

Occult Para-Psoas Hernia during Routine Endoscopic Totally Extraperitoneal Inguinal Hernia Repair

Sarit Badiani, MBChB, MSc, FRACS, Edward A. Cooper, BSc, MBBS, MS, FRACS, Jason Diab, BMedSci, MBBS, MPH, MS, Christophe R. Berney, MB, MD, PhD, FMH, FRACS

ABSTRACT

Background and Objectives: Advantage of the total extraperitoneal (TEP) technique over open inguinal hernia repair allows for exploration of other anatomical regions in search for occult hernias (OH).

Methods: Our institutional practice is to routinely explore the obturator and femoral regions for occult hernias. In addition to this technique, we routinely expose the psoas muscle extensively to perfect mesh placement followed by fibrin glue fixation on both 'triangles of doom and pain'. The use of this technique has led to the identification of three incidental occult para-psoas hernias (PPH) out of a total of 800 TEP repairs performed in a high-volume specialist hernia center.

Conclusions: The purpose of this article is to demonstrate that occult parapsoas hernias (PPH) can be easily identified and safely repaired with mesh glue fixation, using the standard TEP technique during inguinal hernia repair.

INTRODUCTION

Groin pain is a frequent complaint in surgical practice with inguinal hernia representing the most frequent differential diagnosis.¹ With 20 million cases performed annually worldwide, inguinal hernia repair is one of the most common general surgical procedures. Approximately 50% of inguinal hernia repairs are now performed laparoscopically.^{2,3} The endoscopic totally extraperitoneal (TEP) approach allows better exposure and examination of certain anatomical regions that would simply be not possible in open herniorrhaphy. This allows the surgeon to diagnose occult hernias both ipsilaterally and contralaterally. These occult hernias can then be treated simultaneously and may reduce the incidence of delayed complications and/or persistent symptoms. The most commonly diagnosed occult defects identified during routine TEP dissection are either femoral or obturator hernias, which are well-documented in the literature. However, we present a case series of three extremely rare associated occult para-psoas hernias (PPHs) treated simultaneously during inguinal hernia repair, with excellent results and no postoperative morbidity. We aim to outline our technique and salient learning points in identification and management of these atypical types of occult hernias.

Case Report

Case #1

An 82-year-old gentleman presented with a 6-month history of intermittent bilateral groin discomfort and swelling on a background of a previous open left inguinal hernia repair 10 years prior. He underwent an endoscopic TEP bilateral inguinal hernia repair. Intra-operatively, during the inferior dissection phase consisting of upward peritoneal reduction, an associated right-sided PPH situated adjacent to the lateral border of the psoas muscle and around 8 cm cephalad from the iliopubic tract was incidentally identified, containing incarcerated preperitoneal fat. The hernia content was reduced completely, the defect plugged was using a small-size polypropylene (PerFix™ Plug, C.R. Bard, Franklin Lakes, NJ, USA) mesh and further covered with its preshaped onlay patch. Both prosthetics were solely fixed with 2 mL of fibrin glue (Tisseel™,

Bankstown Lidcombe Hospital, Bankstown, NSW, Australia (Drs. Badiani, Cooper).

University of Sydney, School of Medicine, Sydney, Australia (Dr. Diab).

University of Notre Dame, School of Medicine, Sydney, Australia (Dr. Berney).

University of New South Wales, School of Medicine, Sydney, Australia (Drs. Badiani, Cooper).

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Address correspondence to: Dr. Sarit Badiani, MBChB, MSc, FRACS, Department of Surgery, Bankstown Hospital, Eldridge Road, Bankstown, NSW 2200, Australia. Telephone: 61-426279378, E-mail: sarit@badiani.net

