



Comparison of Bilateral Gluteal Artery Perforator Flaps versus Vertical Rectus Abdominis Musculocutaneous Flaps in the Reconstruction of Perineal Wounds

Katherine C Benedict, MD¹; Somjade J Songcharoen, MD¹; Kristen L Stephens, MD², Anna L Winter, BS¹, Shelley R Edwards, BS¹, Christopher A Campbell, MD², Peter B Arnold, MD¹

¹University of Mississippi Medical Center – Division of Plastic and Reconstructive Surgery
²University of Virginia – Department of Plastic and Reconstructive Surgery



INTRODUCTION

Achieving a healed perineal wound following chemoradiotherapy and abdominoperineal resection (APR) or pelvic exenteration is challenging for surgeons and patients. Prior studies have shown trunk-based flaps; including vertical rectus abdominis myocutaneous flaps (VRAM), are superior to both primary closure and thigh-based flaps, however there has been no direct comparison to gluteal fasciocutaneous flaps. This study evaluates postoperative complications after various methods of perineal flap closure of APR and pelvic exenteration defects.

METHODS

Retrospective review of patients who underwent APR or pelvic exenteration from April 2008-September 2020 was analyzed for postoperative major and minor complications. Flap closure techniques including VRAM, unilateral (IGAP), and bilateral (BIGAP) inferior gluteal artery perforator fasciocutaneous flaps were compared.

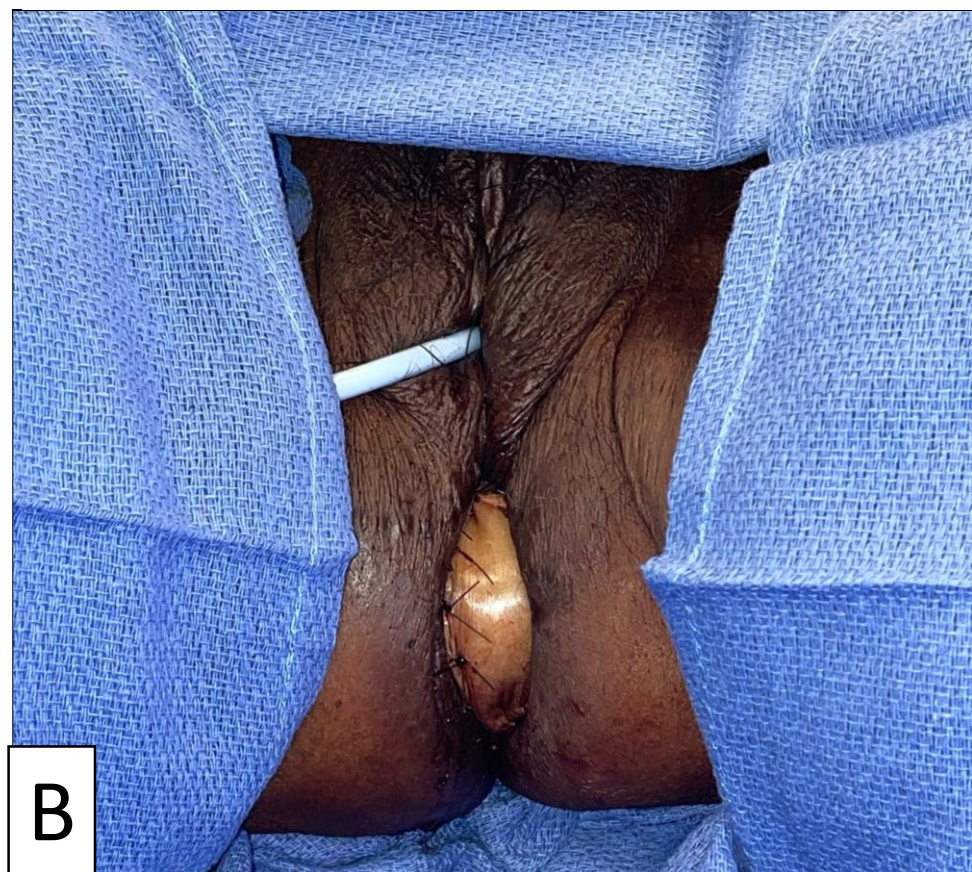
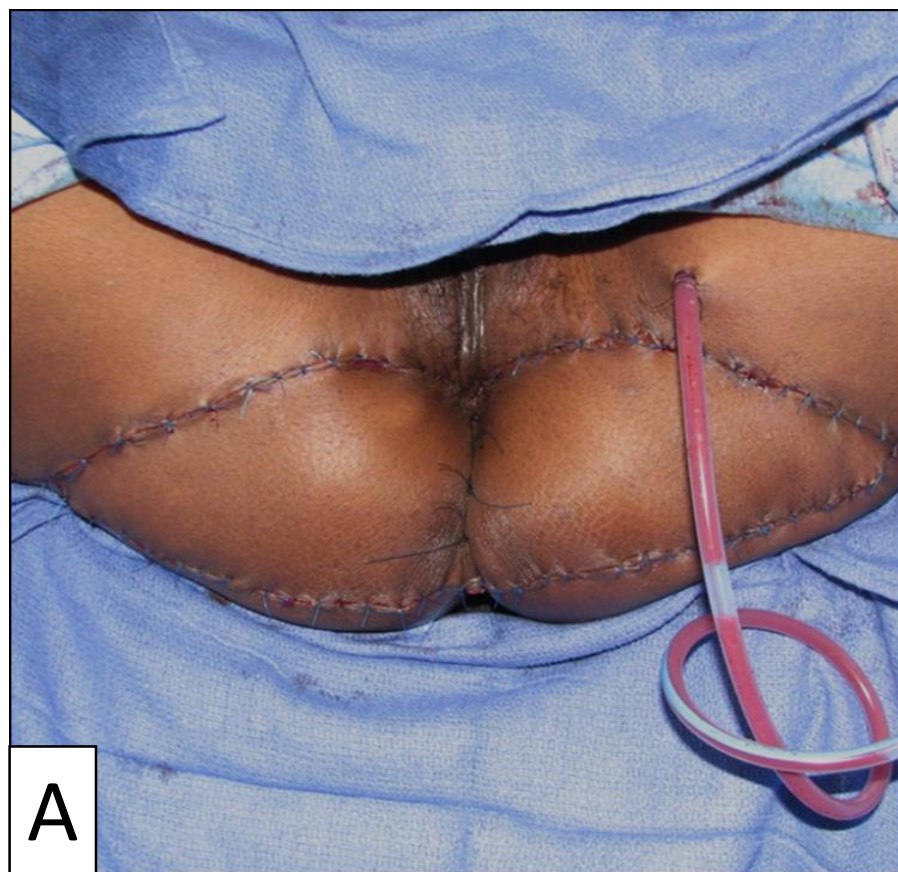


