

# Long-term follow up in two cases of pelvic reconstruction using a combined VRAM flap-sacrocolpopexy for severe perineal hernia after abdominoperineal resection

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## Abstract

Perineal hernia is an infrequent complication of abdominoperineal resection (APR) and, currently, there is no consensus as to the optimal operative technique. Surgical repair can be achieved by either cerclage or the use of mesh or autologous tissue, and it has been reported that the recurrence rate after repair using autologous tissue is 33%. We present two post-APR cases of severe perineal hernia with pelvic organ prolapse (POP) which did not improve after repair using mesh. We regenerated the pelvic floor using a vertical rectus abdominis myocutaneous (VRAM) flap and performed a concomitant sacrocolpopexy to fix the POP. Drooping of the perineum and pelvic floor was greatly improved, and the patients have not experienced any recurrence for 6 years. This dual procedure has not been previously mentioned in the literature, and we consider this the first report of its kind.

**Key words:** abdominoperineal resection, pelvic organ prolapse, sacrocolpopexy, VRAM flap.

## Introduction

The incidence of perineal hernia is reported to be 0.6% after abdominoperineal resection (APR) and 3% after total pelvic resection. It has been reported that the prevalence of the condition is about 7% of cases, including those that are asymptomatic.<sup>1,2</sup> There is currently no consensus as to the optimal operative technique, and surgical repair can be achieved by either cerclage or the use of mesh or autologous tissue.<sup>3</sup> The vertical rectus abdominis myocutaneous (VRAM) flap method, which is performed as a surgical procedure using autologous tissue, was first reported by Mathes and Bostwick<sup>4</sup> as a surgical treatment for perineal hernia. There are advantages and disadvantages to each of the above procedures, and Mjoli et al. reported that repair using autologous tissue was a good indication in the presence of infection or after radiation therapy;

however, the recurrence rate was about 33% in such cases.<sup>1</sup> The two cases presented here are ones in which perineal hernia recurred 1 to 3 months later, even though abdominal mesh surgery was performed for perineal hernia after APR. Since it was considered necessary to reinforce the pelvic floor more strongly, a combined VRAM flap-sacrocolpopexy was performed to support the vagina and bladder. A similar technique has not been previously reported. Over 5 years have passed since the operations, and no perineal hernia, cystocele, or vaginal prolapse has been observed.

## Case Report

Case 1 is a 68-year-old woman with gravida 3/para 0 and a body mass index (BMI) of 22.2 kg/m<sup>2</sup>. Seven months after an APR for rectal cancer stage I, she had

