International Journal of Pediatric Otorhinolaryngology (2008) 72, 715—718

International Journal of Pediatric Otorhinolaryngology

www.elsevier.com/locate/ijporl

CASE REPORT

Treatment of bilateral choanal atresia in the premature infant☆

Annie Lapointe [a,*], Chantal M. Giguère [a], Véronique-I. Forest [b], Marie-Claude Quintal [a]

[a] *Pediatric Otolaryngology, University of Montreal, 3175 Côte-Sainte-Catherine, Montréal, Québec, Canada H3T 1C5*
[b] *Department of Otolaryngology-Head & Neck Surgery, University of Montreal, Montreal, Canada*

Received 20 July 2007; received in revised form 21 January 2008; accepted 22 January 2008
Available online 12 March 2008

KEYWORDS
Choanal atresia;
Premature infant;
KTP laser;
Transnasal approach

Summary An innovative technique for choanal atresia repair was used for a unique case of bilateral choanal atresia in a 28-week premature newborn. Endoscopic transnasal KTP laser was employed as an alternative to standard instrumentation to reach the very small atretic plate of a premature nose, providing good visualization of the operative field, thereby avoiding damage to the adjacent structures. The successful repair allowed for early extubation and avoidance of a tracheotomy. The clinical and surgical aspects of the case are discussed. With the likelihood of encountering more premature infants with choanal atresia given the improving neonatal intensive care, we propose that KTP laser repair be considered as an alternative to conventional procedures for this particular population.

Bilateral choanal atresia is a rare and challenging disease occurring in 1 every 10,000 births [1—15]. The anatomic classification of choanal atresia was classically described as 90% bony and 10% membranous; however, more recent studies using high-resolution CT scan revealed that 30% of the atresia were purely bony and 70% were a mixed bony—membranous anomaly [2—8,11—15]. Theories proposed to explain this congenital malformation include failure of the bucconasal membrane to rupture, persistence of the buccopharyngeal membranes, medial outgrowth of vertical and horizontal processes of the palatine bone and possible defects in neural crest migration [1—15].

The classic presentation includes cyclic cyanosis relieved by crying, but symptoms may vary from mild respiratory distress with feeding to severe airway obstruction [2]. The diagnosis should also be raised when failed extubation of a newborn occurs. Associated congenital anomalies occur in 20—50% of patients [1—15].

The literature describes only a few cases of bilateral choanal atresia in the premature infant population [3—7]. This unusual event brings unique

☆ Presented at the annual meeting of the American Society of Pediatric Otolaryngology, Las Vegas, NV, 28—30 May 2005.

* Corresponding author. Tel.: +1 514 345 4857; fax: +1 514 345 4931.
E-mail address: annie.lapointe@videotron.ca (A. Lapointe).

0165-5876/$ — see front matter © 2008 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ijporl.2008.01.027

challenges to the otolaryngologist, with higher likelihood of failure of non-surgical maneuvers and increased surgical hazards with standard instruments. Tracheotomy is then used until definitive treatment can be undertaken [9]. We present the case of the youngest premature infant to be successfully treated for bilateral choanal atresia, in which a KTP laser assisted technique led to early discharge home of the patient and avoidance of a tracheotomy.

1. Report of a case

The patient is a female dizygotic twin born prematurely at 28 weeks gestation with a birth weight of 1120 g. She was intubated soon after birth for respiratory distress. The diagnosis of choanal atresia was first suspected at 3 weeks of life after two failed extubation attempts. A CT scan confirmed the diagnosis of isolated mixed bony—membranous bilateral choanal atresia (Fig. 1). The following week, the patient underwent an endoscopic atresia repair in a tertiary care pediatric hospital using KTP laser.

