—Case Reports—

# Laparoscopic Repair Using Self-Fixating Mesh in an Adult Patient with a Sciatic Hernia and Irreducible Small Bowel: A Case Report and Literature Review

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Sciatic hernia is a rare type of pelvic floor hernia. The herniated tissue can include the ureter, small and large bowel, and ovary, among other tissues. Only a few cases of laparoscopic treatment for a sciatic hernia with small-bowel incarceration have been reported.

We report our experience using a laparoscopic approach for treatment of sciatic hernia in an 83-year-old woman and review the literature on sciatic hernias. The patient was referred to our hospital complaining of constipation and abdominal bloating. Computed tomography (CT) scanning showed a right sciatic hernia containing the small bowel. Laparoscopic repair of the sciatic hernia was performed using a self-fixating mesh. The patient was discharged after an uneventful postoperative course and has not developed abdominal bloating or constipation postoperatively. In conclusion, a sciatic hernia was successfully repaired using a laparoscopic trans-preperitoneal approach and ProGrip Self-Fixating Mesh.

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**Key words:** sciatic hernia, pelvic floor hernia, laparoscopy, mesh repair

## Introduction

Sciatic hernia is rare form of pelvic floor hernia (which include obturator, paravesical, and perineal hernias) that mainly develops in adult women[1–3], although there have been reports of sciatic hernia in adult men and children[4–8]. Sudden weight loss, concomitant neoplasia, other hernias, and multiparity or pregnancy are putative primary factors in adult sciatic hernia[9].

Sciatic hernia was first described by Papen in 1750 and was observed and recorded by Verdier in 1753[4]. The clinical presentation varies. Patients may experience chronic pelvic pain or intermittent abdominal pain, bloating and discomfort. In some reports, the herniated tissues included the ureter, small and large bowel, or ovary, among other tissue. The treatment of a sciatic hernia depends on affected tissue and includes open and/or laparoscopic repair, transgluteal repair and the placement of a ureteral stent[10]. Only a few studies have reported laparoscopic treatment have been made. Herein, we report our first case of sciatic hernia, which was successfully treated using a laparoscopic trans-preperitoneal approach and ProGrip™ Self-Fixating Mesh (Medtronic, Minneapolis, MN, USA), including notes on the position of the patient during the surgery. We have also reviewed the existing medical literature on the use of laparoscopic surgery for treatment of sciatic hernia.

## Case Report

An 83-year-old woman was referred to our hospital for evaluation of constipation. She presented with a 1-month history of abdominal bloating. A CT scan examination showed a right sciatic hernia containing the small intestine. On the basis of these findings, compression of the piriformis muscle, and a suspected herniation into the in-

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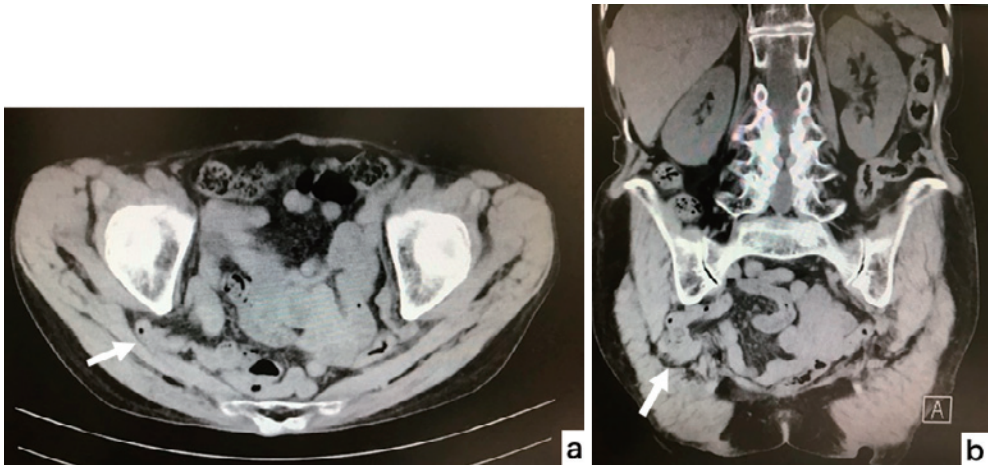

Fig. 1 Computed tomographic (CT) image showing a right-side sciatic hernia containing small bowel and the compression piriformis muscle (arrow) (a) Axial view, (b) coronal view.

frapiriformis space, we provisionally diagnosed greater sciatic hernia (**Fig. 1**).

