International Journal of Surgery 19 (2015) 121–127

Contents lists available at ScienceDirect

International Journal of Surgery

journal homepage: www.journal-surgery.net

Original research

Is laparoscopic treatment of incisional and recurrent hernias associated with an increased risk for complications?

Rüdiger Meyer [a, *], Anna Häge [a], Markus Zimmermann [a], Hans-Peter Bruch [a], Tobias Keck [a], Martin Hoffmann [a, 1], Erik Schlöricke [b, 1]

[a] Department of Surgery, University Hospital Schleswig-Holstein, Campus Lübeck, Ratzeburger Allee 160, D-23538 Lübeck, Germany
[b] Department of General, Visceral, Thoracic and Vascular Surgery, Westküstenklinikum Heide, Esmarchstraße 50, D-25746 Heide, Germany

HIGHLIGHTS

- Complication and recurrence rates in patients undergoing IPOM due to primary, recurrent or incisional hernia were assessed.
- The rate of minor and major complications was significantly higher in patients with recurrent and incisional hernia.
- The recurrence rate was significantly higher in the group of patients with recurrent and incisional hernia.
- A high level of expertise is needed in surgical treatment of complex incisional and recurrent hernias.

ARTICLE INFO

Article history:
Received 24 March 2015
Received in revised form
22 April 2015
Accepted 21 May 2015
Available online 30 May 2015

Keywords:
Ventral hernia
Laparoscopic repair
IPOM
Complications
Hernia recurrence

ABSTRACT

Introduction: Hernias of the ventral abdominal wall can be treated with an intraperitoneal onlay mesh (IPOM). The aim of this cohort study was to analyze the complications and recurrence rates after laparoscopic ventral hernia repair focusing especially on incisional and recurrent hernias.
Methods: The study population comprised 149 patients with a hernia of the abdominal wall, which was treated with an IPOM between January 2006 and January 2011.
Results: Fifty-one patients had a primary hernia (group I) and 98 patients had preceding abdominal surgery (group II). In group II 64 patients had an incisional hernia and 34 patients had a recurrent hernia. The median body mass index was 30.3 kg/m^2 (14.8-69.1) without any significance in sub-group comparison. The mean duration of surgery and the length of stay were significantly longer in group II ($p < 0.05$). The overall rate of minor complications was 18.1%. There were significantly more minor complications in group II (7.8% vs. 23.5%, $p = 0.02$). Notably, there were also significantly more major complications in group II (14.3% vs. 2.0%; $p = 0.02$). The recurrence rate was significantly higher in group II (group I: 3.9% vs. group II: 16.3%, $p < 0.05$). There were no early recurrences in group I, but 5 early recurrences in group II.
Conclusion: Laparoscopic treatment of complex hernias as incisional hernias, recurrent hernias and hernias with interenteric and enteroperitoneal adhesions is associated with high rates of minor and major complications. A high level of expertise of the surgeon and the camera-guiding assistant is therefore needed.

1. Introduction

Ventral hernias including primary defects of the abdominal wall as well as incisional hernias are among the most common surgical problems. About 303,300 ventral hernias are treated in hospitals in the German Federal Republic per year [1]. A number of techniques are currently available for ventral hernia repair, but considerable disagreement remains as to which of these is the best. There are several open ventral hernia repair techniques with implantation of

Abbreviations: BMI, body mass index; CA, cancer; CHD, coronary heart disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; IEHS, International Endohernia Society; IPOM, intraperitoneal onlay mesh.

* Corresponding author.
E-mail address: ruediger.meyer@uksh.de (R. Meyer).

[1] These authors contributed equally.

http://dx.doi.org/10.1016/j.ijsu.2015.05.046
1743-9191/

a mesh in various positions with regard to the layers of the abdominal wall [2]. In 1993, LeBlanc first described a laparoscopic technique of ventral hernia repair using an intra-peritoneal onlay mesh (IPOM) [3]. In comparison to the open ventral hernia repair, the laparoscopic technique was shown to be associated with fewer wound complications, a shorter hospital stay and similar recurrence rates [4,5]. Recently, laparoscopic ventral hernia repair has been shown to be associated with a decrease in quality of life in the early postoperative period. However, there were no differences in the quality of life in comparison to open ventral hernia repair six and 12 months postoperatively [6].

As a result of improved technical devices and the increase in surgical expertise, the laparoscopic IPOM technique for the repair of ventral hernia has become increasingly popular since it was first described. The aim of this study was to analyze the complication and recurrence rates after laparoscopic ventral hernia repair focusing especially on incisional and recurrent hernias.

