

Case Report

Single-incision Laparoscopic Incisional Hernia Repair : How We Do It

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ABSTRACT

Few reports of single-incision laparoscopic surgery (SILS) for incisional hernia repair (IHR) have been published. We report our technique of SILS-IHR in a patient with hernia that developed from an upper-midline incisional scar. The patient was a 78-year-old man who had undergone distal gastrectomy for a duodenal ulcer 40 years earlier. To repair the hernia, a 2.5-cm minilaparotomy was made in the left lower quadrant of the abdomen to place a SILS™ Port with three 5-mm trocars as a single access site. A flexible 5-mm laparoscope and an articulating grasper were used in addition to standard laparoscopic instruments. After adhesiolysis around the hernia orifice, a composite mesh was directly introduced into the abdominal cavity through the laparotomy site and then fixed with tackers and transfascial sutures. The SILS-IHR was successfully performed without complications. The operation time was 90 minutes, and blood loss was minimal. The patient resumed oral intake of food on postoperative day 1 and was discharged uneventfully on postoperative day 5. Postoperative follow-up at 6 months did not reveal recurrence or complications, and the incision was inconspicuous. In conclusion, SILS was safely used for IHR in the present case. However, the indications and limitations of SILS-IHR should be investigated. (Jikeikai Med J 2013 ; 60 : 9-13)

Key words : incisional hernia, single-incision laparoscopic surgery, ventral hernia, single-access surgery, mesh repair

INTRODUCTION

Over the past decade laparoscopic ventral hernia repair has become a standard approach for repairing many types of ventral and incisional hernias. Such an approach has been shown to be as safe and at least as effective as open hernia repair but is generally associated with fewer complications and a lower rate of recurrence¹. However, the current trend is to further reduce the invasiveness of minimally invasive procedures with natural orifice transluminal endoscopic surgery and single-incision laparoscopic surgery (SILS). Indeed, SILS has rapidly been introduced for a variety of procedures and has attracted a great deal of atten-

tion²⁻⁶. However, the use of SILS for incisional hernia repair (IHR) remains challenging, and few reports have been published to date⁷⁻⁹.

In this report, we describe our technique for performing SILS-IHR with the SILS™ Port (Covidien, Inc., Norwalk, CT, USA), an articulating grasper, and a flexible laparoscope.

CASE PRESENTATION

A 78-year-old man (body-mass index : 17.1 kg/m²) was found to have a hernia incarcerated in an upper-midline incision 40 years after he had undergone distal gastrectomy

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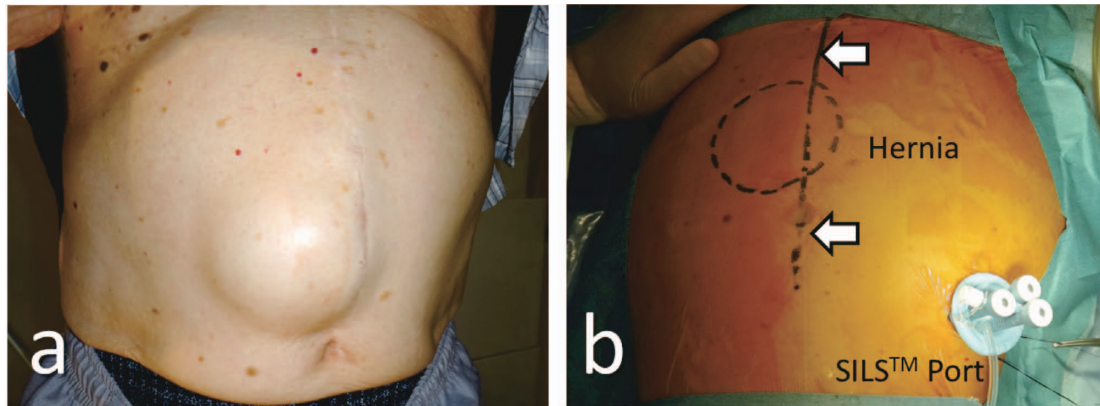


Fig. 1. An incarcerated incisional hernia is recognized in an upper midline incision that was made for distal gastrectomy 40 years earlier (a). A SILS™ Port is placed in the left lower quadrant. The previous incision is indicated by arrows (b).

