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**Title:** CORRELATION OF SUTURE PULL THROUGH STRENGTH TO DERMAL GRAFT THICKNESS: HOW THICK SHOULD GRAFTS BE?

**Aims of Study:**

Increasing reliance on biologic agents as surgical alternates for sling materials has led to questions regarding optimal tissue characteristics. Tissue processing affects tissue integrity and possibly long term tissue incorporation into the implanted host. The purpose of this study was to evaluate the effect of tissue thickness on suture pullout strength using processed human dermal strips. A second goal was to determine the minimally acceptable tissue thickness based on tissue pullout strength.

**Methods:**

Human dermal strips (2 cm x 4 cm dimensions) ranging in thickness from 0.3 to 2 mm were used. Dermal strips were divided into four groups on the basis of thickness (0.3-.39mm, 0.4-0.49mm, 0.5-0.59mm, and > 0.7mm). Within each group, strips were subjected to 1,2, or 3 (2-0) silk suture placement (multiple suture placements were performed to replicate clinical sling stabilization). Suture pullout strength was performed using the Chatillon testing device with a pull rate of 0.5 in/sec. Slings were hydrated for a minimum of 10 minutes prior to testing.

**Results:**

Sample Thickness (mm)	Suture Pullout Strength (N)		
	1 Suture	2 Sutures	3 Sutures
0.3-0.39	4.3	8.5	17.3
0.4-0.49	8.1	13.8	25.8
0.55-0.59	6.8	34.0	44.2
>0.7(0.73-0.84)	9.5	36.2	44.9

Pullout strengths associated with the 0.55mm or thicker strips with 2 sutures approximate 34 Newtons or approximately 7.6 pounds of force.

**Conclusions:**

Differences were noted between dermal strips 0.55 mm and greater in thickness and strips less than 0.55mm in thickness with 2 or more suture placements. These results suggest that thicker dermal segments provide greater pullout strengths and therefore would be more resistant to suture failure in the clinical applications.

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