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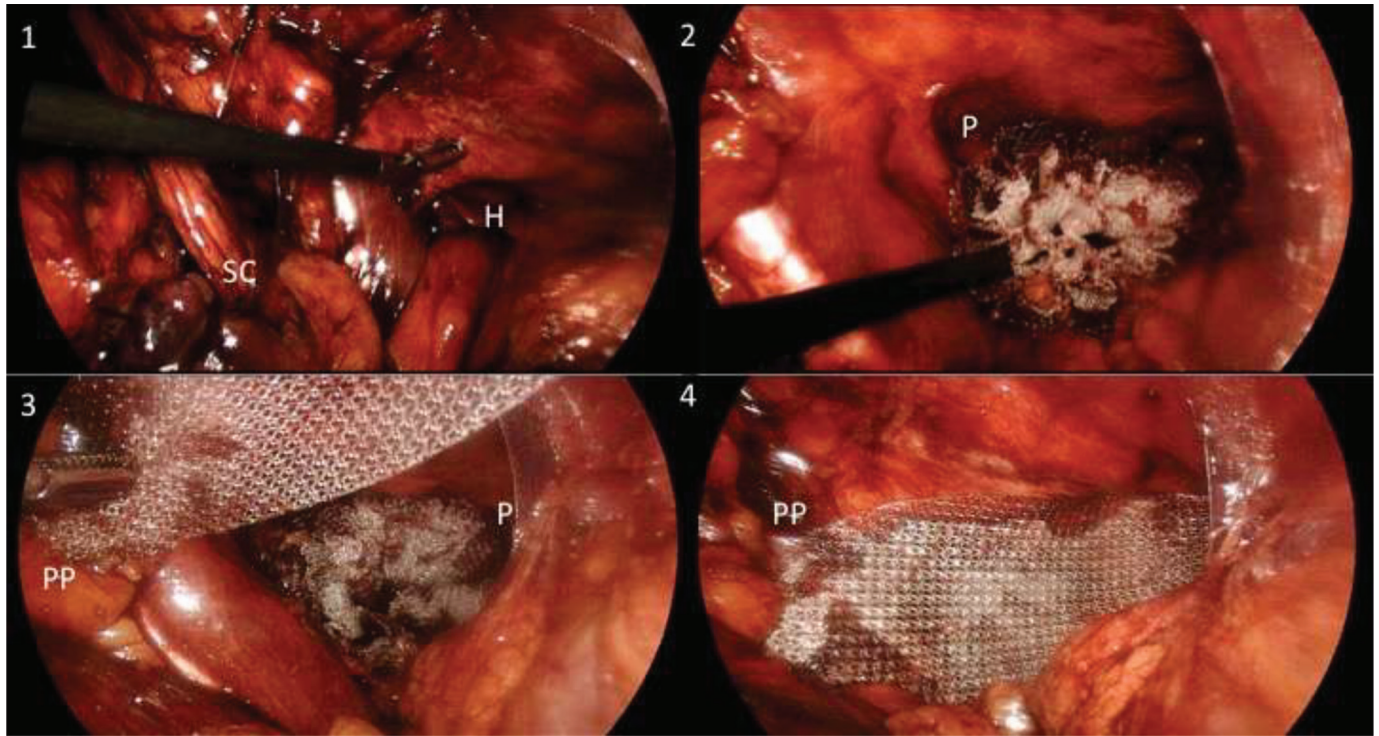


Figure 1. 1) Identification of right parapsaos hernia (PPH) defect lateral to the right psoas muscle. 2–4) Placement of PerFix™ Plug mesh secured with fibrin sealant. H: hernia defect. P: PerFix™ plug. PP: preshaped PerFix™ mesh. SC: spermatic cord. AP: anatomical Parietex™ mesh. T: Tisseel™ fibrin glue.

Baxter, Cleveland, MS, USA) in an atraumatic manner⁴ (**Figure 1**). Both inguinal hernias were also reduced and repaired, as per a previously described technique,⁵ using preshaped anatomical Parietex™ meshes (TECT1510, ADP2, Medtronic, Minneapolis, MN, USA). The patient was discharged home day 1 and made a full postoperative recovery without any residual pain or complaint.

Case #2

A 54-year-old obese gentleman was referred with symptomatic reducible bilateral inguinal hernias. Interestingly, he also reported a 6-month history of right-sided lower back pain that had persisted despite physiotherapy and analgesia. Intraoperatively, a right PPH defect situated in the same location as case #1 and also containing preperitoneal fat was identified. The hernia was reduced, the defect closed using a similar PerFix™ plug mesh and secured with fibrin sealant (**Figure 2**). The patient's bilateral inguinal hernias were repaired in a standard fashion using two ADP2 meshes. He was discharged from hospital on day 1. At 6-week postoperative follow up, the patient reported that his preoperative symptoms, including his chronic

right-sided back pain, had completely subsided allowing him to return to work.

