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ORIGINAL ARTICLE

Laparoscopic incisional hernia repair: Long term results

E. Abet[a,*,c], E. Duchalais[b,c], F. Denimal[a,c], B. de Kerviler[a,c], M.-H. Jean[a,c], A.-G. Brau-Weber[a,c], M. Comy[a,c], Groupe d'étude et de recherche en chirurgie coelioscopique de l'Ouest (GRECCO, Western laparoscopic study, research group)[c]

[a] *Chirurgie digestive, centre hospitalier départemental de Vendée, 85000 La Roche-sur-Yon, France*
[b] *Clinique de chirurgie digestive et endocrinienne, institut des maladies de l'appareil digestif, CHU de Nantes—Hôtel Dieu, 44000 Nantes, France*
[c] *Chirurgie générale et digestive, Cité Sanitaire, 44600 Saint-Nazaire, France*

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KEYWORDS
Incisional hernia;
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Long term outcome

Summary
Objective: The aim of this prospective monocenter study was to evaluate the long-term results of laparoscopic treatment of incisional hernias using intra-peritoneal prosthetic mesh.
Patients and methods: Seventy-seven patients underwent laparoscopic treatment of incisional hernia between January 2002 and January 2008. All patients were followed for at least five years after surgery. The parameters assessed were hernia recurrences and post-operative pain. In case of doubt as to the diagnosis of recurrence or pain, a CT examination was performed.
Results: Nine patients were excluded: four patients refused to participate in the study and five died of unrelated disease during follow-up. Sixty-eight patients (89.7%) were followed for a mean of 92.3 (± 19.8) months. Mean age of patients was 58 (± 11.3) years. There were no deaths and no conversions. The mean operative time was 104 (± 48) minutes. The morbidity rate was 13.2%. Major complications included one case each of mesh infection, post-operative peritonitis (bowel injury), and surgical site pain requiring revisional surgery. Five patients developed seroma. The mean duration of hospitalization was 4.5 (± 2.3) days. The long-term recurrence rate was 8.8%. The average interval to onset of recurrence was 45.8 (± 31.1) months. Trocar site hernias were observed in three patients. Four patients had post-operative pain requiring long-term medical treatment.
Conclusion: Laparoscopic incisional hernia repair using intra-peritoneal prosthetic mesh is a safe technique with satisfactory long-term outcome. One major complication occurred: bowel injury. Suture closure of 10 mm trocar sites should be routine.

* Corresponding author.
E-mail address: emeric.abet@chd-vendee.fr (E. Abet).

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Introduction

Abdominal incisional hernia is a common complication after laparotomy. Its incidence ranges from 2 to 20% [1]. Every subsequent laparotomy carries the risk of further weakening the abdominal wall and consequently to lead to recurrence. Traditionally, incision hernia repair was performed via the incision itself and entailed a simple rhaphy of the fascial margins. In recent years, prosthetic repair was shown to be superior to herniorraphy [2] and now laparoscopy has taken some of the limelight.

Laparoscopic hernia repair is not widely used in France but could present advantages in the overweight patient [3]. While the short-term advantages of this approach have been highlighted, few studies have looked at long-term outcome.

The goal of our monocenter study was to report the long-term outcome of a multicenter study initiated in 2002 (GRECCO) of laparoscopic intra-peritoneal prosthetic incisional hernia repair.

Patients and methods

This study ran from January 2002 to January 2008. Inclusion criteria were:

- absence of antecedent surgical repair for incisional hernia;
- uni- or multi-orifice incisional hernia;
- elective surgery;
- anterolateral ventral incisional hernia.

All procedures were performed by four senior surgeons.

Incisional hernia were characterized by the largest diameter (in mm) of the defect, while the prosthesis was characterized by the smallest diameter(in mm).

Patients were asked to return to their surgeon for follow-up examinations at 6 weeks, 6 months, one, and two years after surgery. Most patients were evaluated at more than five years from surgery. A non-contrast enhanced CT was performed whenever a doubt existed as to clinical recurrence (Fig. 1). Patients who were unable to come to the clinic for follow-up were contacted by telephone.

