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Transoral approach for direct and complete excision of vallecular cysts in children

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ABSTRACT

Objective: To review the presentation, evaluation, and treatment of children with vallecular cysts and introduce a new technique of transoral excision for this entity.
Methods: Retrospective case series of children diagnosed with vallecular cyst between 2001 and 2008 at a single tertiary care children's hospital. Data collected, including age at diagnosis, presenting symptoms, additional diagnoses, diagnostic modality, prior and subsequent surgical therapy, length of hospital stay, length of follow-up, and recurrence were analyzed with descriptive statistics.
Results: Seven children (mean age 198 days, range 2 days to 2.9 years) were included in this series. Five children presented with respiratory distress and/or swallowing difficulties. Vallecular cyst was diagnosed by initial flexible fiberoptic laryngoscopy (5/7), MRI (1/7), and intubating laryngoscopy (1/7). All children underwent complete cyst excision via transoral surgical approach. Two children underwent additional supraglottoplasty for concomitant laryngomalacia, one of whom underwent tracheotomy for persistent respiratory distress and vocal cord immobility. The average length of hospital stay postoperatively was 9.5 days, and four patients stayed less than 2 days. No patients experienced recurrence of the vallecular cyst at last follow-up (range 4–755 days, mean 233 days).
Conclusions: Vallecular cysts are rare but should be considered in children with respiratory distress and dysphagia. Awake, flexible fiberoptic laryngoscopy with particular attention to the vallecular region should be performed on any child presenting with these symptoms. Direct, transoral approach for excision of the vallecular cyst is our preferred method of treatment with no recurrences to date.

1. Introduction

Vallecular cysts are rare anomalies in infants but must be considered in the differential diagnosis of any infant with stridor, dysphagia, and failure to thrive. Although the most common cause of stridor in an infant is laryngomalacia, vallecular cysts can be associated with and may even exacerbate laryngomalacia [1–3]. Suspicion for vallecular cyst should be raised if any life-threatening events or difficulties with feeding occur in conjunction with inspiratory stridor. Awake, flexible fiberoptic laryngoscopy is usually adequate for diagnosis of vallecular cyst, although the diagnosis may be missed if specific attention is not directed to the vallecula or if other findings for laryngomalacia or reflux dominate the examination.

In the small number of reported cases, treatment of vallecular cyst is surgical excision, as no medical intervention is adequate. Simple aspiration is performed to decompress the cyst only in emergent situations as the rate of recurrence is high with this technique [4]. Several authors advocate marsupialization of the cyst with electrocautery or carbon dioxide (CO_2) laser [2,5]. Because this technique carries a known risk of recurrence, as any remaining cyst wall may be a nidus for re-accumulation, various techniques for complete excision of vallecular lesions to treat marsupialization failures and recurrences have been developed [6,7]. Both the transoral median glossotomy approach and transhyoid approach carry a risk of prolonged intubation or need for postoperative tracheotomy to protect the airway, especially in young infants. Additionally, there is a risk of pharyngocutaneous fistula and neck scarring in the transhyoid approach [7]. In this study, we report for the first time a simple, safe, and reliable transoral approach for direct and complete excision of vallecular cyst in a series of seven infants.

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2. Methods

This is a retrospective case series. After approval by the Seattle Children's Hospital (SCH) Institutional Review Board, discharge data and archived quality improvement endoscopic images were searched to identify seven subjects with the diagnosis of vallecular cyst treated between 2001 and 2008. The following variables were recorded from medical record review: age at diagnosis, setting of presentation (outpatient or inpatient), presenting symptoms, additional diagnoses, diagnostic modality, prior and subsequent surgical treatments, operative findings, length of hospital stay, length of follow-up, and recurrence. The clinical course and outcomes of these patients were analyzed with descriptive statistics (Excel, Microsoft, Redmond, WA).

3. Results

The summary of all seven cases is presented in Table 1. The mean age at diagnosis was 198 days with a range from 2 days to 2.9 years. Five of the seven infants were less than 3 months old at the time of diagnosis and had severe respiratory distress. The two older children (patients 3 and 7) had minimal or no symptoms at diagnosis, but the remaining five younger children presented with either mild to severe respiratory distress or dysphagia. In patients 1–4, the cyst was recognized with an awake flexible fiberoptic laryngoscopy performed at the time of initial consultation and managed with a single surgery. The diagnosis was not appreciated on initial fiberoptic laryngoscopy in patients 5 and 6 because of the presence of severe laryngomalacia in both. Both of these cysts were discovered shortly after supraglottoplasties were performed and managed with a second surgery. Patient 6 underwent magnetic resonance imaging (MRI) scan during evaluation for a cause of congenital bilateral vocal cord immobility because of persistent stridor and respiratory failure. A cystic lesion in the vallecula was found incidentally on the MRI scan. Patient 7 was diagnosed with a vallecular mass during intubating laryngoscopy while undergoing ear tube placement and adenotonsillectomy surgery at an outside hospital and was referred to SCH for surgical management.

