

Bladder Distension Causing Flap Congestion in Abdominoperineal Resection with VRAM Perineal Reconstruction

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BACKGROUND

- ❖ Abdominoperineal resection (APR) is a critical surgical procedure primarily indicated for colorectal adenocarcinomas and other cancers where sphincter-preserving surgery is not feasible, or in non-cancer cases such as severe trauma or persistent perianal Crohn's disease.¹
- ❖ The use of pedicled locoregional vascularized flaps such as the transverse, oblique, or vertical rectus abdominis myocutaneous (VRAM), extended or traditional, gracilis flap, and anterolateral thigh flap have long been used to decrease the risks associated with primary wound closure alone, such as wound dehiscence, infection, and pelvic hernia.^{2,3}
- ❖ The VRAM flap is a reliable and safe method for immediate pelvic reconstruction in patients requiring APR or total pelvic exenteration and irradiation with a relatively low rate of donor and recipient site complications, making it one of the most commonly preferred tissue transfers.^{4,5,6}

PURPOSE

1. To discuss factors during the post-op course that can lead to flap complications
2. To review the use of VRAM pedicled flap in perineal reconstruction after APR

CASE DESCRIPTIONS

- ❖ Case 1:
 - ❖ A 64-year-old male with stage IIIb rectal cancer was admitted following robotic-assisted APR with end colostomy and right musculocutaneous VRAM reconstruction, with a perineal skin paddle for monitoring.
- ❖ Case 2:
 - ❖ A 70-year-old female with squamous cell carcinoma of the anus, vaginal introitus and labia minor/majora was admitted to our institution after undergoing robotic assisted APR with end colostomy, *en block* hysterectomy BSO, and posterior vaginectomy, followed by VRAM flap reconstruction of perineum

CLINICAL TIMELINE

- ❖ Case 1
 - ❖ Standard post-op course with NG tube removal on POD 4 and diet advancement with return of bowel function on POD 6, though accompanied by significant increase in perineal drain output
 - ❖ POD 9: High output subsided and Foley removal
 - ❖ POD 10: Physical exam demonstrated superficial epidermolysis and partial necrosis of the most distal aspect of the skin paddle
 - ❖ CT imaging, Figure 1, demonstrated an ileus, bilateral hydronephrosis and significant bladder distention
 - ❖ Upon investigation, the distended bladder was noted to be compressing the flap pedicle, with skin findings shown in Figure 2
 - ❖ POD 14: Foley catheter was replaced and a Veraflo-Negative Pressure Wound Therapy (NPWT) device was applied
 - ❖ POD 21: Repeat CT scan demonstrated a 3.2 cm presacral abscess that was treated with IV antibiotics and continuation of NPWT
 - ❖ POD 30: repeat CT scan demonstrated a resolving abscess, and the patient was discharged to a continuing care hospital
- ❖ Case 2
 - ❖ POD 3: Foley catheter was removed, and she subsequently developed urinary retention with increased abdominal pain and a lack of spontaneous voiding
 - ❖ During this short time, the skin paddle of the flap showed signs of venous congestion with a purplish hue and rapid capillary refill, shown in Figure 3a
 - ❖ After replacement of the Foley catheter, flap capillary refill time and turgor improved, though it continued to have a diffuse pink/purple appearance in addition to mild epidermolysis
 - ❖ Team recommended maintaining Foley catheter for 6 weeks
 - ❖ Flap congestion, erythema, and tenderness resolved over the next two weeks, Figure 3b, and she was discharged to a continuing care hospital