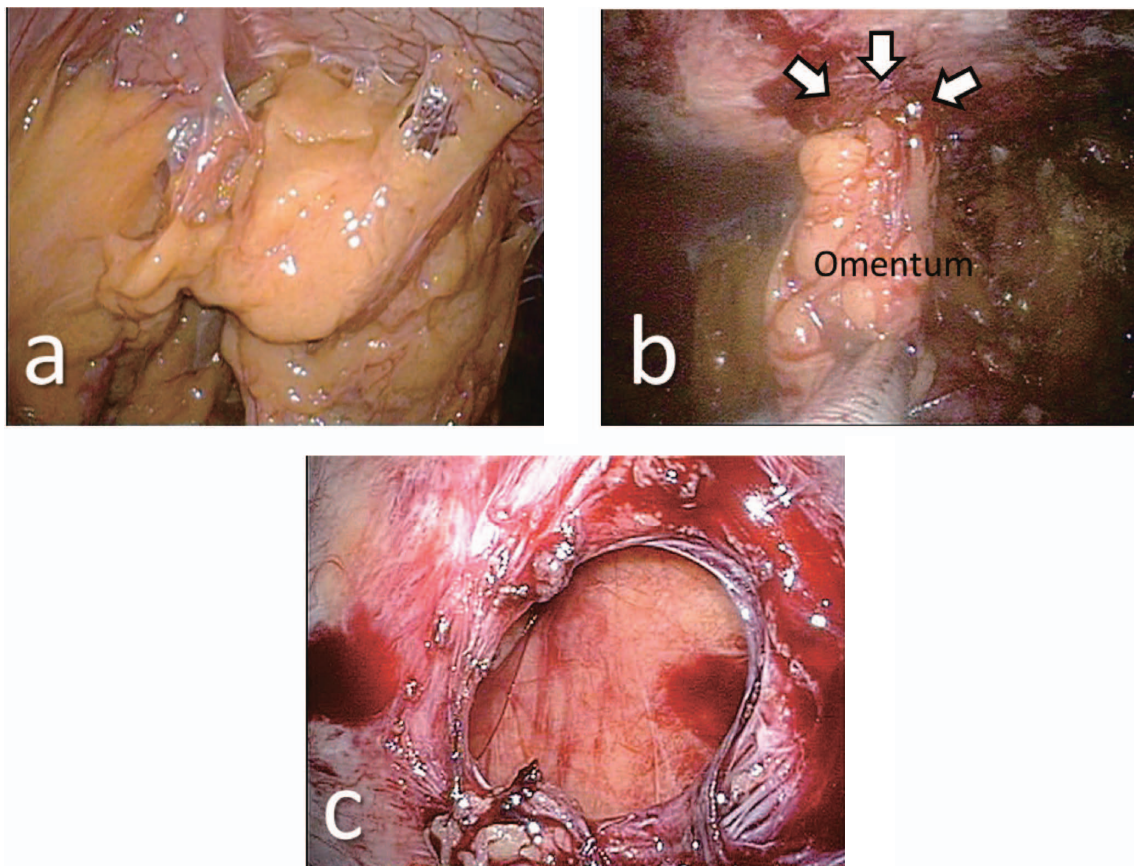


Fig. 2. Dense adhesion of the omentum to the hernia orifice is recognized (a). The incarcerated omentum is pulled into the abdominal cavity from the hernia orifice (arrows, b). The hernia orifice with a clear edge, measuring 2.5×2.5 cm in diameter, is well exposed (c).

for a duodenal ulcer (Fig. 1a). The patient had first noticed protrusion of the painless incisional hernia 6 months before consulting us.

Preoperative blood examination did not show any ab-

normality. Preoperative computed tomography showed incarceration of the omentum in the midline incision. Under the diagnosis of chronically incarcerated incisional hernia, SILS-IHR was performed. Before the operation, the pa-

