiologists Classification—ASA score), recurrence rate, comorbidities, operative details, and patient outcomes.

Preoperative native abdomen/pelvis CT scans were performed for all patients to evaluate defect anatomy and volumetry (abdominal cavity volume, incisional hernia volume, and peritoneal volume). One of the component separation techniques was executed according to Carbonell's equation.

Repair of complex incisional hernias presents challenges due to a high incidence of wound complications. The choice between anterior and posterior component separation techniques remains debated. Our findings did not reveal significant differences in complication rates between the procedures, nor did we identify specific factors associated with complications.

Study 3:

Fascial breakdown leading to incisional hernia (IH) is a significant and challenging complication following laparotomy. Traditionally, the success of abdominal wall reconstruction (AWR) was evaluated solely from the surgeon's perspective, focusing on outcome measures such as wound morbidity and recurrence. However, the recognition that complete recovery encompasses patient perspectives has shifted the focus toward Patient Reported Outcome Measures (PROMs) and Quality of Life (QoL), which are crucial for assessing the success and efficacy of AWR.

We conducted a prospective follow-up study involving 91 patients undergoing mesh-augmented AWR for primary or recurrent incisional hernia from January 2021 to December 2023. Demographic data, comorbidities, and hernia characteristics were recorded. Preoperative evaluations included native abdomino-pelvic CT scans to assess hernia characteristics (length, width, surface area, and volume of the incisional hernia sac and peritoneal cavity), the presence of previously inserted mesh, and the status of abdominal wall muscles. All procedures were performed by the same surgical team using techniques described by Rives-Stoppa (RS), Ramirez (ACS), and Novitsky (PCS).

Abdominal wall function was assessed through trunk raising (TR) and double leg lowering (DLL) measurements at preoperative, 1 month, 6 months, and 1-year postoperative intervals. Additionally, QoL was analyzed pre- and post-operatively using the EQ-5D score.

Our results indicate a significant overall improvement in all five components of QoL measured by the EQ-5D questionnaire. This improvement was influenced by hernia size and certain individual patient factors, including diabetes, cardiovascular diseases, and age over 60 years.

General Conclusions:

Through appropriate preoperative preparation utilizing abdominal wall augmentation techniques for ventral hernia patients with loss of domain, and by implementing a specific reconstruction protocol, it is possible to achieve desired outcomes such as rapid recovery, low postoperative complication rates, and swift socio-economic reintegration. Consequently, even challenges posed by comorbidities (absolute contraindications) can be addressed, minimizing postoperative risks and enabling patients to attain a normal quality of life.