2. Methods

2.1. Patients and statistics

Between January 2006 and January 2011, 149 patients with a hernia of the abdominal wall underwent laparoscopic ventral hernia repair with the intraperitoneal onlay mesh (IPOM) technique at the Department of Surgery, University Hospital Schleswig-Holstein, Campus Lübeck. A prospective database was compiled after obtaining informed consent from the patients, based on which a retrospective analysis was carried out.

The overall patient cohort was divided into two groups. The first group comprised 51 patients with a primary hernia. The second group included those patients who had a hernia of the abdominal wall following a previous, unrelated abdominal operation. For statistical analysis the second group was split into two sub-groups, one comprising the patients with a recurrent hernia (34 patients) and the other including those patients with an incisional hernia (64 patients). Detailed clinical characteristics and biographical data are given in Table 1.

The database included patient characteristics such as demographics, the body mass index (BMI), primary diseases, the diameter of the hernia, operative data as well as the postoperative course and complications. Major complications were defined as all complications requiring invasive treatment (e.g. drainage or operative revision). The primary outcome parameter of the study was the rate of postoperative minor and major complications in the short (≤14 days postoperative) and long term (>14 days postoperative).

For follow-up, each patient included in the study was sent a questionnaire by post, which a total of 76 patients filled in and returned for analysis. For patients who didn't answer the questionnaire, their family physician was contacted. At the time of the survey three patients had died (primary hernia 1 patient, incisional hernia 2 patients), 5 patients had moved to an unknown address and therefore could not be contacted (primary hernia 1 patient, recurrent hernia 3 patients, incisional hernia 1 patient), and no information was available for 15 patients (primary hernia 7 patients, recurrent hernia 3 patients and incisional hernia 5 patients). The median time of follow-up was 881 days (134 - 2036 days) without any statistically significant difference between the sub-groups (primary hernia 872 days (134 – 1562), recurrent hernia 942 days (399 – 1693), incisional hernia 891 days (183 – 2036)).

Statistical analysis of the data was performed using SPSS Version 16.0.2 (SPSS Inc., Chicago, IL, USA). Continuous variables were expressed as median and range or in percentage of the number of patients treated in total. To determine the significance of the relationships between variables the Chi-Square test, Fisher Exact Probability test or Mann-Whitney U-test was performed as appropriate. A p-value of less than 0.05 was considered significant.

2.2. Standard of the surgical technique

The operations were performed by three surgical consultants according to the following standard, which was implemented at our department:

2.2.1. Patient position

The patient was positioned supine with the upper extremities positioned next to the thorax. Shoulder supports were used to ensure most divergent angles of positioning of the patient.

2.2.2. Access

A mini-laparotomy was the primary access with a minimal distance to the lateral hernia orifice of 7–8 cm. Especially in case of incisional hernia, for example on patients who underwent median laparotomy, the incision was made 1 cm sub-costal in the left anterior axillary line. After positioning of the optical trocar (10 mm), two additional trocars (5 mm) were inserted. Their position was individually chosen depending on the limits of the hernia and the intra-abdominal adhesions.

Table 1
Baseline characteristics.

Variable	Total (n = 149)	Group I	Group II	
		Primary hernia (n = 51)	With preliminary surgery (n = 98)	
			Incisional hernia (n = 64)	Recurrent hernia (n = 34)
Age (years; median, range)	63 (29–88)	55.7 (29–82)	66.3 (30–85)	62.9 (32–88)
Male sex (%)	55.7 (83)	50.9 (26)	60.9 (39)	52.9 (18)
BMI (m^2/kg; median, range)	30.3 (14.8–69.1)	30.2 (14.8–59.8)	29.2 (22.9–51.4)	33.1 (22.5–69.1)
Comorbidities				
COPD (%)	11.3 (17)	7.8 (4)	9.4 (6)	20.6 (7)
CHD (%)	18.1 (27)	13.7 (7)	21.9 (14)	17.6 (6)
DM type II (%)	18.1 (27)	25.5 (13)	17.2 (11)	8.8 (3)
CA of the abdomen (%)	22.8 (34)	3.9 (2)	35.9 (23)	26.5 (9)
CA of other primary (%)	7.4 (11)	7.8 (4)	7.8 (5)	5.9 (2)
Diameter of fascia defect				
Group I < 2 cm (%)	21.3 (32)	43.1 (22)	7.8 (5)	14.7 (5)
Group II > 2–5 cm (%)	36.7 (55)	37.3 (19)	37.5 (24)	35.3 (12)
Group III > 5 cm (%)	41.6 (62)	19.6 (10)	54.5 (35)	50.0 (17)