Laparoscopic Sacrocolpopexy: Tips and Tricks of Utilizing Self-Fixating Mesh

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Abstract

Introduction: Advanced pelvic organ prolapse is a public health problem, and its treatment can be difficult and requires a multidisciplinary approach.

Aim: The primary goal is to describe the “tips and tricks” of using Parietex ProGrip® Self-Fixing Mesh for laparoscopic sacrocolpopexy. The secondary objective is to present the initial results of the use of mesh.

Material and methods: This prospective study started in January 2020 but was postponed because of the SARS-COV-2 pandemic. Three consecutive patients with pelvic organ prolapse of grade II underwent laparoscopic sacrocolpopexy using Parietex ProGrip® Self-Fixing mesh. The same multidisciplinary team operated on all the patients. Data on age, parity, operative time, hospital stay, perioperative complications, previous prolapse treatment, and functional and anatomical outcomes were collected.

Results: Patients included in this study were 65.33±8.5 years old and had BMI of 28.1±4.12. All were multiparous and at menopause. No intraoperative or postoperative complications or failure of the surgery was reported. The mean operative time was 211±12.58 minutes. The mean hospital stay was three days. Postoperative quality of life at one year had improved.

Conclusions: Parietex ProGrip® Self-Fixing Mesh is usable in laparoscopic sacrocolpopexy, but the presence of the grips makes it difficult to handle in the peritoneal cavity. A sterile non-adhesive foil can be useful to position the mesh.

Keywords: self-fixing textile mesh, pelvic organ prolapse, laparoscopic sacrocolpopexy

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Introduction and Objectives

Laparoscopic sacrocolpopexy has become more and more common since it was introduced in 1994, due to the well-known advantages of minimally invasive surgery, such as lower rates of recurrence, shorter postoperative hospital stay, faster recovery, and lower incidence of dyspareunia\cite{1,2}.

Our present study aims to describe the “tips and tricks” of using Parietex ProGrip® Self-Fixating Mesh (Medtronic, Minneapolis, MN, USA) in laparoscopic sacrocolpopexy. The secondary objective is to present our initial results using this mesh in laparoscopic sacrocolpopexy.

Material and methods

Study design

The current study started in January 2020 and involved consecutive patients with pelvic organ prolapse (POP) who underwent surgical treatment in Surgical Clinic No.1, Emergency Clinical County Hospital of Târgu Mureș. A total of three consecutive patients underwent laparoscopic sacrocolpopexy using the Parietex ProGrip® Self-Fixating Mesh. The same multidisciplinary team, consisting of a gynaecologist, a urologist, and two general surgeons performed the surgical management of the patients. The surgeries followed the same surgical steps.

The primary goal is to describe the “tips and tricks” of using Parietex ProGrip® Self-Fixating Mesh for laparoscopic sacrocolpopexy. The secondary outcomes were evaluated from the hospital stay, the operative time, and the perioperative complications.

Data on age, parity, operative time, hospital stay, perioperative complications, and previous prolapse treatment were collected. We calculated the operative time starting from skin incision to the closure of the skin and the hospital stays starting from the day of admission to the discharge day. We defined a perioperative complication as a complication that occurred during surgery or within the eight weeks following surgery, while short-term complications were considered those that occurred within six months. A failure of the surgery was defined as the recurrence of the pelvic organ prolapse greater than grade II.

Using the Pelvic Organ Prolapse Quantification system (POP-Q)\cite{3}, we included the patients with pelvic organ prolapse of grade II or higher or those with symptomatic POP.

Patients with untreated bleeding diatheses, those who were not fit for general anaesthesia, and those who refused the surgical treatment were excluded from this study.

Statistical analysis was performed using Graph Pad State Software version 3.6 (San Diego, CA, USA). Dates are expressed as nominal variables. The quantitative variables were compared using t-tests. The Kolmogorov–Smirnov test was used to measure the normality of the distribution of the quantitative variables, and the results are presented as means ± standard deviations. A p-value lower than 0.05 was considered statistically significant.

Ethical approval

This prospective, single-centre study was approved by the Ethics Committee of the Emergency Clinical County Hospital of Târgu Mureș and by that of the G.E. Palade University of Medicine, Pharmacy, Science and Technology of Târgu Mureș (nr.592/12.12.2019). All the participants in the study provided informed consent.

Preoperative evaluation

Prior to surgery, patients underwent a general clinical examination. For a better understanding of the severity and frequency of the symptoms, and to evaluate their quality of life, patients completed the Pelvic Floor Distress Inventory (PFDI-20) and the Pelvic Floor Impact Questionnaire (PFIQ-7)\cite{4}. At the same time, the patients were examined from urodynamic point of view (abdominal ultrasound, postmictional residual urine volume, flowmetry, and pressure flow studies) by the urologist from the study team.

The treatment plan and the postoperative follow-up were explained so that the patients understood the necessity of the follow-up.

2.4 Description of the technique: tips and tricks

A multidisciplinary team of two general surgeons and a gynaecologist performed the procedure. Laparoscopic sacrocolpopexy was performed under general anaesthesia and endotracheal intubation. The patient was in the Lloyd-Davies position, and a urinary catheter was inserted. Also, four trocars were used: two 5-mm ports and two 10-mm ports (Figure 1). The main step of the procedure was to dissect the sacral promontory after careful identification of the left common iliac vein, the right ureter, and the L5-S1 vertebrae. We continued the peritoneal incision, starting from the promontory along the rectosigmoid colon to the cul-de-sac and opening the recto and the vesicovaginal space. After
the dissection of the posterior rectal plane, we measured the diameter of the rectum and mesorectum to create an adequate hole at the level of the mesh to avoid extrinsic stenosis, usually 1.5-2 cm larger than their diameters. The mesh acted as a hammock with the fixed part attached to the promontory (Figure 1) and its flexible arms embracing the rectum and mesorectum to be fixated to the vaginal stump. The side of the mesh with micro grips adhered to the promontory and the vaginal stump, and the non-gripping side worked as a hammock on which the rectum and mesorectum were positioned. Drainage, and closure of the peritoneum using a continuous running suture.