Laparoscopic repair using the ProGrip Laparoscopic Self-Fixating Mesh was performed under general anesthesia. A pillow was placed under the patient's waist, and the patient was then placed in a lithotomy and steep Trendelenburg position. The operating table was rotated towards the left side. The first 12-mm port was created at the umbilicus. In addition, two 5-mm working ports were created bilaterally, one on each side of the umbilicus. Thus, a total of 3 ports were used during the operation. The $CO_2$ insufflation pressure was set at 8-10 mmHg. When the small intestine in the pelvis was carefully removed to the cranial side, we decided to reduce the incarcerated small intestine. After the ovary was moved, intra-abdominal observation revealed a pelvic floor hernia (**Fig. 2a**). A thread was passed through the mesosalpinx, and the ovary and fallopian tube were lifted upwards, which enabled a good field of view (**Fig. 2b**). Initially, we sheared the peritoneum on the lateral side of the hernia orifice (**Fig. 2c**). After dissecting the preperitoneal space, the hernia sac was inverted, and the hernia orifice was visualized (**Fig. 2d**). After considering the anatomy around the herniated orifice, the final diagnosis was greater sciatic hernia in the infrapiriformis space (**Fig. 2e, 3**). ProGrip Laparoscopic Self-Fixating Mesh was inserted directly into the preperitoneal space to repair the hernia (**Fig. 2f**), and the peritoneum was closed with a 3/0 multifilament absorbable intracorporeal suture. The patient was discharged on the third postoperative day after an uneventful postoperative course. At 18 months postoperatively, she has not experienced abdominal bloating or constipation.

## Discussion

Sciatic hernias are classified as pelvic hernias and involve the protrusion of the hernia sac into the sciatic foramen. A sciatic hernia is defined as the herniatd tissue in the greater or lesser sciatic foramen. Furthermore, the greater sciatic foramen is subdivided by the piriformis muscle to form the suprapiriformis and infrapiriformis spaces (**Fig. 3**). We suspected a herniation into the infrapiriformis space in our patient because preoperative CT scans showed that the herniated tissue did not include the infrapiriformis muscles. Our suspicion was confirmed by anatomic observation of the area around the hernia orifice after retroperitoneal dissection.

A search of English-language abstracts in PubMed and Igakuchuo-Zasshi through 2021 using the keywords "sciatic hernia" or "ureterosciatic hernia" identified fewer than 100 reports. Various surgical approaches including open, laparoscopic, transgluteal, and transurethral approaches have been reported. A laparoscopic approach, including robot-assisted surgery, was used in 35 cases (**Table 1**)[11–25].

A laparoscopic approach for repair of sciatic hernia was first described by Miklos in 1998[11], and a robot-assisted laparoscopic approach was described in 2011[15]. At this writing, there have been 16 reports of a laparoscopic repair of sciatic hernia, including the present case. Of the 35 adult cases in this review, including the present case, all were women. Among non-laparoscopy reports, however, sciatic hernia was reported in 4 men. The ovary was the most commonly affected tissue in reported sciatic hernias (24 cases, 68.6%), followed by the ureter (8 cases, 22.9%) and the small bowel (3 cases). The hernia defect was repaired by using prosthetic mesh including a

