

POSTERIOR REPAIR WITH PERFORATED PORCINE DERMAL GRAFT

Hypothesis / aims of study

To compare vaginal incision separation and healing properties of patients undergoing posterior repair with perforated porcine dermal grafts to those that received grafts without perforations.

Study design, materials and methods

The research protocol was reviewed and approved by the Institutional Review Board at Northside Hospital in Atlanta, Georgia. This was a retrospective chart review of 71 patients who underwent posterior repair augmented with perforated porcine dermal grafts. Vaginal incision healing properties were compared to a cohort of 127 previous patients that received posterior repair with nonperforated porcine dermal grafts. All patients underwent posterior site-specific defect repair through a midline vaginal incision. A four by seven centimeter porcine dermal graft was then placed. The graft was attached laterally to the levator fascia, proximal to the vaginal apex, and distally to the perineal body using a delayed absorbable suture. Excess graft material was trimmed and the vaginal skin closed with a delayed absorbable suture. Graft perforation was performed by removal of porcine dermal graft from the sterile packs and perforating them with 3mm holes at 1cm increments using a 3mm keys punch. This resulted in three rows horizontally and six rows vertically. The perforated grafts were placed using the same technique as previously described above.

All patients received preoperative antibiotic prophylaxis.

Patients were initially examined 4 weeks postoperatively and every 2 to 4 weeks thereafter as determined by exam findings. Exam findings were documented with regard to incision dehiscence, infection, documented by foul purulent discharge, and graft expulsion. Incision dehiscence was defined as the ability to visually see graft material through the suture line.

To confirm graft integrity after perforation tensile strength, suture pull out strength, and flexibility test were performed using standard Bard test method TM 0133 and ASTM bending and resistance protocols in the laboratory.

Test were performed on random lots of 10 each perforated and nonperforated porcine dermal grafts.

Statistical analysis were performed using Fischer's exact test.

Results

Twenty one of 127 (17%) patients that received grafts without perforations developed vaginal incision dehiscence compared to 5 of 71(7%) patients who received perforated grafts (p value = 0.078). Four patients with vaginal incision dehiscence with nonperforated grafts required surgical revision to facilitate healing. All patients with perforated grafts and vaginal incision dehiscence healed with conservative treatment (estrogen cream). Vaginal infection rates were 2.8% (2/71) in the perforated group versus 3.9% (5/127) in the non-perforated group (p value = 1.00). Overall complication rates (combining dehiscence and infection) were significantly lower in the perforated graft group (7.0%) versus the nonperforated group (20.5%) (p value = 0.014). Tensile strength for perforated and nonperforated grafts were average 34.7lbs (SD+/-20.7lbs) and 32.2lbs (SD+/-23lbs), respectively (p value = 0.81). The suture pull out strength for perforated and nonperforated grafts were 7.19lbs (SD+/-2.71lbs) and 6.06lbs (SD+/-1.81lbs), respectively (p value = 0.29). Neither tensile strength or suture pull out strength were significantly different between perforated and nonperforated grafts. There was also no difference in the flexibility of the perforated and nonperforated grafts, 24.39mg (SD+/-12.12mg) and 27.86mg (SD+/-2.76mg), respectively (p value = 0.20).

Interpretation of results

Perforated porcine dermal grafts appear to have fewer wound complications when compared to nonperforated porcine dermal grafts. Graft integrity was not disrupted by the 3mm perforations as evidence by comparable tensile strength and suture pull out tests.

Concluding message

Perforated (porous) porcine dermal grafts may facilitate healing by allowing for better tissue drainage, increased tissue ingrowth, and revascularization of the vaginal epithelium overlying the graft. This should be an area of continued research as graft augmented repairs become more common in pelvic reconstructive surgery.