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LETTERS)IN VIVO COMPARISON OF TENSILE STRENGTH OF THREE SYNTHETIC
MATERIALS AND CADAVERIC FASCIA LATA AFTER IMPLANTATION.

Aims of study: Pubovaginal slings for stress urinary incontinence can be constructed of fascia or synthetic materials. Synthetic materials offer an advantage over fascia because of its consistent strength, availability and resistance to enzymatic degradation. The goal of this study was to demonstrate fibroblast ingrowth and collagen deposition in 3 different synthetic materials (ProteGen™, Prolene and Gore-tex®) and cadaveric fascia lata and to compare their tensile strength after six weeks of implantation into the weight bearing abdominal wall fascia of a pig.

Methods: Materials (2x1cm) were soaked in 5,000 units/cc of bacitracin prior to implantation into the abdominal wall fascia of each of 3 pigs (35 kg). Materials were attached with 6 prolene sutures and irrigated with bacitracin solution. The skin was closed with staples. All pigs received intravenous penicillin pre-op and for 24 hours post-op. At 6 weeks, the materials were retrieved and divided in half. Tensile strength was recorded on one half using the Intron Tensiometer with a crosshead speed of 10 mm/min. The second half was formalin fixed, paraffin embedded, sectioned, slide mounted and stained with H/E and Trichrome.

Results: The mean load (to break material) after 6 weeks of implantation for ProteGen™, Prolene, Gore-tex® and cadaveric fascia lata was 12.7, 7.07, 5.35, and 1.89 kgf with a displacement of 5.00, 5.20, 4.64, and 4.13, respectively. Histochemical analysis revealed a lymphohistocytic reaction with all materials which was greatest with ProteGen™. Giant cell reaction was seen with all synthetics but absent with cadaveric fascia lata. Fibroblast infiltration was seen in all materials except Gore-tex®. Eosinophils were markedly increased with ProteGen™ but mild with both Prolene and cadaveric fascia lata and absent with Gore-tex®.

Conclusions: Fibroblast infiltration and collagen deposition was present in all materials at 6 weeks. Tensile strength followed the rank order of ProteGen™ > Gore-tex® > Prolene > cadaveric fascia lata.

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