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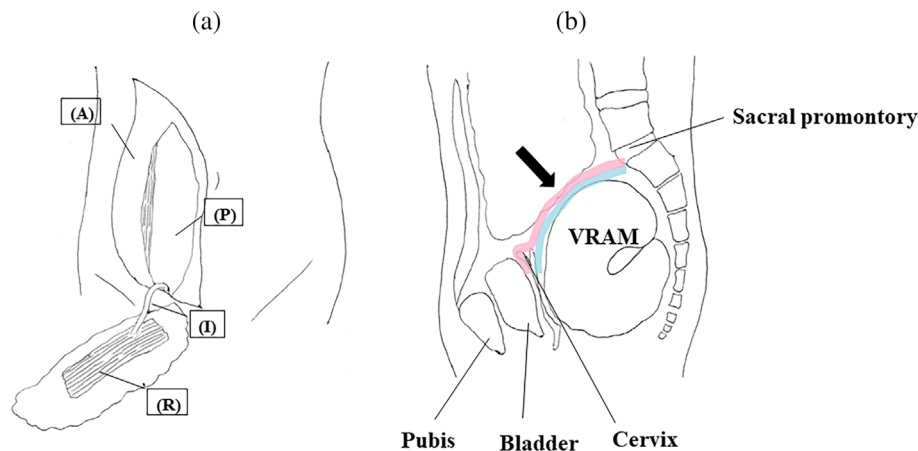
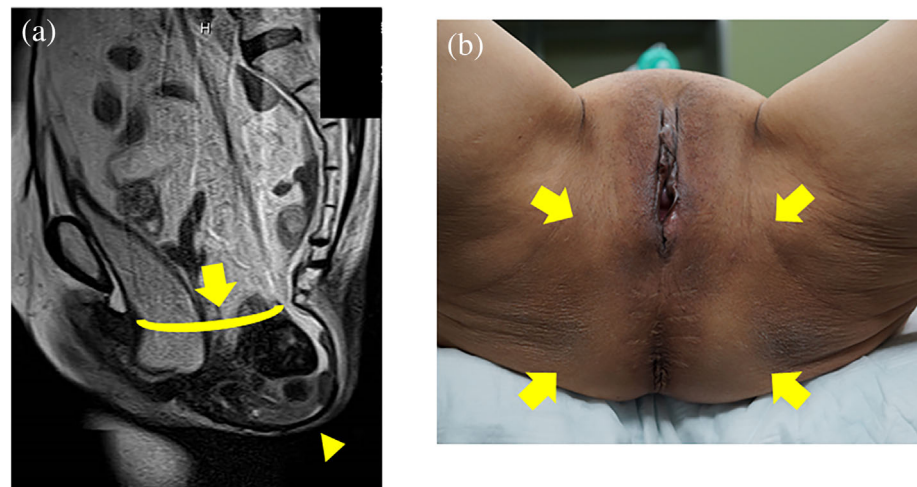
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pain of the perineum, a noticeable bulge, and dysuria. She was diagnosed with perineal hernia and underwent transabdominal repair with a polypropylene and permanently expanded-polytetrafluoroethylene (PTFE) mesh (Bard Composix mesh). However, the patient relapsed 1 month after surgery, and she was referred to our hospital. Figure 1(a) shows the magnetic resonance imaging (MRI) images at the time of visit to our hospital. The pelvic floor bulged from the perineum to the coccyx, and MRI showed the uterus, bladder, and small intestine in the herniated sac (Figure 1(b)). The pelvic floor had thinned substantially, and it was judged

too difficult to sew the pelvic floor muscles. The patient complained of dysuria, and her pelvic organ prolapse quantification (POP-Q) score was Aa:0, Ba:0, C:-2, gh:3, pb:3, tvl:8, Ap:-1, Bp:-2, D:-3 (POP stage II cystocele). Since recurrent cases after mesh surgery require reinforcement of the pelvic floor and repair of the POP stage II cystocele, the surgery in this case employed a VRAM flap to fill the pelvic floor and a sacrocolpopexy to relieve the POP (Figure 2). During the operation, a supracervical hysterectomy was performed transabdominally, and a subsequent right-side VRAM flap was created and guided from the right side of the

**FIGURE 1** MRI images and appearance of perineal hernia in case 1. (a) MRI images. The hernia included the uterus, bladder, Douglas' pouch and small intestine. (arrow) Original pelvic floor, (arrowhead) Drooping and thinned pelvic floor. (b) Appearance of perineal hernia before operation. (arrow) Bulged perineum