The surgical approach for all patients was transoral with complete excision of the vallecular cyst. In one child with associated laryngomalacia (patient 5), an epiglottopexy was also performed. All but one child were extubated immediately following excision. Six of the seven children were observed in the intensive care unit. Six of the children had complete resolution of their presenting symptoms following direct excision using the transoral approach. One of the two children with concurrent diagnosis of laryngomalacia was also found to have bilateral vocal cord immobility, thought to be acquired from prior intubation. This child had persistent respiratory distress from the vocal cord immobility, unrelated to vallecular cyst, and subsequently required tracheotomy.

The average length of inpatient stay after excision was 9.5 days (range 1–41 days), but four of the seven children stayed for less than 2 days postoperatively. On the last documented clinical follow-up (range 4–755 days, mean 233 days), no patients had recurrence of the vallecular cyst on direct oral examination or flexible fiberoptic laryngoscopy. Five of the seven children had no recurrence after at least 4 months of followup. To date, no patients have returned to Seattle Children's Hospital for recurrence of symptoms from vallecular cyst.

The following two cases highlight the range of presenting symptoms of vallecular cysts from mild to severe.

Patient 3 was an otherwise healthy 3 month old girl who presented to the otolaryngology clinic when her pediatrician astutely noted on direct examination a mass in the base of tongue, which he presumed was a hemangioma. She did not have any stridor or failure to thrive, but she did have some difficulty swallowing with gagging. Awake, flexible fiberoptic laryngoscopy in clinic revealed a cystic mass in the vallecula. No airway obstruction was evident. The child's parents were reluctant for her to undergo surgical excision, and since she was relatively asymptomatic, she was observed for 8 weeks. When the child was 5 months old, she was taken to the operating room for excision of vallecular cyst. The cyst extended onto the lingual epiglottis and was completely excised. She was extubated immediately after the surgery and admitted in the hospital for 2 days. On follow-up visit at 131 days after surgery, she had not had recurrence of symptoms or of the cyst.

Patient 5 was a boy, one-month of age, from Alaska, who presented to the otolaryngology clinic with worrisome stridor in addition to failure to thrive. On flexible fiberoptic laryngoscopy, he was noted to have severe laryngomalacia with prolapse of his epiglottis into the glottic airway on inspiration. He was taken to the operating room for a supraglottoplasty and admitted to the neonatal intensive care unit postoperatively. He had some minor improvement in his stridor, and on postoperative laryngoscopy, he was noted to have a cystic mass in the vallecula. The patient was returned to the operating room for transoral excision. Visualization was optimized using the Hopkins II telescope. At the same time, he underwent epiglottopexy. At the 7-month follow-up telephone call, he was much improved but continued to have occasional respiratory issues.

Table 1
Case summary for seven children with vallecular cyst.

Patient	Age at diagnosis (days)	Setting of presentation	Symptoms	Diagnostic modality	Additional diagnoses	Additional surgery	Length of hospital stay (days)	Clinic follow-up (days)[a]
1	2	NICU	Stridor, desaturation	FFL	None	None	2	24
2	90	Clinic	Stridor	FFL	None	None	1	137
3	157	Clinic	Dysphagia	FFL	None	None	2	131
4	37	NICU	ALTE, dysphagia	FFL	None	None	12	375
5	32	Clinic	Stridor	FFL	Severe laryngomalacia	Supraglottoplasty, epiglottopexy	8	203
6	13	NICU	Severe respiratory distress requiring intubation	MRI	Laryngomalacia, bilateral vocal paresis	Supraglottoplasty, tracheotomy, posterior cricoid split with costal cartilage graft	41	755
7	1059 (2.5 years)	OR	Asymptomatic	Intubating laryngoscopy	Recurrent otitis media, adenotonsillar hypertrophy	None	1	4

Abbreviations: ALTE, acute life threatening event; FFL, flexible fiberoptic laryngoscopy; MRI, magnetic resonance imaging; NICU, neonatal intensive care unit; OR, operating room.

[a] No patients have experienced recurrence of symptoms of cyst to date.