Mesh Exposure and Associated Risk Factors in Women Undergoing Transvaginal Prolapse Repair with Polypropylene Mesh

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Introduction

- Mesh reinforcement has been widely adopted for pelvic floor reconstructive procedures
- Vaginal prolapse repair employing mesh is oriented towards achieving the durability of abdominal mesh procedures
- FDA approved the first commercial "system" for the transvaginal delivery of polypropylene mesh for prolapse repair in 2004
- Mesh exposure is a known complication of transvaginal graft placement
- Data regarding mesh exposure and risk factors is limited

Study Objectives

- In women who underwent transvaginal prolapse repair with polypropylene mesh, to determine:
  - Frequency and rate of mesh exposure
  - Risk factors associated with mesh exposure

Methods

- Retrospective analysis
- All women who underwent Prolift ® Pelvic Floor Repair System at Magee-Womens Hospital September, 2005 – September, 2008
- Mesh exposure defined as visible mesh in the vagina
  - Early exposure: ≤ 42 days postop
  - Late exposure: > 42 days postop
- Inpatient and outpatient medical records reviewed
- Postoperative speculum examinations performed by an attending physician
- Student's T-test/Fisher's exact test, where appropriate
- Multivariable logistic regression

Results

- N = 201
- Mesh exposure: 12% (24/201)
- Rate of mesh exposure: 14 per 100 woman-years
- Median values:
  - Time to mesh exposure: 62 days (range 10-372)
  - Duration of follow-up: 339 days (IQR 148-438)
  - Number of postop visits: 5 (range 1 -14)
- <u>Unadjusted risk factors (Table 1):</u>
  - Diabetes (P = 0.03)
  - Greater change in hemoglobin (P = 0.05)
- <u>Independent risk factors:</u>
  - Diabetes (AOR = 7.7, 95% CI 1.6-37.6; P = 0.01)
  - Surgeon (AOR = 7.3, 95% CI 1.9-28.6; P = 0.004)
    - No difference in the frequency of mesh exposure (P = 0.09) when first half of surgeon's case load compared to second half
- <u>Early versus late mesh exposure:</u>
  - ≤42 days postop in 21% (5/24)
  - > 42 days postop in 79% (19/24)
    - No difference in concurrent hysterectomy, smoking, diabetes, change in hemoglobin, or surgeon (P > 0.05)

Hypothesis

- <u>Mesh exposure results from:</u>
  - Incision dehiscience (suture pull through)
  - Tissue necrosis
  - Poor wound healing
- <u>Potential strategies to minimize mesh exposure:</u>
  - Full-thickness dissection of vaginal epithelium
  - Incision closure: Widely place stitches, possibly in an interrupted fashion
  - Avoid hematoma

Table 1. Selected Demographic, Clinical and Surgical Variables

Characteristic	Mesh exposure (N = 24)	No mesh exposure (N = 177)	P
Age (years)*	67.3 ± 8.8	66.1 ± 8.1	0.49
Body Mass Index (kg/m^2)*	28.2 ± 4.0	27.9 ± 5.0	0.78
Smoking status			
Nonsmoker	14/23 (61%)	119/173 (69%)	
Current smoker	2/23 (9%)	6/173 (3%)	0.30
History of smoking	7/23 (30%)	48173 (28%)	
Medical co-morbidities			
Diabetes	4/23 (17%)	7/164 (4%)	0.03
Hypertension	12/24 (50%)	99/175 (57%)	0.66
Surgical history			
Prior incontinence procedure	2/24 (8%)	34/174 (20%)	0.26
Prior prolapse procedure	6/24 (25%)	53/176 (30%)	0.81
POPQ measurements			
Preoperative Ba (cm)*	+3.0 ± 3.0	+2.3 ± 2.6	0.23
Preoperative Bp (cm)*	+0.9 ± 3.7	+0.7 ± 3.1	0.81
Preoperative C (cm)*	-0.7 ± 5.0	-1.7 ± 4.4	0.30
Preoperative TVL (cm)*	8.6 ± 1.2	8.5 ± 2.2	0.77
Surgical variables			
Concomitant hysterectomy	2/24 (8%)	17/176 (10%)	>0.99
EBL (ccs)*	171 ± 194	140 ± 101	0.45
Δ hemoglobin (preoperative - postoperative in g)*	2.9 ± 1.2	2.4 ± 1.1	0.05

*mean ± SD

Comment

- Frequency of mesh exposure = 12%
- 7-fold increased risk of mesh exposure in women with diabetes
- No increased risk with concurrent hysterectomy
- Variability in exposure amongst surgeons may be related to technique rather than learning curve
- Larger sample may demonstrate:
  - Greater change in hemoglobin (as proxy for hematoma) as an independent risk factor
  - Different risk factors for early versus late mesh exposure