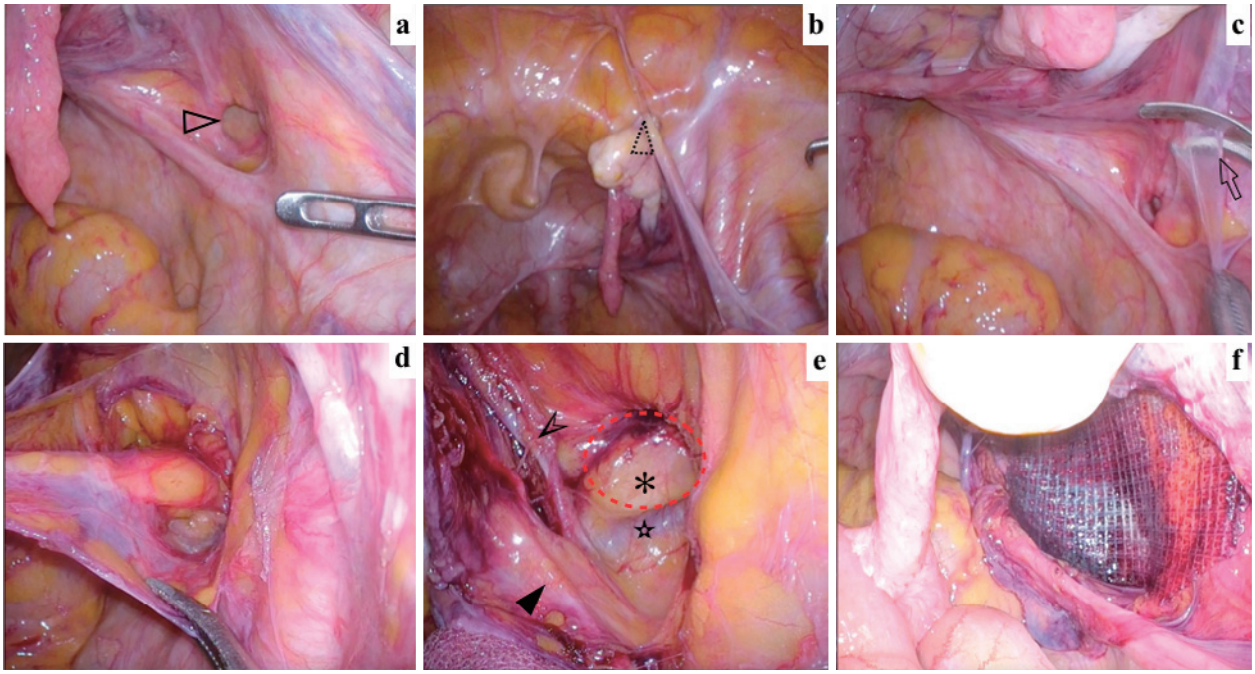


Fig. 2 Intra-abdominal view: (a) A defect in the right greater foramen is visible. ▷ (b) A thread is passed through the mesosalpinx to secure the field of view. ⋯▷ (c) The initial approach point was the lateral side of the hernia orifice. ⇨ (d) The hernia sac was inverted. (e) Anatomy around the hernia orifice (☆ Internal pedestal vein, ▶ Ureter, ➢ Inferior vesical artery, ∗ Sciatic nerve). (f) The foraminal defect was repaired using self-fixating mesh.

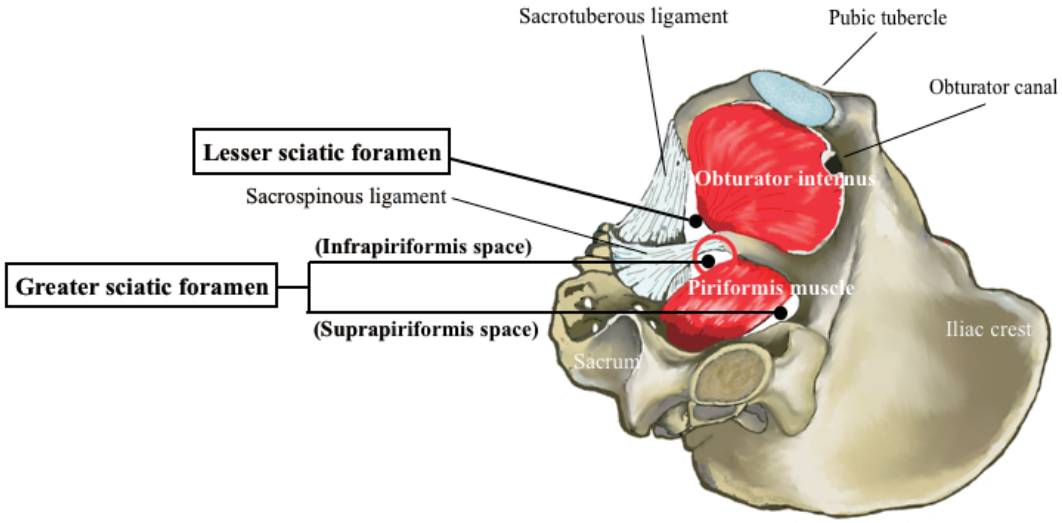


Fig. 3 Anatomy of the sciatic foramen: The red circle shows the location of the sciatic hernia in the present case.

plug in 29 cases (82.9%), by simple sutures in 5 cases (14.3%), and by patch closure in one case (2.9%). The prosthetic mesh was fixed with a hernia stapler, the suturing of a local peritoneal flap or biological glue[11,15,21]. Fixing the prosthetic mesh with the tacker can be difficult anatomically. Therefore, we used the ProGrip Laparoscopic Self-Fixating Mesh after trimming it to an appropriate size, which overlapped all margins of the defect in each direction by at least 2 cm.

