**USE OF SWINE SMALL INTESTINE SUBMUCOSA AS A DERMAL SUTURE**

Paige E. Black, B.S., OMS IV, Charlotte H. Greene, Ph.D.
Department of Bio-Medical Sciences, Philadelphia College of Osteopathic Medicine

---

**Abstract**

**Purpose**: A proof of concept study to determine if swine small intestine submucosa (SIS) can be used to create a suture that will perform comparably to commercial chromic gut sutures for dermal wound healing.

**Background**: This is a report of the final phase of a project to develop an alternative biological graft and suture material for a variety of surgical repairs that is affordable and readily available in resource-poor settings of the developing world. The rationale is to provide instruction for the preparation of an inexpensive, plentiful and functional material that can be harvested from locally raised animals, safely prepared in the fresh state with the flexibility to be adapted for placement in a variety of procedures.

**Methods and Materials**: Two groups of 4 rats each received a 5mm, mid-scrapal, full-thickness, skin wound. Closure was effected in one group using commercial chromic gut, and with swine intestinal submucosa (SIS) suture in the other. SIS sutures were prepared from fresh swine jejunum following removal of the serosal and mucosal layers and then stretched to nearly double its original length. The stretched strips were then cut into 3.0 sutures, then threaded onto a 4-0 reverse cutting needle and sterilized in a 10% gentamycin solution until placement.

**Results**: All animals showed full wound closure at day 21 with no significant differences between the SIS and Chromic Gut groups in any measured parameter.

**Discussion & Conclusions**: After evaluating samples grossly and by light microscopy, no statistically significant differences were found between SIS and chromic gut sutures. In all evaluated parameters of healing, it appears that SIS sutures performed as well as commercially available chromic gut suture material and supported the Null Hypothesis (H0) for this study.

---

**Infiltration of Native Tissue into Suture Material**

**Fibroblasts**: Fibroblasts were counted in a 2.01 by 2.01 sampling square superimposed on micrographic fields at 10X. The average number of fibroblasts per animal calculated, and compared using a Student’s t-test. The t statistic= 0.07, P value= 0.95, therefore, not significant at the P<0.05 level.