A new technique to avoid unintentional adhesion while deploying ProGrip mesh and its utility in the laparoscopic repair of obturator hernia

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INTRODUCTION

The obturator hernia is a relatively rare hernia accounting for 0.5%–1.4%[1] of all abdominal hernias and usually occurs in elderly emaciated multiparous women.[2]

The only treatment for obturator hernias is surgical intervention, but a well-defined consensus over treatment has not yet been reached. Several surgical approaches have been described in the literature, including abdominal, retropubic, obturator, inguinal and laparoscopic approaches.3 The ProGrip™ (Medtronic, Dublin, Ireland) laparoscopic self-fixating mesh provides several advantages, such as lower cost and reduced pain following tack-free fixation in laparoscopic hernia repairs through a transabdominal preperitoneal approach. The primary drawback of this mesh is unintended adhesion to surrounding tissues such as the large and small intestine, omentum and peritoneum during mesh deployment and fixation.[5] We introduced a new technique to avoid unintentional adhesion during ProGrip mesh repair and discuss its utility in the treatment of obturator hernias. We repaired seven obturator hernia lesions in five patients using this technique without any complications. The biggest advantage of our technique is that the position of the mesh can be adjusted after it is expanded, unless the sheet is completely removed, allowing the surgeons to fix the mesh without any unintended adhesion to surrounding tissue.

Keywords: Obturator hernia, ProGrip™ laparoscopic self-fixating mesh, transabdominal preperitoneal approach

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Abstract

The ProGrip™ laparoscopic self-fixating mesh provides advantages such as low cost and reduced pain following tack-free fixation in laparoscopic hernia repair through a transabdominal preperitoneal approach. Obturator hernia repair needs adequate fixation around the hernial orifice without the use of tacking, and ProGrip™ mesh provides options for secure fixation. However, it is often difficult to adequately adjust the mesh placement to cover the obturator hernia orifice with a ProGrip™ mesh, due to adhesion of the grips to the surrounding tissues. We introduce our technique to avoid unintentional adhesion during ProGrip mesh repair and discuss its utility in the treatment of obturator hernias. We repaired seven obturator hernia lesions in five patients using this technique without any complications. The biggest advantage of our technique is that the position of the mesh can be adjusted after it is expanded, unless the sheet is completely removed, allowing the surgeons to fix the mesh without any unintended adhesion to surrounding tissue.

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easy to implement for the treatment of inguinal and femoral hernias.[9]

Here, we report the use of this technique to treat obturator hernias through a TAPP approach.

**Pre-operative preparation**
We employed a polyurethane sheet that prevents the adhesion of the ProGrip™ mesh [Figure 1]. A trimmed polyurethane sheet was rolled with the ProGrip™ and tied at the centre with thread [Figure 2].

**Positioning of patient and ports**
The surgery was performed with the patient in the supine position and with both hands. Surgery was performed with a 12-mm trocar at the umbilicus and two 5-mm ports in the bilateral flanks.

**Operative steps**
After the dissection was complete [Figure 3], the rolled ProGrip™ mesh and polyurethane sheet combination were inserted into the abdominal cavity through the 12-mm trocar and placed into the dissected extraperitoneal space [Figure 4]. It was first fixed against the medial superior part of the extraperitoneal space. One end of the suture was pulled to untie the knot [Figure 5]. The roll is pulled downwards to unroll it gradually [Figure 6]. Once the mesh was sufficiently unrolled, the polyurethane sheet was pulled gradually to expose the grips of the mesh, which were pushed against the abdominal wall to fix the mesh against the superior-inferior portion [Figure 7].

**Post-operative care**
One day after surgery, we confirmed that the hernia was repaired by examining the patients in a standing position and decided to discharge them. After leaving the hospital, an outpatient examination was conducted approximately 2 weeks later. Subsequently, the follow-up was performed on an outpatient basis according to the patients’ symptoms.