Fig 1: Intra-operative photographs of flap closure techniques.

A) Bilateral gluteal artery perforator flaps (BIGAP).
B) Vertical rectus abdominis myocutaneous flap (VRAM).

RESULTS

116 patients were included, the majority underwent fasciocutaneous (BIGAP/IGAP) flap reconstruction (n=69, 59.6%), followed by VRAM (n=47, 40.5%). There were no significant differences between group patient demographics, comorbidities, BMI, or cancer stage.

Characteristic/Comorbidity	Data
Age, y, mean ± SD	57 (± 11.86)
Sex	
Male (n, %)	58 (50%)
Female (n, %)	57 (49.1%)
Active Smoking Status, n (%)	47 (40.5%)
Race, n (%)	
Black or African American	29 (25%)
White	77 (66.4%)
Unknown/Not Reported	6 (5.2%)
Body Mass Index (BMI), mean ± SD	26.6 (± 5.97)
Neoadjuvant Chemotherapy, n (%)	97 (83.6%)
Adjuvant Chemotherapy, n (%)	28 (24.1%)
Neoadjuvant Radiotherapy, n (%)	101 (87.1%)

Table 1: Patient demographics

RESULTS

There were no significant differences between BIGAP/IGAP and VRAM groups in major complications (45% versus 36%, p=0.351) or minor complications (57% versus 49%, p=0.426) including major/minor perineal wounds.