Case #3

A 68-year-old gentleman was referred with intermittent right groin discomfort and a nonreducible right-sided inguinal hernia. Intraoperatively, routine dissection revealed the presence of a PPH defect containing extraperitoneal fat lateral to psoas muscle. The content was reduced, and defect repaired using the same PerFix™ plug method, prior to mesh fixation of his right inguinal hernia (**Figure 3**). At postoperative follow-up, he had made an excellent recovery with only minimal discomfort and returned to full time work.

CASE DESCRIPTION

Our preference for these cases employ a standard endoscopic TEP approach outlined below.⁶ Before the patient enters the room, his bladder is emptied. The patient is placed in a supine position and a paraumbilical incision is performed down to the anterior rectus abdominis muscle sheath. The rectus muscle is swept

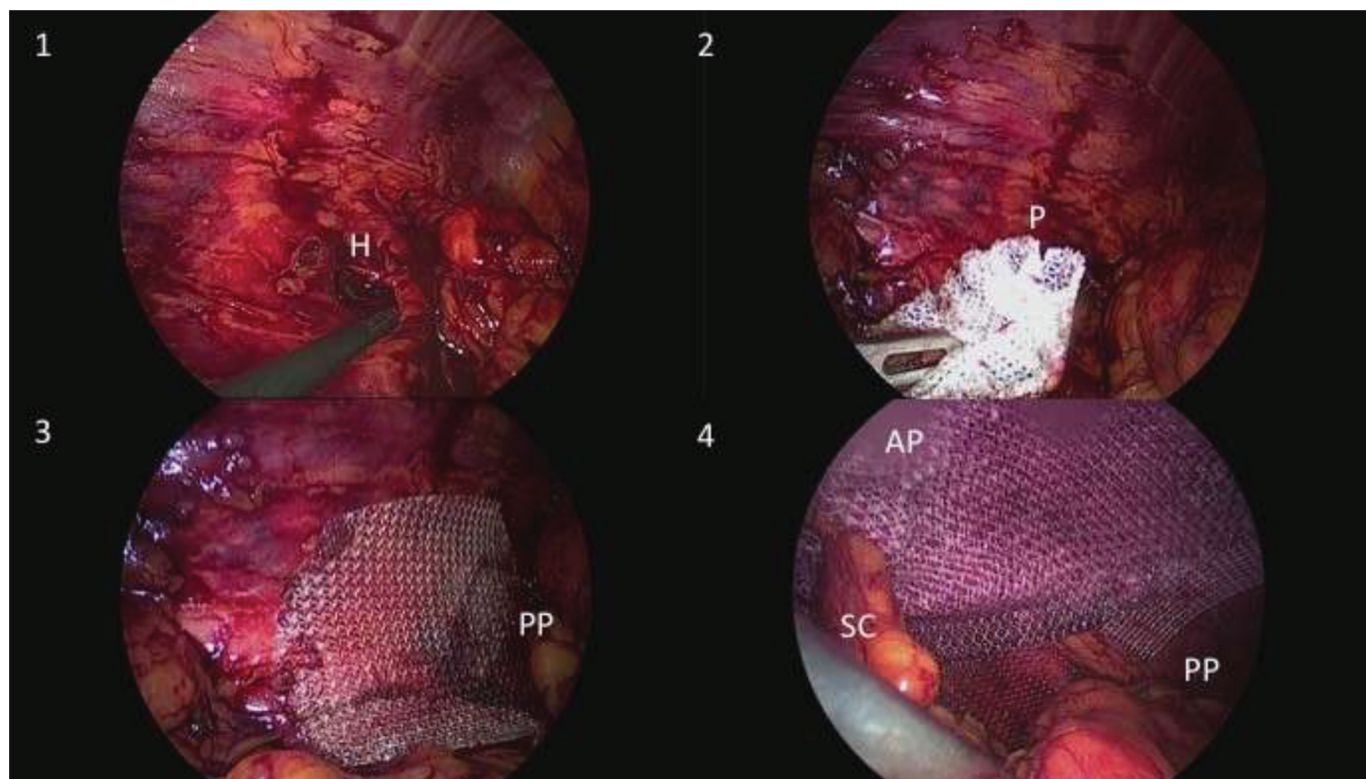


Figure 2. 1) Identification of right paraspsoas hernia defect (PPH). 2) Placement of PerFix™ Plug. 3) Application of flat component of PerFix™ mesh. 4) Result following fixation of right inguinal hernia with Parietex™ mesh slightly overlying the PerFix™ mesh inferiorly. H: hernia defect. P: PerFix™ plug. PP: preshaped PerFix™ mesh. SC: spermatic cord. AP: anatomical Parietex™ mesh. T: Tisseel™ fibrin glue.

laterally and the preperitoneal space is developed with a balloon dissector (Spacemaker™ Balloon Dissector, Medtronic, Minneapolis, MS, USA). The balloon is inflated under vision with identification of the rectus muscle and inferior epigastric vessels superiorly. The balloon remains insufflated for approximately 3 min for hemostatic purposes and then replaced with a single use 10-mm port (Blunt Tip Trocar, Medtronic, Minneapolis, MS, USA). CO₂ insufflation