cellular genetic material, all 4 commercially available fascial allografts which are representative of the current material available for sling formation contain DNA. Further test using DNA primers and polymerase chain reaction (PCR) are being conducted on the isolated DNA to determine the specific length of amplified DNA fragments and the integrity of this genetic material. Parallel studies of RNA isolation and PCR amplification are of paramount importance.

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Perry M. Sutaria and David R. Staskin

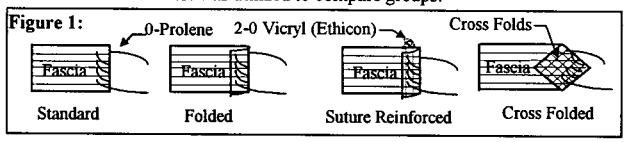
Beth Israel Deaconess Medical Center - Harvard Medical School, Boston, MA, USA

## CADAVERIC ALLOGRAFT STRENGTH: AN ASSESSMENT OF THE EFFECTS OF PRESERVATION TECHNIQUES AND THE METHODS OF SUTURE FIXATION USING TWO SEPARATE EXPERIMENTAL MODELS.

AIMS OF STUDY: Cadaveric tissues are commonly used in reconstructive urology and gynecology. Cadaveric fascia lata allografts (CFA) are the primary tissue that is utilized and various methods for tissue preservation and sterilization exist. There has also been new interest in the use of decellularized cadaveric dermis allografts (DCDA). Unfortunately little data exists about the mechanical properties of the various available cadaveric tissues. In addition, numerous techniques to secure suture to the allograft edge have been described. Our aims were to: 1) evaluate the mechanical and tensile properties of three CFA preparations and two DCDA preparations; and 2) measure the strength of four allograft suturing techniques.

METHODS:
1) Freeze-dried-gamma-irradiated, freeze-dried, and solvent-dehydrated-gamma-irradiated (Tutoplast) fascias were rehydrated and measured for thickness. Freeze-dried DCDA (Alloderm) was similarly rehydrated and 40/1000$^{th}$" and 25/1000$^{th}$" samples were tested. CFA and DCDA strips (2 x 5 cm) were loaded to failure. CFA strips were pulled parallel to the fascial grain and DCDA strips were pulled in a random orientation using a uni-axial tensiometer.
2) Freeze-dried-gamma-irradiated fascia was then selected for suture technique testing. A 0-Prolene (Ethicon) was sutured to 2 cm wide strips of fascia utilizing four methods (Fig. 1). Each configuration was loaded to failure ("pull through" or suture breakage). In both studies, maximum load alone, and adjusted to thickness were calculated. Bimodal Student's t-Test was utilized to compare groups.

Figure 1:




RESULTS:
1) The three different preparations of cadaveric fascia and the 25/1000$^{th}$" cadaveric dermis showed no statistical differences in maximum load, thickness or thickness adjusted maximum load, $p>0.01$. The 40/1000$^{th}$" cadaveric dermis had a significantly higher maximum load to failure compared to the other groups, $p<0.01$. However, when thickness was factored in there were no statistical differences between any of the groups, $p>0.01$. (Table 1).

**Table 1. Tensile Strength of Three Fascial and Two Dermis Preparations (mean ± SD), * $p<0.01$**

| Sample | N | Thickness (in) | Max. Load (lb) | Thickness Adj. Max. Load (psi) |
|---|---|---|---|---|
| Freeze-dried-gamma-irradiated fascia | 12 | 0.019 ± 0.004 | 28.4 ± 5.5 | 1906 ± 470 |
| Freeze-dried fascia | 9 | 0.021 ± 0.003 | 34.1 ± 7.9 | 2049 ± 451 |
| Solvent-dehydrated-gamma-irradiated fascia | 12 | 0.022 ± 0.003 | 34.5 ± 5.6 | 2044 ± 364 |
| Decellularized dermis 25/1000$^{th}$ inch | 13 | 0.025 | 37.3 + 12.9 | 1893 ± 604 |
| Decellularized dermis 40/1000$^{th}$ inch | 7 | 0.040 | **76.2 ± 12.8*** | 2419 ± 407 |

RESULTS: (continued)
2) Statistically significant variations in tensile strength was noted between all four suture techniques ($p<0.05$, Table 2). Cross-folded fascia was 5.5x stronger than "standard", and the 0-Prolene suture broke before "pull through" in all cross- folded samples.

