

Case Report

Single incision laparoscopic surgery repair of a linea alba hernia

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Abstract

A 55-year-old female presented with a subcutaneous mass in the upper midline. Computed tomography scan showed adipose tissue and the falciform ligament in the upper abdominal midline suggesting a linea alba hernia. Surgical repair was undertaken for progressive symptoms using single-incision laparoscopic surgery (SILS). A 2.5cm incision was made at the umbilicus and EZ access™ (HAKKO, Tokyo) placed. Two 5mm ports were inserted and a wrap protector attached. We inserted a 2mm port and forceps to assist. Adipose tissue and the round ligament of the liver were incarcerated in the abdominal wall hernia. They were reduced and we found a linea alba hernia defect measuring 2cm, which was repaired with mesh. We used a tip flexion type tacker and fixed the mesh using the double crown technique. SILS assist with 2mm forceps repair of a linea alba hernia is safe and effective with a good cosmetic outcome.

(Keywords : case report, Linea alba hernia, laparoscopy, single-incision laparoscopic surgery)

Introduction

Linea alba hernias are usually small protrusions in the linea alba between the umbilicus and xiphoid cartilage. This form of hernia is reported to represent 3.6% of all hernias in Europe and the United States, but it is relatively rare in Japan¹⁾, and is usually repaired using open surgery techniques. We report repair of a linea alba hernia using the single-incision laparoscopic surgery (SILS) technique.

Case Presentation

A 55-year-old female with no significant past medical history was aware of an epigastric swelling about 15 years prior to presentation. She presented with increased epigastric discomfort and swelling over the past year. Height, weight, and body mass index (BMI) were 153cm, 50kg and 21.4kg/m². Physical examination showed an elastic soft bulge about 2cm in the epigastrium without tenderness. Laboratory tests were normal. Computed tomography scan of the abdomen showed adipose tissue and the falciform ligament herniated in the upper midline. We diagnosed a

linea alba hernia (Figure 1). Surgical repair was selected because the patient reported increasing symptoms. We elected to perform single-incision laparoscopic surgery to repair this hernia.

Surgery was performed under general anesthesia in the supine position. A 2.5cm vertical umbilical incision

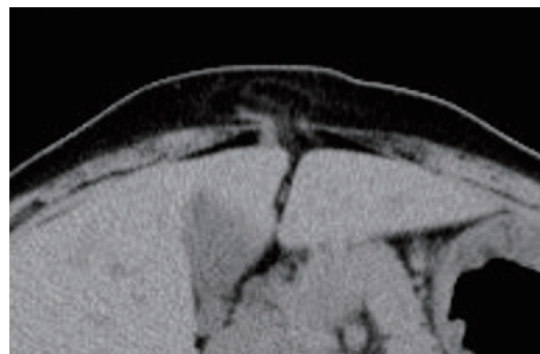


Figure 1 Computed tomography scan shows herniation of adipose tissue and the round ligament through the linea alba in the upper midline.

was made and dilated horizontally. EZ access™ (HAKKO, Tokyo) device and two 5mm ports were inserted and a wrap protector attached. A 2mm port and forceps were inserted in the left lateral abdomen. Carbon dioxide insufflation was maintained between 8 and 12 mmHg. On entering the abdominal cavity with the laparoscope, adipose tissue and the round ligament were incarcerated in the abdominal wall through a hernia in the linea alba (Figure 2a). After transection of the falciform ligament, the adipose tissue was reduced. The hernia orifice was about 2cm in diameter, and that area marked externally. A 3cm margin around the edges of the hernia was then marked externally, and the mesh prepared (Symbotex™ Composite Mesh (Covidien) was trimmed to 8.0 x 8.5 cm). A 23G needle was inserted at the site and we confirmed the hernia orifice was sufficiently covered by mesh. A suture was placed in the center of the mesh and the mesh inserted into the abdominal cavity and lifted to the hernia orifice using a Nylon suture (Figure 2b). Fixation of the mesh was completed with resorbable tacks using double crown technology (Relia Tack™ (Covidien)) which is a tip flexion tacking device (Figure 2c). The mesh was fashioned so that the defect was overlapped on all sides by 3cm. The falciform ligament was similarly tacked to the abdominal wall. We confirmed that the hernia orifice was covered adequately. The operation time was 164 minutes, with minimal blood loss. The patient made an uneventful recovery and was discharged on postoperative day 5. On the 14th postoperative day, the patient was seen in the outpatient clinic and is doing well with an excellent cosmetic result (Figure 3).

Discussion

Glenn et al. reported that linea alba hernias represent 3.6% of all hernias in Europe and the United States, but it is relatively rare in Japan, and less than 100 cases have been reported since Kumagaya et al. reported in 1923¹⁾. However post-mortem studies show a higher incidence than is observed in the general population. Therefore, it is difficult to determine the true incidence of this condition²⁾.

The etiology of linea alba hernias is probably multifactorial and may include (1) a congenitally weak portion of the linea alba (2) increased intra-abdominal pressure due to obesity, pregnancy or ascites, (3) pre-peritoneal fat tissue causing a defect in the linea alba (4) anatomical variants of the abdominal wall musculature (5) vascular lacunae in the linea alba of the abdominal wall and (6) trauma.²⁾³⁾ The present patient is not obese and did not have a history of trauma. Based on the intraoperative findings, a lipoma in the pre-peritoneal space may have been a factor in the development of this linea alba hernia.