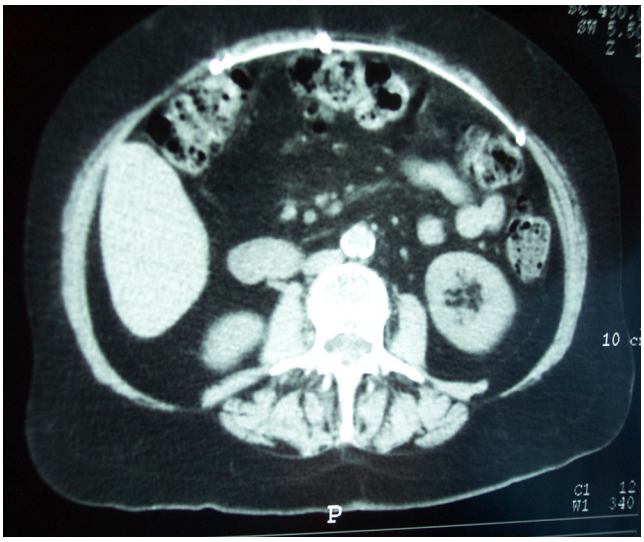

Figure 1. CT image of intra-peritoneal prosthesis.

Operative technique

The technical recommendations were to:

- measure the diameter of the incisional hernia neck;
- tailor the size the prosthesis to overlap the defect by at least 30 mm on all sides;
- use a bi-surface prosthesis with expanded polytetrafluoroethylene (ePTFE) (GoreTex®) on the deep surface;
- interpose the omentum between the prosthesis and the small intestines whenever possible.

All operations were performed using a 10 mm diameter 0° optical scope. The prosthesis was introduced through one of the 10 mm trocars or in a protective bag introduced through the trocar opening. The prosthesis was positioned intra-peritoneally, and fixed by a double corona of staples.

Resection of the hernia sac and closure of 10 mm trocar orifices were not mandatory, but were left to the discretion of the surgeon.

One of the operators fixed the prosthesis by four guy wires at each of the four cardinal points, followed by placement of a double corona of staples.

Antibiotic prophylaxis was routinely administered at the time of anesthesia induction.

Statistical analysis

Microsoft® Excel was used for all analyses. Quantitative data were expressed as means with standard deviations.

Results

Seventy-seven consecutive patients underwent laparoscopic prosthetic mesh incisional hernia repair during the inclusion period. Two different prostheses were used: Composix® from Bard® and Dualmesh® from Gore®. For both meshes, the anti-adherence surface material was ePTFE. Nine patients were not analyzed: four patients refused to participate and five patients died during follow-up. The cause of death was metastatic colonic cancer, cholangitis secondary to a pancreatic head tumor, B-cell lymphoma in two patients, while one cause remained unknown at six years after follow-up. Mean follow-up for the 68 remaining patients was 92.3 ($\pm$ 19.8) months. Twenty-five men and forty-three women composed the population: mean age was 58 ($\pm$ 11.3) years. The mean body mass index (BMI) was 29.3 ($\pm$ 4.5) kg/m^2. The follow-up rate was 89.7%. Clinical follow-up of eleven patients did not extend beyond two years after operation and these patients were contacted by telephone. No deaths related to the procedure were recorded in our study.

The conversion rate was 0%. In 48 patients (i.e. 70.6%), the hernial orifice was unique. Twenty patients with multiple orifices had at least one sub-clinical pocket that was only detected intra-operatively. The mean size of the hernia defect was 60.9 $\pm$ 30.7 mm. The mean size of the prosthesis was 147.2 $\pm$ 35.7 mm. Twenty-two patients had supra-umbilical hernias, 18 infra-umbilical, 16 peri-umbilical and 11 had lateral hernias (right subcostal, right transverse or trocar site hernia). Forty-three patients had guy-wire fixation in addition to the double corona of staples. The mean operative time was 104 ($\pm$ 48) min while the mean duration of hospital stay was 4.5 ($\pm$ 2.3) days.

Post-operative morbidity was 13.2%. Immediate minor complications occurred in four patients who had