

Evaluation of 30-day Complication Rates following Vaginal Prolapse Repair with and without Vaginal Mesh Implants in a Propensity Score Matched Cohort

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Introduction

Aside from mesh-specific complications, there is little understanding of the incidence and type of adverse events surrounding surgery for pelvic organ prolapse when using vaginal mesh compared to native tissue repair. Our objective was to compare rates of perioperative complications between mesh and native-tissue repairs of vaginal wall prolapse in a propensity score matched cohort.

Methods

This was a retrospective cohort study using data from the American College of Surgeons National Surgical Quality Improvement Program database from 2010 to 2017. Common Procedural Terminology codes were used to identify women who underwent vaginal procedures for prolapse repair. Propensity scores were calculated using available demographic, clinical, and surgical information. The propensity score was then used to match women with and without mesh implantation at a ratio of 1:1. The primary outcome was the composite complication rate. Descriptive statistics were reported as means with standard deviations. Pairwise analysis using Student's *t*-test and Fisher's exact test was performed where appropriate. Multivariable logistic regression was used to evaluate independent risk factors for perioperative complications.

Results

There were 1,962 vaginal mesh repairs matched to 1,962 native tissue repairs. There were no differences in demographics or comorbidities. Procedures using mesh were longer (121.3 +/-60.1 minutes vs 115.5 +/-55.8 minutes, $p=0.001$), less likely to include a hysterectomy, and more likely to include a sling or colporrhaphy (all $P<0.002$). Rates of apical suspension were similar. In regards to the primary outcome, there was no difference in complication rates between mesh and native tissue repair (10.9% vs 11.7%, $p=0.76$). Blood transfusion was more common in mesh repair (2.4% vs 1.0%, $p=0.002$); while readmission was more common for the native tissue group (2.3% vs 1.8%, $p=.0.11$). After logistic regression was used to control for confounders, mesh was not an independent predictor of complications.

Table 1: Preoperative Characteristics

	Mesh (n=1,962)	Native Tissue (n=1,962)	P
Age (years)	64.1 +/-11.3	63.9 +/-11.9	0.39
BMI	28.5 +/-6.1	28.6 +/-6.0	0.51
Non-White Race	361 (18.4)	833 (21.2)	0.16
Current Smoker	152 (7.7)	291 (7.4)	0.67
Diabetes Mellitus	47 (2.4)	78 (2.0)	0.33
Hypertension	981 (50.0)	1,931 (49.2)	0.59
COPD	50 (2.5)	112 (2.9)	0.51
Chronic Steroid Use	40 (2.0)	75 (1.9)	0.74
Dependent	6 (0.3)	11 (0.3)	0.89
ASA class ≥ 3	620 (31.6)	1,195 (30.4)	0.45

*Data in columns represents n (%) or mean \pm standard deviation

**BMI, body mass index; COPD, Chronic Obstructive Pulmonary Disease; ASA, American Society of Anesthesiology

Results

Table 2: Surgical Characteristics

	Mesh (n=1,962)	No Mesh (n=1,962)	P
Operative Time (min)	115.5 +/-55.8	119.8 +/-59.5	0.01
Adhesiolysis	4(0.2)	29(0.7)	0.01
Vaginal Hysterectomy	473(24.1)	1,107(28.2)	0.002
Intraperitoneal Colpopexy	250(12.7)	514(13.1)	0.43
Extraperitoneal Colpopexy	1,725(87.3)	3,410(86.9)	0.39
Anterior Colporrhaphy	1,444(73.6)	2,380(60.6)	<0.001
Posterior Colporrhaphy	1,380(70.4)	2,209(56.3)	<0.001
Sling Procedure	1,033(52.7)	1,339(34.1)	<0.001

*Data in columns represents n (%) or mean \pm standard deviation

Table 3: Complication Rates in Mesh vs Native Tissue Repairs

	Mesh (n=1,962)	Native Tissue (n=1,962)	P
Superficial Infection	16 (0.8)	12 (0.3)	0.017
Deep/Organ Space Infection	12 (0.7)	19 (0.5)	0.36
Wound Dehiscence	1 (0.1)	3 (0.1)	0.64
Urinary Tract Infection	100 (5.1)	207 (5.3)	0.43
Sepsis	5 (0.3)	14 (0.4)	0.37
Cystotomy	3(0.2)	18(0.5)	0.06
Post-Operative Transfusion	47 (2.4)	40 (1.0)	<0.001
Pulmonary Embolism	1 (0.1)	10 (0.2)	0.09
Deep Venous Thrombosis	0 (0.0)	4 (0.1)	0.21
Cardiovascular Complication	6 (0.3)	12 (0.3)	0.33
Reoperation	24 (1.2)	42 (1.1)	0.35
Readmission for non surgical indication	35 (1.8)	91 (2.3)	0.11

*Data in columns represents n (%)

Table 4: Independent Risk Factors for Perioperative Complications on Multivariable Logistic Regression

	Adjusted Odds Ratio	95% CI
Dependent Functional Status	5.99	1.96-18.27
Chronic Steroid Use	2.00	1.16-3.45
Concomitant Sling Procedure	1.25	1.04-1.53
Length of Stay (per day)	1.21	1.13-1.29
Operative Time (per minute)	1.04	1.03-1.05
ASA class ≥ 3	1.32	1.08-1.62

Conclusion

In this well matched, large national cohort, vaginal prolapse repair with mesh is not associated with increased short-term complications compared to native tissue repair.

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