These hernias contain pre-peritoneal fat, omentum and small intestine in 30.6%, colon in 11.8% stomach in 7.1%, and the falciform ligament in 2.4%⁴⁾. Multiple hernia orifices are

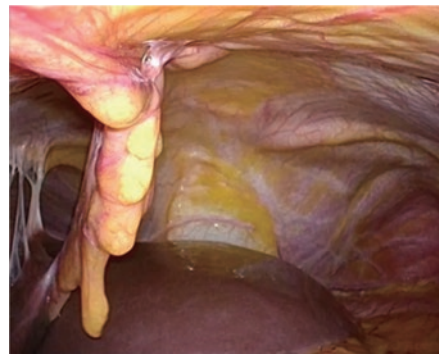


Figure 2a The round ligament was herniated into the abdominal wall at laparoscopy.

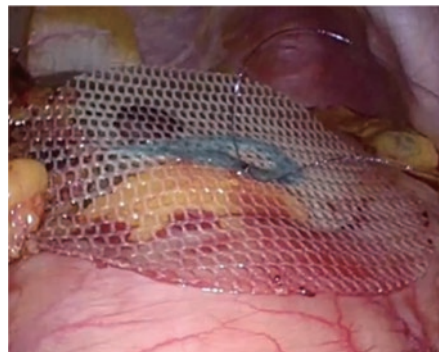


Figure 2b A support suture was put in the center of the trimmed mesh and inserted into the abdominal cavity.

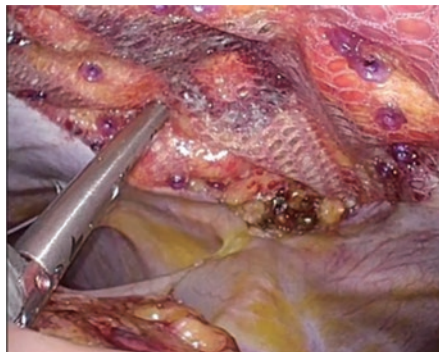


Figure 2c The mesh was fixed around its circumference with a tacking device.



Figure 3 The wound healed well without complications (14th postoperative day)

reported in about 20% of linea alba hernias⁵⁾. This patient's hernia contained pre-peritoneal fat and part of the falciform ligament with a single hernia orifice based on intraoperative findings.

MaCaughan et al. recommend that surgical repair be performed if the hernia is larger than 15mm, but Mori et al. suggested that early surgery is preferable because 27.7% of cases present with incarceration⁶⁾. Linea alba hernias are potentially multiple so they should usually be repaired with mesh. The surgical technique can be laparoscopic or open repair. Laparoscopic surgery is reported to be very effective for abdominal hernias⁷⁾. Advantages of laparoscopic hernia repair using a single-incision include : (1) the incision is trans-umbilical and is concealed with excellent cosmesis, it is less invasive with less resulting pain (2) the hernia contents can be observed directly through the laparoscope during the procedure while lysing adhesions and (3) multiple hernias in the linea alba can be identified during the surgery without another incision and can be treated at the same time⁸⁾. We performed surgery because this patient reported progressive symptoms and wished to have a better cosmetic result. The mesh should be placed so that it exceeds the size of the defect in all directions by 3cm. Fixation of the mesh to the abdominal wall is performed by tacking it to 1cm of fascia around the circumference so that intra-abdominal contents cannot get inside the mesh⁹⁾. The technique used here is described as the double crown technique. Mesh fixation is performed during SILS using a tip flexion type tacker which can be used over a wide distance with insertion through only one port. It may be better to place the SILS port in the lateral or lower abdomen because it is difficult to properly position the mesh when the hernia orifice is near the umbilicus. Placing the 2mm port on the right side to facilitate use of an energy device may facilitate the operation.

There are reports of laparoscopic repair for linea alba hernia⁷⁾⁸⁾⁹⁾, but there is no report of repair by SILS in this country yet. The hernia in this patient was repaired by SILS using a tip flexion type tacker and 2mm forceps. SILS repair with a 2mm forceps of a linea alba hernia is safe and effective with a good cosmetic outcome.

Declaration of interest : The authors have no conflicts of interest to declare.

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白線ヘルニアに対する単孔式ヘルニア修復術を施行した1例

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要 約

症例は55歳、女性。上腹部正中の腫瘤を主訴に当科を受診した。腹部CT検査にて上腹部正中に腹腔内から連続する脂肪組織と肝円索の腹膜前腔への逸脱を認め、白線ヘルニアと診断した。有症状の白線ヘルニアに対して単孔式腹腔鏡下手術(SILS)にて手術をする方針とした。臍に2本の5mmポートを留置したEZアクセス™(八光)を用いてラッププロテクターに装着後、右側より2mmポートを留置し手術を施行した。上腹部正中に肝円索と脂肪組織が嵌頓していた。嵌頓したヘルニア内容を引き出し、2cmのヘルニア門を同定した。ヘルニア門はmeshを使用し、先端屈曲型のタッカーを使用し、double crown法で固定した。SILSでも先端屈曲式のタッカーと2mm鉗子を用いることで、整容性にも優れ、安全で確実な白線ヘルニア修復術が可能であった。

(キーワード：症例報告, 白線ヘルニア, 腹腔鏡, 単孔式腹腔鏡手術)