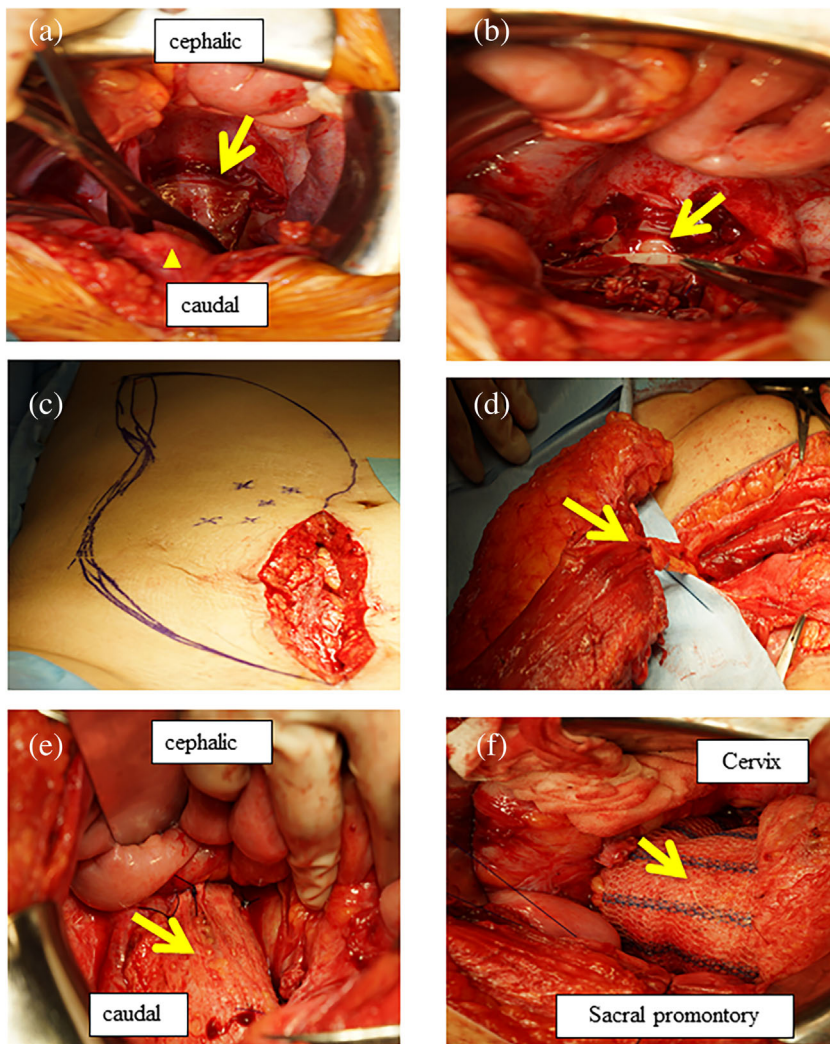


**FIGURE 2** VRAM flap and sacrocolpopexy. (a) VRAM flap. (A) Anterior lamina of the rectus sheath, (P) Posterior lamina of the rectus sheath, (I) Inferior epigastric artery and vein, (R) Rectus abdominis muscle. (b) Sacrocolpopexy. (arrow) Propene mesh sutured to the cervix and anterior and posterior vaginal walls with non-absorbable thread. The mesh is fixed to the anterior longitudinal ligament of the sacral promontory so as to cover the flap

bladder peritoneum to the pelvic floor. A prolene mesh was then used to bridge the anterior longitudinal ligament of the first sacral vertebra and the remaining uterine cervix, including the vaginal stump, on the ventral side of the VRAM flap, therefore raising the vaginal wall and bladder (Figure 3(a)–(f)). The feeling of drooping was alleviated after the operation, and the position of the VRAM flap in the pelvic floor and the resulting bladder elevation were good on postoperative MRI. Operation time was 7 h and 19 min, and the amount of bleeding was 235 mL. The postoperative course showed exudate accumulation on the dorsal side of the buttocks after surgery, but it was removed by fine needle aspiration. Urge incontinence appeared 1 month after surgery, but it was alleviated by drug

administration. Currently, 6 years have passed since the operation, and no recurrence of perineal hernia or POP has since been observed.

Case 2 is an 80-year-old woman with gravida 4/para 2 and a BMI of 27.6 kg/m<sup>2</sup>. Both deliveries were vaginal deliveries. Three months after an APR for rectal cancer stage I, she noticed a bulge in the perineum and dysuria and was diagnosed with perineal hernia. She also underwent transabdominal repair with a polypropylene and permanent expanded-PTFE mesh (Bard Composix mesh). However, she relapsed 3 months after surgery and was referred to our hospital. Similar to case 1, the pelvic floor bulged from the perineum to the coccyx, and MRI showed the uterus, bladder, and small intestine in the herniated sac. The patient's POP-Q score was Aa:1, Ba:2, C:-1, gh:3, pb:2, tvl:8, Ap:-1, Bp:-1, D:-2 (POP stage



**FIGURE 3** Surgical images of case 1. (a) Before supracervical hysterectomy (arrow) Pelvic floor, (arrow-head) Uterus pulled up from the pelvic floor. (b) After supracervical hysterectomy (arrow) Polypropylene and permanent expanded-polytetrafluoroethylene mesh (Bard Composix mesh), supracervical hysterectomy and bilateral salpingo-oophorectomy were performed without removing the mesh, as it adhered tightly to the pelvic floor. (c) VRAM flap was made between the level of the costal arch and pubis. (d) (arrow) Feeding artery (inferior epigastric artery and vein) was separated and conserved with the VRAM flap. (e) The flap was transferred through the inguinal triangle and filled pelvic floor. (arrow) VRAM flap. (f) We bridged the sacrum and the uterine cervix with prolene mesh (GyneMesh) over the flap and suspended the apex of the vagina, including the vaginal wall. (arrow) prolene mesh (GyneMesh)