**Table 2. Tensile Strength of Four Suture to Fascia Configurations (n=6), * $p<0.05$**

| Configuration | Thickness (in) | Max. Load (lb) | Thickness Adj. Max. Load (psi) |
|---|---|---|---|
| Standard | 0.25 ± 0.03 | **4.7 ± 0.8*** | **24.2 ± 5.5*** |
| Folded | 0.21 ± 0.06 | **8.9 ± 4.2*** | **51.1 ± 13.5*** |
| Suture reinforced | 0.16 ± 0.01 | **12.4 ± 1.6*** | **98.3 ± 10.9*** |
| Cross-folded | 0.17 ± 0.01 | **17.3 ± 1.3*** | **132.7 ± 10.3*** |

CONCLUSION:
1) Cadaveric fascia has equivalent mechanical properties, *in vitro*, independent of the preservation technique. In addition, our results demonstrate that decellularized cadaveric dermis has equivalent tensile strength to cadaveric fascia when adjusted for sample thickness. However, studies have yet to be performed which support the extrapolation of *in vitro* mechanical properties to *in vivo* long-term clinical performance. Clearly, *in vivo* studies, which evaluate tensile strength and durability over time, would be necessary for before an "ideal" reconstructive allograft tissue is identified.
2) The technique for securing suture to the fascial edge has a definite effect on "pull-through" strength. Comparison of the four different suture techniques revealed that forces applied parallel to the fascial grain cause separation of the fibers and tissue failure. The cross-fold technique reorients the fascial grain 45 degrees to the applied force decreasing the tendency to "pull through" between the fibers. Due to the ease of performing this technique and its demonstrated strength, we would recommend the cross-fold technique as the ideal method to secure suture when using fascia for reconstructive urologic and gynecologic procedures.

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A. Hextall, J. Bidmead, L. Cardozo, K. Boos, J. Mantle

Department of Urogynaecology, King's College Hospital, London, UK

## ASSESSMENT OF PELVIC FLOOR FUNCTION IN WOMEN WITH GENUINE STRESS INCONTINENCE: A COMPARISON BETWEEN ULTRASOUND, DIGITAL EXAMINATION AND PERINEOMETRY

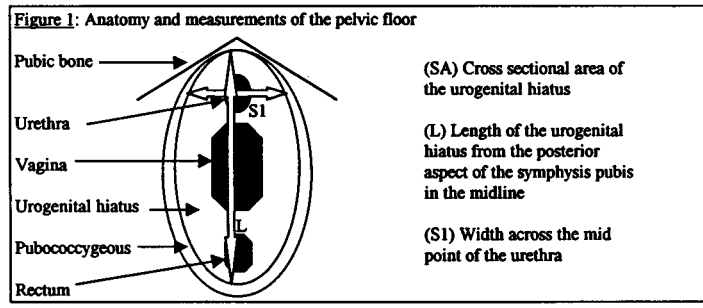
AIMS OF STUDY

A number of different tools can be used to grade the severity of genuine stress incontinence including urinary symptom questionnaires and quality of life instruments. Objective assessments include cystometry, pad testing and evaluations of pelvic floor musculature such as ultrasound, digital assessment and perineometry. These latter tests are frequently used as outcome measures in studies of conservative therapies for incontinence including pelvic floor exercises, electrical stimulation and vaginal cones. The purpose of this study was to correlate measurements of pelvic floor function with urodynamic parameters and pad testing in women with genuine stress incontinence.

METHODS

Consecutive women entering a physiotherapy research program with urodynamically proven genuine stress incontinence were prospectively evaluated. Each underwent a standardized half hour pad test with 250ml of normal saline in the bladder. The urogenital hiatus and pubococcygeus were imaged using transvaginal ultrasound at the level of the bladder neck. The measurements shown in Figure 1 were recorded at rest and during a maximal voluntary pelvic floor muscle contraction. Assessment of pelvic floor musculature was performed by a specialist physiotherapist who was blind to the ultrasound and pad test results; digital assessment was made using a modified Oxford grading scale (0-5) and for perineometry a Peritron 9300+ precision perineometer was used.

Figure 1: Anatomy and measurements of the pelvic floor




RESULTS

50 women with a mean age of 49.6 years (range 30-76) were recruited to the study. On the basis of cystometry 9 (18%) women were diagnosed as having mild, 20 (40%) moderate and 21 (42%) severe genuine stress incontinence. The