



Case Series

Laparoscopic Repair of Ventral and other hernias of the abdominal wall with Composite meshes (Ventralight ST with Echo PS System and Physiomesh): Our case series of 101 patients and the literature



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ABSTRACT

INTRODUCTION: A meta-analysis of studies has shown that the incidence of ventral hernias varies from 4 to 10%. During the last twenty years, the use of laparoscopic repair of ventral and other hernias of the abdominal wall has rapidly increased.

PRESENTATION OF CASES: From January 2011 to March 2020 101 patients underwent laparoscopic ventral hernia repair (LVHR).

The diameter of the hernial defect intraoperatively was in average 6.22 ± 5.17 cm (SD) (range 2–30 cm). The difference with the defect diameter measured in CT is small (average 0.77 ± 2.21 cm). The mean operative time was 96.20 min. We used Physiomesh and Secure strap in 37 cases and Ventralight ST plus Sorbafix in 58 cases. The conversion rate was 6.93%. The mean hospital stay was 6.03 days. The 30-day mortality was 0%. The overall morbidity was 11.88%.

DISCUSSION: LVHR indications are debated. The IEHS guidelines and the EAES/EHS Consensus conference of 2015 discussed the main indications, contraindications, and features of laparoscopic techniques. Laparoscopic approach seemed to have some benefits: absence of intraparietal dissection, of postoperative immobilization, lower risk of bronchopulmonary complications and lesser abdominal pain. We compared our case series with other similar studies, and we revealed our short-term outcomes are in line with literature.

CONCLUSION: Our case series revealed that the LVHR with Ventralight ST/Sorbafix is a safe and effective technique with low postoperative morbidity and low reoperation rate. Careful patient selection is one of the main methods of choice. Studies with higher level of evidence are needed.

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1. Introduction

A meta-analysis of studies has shown that the incidence of ventral hernias varies from 4 to 10% [1]. Currently, laparoscopic surgical repair of incisional hernias has rapidly increased due to less postoperative pain and hospital stay, lower hernial recurrence rates and surgical wound complications compared to open surgery [2].

We described a case series of 101 patients underwent to LVHR analyzing the features of patients, the 30-day mortality and the overall morbidity.

This paper has been reported in line with the SCARE criteria [3].

2. Presentation of cases

From January 2011 to March 2020 101 patients underwent a LVHR at Division of General Surgery, Presidio Ospedaliero Martini in Turin from three surgeons who had performed at least 50 advances laparoscopic operation. We included patients with abdominal wall defects > 2 cm or < 2 cm if obesity (BMI > 30 kg/m²), ASA I-III and multiple defects.

Patients were selected after a clinical examination and an abdominal ultrasonography to determine the size of parietal

Abbreviations: LVHR, laparoscopic ventral hernia repair; CT, computed tomography; SD, standard deviation; TAP block, transversus abdominis plane block.

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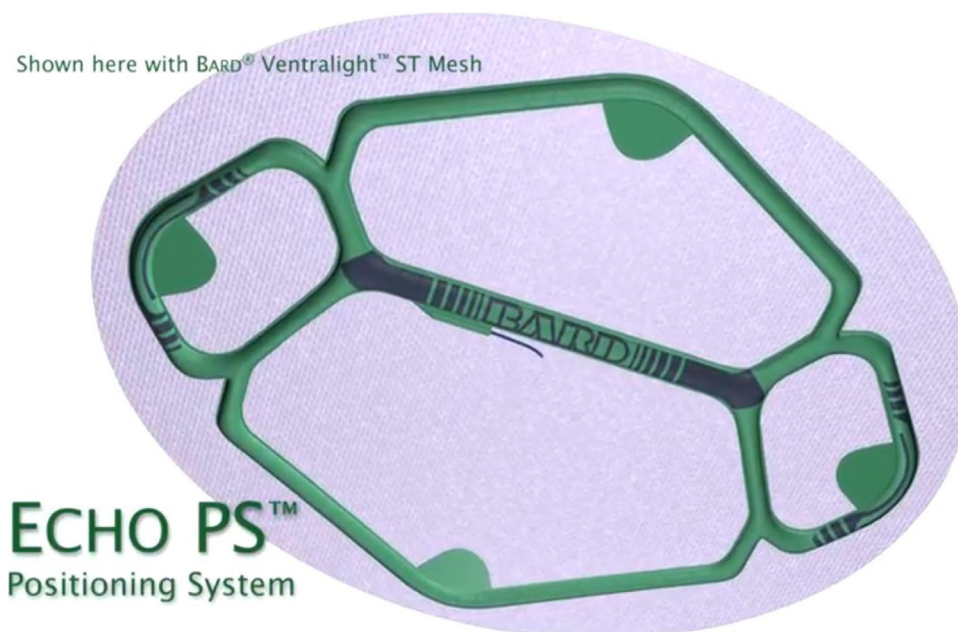


Fig. 1. Ventralight ST mesh con ECO PS system (image extracted from (<https://www.youtube.com/watch?v=fluQ2KV10-s>)).

