**Abstract**

Objectives: The aim of this study is to describe the utility of the pig as an animal model for fellowship training in the complex operative management of laryngotracheal reconstruction.

Study Design: Descriptive Study

Setting: Animal Laboratory Facility of a Tertiary academic pediatric hospital

Study Population: Piglets weighting between 8 to 15kg were used to perform a variety of surgical interventions in the larynx for the management of Sus scorfa laryngotracheal stenosis.

Methods: Assessment of the Sus scorfa piglet anatomy was performed to identify anatomical similarities to the human neck. The following procedures were successively performed: 1) Anterior cricoid split with thyroid ala graft augmentation 2) Anterior and posterior cricoid split with costal cartilage augmentations 3) Partial cricotracheal resection 4) Tracheal resection with primary anastomosis 5) Cricotracheal resection, reconstruction.

Conclusions: We described the Sus scorfa piglet as a reliable animal model for the training of Pediatric Otolaryngology clinical fellows in training of the different procedures implicated and available for laryngotracheal reconstruction including the management of the airway during surgery. The anatomy and tissue quality was proven to be a realistic representation of the human neck and laryngeal structures. This model will be able to fulfill the current deficits in training fellowships due to the relative rarity of this condition and trainee’s limited exposure.

**Figure 1. Sus Scrofa Piglet Anatomy**

**Figure 2. Anterior Cricoid Split with Thyroid Ala Graft**

**Figure 3. Harvest of Costal Cartilage**

**Figure 4. Anterior Cricoid Split with Costal Graft**

**Results**

1. The anatomy of the neck and laryngeal structures of the Sus Scrofa Piglet was studied and differences and similarities to the human were observed (Figure 1).

2. The following procedures were performed:
   1) Anterior cricoid split with augmentation using thyroid ala graft (Figure 2)
   2) Harvest of costal cartilage (Figure 3)
   3) Anterior cricoid split with augmentation using costal cartilage graft (Figure 4)
   4) Posterior cricoid split with augmentation using costal cartilage graft
   5) Cricotracheal Resection
   6) Slide Tracheoplasty

**Conclusions**

1. The anatomy and tissue quality of the Sus Scrofa Piglet provided a realistic representation of the human neck and laryngeal framework.

2. This model can be used to enhance pediatric surgical airway training during both Residency and Fellowship.

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Context

1- Exposure to open airway surgery within Otolaryngology Residency and Pediatric Otolaryngology Fellowship Programs is variable and in many instances inadequate.

2- This problem is further aggravated by restricted working hours.

3- Residency and Fellowship Programs may need to develop surgical simulation models to ensure adequate training exposure.

**Objectives**

1- To introduce the Sus Scrofa Piglet as a live animal model for training in open airway surgery.

2- To provide a training approach that supplements exposure to open airway surgical cases.

**Project Outline**

1- All procedures took place at The Animal Laboratory Facility at The Hospital for Sick Children from September 2009-September 2010.

2- All personnel completed an animal handling course and The Animal Care Committee approved the protocol for training purposes.

3- All surgeries were supervised by an Attending Pediatric Otolaryngologist and subsequently performed independently by an Otolaryngology Trainee.

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