THREE-DIMENSIONAL SUPRAGLOTToplasty: improved visualization of the supraglottis in laryngomalacia

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INTRODUCTION

- The use of three-dimensional (3D) endoscopy has been described in the pediatric airway to improve visualization of complex airway anatomy.
- Laryngomalacia is one of the most common forms of airway pathology evaluated in pediatric otolaryngology offices.
- It is unclear whether 3D visualization is superior to standard endoscopy as a means to assess and surgically manage complex airway anatomy.

Objective: To describe a pilot series in which 3D endoscopy was used to facilitate supraglottoplasty and present outcomes data.

METHODS AND MATERIALS

- Patients with symptomatic laryngomalacia consented to have supraglottoplasty performed using 3D endoscopy.
- Postoperatively, data was collected concerning length of hospital stay, presence of aspiration, granuloma formation, supraglottic stenosis, need for revision surgery, need for tracheostomy, and need for gastrostomy.

RESULTS

- Eleven patients have undergone 3D supraglottoplasty to date.
- 4 also had grade I subglottic stenosis.
- Intraoperatively, the 3D endoscope was subjectively felt to improve visualization of the supraglottic anatomy and allow for more precise tissue removal.
- Hospital stay was found to be an unreliable indicator due to significant comorbidities in many patients.
- Aspiration was seen in one patient who subsequently required gastrostomy placement. This patient had severe hypotonia and developmental delay.
- One patient with subglottic stenosis and subglottic cysts required a subsequent tracheostomy in the setting of a severe rhinovirus infection.

DISCUSSION

- 3D technology is increasingly being used to facilitate surgical resections.
- Use of the surgical robot has increased interest in 3D visualization.
- 3D endoscopy has been used to improve visualization in laparoscopy and in anterior skull base resections.
- It has previously been shown to decrease operative times and may be easier to teach and learn for novice surgeons.
- We previously published our experience with the use of this technology in other airway lesions.
- The variable anatomy associated with laryngomalacia may be better visualized with 3D endoscopy.
- We did not see higher complication rates associated with the use of 3D technology.

CONCLUSIONS

- 3D supraglottoplasty holds promise in providing superior visualization allowing for more precise tissue removal.
- The rates of complications are similar to standard techniques.
- More research is needed to compare outcomes between 2D and 3D techniques.