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Laparoscopic repair of poststernotomy subxiphoid epigastric hernia

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Abstract
Background: The repair of a subxyphoid hernia is a difficult procedure that nonetheless results in a high rate of recurrence. The laparoscopic approach is a promising new technique for more efficacious treatment of this condition. This is the first report in the English-language literature to describe the use of this approach for the correction of poststernotomy subxiphoideal hernia.
Methods: Information was retrieved from the patients' hospitalization and outpatient clinic files. Of 984 patients who had a median sternotomy, 10 developed a substernal subxiphoid epigastric hernia. These patients had all been treated laparoscopically using Gore-Tex mesh.
Results: Nine patients were admitted electively and one urgently. The fascial defect sizes were 4–15 cm (mean, 8.5) in length. Intraabdominal content was adherent to the hernia in six patients; in the other four cases, the defect was adhesion free. In four patients, an incidental surgical procedure was performed (three cholecystectomies and one inguinal hernia repair using the trans abdominal preperitoneal [TAPP] technique). The operations lasted 25–120 min (average, 55). No death occurred as a result of the operations, and none of the operations was converted to an open procedure. Three patients had minor postoperative complications. During 20–42 months of follow-up, one patient suffered a recurrence.
Conclusions: Laparoscopic repair of a poststernotomy subxiphoideal epigastric hernia is feasible and has a low rate of minor complications. Our review of the literature indicates that this technique produces a better outcome than the conventional open repair.

Key words: Laparoscopy hernia — Incisional hernia — Subxiphoid hernia — sternotomy

Incisional hernia is a common complication of abdominal operations, affecting 10–26% of patients [4, 5, 6]. The longitudinal sternotomy incision, which extends to the epigastric region, weakens the upper abdominal wall, leading to the possibility of a hernia in 4% of patients [2, 3].

The repair of these hernias is frequently complicated and requires a lengthy operating time. Incisional hernia repairs often result in recurrence of the abdominal defect, which is sometimes even larger than the original one. To address this problem, the laparoscopic repair of incisional hernias has been gaining in popularity [2]. This method has been used routinely in our department for these repairs for the last 4 years.

Herein we report our experience with the laparoscopic repair of poststernotomy epigastric hernia. To the best of our knowledge, this is the first report of the use of this technique for poststernotomy subxiphoid hernia in the English-language literature.

Patients and methods

Patients

Information was retrieved retrospectively from patients' hospitalization and outpatient clinic files. Between January 1996 and December 1998, 984 patients had undergone a sternotomy in the Cardiothoracic Department of the Edith Wolfson Medical Center. In that period, 10 patients (1%) were identified as suffering from a hernia at the lower end of the chest incision that extended to the upper abdominal wall. All patients were referred to the surgical department and were examined by us in person.

The patients ranged in age from 51 to 86 years (mean, 67). They weighed 67–98 kg and had an average body mass index (BMI) of 28. All patients suffered from chronic ischemic heart disease. Five had hypertension, three cholelithiasis, two chronic renal failure, two a cerebrovascular accident, one congestive heart failure, one benign prostatic hypertrophy, one inguinal hernia, one peptic ulcer, one Parkinson's disease, and one atrial fibrillation. Postoperatively, all patients were followed for a period of 20–42 months (mean, 29.4).

Surgical technique

All patients were given a single dose of 1 g of cefonicid monocef IV preoperatively. The operation was performed under general anesthesia.

With the aid of a Veress needle, the peritoneal cavity was insufflated to 15 mmHg, and three trocars were inserted: one 10-mm infraumbilically and

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two (10- and 5-mm) in the left anterior axillary line. Either a 30° or a 45° laparoscope was used.

In the first stage of the operation, all of the adhesions were lysed from the defect and 5 cm around it, leaving the peritoneal sac intact. The preparation of the mesh included two 2/0 Vicryl stitches; one at each caudal corner of the mesh and one in loop form in the middle cephalad part of the mesh. The mesh was introduced into the peritoneal cavity via the 10-mm hole previously created for the laparoscope. Once the mesh was spread inside the abdominal cavity, it was hooked by an endoclose needle with the two caudal threads and by an endoclinch for the cephalad thread. The mesh was then fixed by 5-mm endoscopic tackers (Origin Tacker™ System (Origin Mede systems, Menlo Park, CA, USA)). In cases where extensive dissection was done during the adhesiolysis, a drain was left in the abdominal cavity and then removed after 24 h.

Results

Between January 1996 and December 1998, 984 patients underwent a median sternotomy at our hospital for coronary artery bypass graft [CABG]. Ten patients (1%) had a repair of an incisional hernia using a novel laparoscopic technique. Nine of them (90%) were admitted electively and one (10%) urgently due to repeated incarcerations.

The mean defect diameter was 8.5 cm (range, 4–15). The defect was free of adhesions in four patients; four had omental adhesions, and in two others the small bowel was adherent to the defect. In three patients with cholelithiasis, the gallbladder was removed; in one patient with an inguinal hernia, the defect was repaired with a Prolene mesh using the trans abdominal preperitoneal [TAPP] technique. Average operating time was 55 min (range, 25–120).

Minor postoperative complications developed in three patients. One patient had an elevated temperature (37.5–38.0°C) that lasted 7 days and returned to normal spontaneously; no specific was identified etiology. In the second patient, who was known to suffer from benign prostatic hypertrophy, a Foley catheter was inserted for 48 h to treat urinary retention. That same patient had a seroma over the repair (between the mesh and the peritoneum) that was evacuated uneventfully. The third patient had small bowel obstruction that was successfully treated laparoscopically.

Mean hospital stay was 3.3 days (range, 1–8). For postoperative pain control, the patients received two to seven doses of diclofenac (Voltaren). During 20–42 months of follow-up, one patient had a recurrence but he refused reoperation since he was asymptomatic.

Discussion

Even for the most experienced surgeons, the repair of an incisional hernia is a difficult challenge. The recurrence rate for incisional hernia is >20% [1] and may even reach 80% where the primary repair of a subxiphoideal epigastric hernia is done with sutures [3]. In our department, the laparoscopic repair of incisional hernia has been done routinely since 1996 [1].

Although Gore-Tex mesh (W.L. Gore & Associates, Flagstaff, AZ, USA) is the most expensive kind, we prefer it over the other type. Gore-Tex mesh is relatively inert and adheres less to the tissue. Since the mesh is positioned intraperitoneally, in laparoscopic procedures, this characteristic gives it a very important advantage. Our previous (unpublished) experience has shown that the use of Prolene mesh in the intraperitoneal position causes severe adhesions; in several cases, it also led to bowel fistula. So, thus, despite the additional expense, we believe that the use of Gore-Tex mesh is justified in terms of the avoidance of long-term complications.

Due to the special anatomic structure of the subxyphoideal region (the sternum and the ribs superior, the diaphragm posterior, and the high intraabdominal pressure with the sheering forces of the musculature in the upper abdomen), it is even harder to create a successful repair of a hernia defect in this area. Poststernotomy subxyphoid hernia is a rare complication of cardiac operations, accounting for ≤4% of all median sternotomies. In our series, the incidence was 1% of total sternotomies. The open repair for this type of hernia does not offer an optimal solution because the postoperative hospital stay is long and the recurrence rate is high [7]. With our method of repair, which is based on the well-known laparoscopic technique, the postoperative stay is shorter, the need for pain control is minimal, and the long-term results are highly promising.

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