Major Complication	Total (N= 116, %)	VRAM (N=47, %)	IGAP (N=12, %)	BIGAP (N=57, %)
Perineal wound dehiscence requiring hospitalization or return to operating room	22 (19%)	9 (19.1%)	1 (8.3%)	12 (21.1%)
Bleeding requiring hospitalization or extended length of stay	3 (2.6%)	1 (2.1%)	0 (0%)	2 (3.5%)
Deep vein thrombosis	5 (4.3%)	2 (4.2%)	0 (0%)	3 (5.3%)
Pulmonary embolism	1 (0.9%)	0 (0%)	0 (0%)	1 (1.8%)
Cardiopulmonary complication	8 (6.9%)	5 (10.6%)	0 (0%)	3 (5.3%)
Small bowel obstruction requiring return to operating room	3 (2.6%)	0 (0%)	0 (0%)	3 (5.3%)
Intra-abdominal abscess/fistula/anastomotic leak requiring intervention	11 (9.5%)	4 (8.5%)	1 (8.3%)	6 (10.5%)
Parastomal hernia or incarceration requiring intervention	1 (0.9%)	0 (0%)	0 (0%)	1 (1.8%)
Abdominal wound complication requiring hospitalization or return to operating room	8 (6.9%)	5 (10.6%)	1 (8.3%)	2 (3.5%)
Disease recurrence	4 (3.4%)	3 (6.4%)	0 (0%)	1 (1.8%)

Table 2: Post-operative major complications

Minor Complication	Total (N= 116, %)	VRAM (N=47, %)	IGAP (N=12, %)	BIGAP (N=57, %)
Perineal wound/fistula managed non-operatively and without hospitalization	47 (40.5%)	15 (31.9%)	5 (41.7%)	27 (47.4%)
Ileus/small bowel obstruction managed non-operatively	6 (5.2%)	5 (10.6%)	0 (0%)	1 (1.8%)
Intra-abdominal abscess managed non-operatively	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Incisional hernia	3 (2.6%)	0 (0%)	0 (0%)	3 (5.3%)
Parastomal hernia managed non-operatively	7 (6%)	4 (8.5%)	1 (8.3%)	2 (3.5%)
Abdominal wound complication or fistula managed non-operatively	14 (12.1%)	4 (8.5%)	1 (8.3%)	9 (15.8%)
Infectious or urologic complication post-operatively	6 (5.2%)	3 (6.4%)	1 (8.3%)	2 (3.5%)

Table 3: Post-operative minor complications

BIGAP/IGAP group had shorter length of stay compared to VRAM group, this did not reach significance (10.81 versus 16.89 days, p=.120).

CONCLUSION

Prior studies have shown flap closure is superior to primary perineal closure after neoadjuvant radiation, but lack consensus on which flap offers superior post-operative morbidity. This study comparing outcomes of perineal closure between VRAM and BIGAP flaps showed no significant difference in post-operative complication rates.