All patients who underwent a TAPP procedure using this technique for an obturator hernia in Obihiro Kosei General Hospital, between January 2016 and December 2018, were included in this study. Patient data regarding age, sex and hernia classification, as well as operation time, blood loss, post-operative complications and recurrence were evaluated.

**RESULTS**
We used this technique to treat five patients with seven obturator hernia lesions. The patients were predominantly...
female with a median age of 74 years (range: 67–77 years). The majority of patients had a combined femoral hernia. The median surgical time was 73 min (range: 53–195 min) with minimal blood loss and no post-operative complications or recurrence [Table 1].

**DISCUSSION**

We report the use of the ProGrip™ mesh in TAPP repair of obturator hernias using a new technique to deploy the mesh. The biggest advantage with our technique is that the position of the mesh can be adjusted after expanding the mesh unless the sheet is completely removed, allowing surgeons to adjust the mesh position without any unintended adhesion. This is especially important in ensuring that the myopectineal orifice and obturator hernia are adequately covered.

The Kugel patch or flat meshes have been previously used in mesh repair for obturator hernias. ⁶⁻⁷ These meshes need to be fixed, and Cooper’s ligament is conventionally the lower border for fixing the mesh. With this fixation, the conventional inguinal hernia and femoral hernia are adequately covered by the mesh and secured using the tacks. The obturator hernia, however, is located below Cooper’s ligament, and only the free flap of the mesh covers the defect. Tacking is not possible below the defect owing to the rich presence of nerves and vascular tissues. Due to this location, it is possible that the mesh may flip and cause recurrence.

The ProGrip™ mesh is a self-gripping mesh that does not need tacking. Consequently, even in obturator hernia repair, it offers adequate fixation around the hernial orifice without tacking. This enables secure fixation of the mesh and avoids the complications of tacking, such as nerve damage and pain. During hernia repair, not only the obturator hernia orifice must be covered, but we must also adequately cover the myopectineal orifice that must be covered to prevent a recurrence. With a ProGrip™ mesh, it is often difficult to adequately adjust the mesh placement to cover the obturator hernia orifice, owing to adhesions of the grips to the surrounding tissues. However, using our technique, it is easier to adjust the position of the mesh to adequately cover the defects.

This study has several limitations. It is a retrospective study with small sample size and short follow-up period. To confirm our findings, we need to accumulate more cases and follow up the patients for a longer time period. However, preliminary findings of the use of a ProGrip™ mesh in the TAPP procedure using our technique have

| Case | Gender | Age (years) | Time (min) | Types of herniated herders | Side affected | Blood loss | Bowel resection | Recurrence | Outcome |
|------|--------|-------------|------------|-----------------------------|---------------|------------|----------------|------------|---------|
| 1    | Male   | 74          | 53         | II–1 (epigastric)            | Left          | 0          | -              | -          | Survived |
| 2    | Female | 75          | 73         | Femoral hernia              | Right         | 0          | -              | -          | Survived |
| 3    | Female | 71          | 195        | Femoral hernia              | Left          | 0          | -              | -          | Survived |
| 4    | Female | 67          | 122        | Femoral hernia              | Right         | 0          | -              | -          | Survived |
| 5    | Female | 77          | 73         | Femoral hernia              | Left          | 0          | -              | -          | Survived |

**Table 1: Clinical and surgical details of five patients with obturator hernia**

**Figure 5:** The knot is opened by pulling the thread. White arrows: Silk thread.

**Figure 6:** Once the mesh is sufficiently expanded, the sheet alone is pulled downwards step-by-step and removed by pushing the mesh backwards, fixing it against the extraperitoneal space, from the superior to the inferior part. White arrows: Polyurethane sheet.
Muto, et al.: A new technique while deploying ProGrip mesh and its utility in the laparoscopic repair of obturator hernia

CONCLUSION

Placing the ProGrip™ laparoscopic self-fixating mesh using this new technique is a useful approach to obturator hernia repair.

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Conflicts of interest

There are no conflicts of interest.

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