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Single Incision Endoscopic Surgery for Lumbar Hernia

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Abstract (200 words)

Background: Single Incision Endoscopic Surgery (SIES) has emerged as a less invasive surgery among laparoscopic surgeries, and this approach for incisional hernia was reported recently. This is the first report of SIES for an incisional lumbar hernia. Case: A 66-year-old Japanese woman was referred to our institute because of a left flank hernia that developed after left iliac crest bone harvesting. A 20-mm incision was created on the left side of the umbilicus and all 3 trocars (12, 5, and 5 mm) were inserted into the incision. The hernial defect was 14 × 9 cm and was repaired with intraperitoneal onlay mesh and a prosthetic graft. The postoperative course was uneventful. Discussion: SIES for lumbar hernia offers a safe and effective outcome equivalent compared to laparoscopic surgery. In addition, SIES is less invasive and has a cosmetic benefit.

Key words: Hernia, Incisional hernia , Lumbar hernia, Endoscopic surgery, Single incision

Introduction

An incisional hernia is difficult to repair, because the development of a hernia depends not only on the fragility of the suture line causing it but also on the fragility of the abdominal wall and increasing intra-abdominal pressure. Furthermore, unlike a ventral incisional hernia, the treatment for a flank hernia requires the identification of complicated structures [1].

Incisional hernias need to be treated surgically and various surgical procedures have been reported. Currently, 2 major approaches are available [2,3]; one is conventional open surgery and the other is laparoscopic surgery. Open surgery usually involves a direct approach to a defect through its incisional scar as well as its repair by suturing with a prosthetic graft. Laparoscopic surgery is less invasive, and intraperitoneal onlay mesh (IPOM) is a method derived from laparoscopic inguinal hernia repair. It is an ideal procedure that avoids the destruction of anatomical structures around the hernia [4].

This is the first report on single incision endoscopic surgery (SIES) for treatment of an incisional flank hernia. SIES was developed in 1998 [5], and is a less invasive surgery among laparoscopic surgeries. Recently, good results have been reported with SIES for incisional hernioplasty [6,7].

Case

A 66-year-old Japanese woman was referred to our institute because of a left flank hernia, which had developed after left iliac crest bone harvesting. The hernia recurred 3 months after an open hernioplasty using a sublay patch. Her medical history included alcohol abuse, adjustment disorder, chronic obstructive pulmonary disease, primary biliary cirrhosis, and arteriosclerosis obliterans.

A CT scan revealed an incisional hernia in the left flank, which was out of the

abdominal cavity and over the left iliac crest (Fig. 1). A 20-mm incision was created on the left side of the umbilicus, a 12-mm port (VersaStep™, Covidien, Mansfield, MA, USA) was introduced by using an open approach, and the abdominal cavity was explored with a 5-mm 30° endoscope. Second and third 5-mm port trocars (Pedy Port, Covidien) were introduced respectively on each side of the first 12-mm port. The patient was put in the Trendelenburg position and was rotated to the right.

The hernia comprised the middle part of the sigmoid colon, which was reduced to the abdominal cavity after adhesiolysis (Fig. 2a).

The oval shaped hernial defect (14 × 9 cm) was located in the left flank. Hernia repair was performed by IPOM with a composite mesh (Bard Composix mesh™ , C. R. Bard. Inc.; Glen Falls, NY, USA). A 20 × 15 cm mesh was fixed with multiple spiral tacks (Protack ™, Tyco Healthcare; Mansfield, MA, USA). The mesh was first rolled and tied with a string that was inserted through the 12-mm port. The rolled mesh was fixed at the edge of the defect and unrolled so that it was fixed to the rim of the hernia with tacks in a stepwise manner (Fig. 2b). The mesh covered the defect and overlapped its margins by at least 3 cm. The surface of the incision site was closed with 1-0 Vycril. Although she suffered from postoperative local pain due to the patch fixation for a few days, the postoperative course was uneventful. A CT scan taken 1 month after the surgery showed no recurrence of the hernia (Fig. 3). The 3-month postoperative follow-up also ruled out recurrence.

Discussion

SIES for the treatment of an incisional flank hernia was successfully completed and neither recurrence nor complication has been observed in the short postoperative course.

The results of SIES for incisonal hernia are similar to those of standard laparoscopic

surgery using IPOM [6,7]. Compared to conventional open surgery, laparoscopic procedures offer benefits such as fewer complications along with a shorter hospital stay and surgical time [2,3]. However, the disadvantage of a laparoscopic procedure is that it is prone to induce an enterotomy more often than open surgery, which may lead to lethal results. Thus, it is important to perform SIES even for incisional hernias.

Laparoscopic surgery is also effective for flank hernias [8]. CT or MRI is used for the diagnosis[9], because it is important to identify the anatomical structure of the flank [1,10]. Although laparoscopic surgery for lumbar hernia is usually done in a lateral position [8], this case was performed in a supine position because the flank hernia was located anterior to the triangle of Petit [1,11]. In the IPOM procedure, it is important to fix the mesh properly, which also applies to an incisional ventral hernia.

Especially in SIES for a lumbar hernia, the covering space of the posterior side of the rim is usually narrow because the colon is often physically adherent. Covering space and graft fixation to the posterior side are critical points in lumbar hernia surgery. Fortunately, the presented hernia was located on the anterior side.

SIES is less invasive than conventional laparoscopic surgery. Although usually 2–3 trocars are necessary for laparoscopic surgery, SIES can be performed with a single incision through which all trocars are inserted. Single incision surgery provides patients with cosmetic benefits. Although a trocar site incisional hernia may develop during laparoscopic surgery [12], SIES has only one incisoin and then adequate suturing of the incision can reduce its incidence.

Unlike conventional laparoscopic surgery, SIES has some challenging aspects. Trocars in an incision may collide with each other during surgery. Therefore, Roticulator Endograsp™, Roticulator Endodissect™, and Roticulator Endo Minishears™ (5mm; Covidien) are used in SIES to create ideal instrument angles. We conducted SIES training in our dry-lab for laparoscopic surgery.

We have several treatment schemes for satisfactory hernia repair. Because the abdominal cavity has limited space, handling of a large mesh can be difficult. Therefore the mesh was rolled so that it was fixed at the rim of the hernial defect, and then the mesh was unrolled. Next, the mesh was fixed with tacks around the defect. The mesh should be fixed to the fascia with tacks before being pushed to the abdominal wall to prevent dislocation from the mesh.

Although this is a preliminary report, the SIES approach may become an option for lumbar hernia treatment. SIES offers safe and effective outcomes equivalent to those of laparoscopic surgery. Furthermore, SIES is less invasive than conventional laparoscopic surgery and has a cosmetic benefit.

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Figure Legends

Figure 1. Abdominal CT scan shows a lumbar hernia on the left flank. The hernia included the middle part of the sigmoid colon and overrode the left iliac crest.

Figure 2. Intra-abdominal findings during surgery: a, adhesiolysis of the hernial sac; b, fixation of a composite mesh to the hernial rim.

Figure 3. Abdominal CT scan one month after surgery showing no evidence of recurrence (arrow) or fluid collection in the cavity of the hernial sac.