The surgery was performed under general anesthesia with oral intubation. The nose was first decongested using xylometazoline soaked pledgets. Local anesthesia of the atretic plate, posterior septum and posterior inferior turbinates was achieved using 1% xylocaine with 1:100,000 epinephrine. The KTP laser (model 10-0612, Laserscope, San José, CA) was employed with a 0.6-μm fiber in a small handpiece at a setting of 1 W in continuous mode under direct vision from a 2.7-mm 0 degree endoscope. Vaporization of the atretic plate and posterior septum was performed in contact mode until a 3.0 endotracheal tube could fit in each nasal cavity. Backbiting forceps were used to complete the resection of the posterior vomer. Mitomycin was applied bilaterally (1 mg/ml, three times 1 min). Finally, nasal stents were fashioned with a 3.0 polyethylene endotracheal tube in the classic way to allow nasal breathing, and were sutured in place for a 4-week period.

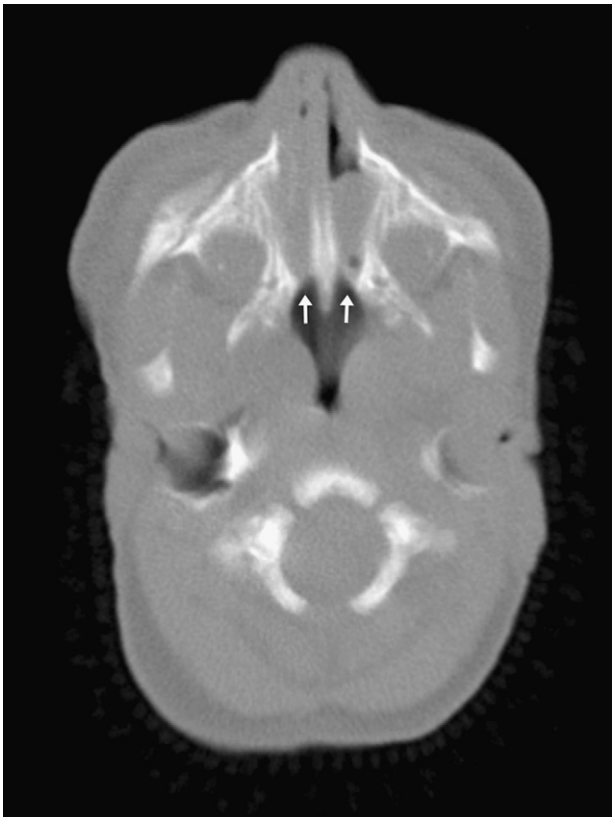

Fig. 1 Axial CT scan showing mixed bilateral choanal atresia (arrow). Distance from posterior vomer to lateral pterygoid plate is 2.1 mm on each side.

There were no peri-operative complications. Frequent saline irrigations and suctioning of the stents was done to preserve their patency. Gentamycin and steroid antibiotic drops were used twice daily whilst the stents were in place and for 2 additional weeks after their removal. The patient was successfully extubated 3 days after the procedure. The only postoperative complication was nasal bleeding secondary to septal granulation tissue which developed 4 weeks post-procedure. This necessitated removal of the stents, nasal packing and reintubation for 3 days. The stents did not need to be replaced after nasal packing removal. She still has patent choanae after 2 years of follow-up.

2. Discussion

Bilateral choanal atresia causes severe airway compromise as neonates are obligate nasal breathers [1—15]. Management first requires timely diagnosis and airway stabilization [2,9]. Surgical correction is then usually done within the first few weeks of life, using one of four approaches to the choanae (transnasal, transpalatal, transseptal and transantral) [2,4,7]. There is limited information in the literature to compare choice of approach and none to compare drills, microdebriders or lasers as choice of surgical instrument for transnasal repair [14]. It has been shown that the results after transnasal surgery are comparable to those after transpalatal surgery, but with less peri- and postoperative complications [2,4,8,14]. Surgeons then preferably use a variety of transnasal methods to avoid the malocclusion associated with transpalatal repair [2]. Standard transnasal techniques with powered instrumentation or otoscopic drills are however likely to be risky in premature infants. The very small size of a prema-