is kept at 8-mm Hg. Under direct visualization using a 30-degree 10-mm scope, two further 5-mm working ports are placed at the midline. For a bilateral repair positioning of the most inferior trocar should be at least 4-5 cm away from the pubic symphysis. For a unilateral repair, the most caudal port is placed lateral to the midline on the contralateral side.

To allow sufficient anatomical exposure and adequate mesh placement, blunt dissection is initially developed towards the ASIS with lateral release of a low arcuate line if necessary. The dissection is continued caudally towards the deep inguinal ring with identification of the

spermatic cord, isolation and reduction of the indirect hernia sac, as well as reduction of any associated cord lipomas. Medially, the Hesselbach's triangle is exposed looking for any weakness of the transversalis fascia generally signing the presence of a direct inguinal hernia defect. We routinely enter the retropubic space (of Retzius) exposing the obturator membrane and the femoral canal with careful identification of the medial aspect of the external iliac vein. Inferiorly, both the "triangle of doom" and "triangle of pain" are totally exposed, which also includes the psoas muscle that is cleared cranially up to at least 5 cm, after upward reduction of the reflected peritoneum. This step is essential in providing sufficient space for mesh placement and adequate glue fixation at the "floor" of our dissection, which represents the most common area for hernia recurrence.⁷ The genitofemoral and lateral femoral cutaneous nerves are commonly identified and preserved at this point too. This wide extraperitoneal dissection provides an excellent panoramic view to incidentally identify and simultaneously repair occult PH.