III cystocele). The surgery employed a VRAM flap to fill the pelvic floor and a sacrocolpopexy as in case 1. Operation time was 9 h and 45 min, and the amount of bleeding was 625 mL. Currently, 5 years have passed since the operation, and no recurrence of perineal hernia or POP has since been observed. We obtained informed consent from each subject after providing detailed information.

## Discussion

Repairs for perineal hernia have been reported to include simple cerclage or the use of mesh or autologous tissue. However, in such cases where the pelvic floor tissue is substantially thinned or damaged and simple cerclage is not possible, or when mesh is not suitable, the use of autologous tissue can be effective. Reconstruction using autologous tissue has been reported for gluteus maximus suturing, retroverted uterus fixation, free femoral myocardial transplantation, and pedunculated rectus abdominis myocutaneous flap.<sup>5</sup> Compared to mesh, autologous tissue can lead to disuse atrophy. However, it does have the advantages of being resistant to infection, having abundant blood circulation, and able to fill dead space. On the other hand, there is a report that the recurrence rate for autologous tissue repair is 33%,<sup>1</sup> and it has been considered that even stronger pelvic floor repair is necessary for cases of recurrence and POP (cystocele stage II and III), as was the case in this study.

Huffman et al. reported vaginal prolapse in perineal hernia after posterior resection, hysterectomy, bilateral salpingo-oophorectomy, pelvic floor transplantation, and artificial anus construction for stage 4A vulvar cancer.<sup>6</sup> According to the report, the perineal hernia was repaired using the VRAM flap method. However, due to the flap's drooping against the vaginal wall, the flap was then fixed to the anterior longitudinal ligament of the sacral promontory, and the drooping was healed after the second reoperation. The report also pointed out that it was necessary to consider the reinforcement of areas that were not filled with any flap or drooping of the flap itself.

Sacrocolpopexy is a surgical procedure that has been performed for POP for more than 60 years and since the report by Arthur et al. in 1957.<sup>7</sup> In recent years, it has become more common due to the proliferation of laparoscopy.<sup>8</sup> It is reported that the postoperative success rate for sacrocolpopexy is as high as 78%–100%.<sup>9</sup> Compared to other pelvic organ prolapses treated

with transvaginal mesh, sacrocolpopexy has shown better results in terms of recurrence rates (2.3%–4% vs. 4.3%–18%) and incidence of dyspareunia (4%–9% vs. 10%–50%).<sup>8</sup> As an operation to repair the pelvic floor transabdominally, as in this study, sacrocolpopexy is considered to be useful and effective. Proline mesh, however, is no longer used worldwide due to its various complications, and it is therefore necessary to consider performing sacrocolpopexy more safely by utilizing other, improved types of mesh. For example, in Japan, PTFE mesh has been introduced as a new type of mesh, and its use has been reported.<sup>10</sup> As a further advantage of this technique, flap filling not only fills the dead space, but it also keeps the distance between the bowel resection site and the mesh itself, which is thought to help prevent the occurrence of mesh complications.

Repairing a perineal hernia can still cause cystocele or vaginal ptosis in women. In addition to the VRAM flap technique, this technique has both functions of filling in dead space and suspending the anterior and posterior walls of the vagina and the sacrouterine ligaments. Our surgical procedure reported herein is a combination of the VRAM flap and a concomitant sacrocolpopexy for patients with recurrent perineal hernia after mesh surgery. A similar technique has not been previously reported, as far as the authors have investigated. We believe that this dual surgical procedure, which both reinforces the pelvic floor and fixes pelvic organ prolapse, is both useful and effective in the long-term and thus leads to an improved quality of life for the patient. We think that the accumulation of future cases is also important.

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## Conflict of interest

None declared.

## Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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