CASE SERIES

Peritoneal sandwich technique: a novel technique in the treatment of large ventral hernias

R. C. A. Arunan, S. Janarthan, A. N. K. Abayajeewa
National Hospital Colombo, Sri Lanka

Keywords: Large ventral hernia; peritoneal sandwich technique

Introduction

Ventral hernias are one of the common problems encountered during surgical clinic visits. They are a nuisance to the patients and a nightmare to the surgeon. Large hernia (incisional) is defined as those with a size defect of 10cm or more [1].

Large ventral hernia repair is more challenging to surgeons when the primary fascial closure cannot be achieved [2]. The peritoneal sandwich technique is an excellent and versatile technique to overcome this problem.

Case series

Here the author describes the surgical technique and the outcome of the peritoneal sandwich technique among six patients who underwent surgery for large ventral herniae over one year. Amongst those six patients, 4 were incisional hernias and 2 were large para-umbilical herniae.

Patients were subjected to a nutritional assessment and weight reduction regime in the preceding 3 months of the surgery. All patients were operated on under general anaesthesia with prophylactic antibiotic cover. The skin incisions were made over the previous scars for the incisional hernial repairs (except for one patient where a transverse incision was made for a previous vertical laparotomy scar). Vertical midline incisions were made for the para-umbilical hernial repairs.

The hernial sacs were dissected carefully and were opened vertically to create right and left peritoneal sac flaps. After careful dissection and reduction of the hernial contents the anterior layer of the right or left rectus sheath was divided close to the margin of the hernial defect along with its corresponding hernial sac. This was used to reconstruct the posterior layer of the rectus sheath. A polypropylene mesh was positioned behind the rectus muscles and placed over the reconstructed posterior rectus sheath. This is a modification of the sub lay technique. To cover the mesh, the anterior layer of the rectus sheath was reconstructed by using the contralateral hernial sac after the division of its corresponding posterior rectus sheath close to the margin of the hernial defect [Figure: 1]. This will lead to a partial bridging situation, where a part of the defect is closed only with the mesh and two layers of peritoneal covers derived from the original sac ("peritoneal sandwich technique"). Once meticulous haemostasis was achieved, two suction drain tubes were inserted into the mesh plane and subcutaneous tissue plane. The skin was closed with clips.

Postoperatively the patients were kept in the ward for 48 hours for observations and intravenous antibiotics. The average days to discharge was 3 and the average days to drain removal was 5. Out of the 6 patients, 3 developed superficial surgical site infections and 1 developed skin necrosis. All of these complications were treated conservatively with antibiotics and wound debridement, without necessitating any major surgical procedures or mesh removal.

Discussion

According to the European Hernia Society, large hernia (incisional) is defined as those with a hernial defect sized 10cm or more [1]. Repair of large ventral hernias is a challenging surgery for the surgeon when primary fascial closure cannot be achieved [2] and for the patient when it is closed under tension it leads to serious complications such as abdominal compartment syndrome, burst abdomen and later recurrence. The peritoneal sandwich technique addresses these problems by bridging the fascial gap, using part of the hernial sac and isolating the mesh from both the intra-peritoneal contents and the subcutaneous tissue. This technique applies to both midline and transverse hernias [2]. The main disadvantage of this technique is a high rate of postoperative wound-related complications of up to 68%, which is mainly due to the formation of large skin and subcutaneous tissue flaps [1]. However, these complications can be treated conservatively, without the need for any major surgical procedures or removal of mesh [1]. The recurrence rate of the peritoneal sandwich technique is almost zero per cent [1].

Correspondence: R. C. A. Arunan
E-mail: arunan006@yahoo.com
https://orcid.org/0000-0002-4296-9990
Received: 08-01-2021 Accepted: 04-03-2022
DOI: http://doi.org/10.4038/sljs.v40i1.8873