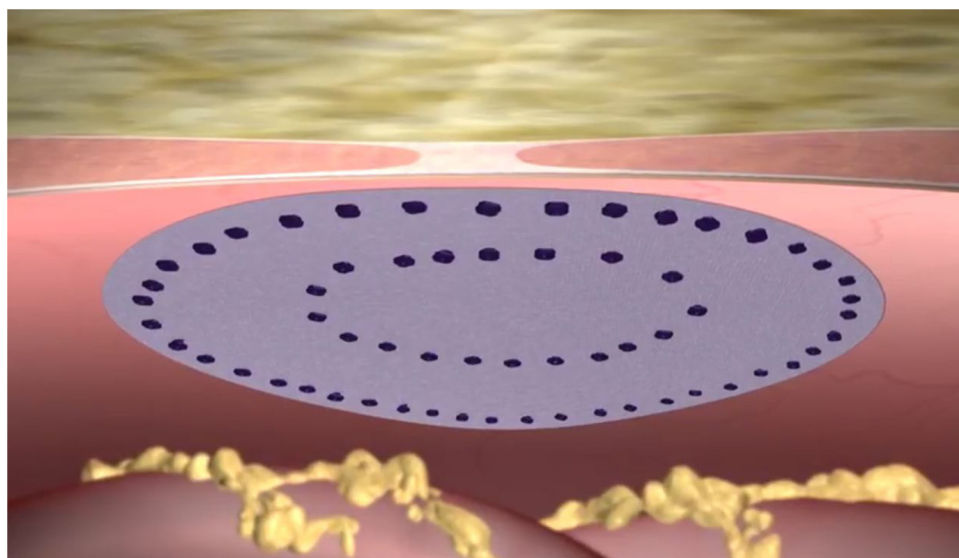


Fig. 2. Ventralight ST mesh complete positioned in ventral hernia with Sorbafix (image extracted from (<https://www.youtube.com/watch?v=fluQ2KV10-s>)).

defects. An abdominal CT without contrast was used routinely in case of obesity and incisional hernias of the borders of abdominal wall.

For induction of pneumoperitoneum at 12 mmHg CO₂, we used Hasson's trocar in left paraumbilical for 30° optical camera and other two work trocars in left hypochondrium and left iliac fossa. Then we performed the reduction of hernia contents and the measurement of the defect sac. We positioned a Ventralight ST mesh (Bard, Warwick, RI, USA) whose size was in according to the size of defect.(overlap of at 4–5 cm) We used the Echo PS system, a low-profile balloon pre-attached to this mesh and, when inflated, facilitates its deployment. Fixation was with Sorbafix in two circumferential circles. Up to April 2016 we used Physiomesh (Ethicon, Somerville, NJ, USA) fixated with Securestrap. Fascial synthesis of trocars accesses of more than 1 cm in diameter (Figs. 1 and 2).

The clinical features of 101 patients are summarized in Table 1 and the types of hernias in Table 2.

We used Physiomesh/Secure strap in 37 patients (36.63%) and Ventralight/Sorbafix in 58 (57.43%). The 30-day mortality was 0%. The complications are summarized in Table 3. The overall morbidity (sum of rates of seromas, hematomas, wound infections, late recurrences, and 30-days reoperations) was 11.88%.

About 30 days reoperations, we had one case of hemoperitoneum undergoing exploratory laparotomy (no sources of bleeding in progress) and one of ileal perforation subjected to resection and anastomosis. Then he developed a septic shock and spent one month in intensive care unit and four with negative pressure wound therapy (discharged on 181 postoperative day).

All seromas, hematomas and wound infections were treated conservatively.

Table 1

Clinical features of 101 laparoscopic ventral hernia repair (AF Atrial Fibrillation; SD, standard deviation; Difference defect size = (Intraoperative defect size – CT defect size)).