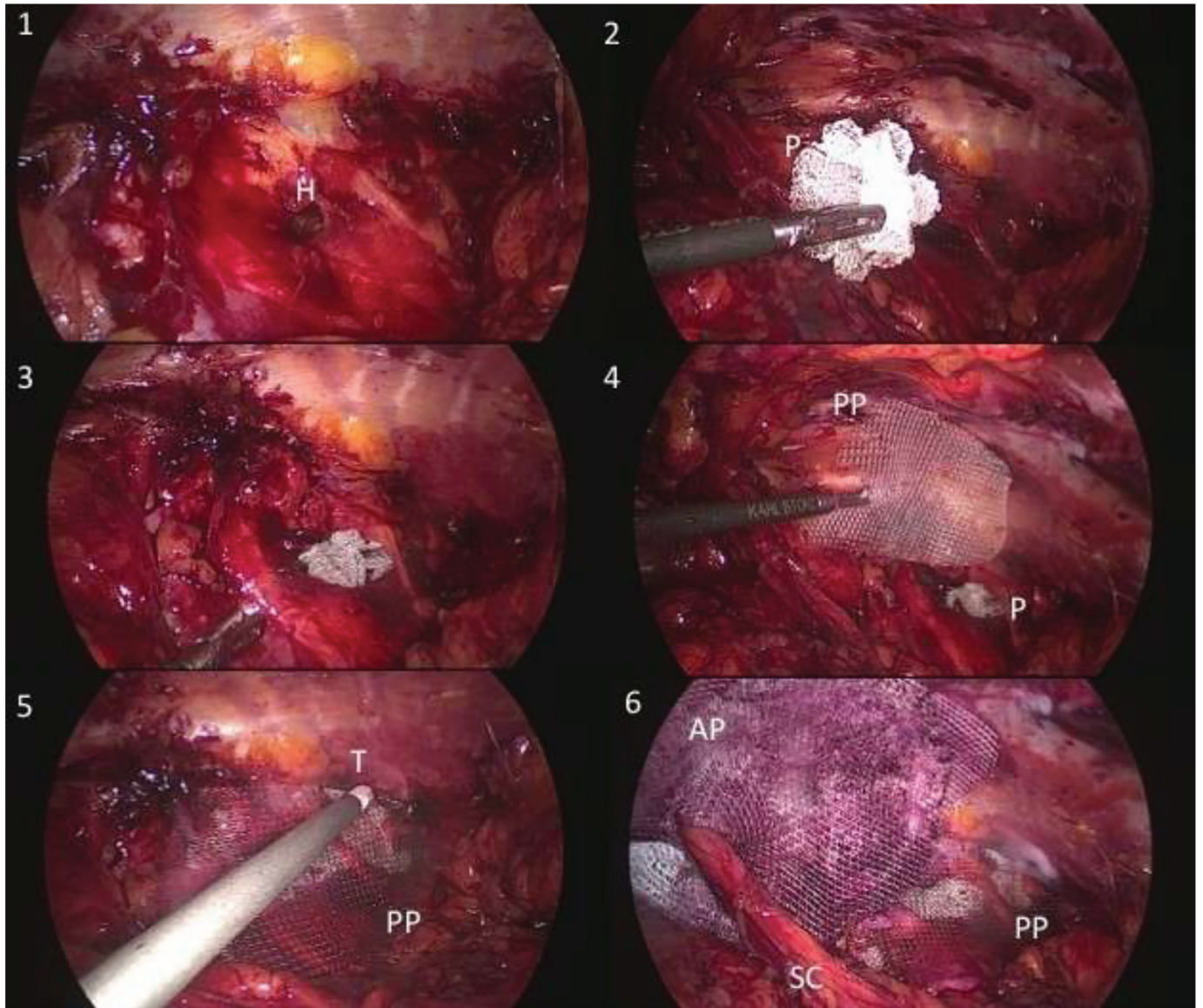


Figure 3. 1) Identification of right para-psoas hernia defect. 2, 3) Insertion of PerFix™ Plug; the lateral cutaneous nerve of the thigh can be identified. 4) Application of flat component of PerFix™ mesh. 5) Securing mesh with Tisseel™ fibrin glue. 6) Result following fixation of right inguinal hernia with Anatomical Parietex™ mesh slightly overlying the PerFix™ mesh inferiorly. H: hernia defect. P: PerFix™ plug. PP: preshaped PerFix™ mesh. SC: spermatic cord. AP: anatomical Parietex™ mesh. T: Tisseel™ fibrin glue.

Following identification of a PPH, a small size preshaped polypropylene mesh (PerFix™ Plug) is easily inserted into the defect, situated lateral to the psoas muscle and safely secured with 2 mL of fibrin glue (Tisseel™). Inguinal hernia repairs are then performed after dissection of the cord structures, reduction of the peritoneal sac and potential lipoma of the sac, with placement of an anatomical Parietex™ mesh (TECT1510, ADP2, Medtronic, Minneapolis, MN,

USA) that is preferentially fixed inferiorly and medially with 2 mL of fibrin glue per side.

