International Journal of Pediatric Otorhinolaryngology 90 (2016) 236–240

Contents lists available at ScienceDirect

International Journal of Pediatric Otorhinolaryngology

journal homepage: http://www.ijporlonline.com/

Early surgical intervention in type I laryngeal cleft

Kristine E. Day [a], Nicholas J. Smith [b], Brian D. Kulbersh [b, *]

[a] Department of Otolaryngology, University of Alabama at Birmingham, Birmingham, AL, USA
[b] Pediatric ENT Associates, Children's of Alabama, Birmingham, AL; Children's of Alabama Aerodigestive Program, USA

ARTICLE INFO

Article history:
Received 31 May 2016
Received in revised form
13 September 2016
Accepted 13 September 2016
Available online 14 September 2016

Keywords:
Laryngeal cleft
Type I laryngeal cleft
Endoscopic repair
Early surgical intervention

ABSTRACT

Objective: Diagnosis and treatment of type 1 laryngeal clefts remains a challenge. The purpose of this study is to determine if early surgical intervention in type I laryngeal clefts improves outcomes.
Methods: A retrospective case series was conducted at an academic tertiary care children's hospital. 18 children undergoing early (≤3 months from diagnosis) surgical intervention for type I laryngeal cleft repair between August of 2012 and December 2014. Data was compiled through a manual chart review.
Results: 18 children who underwent early surgical intervention for type I laryngeal cleft repair were identified for review. 14 (78%) were male and 4 (22%) were female and the average age at time of repair was 1.6 years. Most frequent presenting symptoms included dysphagia (61%) and recurrent respiratory issues (22%). Successful swallowing outcomes, defined as subjective improvement (i.e. absence of previous symptoms) per parental report in follow-up visits, +/− normal post-operative MBS (modified barium swallow) findings, was seen in 11 patients (61%). 9 patients required hospitalization for respiratory issues prior to surgical repair. Post-operatively, 4 patients still incurred an admission for respiratory reasons.
Conclusions: Our series shows a success rate of 61% with early surgical intervention (≤3 months from diagnosis). A decrease in post-operative hospitalizations is appreciated.

1. Introduction

Laryngeal clefts represent an uncommon congenital malformation, with an incidence historically reported as 1 in 10,000–20,000 births [1]. First described in 1792 by Richter, clefts are now most commonly classified into four types as first described by Benjamin and Inglis [2–4] (Fig. 1). Type 1 clefts represent those that do not extend below the level of the true vocal folds and can present with non-specific symptomatology, often leading to a delay in diagnosis. Because symptomatology often includes dysphagia, recurrent respiratory illnesses, and breathing abnormalities, patients are often referred to one or more subspecialties. These include gastroenterology, pulmonology, and otolaryngology. In recent years, there has been an increase in the frequency of reported cases (up to 7.6% incidence) [1]. A high index of suspicion for the diagnosis in addition to the advent of specialized airway centers and multidisciplinary aerodigestive teams may have led to this increase.

Evaluation and management of type I clefts continue to incite controversy in the absence of a standardized plan of care. Not only are diagnostic tools such as MBS and FEES (fiberoptic endoscopic evaluation of swallowing) debated, but also the types of feeding therapies and timing of surgical intervention. Many authors agree that a trial of medical management is warranted prior to surgical intervention [1,5–7]. Those that fail these measures then undergo endoscopic repair. However, the lengths of time for trialing feeding therapies vary. The success rate overall for medical management is also quite variable, anywhere from 20 to 100% [2], and the risk of continued aspiration and pulmonary morbidity during this period remains. Up to 80% of patients may still require surgical intervention after a trial of conservative measures [6]. In light of continued aspiration risk, variable medical management success rates, and a not insignificant rate of those ultimately requiring surgical intervention, an

* Corresponding author. Pediatric ENT Associates, Children's of Alabama, 1600 7th Avenue South, Birmingham, AL 35233, USA.
E-mail address: brian.kulbersh@childrensal.org (B.D. Kulbersh).

