10 year old male with history of burn injury who required a tracheotomy due to prolonged intubation/inhalational injury at age 5. Following tracheotomy, the patient was unable to be decannulated and Otolaryngology was consulted. Subglottic/tracheal stenosis was identified involving the cricoid cartilage and the first three rings of the trachea and anterior cartilaginous grafting involving the thyroid cartilage, cricoid cartilage, and trachea was performed. The patient underwent bronchoscopy several weeks later which revealed granulation tissue and a portion of the graft was removed. One month later he underwent a repeat bronchoscopy which revealed anterior graft prolapses and an additional portion of the graft was removed. He was lost to follow-up for several months and subsequently was noted to have recurrence of the subglottic stenosis. He remained tracheotomy dependent for six years due to failed graft and postoperative complications despite several attempts to improve the airway with CO2 laser and balloon dilation. In 2011, preoperative CT with 3D reconstruction revealed a 32mm long segment of complete stenosis. The patient underwent suprahilary release and single stage cricotracheal resection and partial preservation of the anterior costal cartilage graft found in the luminal scar tissue. Postoperatively the patient was stented with a nasal endotracheal tube for 2 weeks. Bronchoscopy showed mild tracheal collapse inferior to the site of anastomosis and granulation tissue at the site of anastomosis. Granulation tissue was removed and the subglottic anastomosis site was stented with a 2 cm Dumon stent for 6 months. He did well for several weeks following removal of the stent, however, he was readmitted with respiratory distress approximately three weeks following the initial removal of the stent. Findings were consistent with granulation tissue at the site of the anastomosis and balloon dilation was performed. He did well for a short time, however, the stent was replaced due to dynamic collapse and calcified scar tissue noted at the anastomosis. At this time, as part of his puberty, his laryngotracheal tissue underwent rapid change with increasing calcification and harder scar tissue. A larger stent was placed and recent examination reveals the stent in good position with no granulation tissue.

METHODS AND MATERIALS

The patient underwent suprahilary release and single stage reconstruction with partial cricotracheal resection and end-to-end anastomosis. The costal cartilage graft from previous laryngotracheal reconstruction was found collapsed into the lumen and firmly attached to trachea obstructing a segment 3.2 cm. The tracheal portion of the cartilage graft was removed along with the obstructed tracheal segment. After resection, the superior cricotracheal portion of the previous graft leading into the thyroid cartilage was observed to provide support to the airway. This was preserved in place and trimmed to accept an end to end anastomosis from the trachea below. The portion of graft cartilage that was preserved was wedged into the cricothyroid anteriorly effectively helping expand the lumen. Preservation of this costal cartilage graft in the superior portion has helped perform a primary end-to-end anastomosis without the need for transsternal tracheal release.

CONCLUSIONS

Tracheal stenosis continues to be a difficult problem requiring multiple management modalities with partial cricotracheal tracheal resection and end-to-end anastomosis representing a viable treatment option when more conservative options fail.