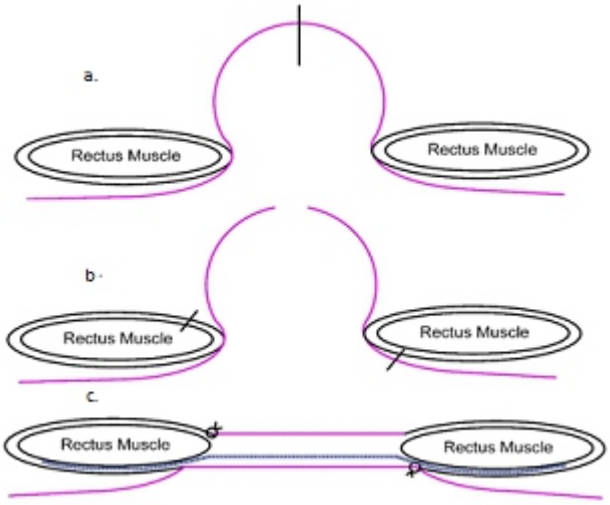

Figure 1. Illustrate the peritoneal sandwich technique. (a) Hernial sac is divided vertically, (b) anterior and posterior rectus sheath is divided close to the margin of the defect, (c) left part of the sac is used to reconstruct the posterior rectus sheath. Sublay poly propylene mesh is placed under the rectus muscles and right part of the sac is used to reconstruct the anterior rectus sheath.

In this case series, four out of six patients (approximately 67%) developed wound-related complications and all were treated conservatively without any major surgical procedures and removal of the mesh. All the wounds healed completely without any complications. During the short period of this study, there was no recurrence noted. Although a larger number of cases and long term observation is essential in future to prove the statistical significance.

Conclusion

The peritoneal sandwich technique is an excellent and versatile novel technique to treat large ventral hernias with very low rates of recurrence. Although this technique has a high rate of wound-related complications, most of them can be managed conservatively without the need for any major surgical interventions or the removal of the mesh.

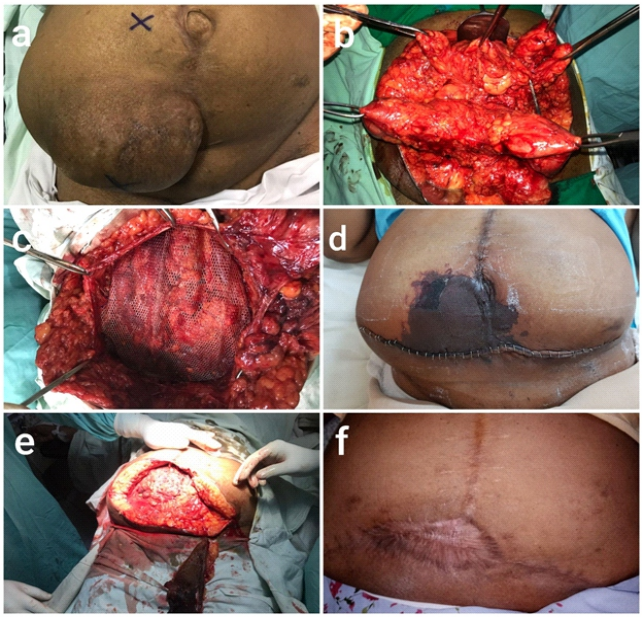

Figure 2. Images of one of the patients in this case series. (a) Large incisional hernia, (b) with multiple hernia sacs, (c) underwent peritoneal sandwich technique with prolene mesh, (d) developed post-operative skin flap necrosis, (f) thorough wound debridement followed by VAC wound dressing applied without the removal of mesh, and (f) complete wound healing was achieved after 6 weeks duration.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

References

1. Köckerling F, Scheuerlein H, Schug-Pass C. Treatment of Large Incisional Hernias in Sandwich Technique - A Review of the Literature. 2021. doi: 10.3389/fsurg.2018.00037
2. Nielsen M, de Beaux A, Tulloh B. Peritoneal Flap Hernioplasty for Reconstruction of Large Ventral Hernias: Long-Term Outcome in 251 Patients. 2021. doi: 10.1007/s00268-019-05011-0
3. Matapurkar B, Gupta A, Agarwal A. A new technique of "Marlex®-peritoneal sandwich" in the repair of large incisional hernias. 2021. doi: 10.1007/BF01665314

Learning Points:

- Large hernia (incisional) is defined as those with a size of defect of 10cm or more.
- The peritoneal sandwich technique is an excellent and versatile technique to repair the large ventral herniae.
- The peritoneal sandwich technique has a low rate of recurrence.
- Even though the peritoneal sandwich technique has relatively a high rate of wound related complications, it can be managed conservatively without necessitating any major surgical procedures or mesh removal.