

## Laparoscopic abdominal hernia repair with SILS® port – our first experiences

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### Abstract

*Laparoscopic abdominal hernia repair has recently become an accepted surgical method. Nevertheless, it faces limitations of mesh properties and hernia size as much as anatomical conditions inside the abdominal cavity. The presented clinical experiment was undertaken to assess the usefulness of a single silicon SILS® port for laparoscopic repair of abdominal hernia. A fifty-six year old patient was operated on for recurrent umbilical hernia after Mayo repair. A SILS® port was placed in the anterior axillary line at the level of the umbilicus. The port was introduced through a 2 cm skin and fascia incision. Layers of the wall were sectioned approximately 3 cm apart. The round hepatic ligament was mobilized at proximity to the umbilicus to obtain 5 cm margins. A Parietex Composite® (10 × 15 cm) implant was fixed with 2 transabdominal sutures and Double Crown stapling technique. Application of the SILS® port in laparoscopic abdominal hernia repair is a valuable alternative to IPOM access. Such a procedure is technically viable and theoretically can increase safety and the number of operated patients.*

**Key words:** ventral hernia, laparoscopy, SILS®.

### Introduction

In recent years, laparoscopic abdominal hernia repair has become an accepted surgical method. So far numerous randomized trials prove this method of treatment to be more effective than the transabdominal, open-access method, especially for small and middle-sized hernias [1-5]. The method, however, faces restrictions due to physical properties of the mesh, size of the hernia and intra-abdominal conditions resulting from previous surgical procedures (which actually caused abdominal hernia) [6]. In large abdominal hernias patients expect single-stage abdominoplasty, and application of laparoscopy may be limited by the size of the mesh if the ring of the hernia is extensive [7]. Intraperitoneal adhesions can make introduction of trocars impossible. Theoretically, placement of the trocars in

close proximity needs only selection and preparation of a very narrow adhesion-free area. The clinical trial described below was to assess the usefulness of a single incision laparoscopy (SILS) port for laparoscopic treatment of abdominal hernias from the lateral access to the abdominal cavity. SILS technique had earlier been applied for cholecystectomy, TEP inguinal hernia repair and other abdominal surgeries [8, 9].

### Case report

Recurrent umbilical hernia repair procedure in a 56-year old male patient was reviewed. A SILS® port (Covidien Inc.) was placed in the anterior axillary line at the level of the umbilicus. The port was placed through a 2 cm skin and fascia incision. Layers of the abdominal wall were cut approximately 3 cm

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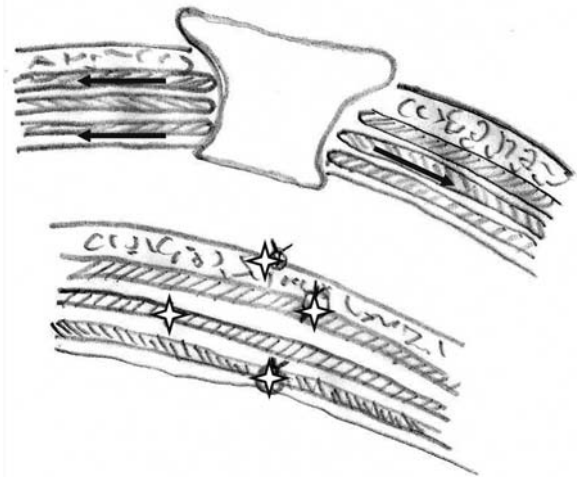
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apart (Figure 1). Following dissection of some adhesions, the ligamentum teres of the liver was freed close to the umbilicus to provide a 5 cm space margin for mesh implantation. Parietex Composite® (10 × 15 cm, Covidien Inc.) was mounted with 5 cm margins and 2 transabdominal PDS (2-0) sutures (Ethicon Inc.) that fixed the long axis of the mesh and Double Crown stapling technique (Protac® staplers, Covidien Inc.). After removal of the port the peritoneum and external fascia were closed with absorbable suture (Polysorb 2-0). The skin was adapted with intradermal absorbable suture (Vicryl Rapid 4-0, Ethicon Inc.).

The procedure lasted 46 minutes. Neither intraoperative complications nor intra-abdominal bleeding were noted. SILS® port placement allowed for easy manoeuvres with the tools, including the stapler (change of the axis of the tool was not possible). Laparoscopic scissors were used, also without change of the axis, which had no impact on operative technique. Manoeuvring and unfolding the mesh and placement of transabdominal sutures could be done without restraint or conflict of working tools with the camera. Slightly larger 2 cm incision of the abdominal wall layers allowed for easy and safe access to the peritoneum and visualization of each layer while closing the wound. What is more, shifting the incisions on the port placement resulted in additional strength of the incision line, when the layers returned to their normal position after port removal. In the authors' opinion, this practice may decrease the risk of incisional hernias. Standard analgesia was used in the post-operative period (according to PROSPECT group guidelines, [www.postoppain.org](http://www.postoppain.org)). Midazolam in 1 g dose was administered every 8 hours. The patient was discharged 18 hours following surgery with no complaints of postoperative pain.

## Discussion

In recent years, reconstructive laparoscopic procedures for abdominal hernias have been gaining more and more interest due to significant improvement of life quality and shortening of postoperative convalescence [3, 4, 7]. Smaller operative wound and limited abdominal wall preparation limit the rate of surgical site infection. In clinical case series rare cases of wound infection were reported. In randomized trials however, this number is even lower and amounts to 2.5% in



**Figure 1.** SILS® port placed in anterior axillary line after retraction of muscle layers (direction of muscle retraction shown with arrows). Bottom: location of sutures of each layer (pointed with stars) after repositioning of the muscles

laparoscopic and 7% in open procedures [1, 4, 5]. The surgical access we describe allows for shortening of the surgery duration. Similarly, hospitalization time following laparoscopy is shorter than after the open procedure. This was confirmed in published randomized trials, with hospitalization after open surgery being 2-5 times longer [2, 3, 7]. This is not only due to smaller operative wound – neither wound nor abdominal cavity drainage is needed [2, 3, 8].

Single incision for the SILS® port seems to be another step towards minimization of operative access – and we believe at the moment that it is the limit of minimization, as a mesh (which is too big) cannot be pulled through and a stapler (there are no flexible ones) cannot be used with the NOTES technique. The procedure described above has brought some benefits of SILS® port application. A larger incision (2 cm) allows accurate visualization of each layer of the abdominal wall on mini-laparotomy and a view of the peritoneal cavity before the port is placed. Thorough wound closure with visual control, safe laparotomy and insertion of the port even in intraperitoneal adhesions are advantages of the method. Besides, incision of each layer made in a different plane can additionally

protect against incisional hernia, as the slits are away from one another after muscle retraction to their original position. This complication, reported in numerous studies, is an important issue of the IPOM technique [9-12]. Positioning of the camera and the tools in the same axis can be useful in dissecting the adhesions, when another trocar cannot be introduced with video guidance. This advantage in the near future may expand indications for laparoscopic hernioplasty in patients who so far could not have benefited from this technique due to extensive intra-abdominal adhesions.

The procedure we performed had no influence on duration of surgery, which was comparable to other reports [2, 3]. Nor was the patient's hospital stay prolonged. No complications attributable to port implantation were seen during the follow-up, which confirms similarity with classical laparoscopic IPOM method.

## Conclusions

Application of the SILS® port in laparoscopic repair of abdominal hernia is a valuable alternative to IPOM access used until now. Such a procedure is possible from the technical point of view and theoretically increases safety of the surgery and increases the potential population of operated patients.

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