http://dx.doi.org/10.1016/j.ijporl.2016.09.017
0165-5876/

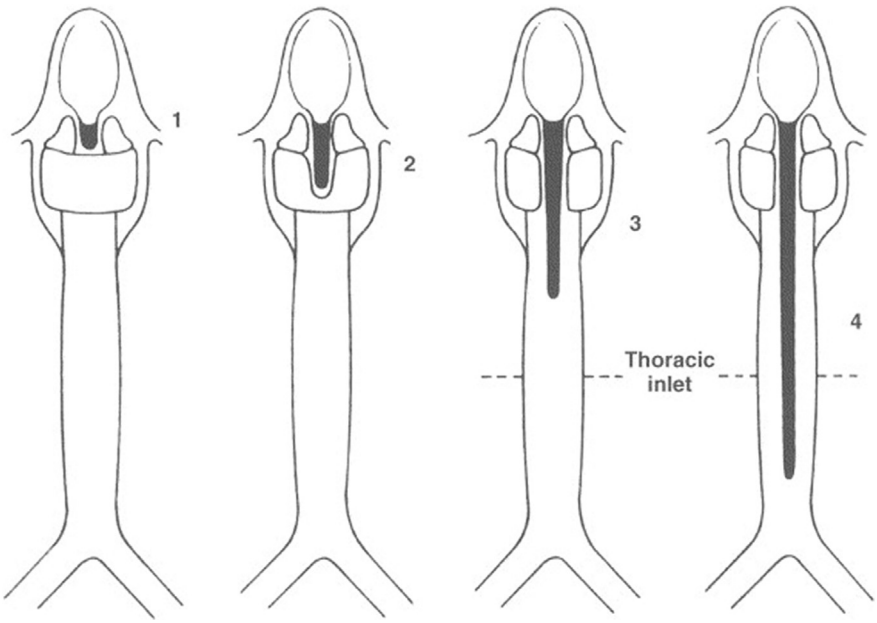

Fig. 1. The Benjamin-Inglis laryngeal cleft classification system [4]. Type I clefts do not extend below the level of the true vocal cords. Reprinted by Permission of SAGE Publications, Inc.

argument for early surgical intervention can be made. The purpose of our study, therefore, is to determine if early surgical intervention improves outcomes of patients with type I laryngeal cleft.

2. Methods

University of Alabama at Birmingham (UAB) Institutional Review Board approval was first obtained. 22 children were then identified via ICD-9 code as having undergone surgical repair of type I laryngeal cleft at Children's of Alabama between August 2012 and December 2014. These cases correspond with the induction of a multidisciplinary aerodigestive program at Children's of Alabama. Patient cases were discussed and recommendations made in a round table format with specialists from pulmonology, otolaryngology, gastroenterology, and speech language pathology present. Early surgical intervention was defined as surgery less than or equal to 3 months from the diagnosis. One child was excluded secondary to no post-operative follow up whatsoever. 3 children who underwent repair >3 months after diagnosis were also excluded from the study, for a final of 18 patients. All children underwent suspension laryngoscopy and bronchoscopy with palpation of the interarytenoid region using a nerve hook to confirm the presence of a type I cleft (Fig. 2). Typically, surgical repair consisted of the following: using microlaryngoscopy, the mucosa lining the cleft was ablated with a CO_2 laser and the edges then re-approximated with non-absorbable suture. A retrospective review of medical records was then undertaken for the following variables: date of birth, sex, medical comorbidities, service to whom the patient presented first, presenting symptom, initial modified barium swallow (MBS) findings, how the patient was diagnosed, time from diagnosis to repair, number of pre-operative MBS studies, procedure date, age at the time of procedure, performing surgeon, results of first post-operative MBS study, number of post-operative MBS

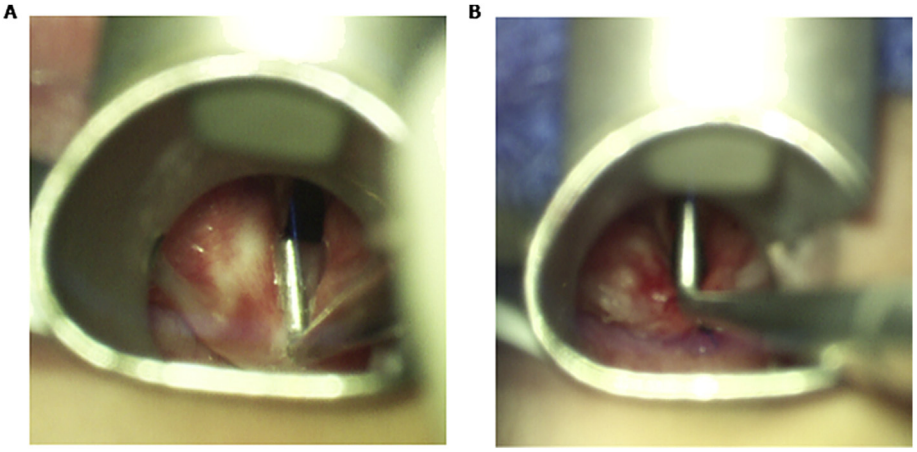

Fig. 2. A. A nerve hook demonstrates palpation of the cleft prior to repair. B. The cleft has been successfully repaired using a CO_2 laser and non-absorbable suture.