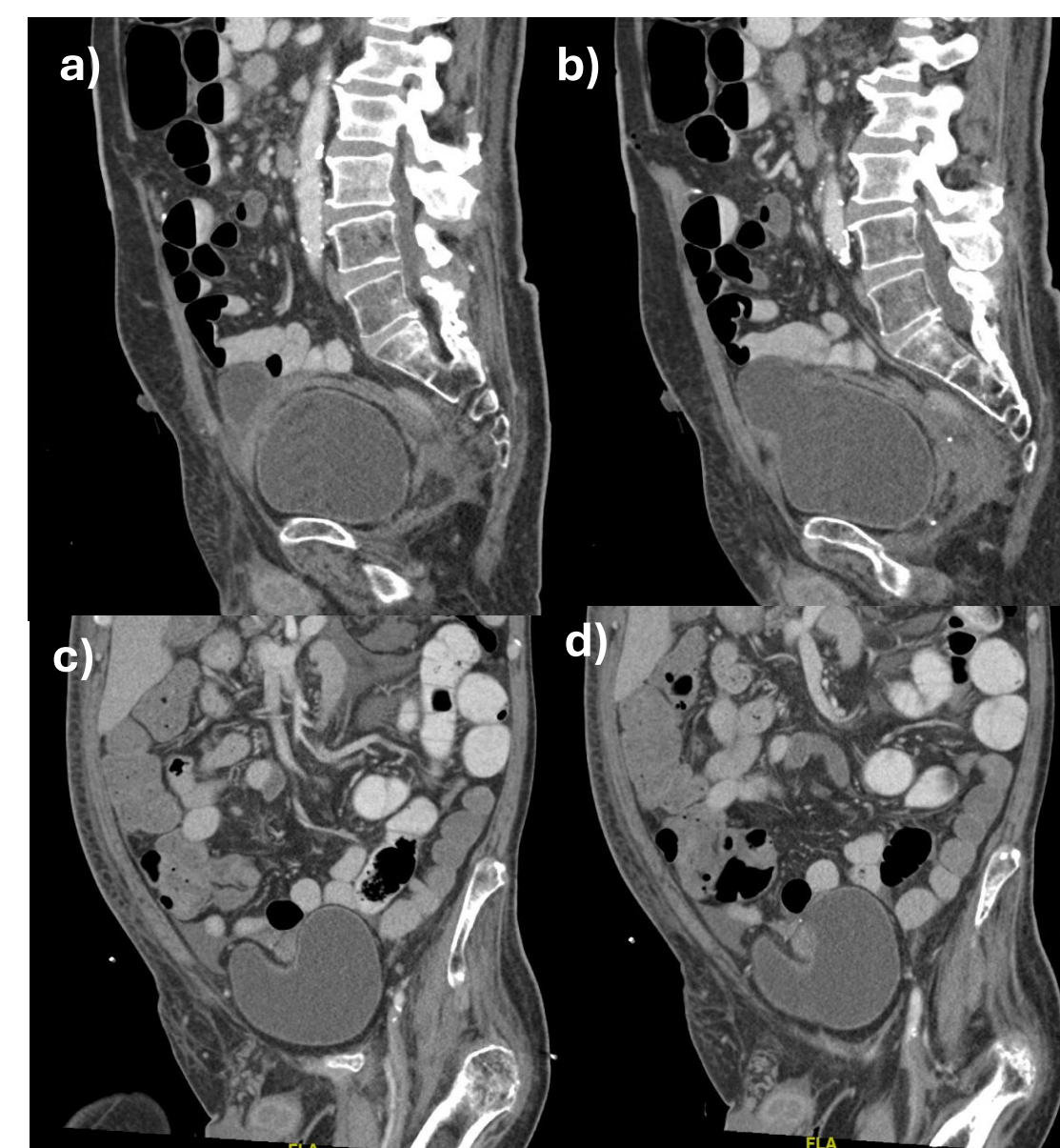


Figure 1: CT images taken POD 13 demonstrating bladder distention and VRAM flap congestion in a-b) sagittal and c-d) coronal views

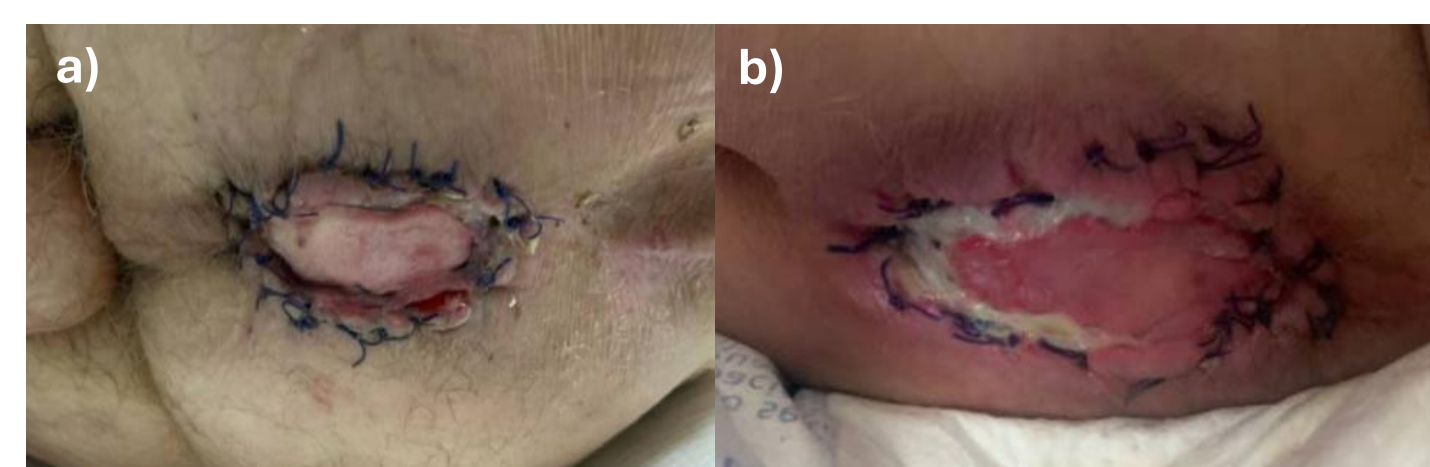


Figure 2: VRAM flap on a) POD 6 and b) POD 12 before and after removal of Foley catheter, respectively. Image a) demonstrating superficial epidermolysis and necrotizing tissue after bladder compression of VRAM pedicle