DISCUSSION

Patients referred with groin pain can pose a diagnostic and therapeutic challenge for surgeons. It is important to

undertake a thorough history and clinical examination in these patients. In most practices surgeons will be referred patients with symptoms of groin pain along with clinical evidence of a groin lump, these patients can proceed straight to operative intervention without the need for further imaging. In our three cases with PPH none of the patients had preoperative imaging due to obvious clinical signs representative of a groin hernia. When patients present with groin pain or atypical symptoms such as back pain, flank discomfort, or pelvic pain without evidence of a clinical palpable hernia a high index of suspicion for occult or atypical hernias should be considered. In these cases, the question arises what is the best modality of imaging. Most hernia guidelines recommend the use of only ultrasonography and CT as modalities for evaluation for hernias, especially those not readily evident on physical examination.⁸ Magnetic resonance imaging (MRI) is generally not considered a first or even second line evaluation modality for hernias, although MRI is likely more effective than the alternative imaging techniques, the theoretical improvement is not enough to justify the increased expense.⁹ It is unclear whether PPH would be visible on preoperative imaging due to the rarity of these findings, however, if recurrence was suspected then either a CT or MRI should be considered.

A significant advantage of laparoscopic surgery compared to open herniorrhaphy is the ability to explore the common hernial orifices in the ipsilateral and contralateral groin. Although most of these occult defects are more likely to represent either femoral or obturator hernias, surgical awareness for other occult defects should be high. The importance of a good anatomical exposure of the extraperitoneal space is therefore critical, especially in female patients.¹⁰⁻¹² Modeste and colleagues¹³ reported a young female presenting with persistent groin pain with normal clinical and preoperative imaging. The authors performed a diagnostic transabdominal preperitoneal approach (TAPP), which identified a small groin defect that was deemed unlikely to contribute to the symptoms she described and therefore further inferior dissection of the peritoneal flap revealed incarcerated fat situated at the junction of psoas and iliac muscles, and therefore termed “para-psoas” hernia.¹³ The authors described placement of a standard polypropylene mesh without any prefix plug with immediate complete resolution of her symptoms and no evidence of recurrence at 2-year follow up. Goel et al.¹⁴ reported another young female who presented with groin pain following sudden strenuous activity, which resulted in a groin lump and persistent pain. The authors performed a TEP exploration and identified an indirect inguinal hernia that was reduced. However,

during infero-lateral dissection of the extraperitoneal space, a well-defined defect protruding through the left psoas muscle was identified that we consider as a close variant of this recently described PPH and further reported by us with our 3 cases. It also outlines the importance of routine wide extraperitoneal dissection during TEP inguinal hernia repair. Without it, those three hernias would have been easily missed and may have accounted for persistence of chronic lower back pain in one of our patients. Albeit very small, this defect can indeed allow for chronic incarceration of the preperitoneal fat and persistent patient discomfort. We therefore advocate this endoscopic technique over open herniorrhaphy to avoid missing the chance of repairing a synchronous occult hernia, as incomplete repair or misdiagnosis may account for recurrence or persisting symptoms after surgery.¹⁵

Following adequate extraperitoneal dissection and identification of occult defects the specific attention should be towards adequate placement and mesh fixation. The variations in endoscopic mesh fixation include tacks, transfascial sutures, bone anchor fixations, and glue (synthetic or biological). The drawbacks of mechanical fixation is the potential for postoperative vascular and/or nerve injury leading to chronic pain due to inappropriate placement.¹⁶ In our institution we routinely use a fibrin-based glue (Tisseel™) for mesh fixation, which completely mitigates those risks. A review of 1000 TEP inguinal hernia repairs reported in our institution demonstrated excellent postoperative outcomes with this method of fixation.⁵ Similar results have been reported by others.¹⁷ Additionally, we favor the anatomical hydrophilic Parietex mesh, which offers a wide coverage of the common hernial orifices (inguinal, femoral, obturator) with the inferior border of the mesh extending over the psoas muscle to mitigate the risk of hernia sac (peritoneum) migrating beneath it.⁴ Depending on the size of the hernia, we still recommend placement of an additional prosthesis such as a small size Perfix plug in the para-psoas defect if identified.

The uniqueness of this report is the detection of 3 similar cases of an extremely rare type of PPH defect during routine TEP inguinal repairs. It should raise awareness to search for occult hernias and the importance of routine wide dissection, mesh placement, and fixation.

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