

Robotic VRAM Flap Reconstruction In APR: A Promising Approach To Reduce Abdominal Donor Site Complications



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INTRODUCTION

Abdominoperineal resection (APR) for low rectal and anal cancers poses challenges in perineal wound defects — particularly for patients who have received neoadjuvant chemotherapy and radiation.

Traditional vertical rectus abdominis myocutaneous (VRAM) flaps have proven efficacious but require large abdominal incisions, with donor site hernia rates reported up to 50%.¹

Robotic techniques may offer a solution to the limitations of conventional VRAM flaps by sparing a large abdominal incision and **leaving the anterior rectus fascia intact**.

METHODS

A retrospective review of all patients who underwent robotic APR with VRAM by a single surgeon from 2021 to 2024 was performed.

Demographics, operative data, and complications were analyzed. **Donor site hernias were diagnosed via CT imaging.**

Statistical analysis was performed in R Studio using T-tests or Mann-Whitney U tests for continuous variables, Fisher’s Exact tests for categorical variables, Shapiro-Wilk tests for normality, and logistic regression modeling to adjust for covariates.

OBJECTIVE

To assess rates of abdominal hernia and bulge in patients undergoing robotic VRAM flap harvest and compare to published data of conventional open VRAM harvest.

RESULTS

All patients (n = 17) received neoadjuvant chemoradiation. Mean age was 61.3 ± 8.7 and mean BMI was 28.3 ± 6.3 . Diabetes and tobacco use were present in 35.3% and 29.4% of patients, respectively.

The incidence of donor site hernia was 23.5% (n = 4). Of those four hernias, one was symptomatic and required operative repair.

Patients undergoing robotic APR with VRAM were 69% less likely to develop a donor site hernia, compared to data for those undergoing conventional open VRAM (OR = 0.311, p = 0.049).²

Table 1. Postoperative Outcomes of Robotic VRAMs

Outcomes	
Mean length of stay, days	6.4 ± 2.8
Complication, n (%)	
Donor site hernia	4 (23.5%)
Perineal hernia	0 (0.0%)
Perineal wound dehiscence (local wound care)	3 (17.6%)
Pernieal wound dehiscence (requiring OR)	1 (5.9%)
Perineal wound infection (requiring OR)	3 (17.6%)

Table 2. Diabetes, Tobacco Use, and Adjuvant Chemotherapy Covariate Analysis and Complications

	Wound Dehiscence	Wound Infection	Postoperative Hernia
Diabetic (n = 6)	1 (16.7%)	3 (50.0%)	1 (16.7%)
Non-Diabetic (n = 8)	3 (37.5%) <i>p</i> = 1.000	0 (0%) <i>p</i> = 0.029*	7 (63.6%) <i>p</i> = 0.131
Tobacco Use (n = 5)	0 (0%)	1 (20.0%)	1 (20.0%)
No Tobacco Use (n = 12)	4 (33.3%) <i>p</i> = 0.430	2 (16.7%) <i>p</i> = 0.400	7 (58.3%) <i>p</i> = 0.670
Adjuvant Chemotherapy (n = 4)	3 (75.0%)	1 (25.0%)	2 (50.0%)
No Adjuvant Chemotherapy (n = 13)	1 (8.3%) <i>p</i> = 0.020*	2 (15.4%) <i>p</i> = 0.580	6 (46.2%) <i>p</i> = 0.007

CONCLUSION

Robotic APR with VRAM reduces donor site hernia rates compared to traditional VRAM harvesting techniques (23.5% vs. ~50%), likely due to anterior rectus fascia preservation.^{1,2}

This minimally invasive approach maintains similar perineal reconstruction complication rates while improving donor site outcomes.

Robotic VRAM has the potential to redefine standards in APR reconstruction and warrants further investigation, particularly due to its ability to improve patient care.

¹ Mortensen AR, Grossmann I, Rosenkilde M, Wara P, Laurberg S, Christensen P. Double-blind randomized controlled trial of collagen mesh for the prevention of abdominal incisional hernia in patients having a vertical rectus abdominis myocutaneous flap during surgery for advanced pelvic malignancy. *Colorectal Dis.* 2017 May;19(5):491–500.

² Tang AM, Spencer N, Parkins K, Bevan V, Taylor G, Markham D, Drew P, Harries RL. Radiological incidence of donor-site incisional hernia and parastomal hernia after vertical rectus abdominus myocutaneous flap-based reconstruction following colorectal surgery. *Colorectal Dis.* 2023 Apr;25(4):738-746. doi: 10.1111/codi.16400. Epub 2022 Nov 20. PMID: 36328985.