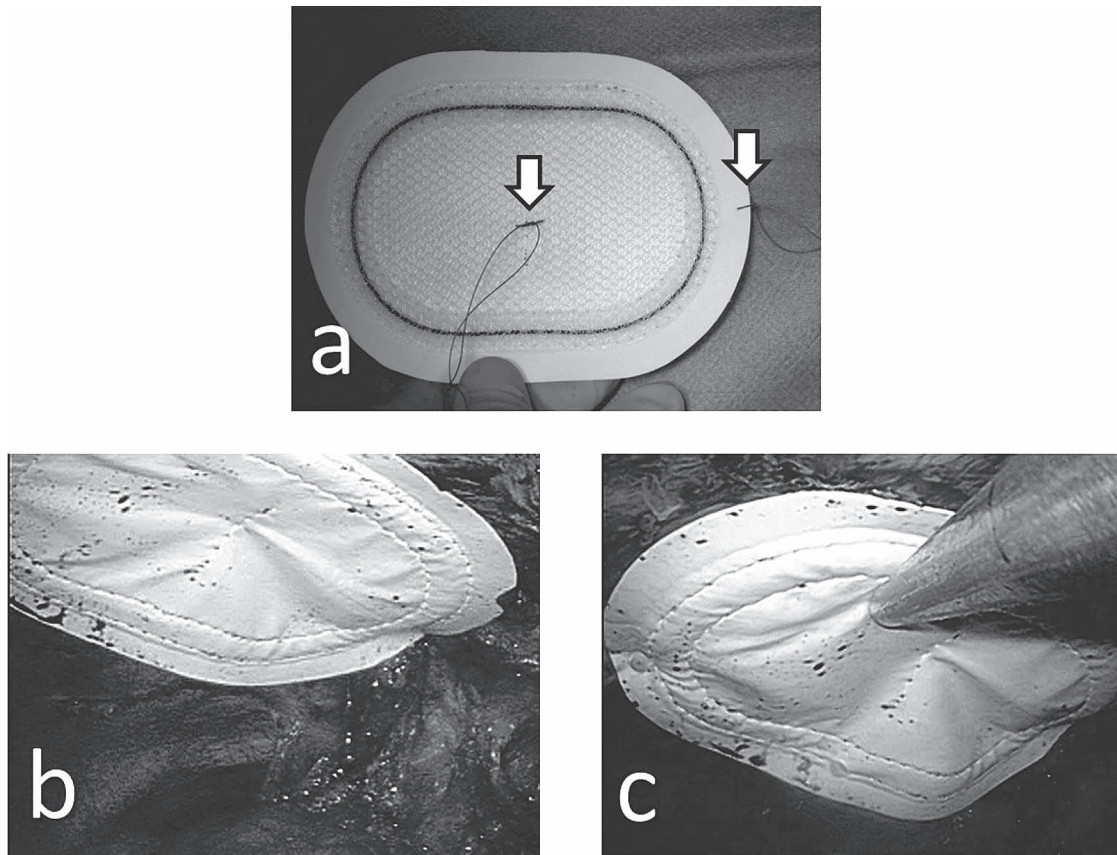


Fig. 3. In advance, 2 stay sutures (arrows), at the center and the edge, are placed in the patch (a). By pulling the stay sutures, the patch is fixed in the appropriate position covering the hernia orifice with sufficient margins (b). The edge of the patch is circumferentially fixed to the abdominal wall with tackers (c).

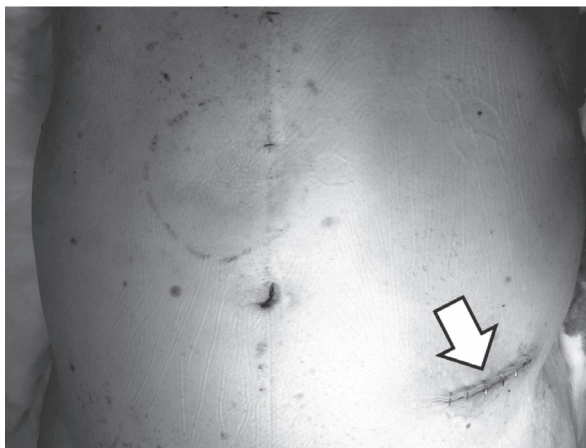


Fig. 4. The postoperative wound is inconspicuous (arrow).

tient was informed about the details of the surgical procedures, including the possibility of conversion from SILS-IHR to standard laparoscopic IHR with multiple trocars or open IHR, and informed consents were obtained.

SURGICAL TECHNIQUE

The patient was placed in the supine position. With the patient under general anesthesia, an approximately 2.5-cm minilaparotomy was made in the left lower quadrant. A SILS™ Port with three 5-mm trocars was then placed through the minilaparotomy site as a single access site (Fig. 1b). Under pneumoperitoneum with a maximum pressure of 10 mm Hg CO₂, a flexible 5-mm laparoscope (Olympus LTF Type VH, Olympus Surgical, Orangeburg, NY, USA) and an articulating grasper (Roticulator™ Endo Grasp™, Covidien, Inc.) were used in addition to standard laparoscopic instruments. Once the laparoscope, grasper, and dissector had been positioned, the overall procedures were similar to those for standard laparoscopic IHR with multiple trocars. The dense adhesions of the omentum and the small intestine at the hernia orifice were dissected with a laparoscopic coagulating shears (Fig. 2a). Then, the

