

### **C58. Right Ventricular Outflow Tract Conduit Made From Small Intestine Submucosa**

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**OBJECTIVES:** The use of an extracardiac conduit between the right ventricle and the pulmonary artery has made possible the routine repair of various forms of congenital heart disease. Although techniques of reconstruction of the right ventricular outflow tract (RVOT) have been refined, materials for the conduit are still far from ideal. In addition to conduit material failures, the materials all lack viability and the ability to grow. In this study, the possible use of small intestinal submucosa (SIS) as a tissue-engineered RVOT conduit was evaluated.

**METHODS:** A piece of small intestine was harvested from euthanized swine. It was decellularized and a valved conduit was fashioned while the piece of SIS was kept as a cylinder shape. Three pigs and three sheep received the valved conduit and were followed up for three months. Prior to euthanasia, catheterization and echocardiogram were performed. After euthanasia, the conduit was excised and prepared for histological analysis.

**RESULTS:** All animals survived without complications until scheduled euthanasia. At euthanasia, one pig had moderate pulmonary regurgitation. Necropsy in one pig showed vegetation on the valve cusps. The conduits in other animals were free of vegetation, rupture, or thrombus. Histopathological analysis showed aligned smooth muscle cells and occasional blood vessels in the conduit wall and elastin formation near the proximal and distal anastomosis.

**CONCLUSIONS:** Significant cell growth on the SIS conduit including smooth muscle cells and elastic tissue were identified at three-months follow-up. The SIS has the potential to serve as a tissue-engineered RVOT conduit.