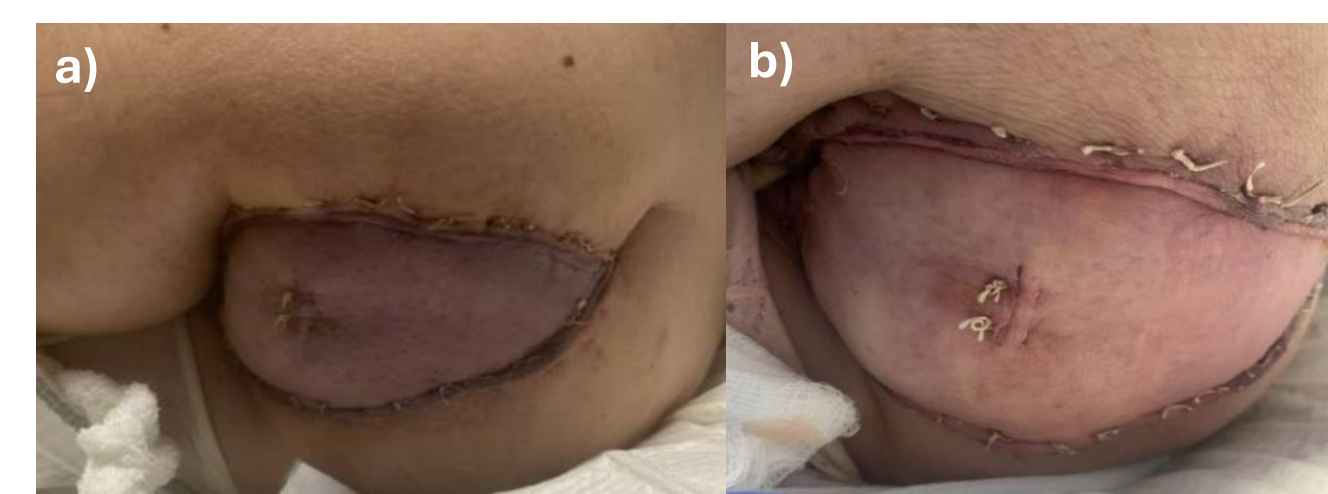


Figure 3: Clinical images showing a) VRAM flap congestion after removal of Foley catheter and b) the subsequent resolution of flap venous congestion 3 days after Foley replacement

DISCUSSION

- ❖ In both of these cases, **flap congestion began shortly after removal of the Foley catheter** and subsequent urinary retention, with at least one case demonstrating an overfilled bladder on CT scan
- ❖ Prompt insertion/reinsertion of the Foley catheter in our cases resolved the bladder distension and improved flap perfusion, **suggesting that the ensuing complications and infections could have been avoided with earlier interventions or prolonged Foley catheter placement**
- ❖ These cases include patients with visible skin paddles that allowed monitoring of flap status. Frequently, pedicled rectus abdominis muscle flap reconstruction is buried without the ability to monitor, making the development of a **Foley catheter protocol or close monitoring of urinary function** even more pertinent

CONCLUSIONS

- ❖ This case series suggests that patients recovering from **APR reconstruction with pedicled VRAM flaps should undergo regular observation of their urinary status** to prevent possible compression of the flap vasculature and impaired wound healing. Institutions may consider a standardized protocol
- ❖ It also reinforces the importance of reconstructive flap techniques in managing complex perineal defects following APR

REFERENCES

1. Hawkins AT, Albutt K, Wise PE, et al. Abdominoperineal Resection for Rectal Cancer in the Twenty-First Century: Indications, Techniques, and Outcomes. *J Gastrointest Surg*. 2018;22(8):1477-1487. doi:10.1007/s11605-018-3750-9
2. Bullard KM, Trudel JL, Baxter NN, Rothenberger DA. Primary perineal wound closure after preoperative radiotherapy and abdominoperineal resection has a high incidence of wound failure. *Dis Colon Rectum*. 2005;48(3):438-443. doi:10.1007/s10350-004-0827-1.
3. Galbraith NJ, McCollum C, Di Mascio L, et al. Effect of differing flap reconstruction strategies in perineal closure following advanced pelvic oncological resection: a retrospective cohort study. *Int J Surg*. 2023;109(11):3375-3382. doi:10.1097/JS9.0000000000000617.
4. Horch RE, Hohenberger W, Eweida A, et al. A hundred patients with vertical rectus abdominis myocutaneous (VRAM) flap for pelvic reconstruction after total pelvic exenteration. *Int J Colorectal Dis*. 2014;29(7):813-823. doi:10.1007/s00384-014-1868-0.
5. Lefevre JH, Parc Y, Kerneis S, Shields C, Touboul E, Chaouat M, Turet E. Abdomino-perineal resection for anal cancer: impact of a vertical rectus abdominis myocutaneous flap on survival, recurrence, morbidity, and wound healing. *Ann Surg*. 2009;250(5):707-711. doi:10.1097/SLA.0b013e3181bce334.
6. Houvenaeghel G, Ghouti L, Moutardier V, Buttarelli M, Lelong B, Delperio JR. Rectus abdominis myocutaneous flap in radical oncopelvic surgery: a safe and useful procedure. *Eur J Surg Oncol*. 2005;31(10):1185-1190. doi:10.1016/j.ejso.2005.07.004.

DISCLOSURES

- ❖ No disclosures.