

Perineal Reconstruction Following Anorectal Tumor Resection: An 18-year Single-Center Experience.

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Abstract

Background: Development of a chronic nonhealing perineal wound is a significant complication of abdominoperineal resection (APR), occurring in excess of 60% of these patients. The purpose of this study was to determine criteria for immediate flap coverage of the perineum following APR for anal and rectal cancer and examine our long-term cross-sectional surgical outcomes.

Methods: With institutional approval, we retrospectively analyzed a prospectively collected database of patients who underwent APR or pelvic exenteration for anorectal cancer with or without immediate flap closure of the perineum. We included demographic characteristics, premorbid and oncologic data, surgical treatment, reconstruction, and recovery. Outcomes were: successful wound healing, surgical complications necessitating intervention (admission or return to OR), infectious complications, and progression to chronic wounds. Descriptive statistics and multivariate logistic analyses were performed using JMP (v11, SAS Institute).

Results: 214 patients were identified from 1995-2013. 47 patients received flaps and had higher rates of recurrence and reoperation, active smoking, Crohn's disease, HIV, anal cancers and had higher AJCC Tumor stages (Table 1). 30-day complication rates were equivalent in the two cohorts (Table 2). There were no complete flap losses or reconstructive failures. Perineal wound complication rates were marginally but not significantly higher with flaps (55% vs. 41%, $p=0.088$). Infectious complications, readmissions, and operative revisions were more frequent in the flap cohort. A larger proportion of the primary closure cohort developed chronic wounds (23.3 vs. 8.5%, $p=0.025$). In multivariate analysis, Independent predictors of perineal complications included anal cancer, IORT, inflammatory bowel disease, as well as preoperative chemotherapy and radiation. Notably, selection for flap coverage was not identified as an independent predictor of complications.

	Primary Closure (n=167)	Flap Closure (n=47)	p-value
Demographics/ Comorbidities			
Mean Age (years)	61.7	54.7	0.003*
Female Patient	81 (48.5%)	23 (48.9%)	1
Mean BMI (kg/m ²)	26.9	25	0.34
Diabetes	13 (7.8%)	4 (8.5%)	1
HIV	0 (0%)	8 (17%)	<0.001*
COPD	4 (2.4%)	1 (2.1%)	0.7
Current smoker	25 (15%)	14 (29.8%)	0.031*
Crohn's disease	2 (1.2%)	5 (10.6%)	0.006*
Preop corticosteroid use	6 (3.6%)	1 (2.1%)	0.52
Oncologic Characteristics			
Anal Cancer Primary	9 (5.4%)	22 (47.8%)	<0.001*
Laparoscopic/Robot assisted	36 (21.6%)	1 (2.1%)	0.001*
Pelvic exenteration	19 (11.3%)	18 (38.3%)	<0.001*
Palliative procedure	17 (10.2%)	4 (8.5%)	0.79
Recurrent cancer	27 (16.2%)	20 (42.6%)	<0.001*
Re-do operation	24 (14.4%)	16 (34%)	0.003*
Neoadjuvant XRT-CTX	115 (68.9%)	23 (48.9%)	0.015*
Previous XRT	19 (11.3%)	17 (36.2%)	<0.001*
T3 tumor	77 (46.1%)	7 (14.9%)	<0.001*
T4 tumor	6 (3.6%)	8 (17%)	0.003*
Positive margins	13 (7.8%)	10 (21.3%)	0.015*

Table 1: Demographics and Comorbidities

	Primary Closure (n=167)	Flap Closure (n=47)	p-value
Recovery without complication	82 (49.1%)	18 (38.3%)	0.25
30-day Mortality	1 (0.6%)	0 (0%)	--
30-day Complication	71 (42.5%)	21 (44.7%)	0.87
Hematoma	3 (1.8%)	1 (2.1%)	0.61
Organ space infection	4 (2.4%)	2 (4.3%)	0.61
Readmission	29 (17.4%)	12 (25.5%)	0.29
Wound Care Readmission	9 (5.4%)	8 (17.0%)	0.015*
Overall Perineal Complications	69 (41.3%)	26 (55.3%)	0.09
Cellulitis	21 (12.6%)	12 (25.5%)	0.039*
Superficial incisional SSI	3 (1.8%)	4 (8.5%)	0.043*
Deep incisional SSI	8 (4.8%)	4 (8.5%)	0.47
Draining Wound >30 days	39 (23.4%)	4 (8.5%)	0.037*
Superficial Dehiscence	59 (35.3%)	19 (40.4%)	0.61
Overall Abdominal Complications	35 (21.0%)	8 (17.0%)	0.68
Abdominal Cellulitis	26 (15.6%)	3 (6.4%)	0.15
Superficial SSI	5 (3.0%)	2 (4.3%)	0.47
Deep SSI	4 (2.4%)	1 (2.1%)	1
Abdominal Hernia	6 (3.6%)	2 (4.3%)	1
Reoperation	13 (7.8%)	16 (34%)	<0.01*
Other Complications			
Bowel Obstruction	15 (9.0%)	1 (2.1%)	0.13
Organ Injury	8 (4.8%)	5 (10.6%)	0.16
EC Fistula	1 (0.6%)	2 (4.3%)	--
MI/Cardiac Arrest	2 (1.2%)	1 (2.1%)	--
Respiratory Failure	5 (3.0%)	1 (2.1%)	--

Table 2: Complications

Conclusion: In our large series, immediate flap coverage of the perineum was less likely progress to a chronic wound, but had higher postoperative infectious complication rates in comparison to closure without a flap. We attribute this to increased comorbidity in this cohort, reflecting the surgical decision-making in approaching these high-risk closures. In multivariate analysis, flap coverage was not identified as an independent predictor of complications. Further work will involve prospective validation of identified comorbidities as criteria for flap coverage.

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