Case Series

The use of self-gripping mesh with anterior component separation technique in incisional hernia repair: A case series

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A B S T R A C T

INTRODUCTION: Incisional hernia (IH) is a common postoperative complication that affects 10% of the patients who undergo abdominal surgery. The component separation (CS) technique is suitable for large and/or complex hernias; however, CS alone may not eliminate recurrence and is associated with an increased incidence of wound complications. Self-gripping mesh enhances tissue adhesion and contributes to a reduced risk of migration, chronic pain, and other complications. Here, we present three cases of IH that were successfully repaired by anterior CS (ACS) using onlay self-gripping meshes.

CASE PRESENTATION: All three patients underwent surgery using the following technique: Briefly, a skin flap was created with release of the external oblique muscle and preservation of the perforating vessels. The linea alba was closed with absorbable interrupted sutures. A self-gripping mesh was trimmed and placed with a 4–5 cm overlap bilaterally from the closed linea alba using an onlay technique. For all patients, the postoperative courses were uneventful and there were no complications at the 3-month follow-up.

DISCUSSION: The advantages of our technique include more sufficient abdominal reinforcement, technical simplicity, and minimal time required for mesh placement. The disadvantages are the potential risk of decreased blood flow of the skin flaps, wound infection, intestinal fistula, persisting or chronic pain, and difficulty with subsequent abdominal surgery.

CONCLUSION: The use of self-gripping mesh with ACS can be performed without increasing the operative time or causing short-term surgical complications. This technique may be recommended for large IH because of its simplicity and secure abdominal reinforcement provided.

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1. Introduction

Incisional hernia (IH) is a common postoperative complication that leads to a significantly decreased quality of life after abdominal surgery. The incidence of IH is approximately 10% among patients who undergo open laparotomy [1,2].

Surgery is the standard treatment for IH. The available surgical procedures are primary suture, the component separation technique (CS), and open or laparoscopic repair with onlay, sublay, or underlay (inlay) mesh placement. IH often extends from the upper abdomen to the lower abdomen, and CS is suitable for repairing large and/or complex hernias. Furthermore, this procedure can be indicated for IHs with a history of wound infection since it typically does not require mesh placement [3,4].

Despite these advantages, CS alone may not eliminate recurrence and is associated with an increased incidence of wound complications. CS with the periumbilical perforator sparing technique (PUPS) preserves an adequate blood supply to the lipocutaneous flaps, thus decreasing wound complications [4]. However, the reported recurrence rate is somewhat similar to that for CS alone [5].

Consequently, supplemental mesh placement with CS has been considered. However, some of the procedures are complex [6], and the risk of many complications, such as infection, mesh bulging, migration, fistula, and intestinal obstruction due to adhesion, is associated with mesh placement [7,8]. Therefore, an effort should be made to simplify the surgical technique and reduce the incidence of these complications when indicating mesh placement with CS.

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Self-gripping mesh enhances tissue adhesion with minimal suture fixation during surgery and contributes to a reduced risk of migration, chronic pain, and other complications [9]. Hopson et al. recently reported successful surgical treatment for giant ventral hernias using self-gripping mesh with open onlay repair [10]. Thereafter, we supposed that self-gripping mesh can be applied using the anterior component separation technique (ACS) without an increase in mesh-related complications.

Here we present a retrospective, consecutive report of three cases of IH that were successfully repaired by ACS with onlay self-gripping mesh placement. This work has been reported in line with the PROCESS criteria [11]. This study was registered as a case series on the www.researchregistry.com website with the research number of “researchregistry4921”.

2. Case presentation

All three patients underwent ACS under general with epidural anesthesia that was administered, as described previously [4]. Briefly, adhesiolysis was performed and the defect of the IH was completely exposed (Fig. 1). A large skin flap was created with the release of the external oblique muscle. Additional release of the posterior rectus sheath was performed, if necessary, to further reduce the abdominal wall tension. In all cases, we preserved the perforating vessels and avoided excessive separation to prevent low blood flow and skin necrosis (Fig. 2). The linea alba was subsequently closed with absorbable interrupted sutures (1-Vicryl™; Ethicon Inc., Cincinnati, OH, USA) (Fig. 3). We used a macroporous polyester mesh with resorbable polylactic acid microgrids (ProGrip™; Medtronic plc, Dublin, Ireland). This self-gripping feature enhances tissue adhesion and requires minimal suture fixation. Furthermore, it can be easily spread using an onlay mesh technique after closure of the linea alba. These features significantly reduce the operative time for mesh placement. In our cases, the mesh placement was completed within 3 min. The ProGrip™ (30 × 15 cm) was trimmed and placed with a 4–5-cm bilateral overlap from the closed linea alba (Fig. 4). Closed-suction drains were placed on the mesh to prevent formation of seroma and hematoma.

The patients’ characteristics and surgical details are summarized in Table 1. For all patients, the postoperative courses were uneventful and there were no complications or hernia recurrence at the 3-month follow-up.

3. Discussion

In this report, all three cases of IH were successfully repaired by ACS using self-gripping onlay mesh placement. Our surgical
The patients for late postoperative complications and assess their long-term outcomes including hernial recurrence.

4. Conclusion
ACS using self-gripping mesh can be performed without increasing surgical time or short-term surgical complications. This technique may be a recommended option for large IH for its simplicity and secure reinforcement.

Declaration of Competing Interest
All authors declare that there is no conflict of interest.

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Ethical approval
The institutional ethics committee determined that approval was not necessary for this retrospective research work involving less than 9 patients, where the surgical intervention consisted of commercially available materials and standardized techniques (not considered as a 'first-in-man' study).

Consent
Written informed consent was obtained from the patients 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
Study conception and design: Fukuda, Tsujinaka.
Surgical team: Fukuda, Tsujinaka, Maemoto, Takenami.
Patient follow-up: Tsujinaka, Fukuda, Takenami.
Drafting the paper: Tsujinaka, Fukuda, Maemoto, Takenami.
Critical revision of manuscript: Toyama, Rikiyama.
Final approval for submitting the manuscript: Fukuda, Tsujinaka, Maemoto, Takenami, Toyama, Rikiyama.

Registration of research studies
We have registered our case series in “Research Registry” with registration number of “researchregistry4921” on May 29th, 2019.

Guarantor
Shingo Tsujinaka, the corresponding author of this paper.
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CRediT authorship contribution statement

Rintaro Fukuda: Conceptualization, Methodology, Investigation, Writing - original draft. Shingo Tsujinaka: Conceptualization, Methodology, Data curation, Software, Writing - original draft. Ryo Maemoto: Data curation, Resources, Visualization. Tsutomu Take-nami: Data curation, Resources, Visualization. Nobuyuki Toyama: Writing - review & editing. Supervision. Toshiki Rikiyama: Writing - review & editing. Supervision.

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