The grips ensured a good fixation of the mesh, but at the same time they made its handling difficult inside the peritoneal cavity, due to their adhesion to the intraperitoneal organs (Figure 2). To facilitate the handling of the mesh, we used sterile foil, with which the mesh is packed and inserted through the 10-mm trocar into the peritoneal cavity. This foil acted as a non-adhesive film that interposed between the mesh and the intraperitoneal organs (Figure 3). Through this technique, the intraperitoneal organs were isolated from the self-fixing mesh.

After fixing the mesh, this foil was extracted from the peritoneal cavity.

Postoperative care
A liquid diet started six hours following the surgery. Antibiotic treatment continued for a total of seven days, and the anticoagulant treatment continued during the hospital stay. Urinary catheter and drainage tubes were removed 24 hours after the surgery.
Postoperative follow-ups of patients were carried out at six and 12 months following the surgery.

Results
A total of three patients were included in this study. All the patients had grade II POP. The perioperative characteristics of the patients are shown in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Perioperative characteristics of the patients</th>
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<tbody>
<tr>
<td>N=3</td>
</tr>
<tr>
<td>Age (year, mean± SD)</td>
</tr>
<tr>
<td>Body mass index (Kg/m2, mean±SD)</td>
</tr>
<tr>
<td>Parity (n)</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Menopause (n)</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Prolapse stage (n)</td>
</tr>
<tr>
<td>POP-Q I</td>
</tr>
<tr>
<td>POP-Q II</td>
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<tr>
<td>POP-Q III</td>
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Figure 1 Fixing the mesh to promontory
Figure 2 Mesh is attached to sigmoid colon
Figure 3 Mesh with the protective sterile foil
No intraoperative or postoperative complications were detected.

All patients reported significant improvements of preoperative symptomatology and quality of life (Table 2).

### Table 2. PFDI-20 and PFIQ-7 mean values

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<thead>
<tr>
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<th>PFDI-20</th>
<th>PFIQ-7</th>
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<tbody>
<tr>
<td>Preoperative value&lt;br&gt;(mean±SD)</td>
<td>224.86±48.14</td>
<td>252.18±41.40</td>
</tr>
<tr>
<td>Postoperative value&lt;br&gt;(mean±SD)</td>
<td>124.29±32.81</td>
<td>136.49±52.23</td>
</tr>
<tr>
<td>P</td>
<td>P=0.0404</td>
<td>P=0.0397</td>
</tr>
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### Discussion

Laparoscopic sacrocolpopexy is safe, effective, and possibly a substitute for the open procedure\(^5\,^6\). In this study, we wanted to highlight the “tips and tricks” of using a self-fixating mesh (Parietex ProGrip\(^\circledR\) Self-Fixating Mesh) for laparoscopic sacrocolpopexy. Because patients with chronic conditions could not be hospitalized during the emergency state of the SARS-COV-2 pandemic, the number of patients available for this study was small. The main advantage of this mesh is that it doesn’t require additional fastening means, but it is more difficult to handle in the peritoneal cavity. The grips attach the mesh to the surrounding tissues, as shown in Figure 2.

None of the performed surgeries were converted to laparotomy. No complications nor recurrences were found during the follow-up period. Hokenstad et al. reported a 1.59% readmission and a 1.5% reoperation rates within 30 days\(^7\).

The mean operative time was 211±12.58 minutes.

When compared to other studies, our operative time was longer. Kallidonis et al.\(^6\) reported a mean operative time of 99.75 minutes, while Mourad et al. reported a mean operative time of 109.71 minutes\(^1\). This prolonged operative time can be explained by the learning curve and the time needed to treat the peritoneal adhesions. The mean hospital stay of three days is longer compared to the data provided in the literature because we are on a learning curve and because the patients are better monitored.

One year following the surgery, all patients included in this study reported an improved quality of life (Table 2). We continued the multidisciplinary monitoring of the patients at 24 and 36 months.

The limitations of the study are the small number of patients enrolled and the short follow-up.

### Conclusion

Even though the Parietex ProGrip\(^\circledR\) Self-Fixating Mesh has been shown to be usable in laparoscopic sacrocolpopexy, the presence of the grips makes it difficult to handle in the peritoneal cavity. The use of a sterile non-adhesive foil is useful to position the mesh. The continuation of this study is necessary to strengthen these results.

**Financial support**

This study was not sponsored by any surgical device company. This work was supported by G. E. Palade University of Medicine, Pharmacy, Science and Technology of Târgu Mureș Research Grant number 294/1/14.01.2020.

**Acknowledgements**

None of the authors have received any financial support for this study. The Ethics Committee of G. E. Palade University of Medicine, Pharmacy, Science and Technology of Târgu Mureș (nr.592/12.12.2019) and the Ethics Committee of Emergency Clinical County Hospital of Târgu Mureș approved this study.

**Declaration of competing interest**

The authors declare no conflicts of interest.

**References**