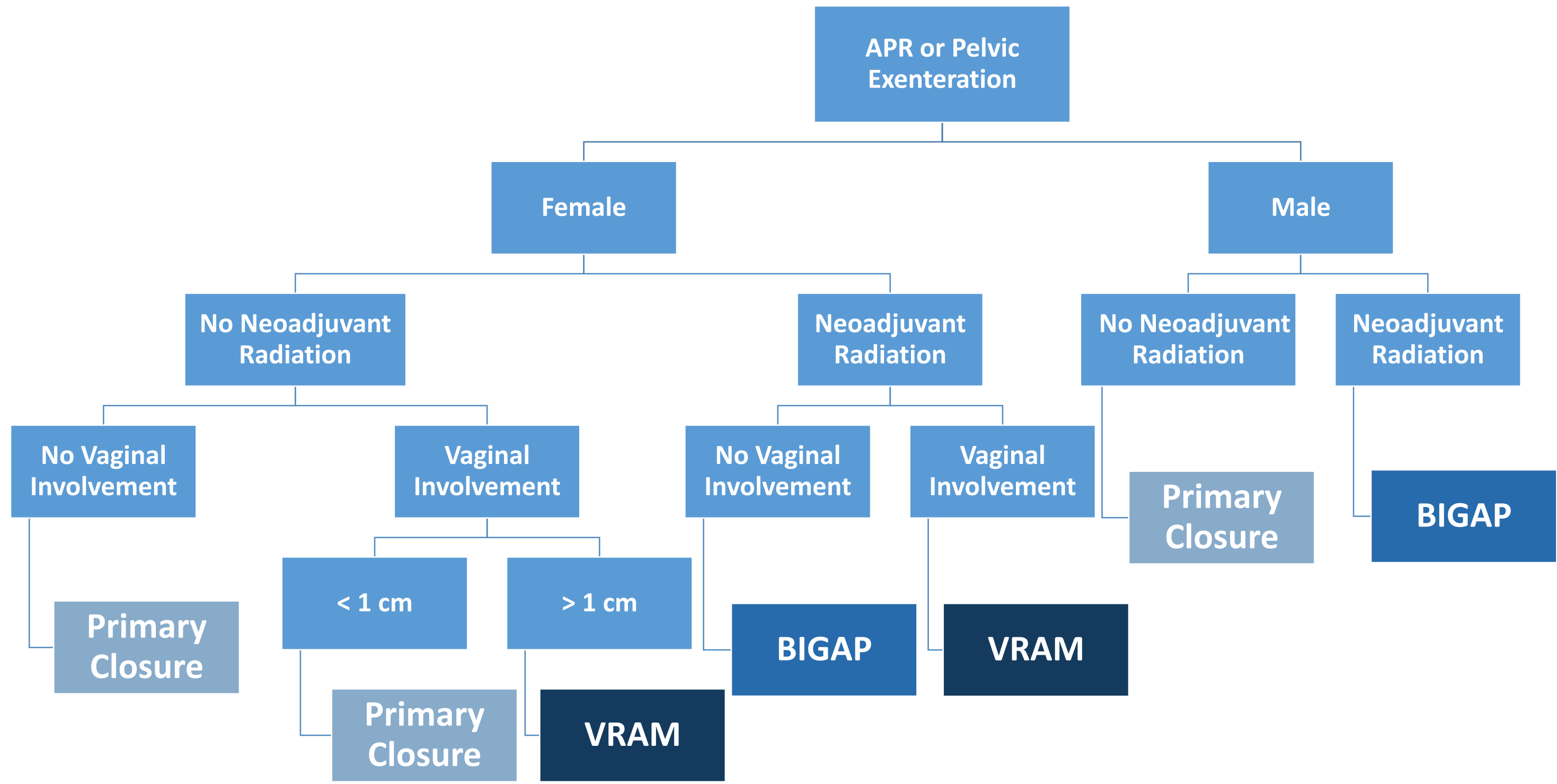


Fig 2: Algorithmic approach to perineal reconstruction after APR or pelvic exenteration

Fasciocutaneous flaps are an excellent choice for perineal reconstruction due to their ease of elevation and low donor site morbidity. This study highlights the utility of an algorithmic approach to perineal reconstruction when considering multiple patient factors.

REFERENCES

- Daigeler, A. *et al.* The versatility of the pedicled vertical rectus abdominis myocutaneous flap in oncologic patients. *Langenbecks Arch. Surg. Dtsch. Ges. Für Chir.* 396, 1271–1279 (2011).
- John, H. E. *et al.* An algorithmic approach to perineal reconstruction after cancer resection--experience from two international centers. *Ann. Plast. Surg.* **71**, 96–102 (2013).
- Saleh, D. B. *et al.* Reconstruction of the irradiated perineum following extended abdomino-perineal excision for cancer: an algorithmic approach. *J. Plast. Reconstr. Aesthetic Surg. JPRAS* **65**, 1537–1543 (2012).
- Winterton, R. I. S. *et al.* Gluteal fold flaps for perineal reconstruction. *J. Plast. Reconstr. Aesthetic Surg. JPRAS* **66**, 397–405 (2013).
- Devulapalli C, Jia Wei AT, DiBiagio JR, et al. Primary versus flap closure of perineal defects following oncologic resection: a systematic review and meta-analysis. *Plast Reconstr Surg* 2016;137:1602–13.

CONTACT

Katherine C. Benedict, MD | kbenedict@umc.edu