First, the retroperitoneum was dissected from the lateral side of the hernia orifice and the hernia sac was inverted; both the pelvic plexus and the ureter were then dissected. As a result, a preperitoneal space sufficient to contain the mesh was secured. If the dissection had been performed from inside of the hernia orifice, the pelvic plexus and ureter could have been damaged.

Table 1 Reports of adults with sciatic hernia treated laparoscopically (including robot-assisted procedures)

| No. | First author | Year | Case (n) | Age (years) | Gender | Side | Contents | Hernia repair |
|---|---|---|---|---|---|---|---|---|
| 1 | Miklos[11] | 1998 | 20 | Mean 34.3 (range 23-58) | F (all patients) | R: 14, L: 5, B: 1 | ovary (or with fallopian tube) | Mesh with hernia stapler |
| 2 | Gee[12] | 1999 | 1 | 60 | F | L | ureter | Mesh |
| 3 | Witney-Smith[13] | 2007 | 1 | 59 | F | L | ureter | Mesh plug |
| 4 | Bernard[14] | 2010 | 1 | 72 | F | R | small bowel, right ovary | Plug and patch |
| 5 | Singh[15] (Robot-assisted) | 2011 | 1 | 79 | F | R | preperitoneal fat | Mesh with suturing of a local peritoneal flap |
| 6 | Whyburn[16] | 2013 | 1 | 74 | F | B | bilateral ureter | Mesh |
| 7 | Tsuzaka[17] | 2014 | 1 | 78 | F | L | ureter | Simple suture |
| 8 | Taguchi[18] | 2014 | 1 | 84 | F | R | ovary | Simple suture |
| 9 | Iida[19] | 2015 | 1 | 60 | F | R | ovary | Patch closure |
| 10 | Regelman[20] (Robot-assisted) | 2016 | 1 | 60 | F | L | ureter | Simple suture |
| 11 | Colombo[21] | 2017 | 1 | 65 | F | R | ovary | Mesh with biological glue |
| 12 | Ishikawa[22] | 2017 | 1 | 77 | F | R | small bowel | Plug and patch |
| 13 | Moon[23] | 2019 | 1 | 72 | F | R | ureter | Simple suture |
| 14 | Kamisawa[24] | 2020 | 1 | 70 | F | R | ureter | Simple suture |
| 15 | Rose[25] (Robot-assisted) | 2020 | 1 | 68 | F | L | ureter | Mesh |
| 16 | Present case | 2021 | 1 | 83 | F | R | small bowel | Self-fixating mesh |

L= Left, R= Right, B= Bilateral, F= Female

The hernia defect was located closer to the bottom of the pelvis. Therefore, it was important to place a pillow under the patient's waist and to position her in a steep Trendelenburg position, to enable the small intestine to be removed to the cranial side.

The present case was diagnosed as an irreducible rather than an incarcerated hernia because the pain was manageable laboratory findings did not worsen, and there were no ischemic signs in intraoperatively. An open approach is helpful in emergent cases, such as those with ileus. Only 2 reported patients were treated using a laparoscopic approach when small bowel incarceration was present. However, laparoscopic treatment should be considered in patients with mild bowel dilatation when the prolapsed organ is the bowel, such as in the present case.

ProGrip™ Self-Fixating Mesh does not require tacking or suturing to fix and thus results in less damage to nerves, vessels, and the ureter. We have had no recurrences for inguinal hernia repair after using a ProGrip Laparoscopic Self-Fixating Mesh in a series of 37patients, which is consistent with some other reports[26–28]. However, Denham et al. suggested that a randomized trial powered to detect differences in recurrence rates would likely require over 1,000 participants, if a recurrence risk of 1% is assumed[28]. Therefore, we will continue to follow patients in the future.

## Conclusion

We described our experience repairing a sciatic hernia with ProGrip Laparoscopic Self-Fixating Mesh. Laparoscopic repair of a sciatic hernia can be performed safely using an approach that enables proper patient positioning and preperitoneal dissection. Laparoscopic Self-Fixating Mesh repair may reduce the risk of damage to nerves, vessels, and the ureter.

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