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Title (type in CAPITAL LETTERS): IN VITRO ANALYSIS OF TENSILE STRENGTH AND BACTERIAL ADHERENCE ON SYNTHETIC MATERIALS USED IN PUBOVAGINAL SLINGS

Aims of Study: The success of a synthetic material used for a pubovaginal sling is dependent, in part, on its tensile strength and its resistance to infection. Synthetic materials have reliable strength that may be enhanced by fibroblast infiltration and collagen deposition. The goals of this study were to determine whether the tensile strength of synthetic materials increased with fibroblast growth. In addition we aimed to demonstrate varying bacterial adherence with different synthetic materials.

Methods: Human lung fibroblasts (10^5/ml) or 1 ml media were dispensed into each well of a 6-well culture plate and incubated for 24 hrs at 37°. Sterile synthetic material 1 cm^2 was placed into each well. After 5 days at 37°C, materials were harvested and tensile strength recorded using an Intron Tensiometer with a crosshead speed of 10mm/min. Separately, biofilm forming Staph. Epidermidis (10^6 CFU/ml) was incubated with each material (± 5,000U/cc bacitracin wash) for 24 hrs at 37°. Bacteria adherent to material was dispersed in media, serially diluted and plated to enumerate CFU/cm^2.

Results: The amount of force required to break (load) ProteGen™®, Gore-tex and Prolene incubated without cells was 13.32 ± 0.09, 8.09 ± 0.81 and 6.94 ± 0.90 kgf, respectively. The displacement at maximum load followed the same rank order. After 5 days of incubation with cells, the load was increased, significantly only for ProteGen™, 16.77 ± 0.23 kgf, ($p<0.0001$). All materials suported bacterial growth. However, bacitracin was much more effective in inhibiting growth in ProteGen™ and Gore-tex® compared to Prolene.

Conclusions: The tensile strength of the three materials tested followed the rank order ProteGen™>Gore-tex®>Prolene and this rank order remained the same after 5 days of incubation with fibroblasts. Bacitracin was effective in inhibiting bacterial growth in synthetic material.

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