incarcerated omentum was pulled out from the hernia into the abdominal cavity using graspers while the abdominal wall was pushed down from outside by a surgeon's hand (Fig. 2b). The hernia orifice, measuring 2.5×2.5 cm in diameter, was well exposed (Fig. 2c). As indicated in Figure 3a, 2 stay sutures (3-0 Vicryl, Ethicon, Inc., Somerville, NJ, USA) were placed in the center and edge of the anterior flap of a 4.3×5.5 -inch oval polypropylene mesh patch (Ventrio™ Hernia Patch, Bard, Davol, Inc., Warwick, RI, USA). The SILS™ Port was temporarily removed, and the patch was directly inserted into the abdominal cavity through the wound. Because of its memory recoil ring, the patch self-expanded and was easy to handle. After the SILS™ Port was reset, the 2 stay sutures were extracted with a suture passer through the stab wounds placed in appropriate sites of the abdominal wall. The suture at the center of the patch was extracted through the center of the orifice. By pulling the stay sutures from outside the abdominal wall, the patch was fixed in the appropriate position covering the hernia orifice with sufficient margins (Fig. 3b). Then, a tackler (PermaFix Permanent Fixation System, Bard, Davol, Inc.) was used to circumferentially fix the edge of the patch to the abdominal wall (Fig. 3c). The application of pressure to the external abdominal wall enables the tackler and the internal abdominal wall to be in contact at 90° in every position, ensuring that the mesh is properly secured. The 2 stay sutures were subcutaneously tied as transfixing sutures. The access site was closed layer to layer without drains.

The SILS-IHR was successfully performed without intraoperative or postoperative complications. The operation time was 90 minutes, and the blood loss was minimal (unmeasurable). The patient began oral intake of food on postoperative day 1 and was discharged uneventfully on postoperative day 5. Follow-up examination 6 months after surgery did not reveal recurrence or complications, including surgical site infection, and the incision was inconspicuous (Fig. 4).

DISCUSSION

Along with offering the benefits of minimally invasive surgery, such as decreased postoperative pain, short length of stay, and quick return to the activities of daily life, laparoscopic repair has operative advantages. In laparoscopic

IHR, visualization is enhanced, providing a complete view of the entire defect and ensuring tacking of the mesh to healthy tissue. In traditional laparoscopic IHR, as many as 5 trocar sites are placed. These trocar sites create new points of laxity in the abdominal wall and the potential for additional hernia formation¹⁰.

An alternative technique to traditional laparoscopic repair is SIL-IHR. In addition to having the benefits of laparoscopic surgery, the fewer incisions in SIL-IHR may prevent additional port site hernias by decreasing the number of fascial defects. Moreover, the single larger defect may allow more adequate closure of the abdominal wall¹⁰. From the educational point of view, because the technique of SILS-IHR is simple and easy to learn, it is a good introduction to SILS and good practice for it. The other benefits are likely only minor and include slightly improved cosmesis and, possibly, decreased pain⁸.

Because no mortality or major complications were reported in previous studies of SILS-IHR, the technique is considered both safe and feasible⁸⁻¹⁰. Also, clinical variables, such as operative time, length of hospital stay, and estimated blood loss, were acceptable, and did not differ significantly from those with traditional laparoscopic IHR^{9,10}. On the other hand, SILS-IHR has very few disadvantages compared with traditional laparoscopic repair. Cost should be approximately the same or even less, depending on what trocars are used⁸.

Our technique is similar to that used by Sánchez López, et al.⁷ but differs in several significant ways. Instead of a 10-mm laparoscope and standard laparoscopic graspers, we used a 5-mm flexible scope and an articulating grasper, which provides better triangulation in the operative field. To avoid possible intra-abdominal adhesion due to the previous operation, we chose a far-lateral access site in the left lower quadrant which contributed to the inconspicuousness of the postoperative wound. Whereas Podolsky, et al.¹⁰ fixed the mesh to the abdominal wall with only tackers, we also placed 2 transfascial sutures. We believe that the transfascial sutures prevent mesh migration and, thus, contribute to a lower recurrence rate. Like Podolsky, et al., however, we have performed SILS-IHR for a limited number of patients with small hernias; therefore, we require further experience to clarify the efficacy of this procedure.

In conclusion, SILS can be safely used for IHR in se-

lected patients. However, the short follow-up period and the small number of patients do not allow us to make any conclusions regarding long-term results or the rate of recurrence. In addition, we can make no judgment about any benefit of SILS-IHR over multiport procedures regarding decreased pain, improved recovery, or faster return to work. Furthermore, the indications and limitations of SILS-IHR should be investigated.

Authors have no conflict of interest.

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