Clinical data	Mean value ± SD (range)
Age (years)	60.48 ± 12.06 (41–82)
BMI (kg/m ²)	29.05 ± 4.64 (21.88–42.97)
ASA score	2.14 (1–3)
Diabetes mellitus (%)	15/101 (14.85%)
Cardiopathy	Hypertensive in 43/101 (42.57%), Ischemic in 4/101 (3.96%) e AF in 2/101 (1.98%)
Pneumopathy	15/101 (14.85%)
Intraoperative defect size (cm)	6.22 ± 5.17 (2–30)
CT defect size (cm)	5.73 ± 5.04 (2–30)
Difference defect size (cm)	0.77 ± 2.21 (–1.4 ± 4.3)
Operative time (minutes)	96.20 ± 38.62 (45–210)
Conversion rate	7/101 (6.93%)
Length of hospital stay (days)	6.03 ± 17.71 (2–181)

Table 2

Characteristics of incisional and other hernias.

Type of hernias	Number of cases (%)
Supraumbilical and umbilical incisional hernias	58 (57.42%)
Epigastric hernias	4 (3.96%)
Spiegel hernias	2 (1.98%)
Multiple (double and multi-chambered) hernias	37 (36.63%)
Total	101 (100%)

Table 3

Complications of laparoscopic ventral hernia repair (late recurrences (other than 30 days)).

	Number of cases (%)
30 days reoperations	2/101 (1.98%)
Seroma rate	4/101 (3.96%)
Hematoma rate	2/101 (1.98%)
Wound infection rate	1/101 (0.99%)
Late recurrences	3/101 (2.97%)
Total (overall morbidity)	12/101 (11.88%)

Regarding the recurrences, a case (1 year later) underwent to laparoscopy converted in open surgery and was positioned a polypropylene mesh. Another case (4 years later) had a laparoscopic reoperation with Ventralight ST mesh. The last case (3 years later) underwent reoperation in open surgery for strangled incisional hernia. He died on the first postoperative day for cardiac arrest.

3. Discussion

Laparoscopic hernia repair has recently spread because seemed to have some benefits: absence of intraparietal dissection, of postoperative immobilization, lower risk of bronchopulmonary complications and lesser abdominal pain demonstrated by some retrospective studies comparative with open surgery [4,5].

The indications of LVHR are debated. The IEHS guidelines published in 2013 [6] and the EAES/EHS Consensus conference of 2015 [7] discussed the main indications, contraindications, features of laparoscopic techniques and the postoperative complications. About the indications, for repair of primary defects larger than 2 cm or recurrent hernias of any size, mesh repair should be considered as the first choice [6].

In our series, we observed that recurrences were all with use of Physiomesh/Securestrap and for this and other technical reasons we abandoned this mesh after April 2016. There is a prospective randomized trial stopped early for safety reasons that revealed 20% of recurrences in Physiomesh/Securestrap group in the first

6 months and none in the other group (Ventralight ST/Sorbafix) [8].

About the rate of seromas (3.96%) and of late recurrences (2.97%) in our series, the reported incidence in many systematic reviews varies respectively from 3 to 78%; and from 0 to 20.7% [9,10]. Seromas were always treated conservatively and had almost complete resolution in 90 days after surgery.

Finally, our report discussed a case series of 101 of LVHR with use of Ventralight ST mesh with rates of seroma, surgical site infections and mobility in line with other studies with other Composite meshes [11].

4. Conclusion

This case series revealed that the LVHR with Ventralight ST/Sorbafix is a safe and effective technique with low postoperative morbidity and low reoperation rate in one of the largest case series of literature. Careful patient selection is one of the main methods of choice. Studies with higher level of evidence are needed.

Declaration of Competing Interest

The authors report no declarations of interest.

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None.

Ethical approval

No Ethical approval is needed by this is a retrospective case series analysis of known disease for which treatment was conducted with surgical material already widely adopted by many years and many surgical centers and whose reliability and safety is It has been documented by formal clinical studies.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Dario Bono: Conceptualization, Methodology, Software, Data curation, Writing - Original draft preparation, *Marco Di Ciero, Giovanni Arnone, Francesco Tomaselli and Roberto Saracco*: Writing - Review and editing, Supervision and Project administration.

Registration of research studies

1. Name of the registry: Researchregistry.com.
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