CASE REPORT

Choanal Atresia Treated with Transpalatal Approach

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ABSTRACT
A case of unilateral choanal atresia (CA) presented in adulthood with unilateral nasal discharge and obstruction, and coloboma of right lower eyelid. Diagnosis of choanal atresia was made with 0° telescope and CT scan. It was treated surgically by transpalatal (TP) approach. Stent was kept for 6 weeks. Few adhesions developed, which were broken. There was no other complication in follow-up.

Key words: Choanal atresia. Transpalatal approach. Nasal discharge. Coloboma.

INTRODUCTION
Choanal Atresia (CA) is a commonly observed congenital anomaly of nose but overall it is a rare entity; incidence is one per 5000 to 8000 live births.1 Unilateral CA is commoner than bilateral one. Typical case usually presents late when complications develop. Coloboma of eyelid is also a congenital anomaly of eyelid associated with CA. Female to male ratio in case of CA is 3:2. It may be related to twin pregnancies and chromosomal anomalies. A study showed that CA is more common in children whose mothers were taking methimazole during pregnancy for Graves’ disease.2

Embryologically by the 38th day of development, the two layer membrane consisting of oral and nasal epithelia (buccopharyngeal or bucconasal membrane) ruptures and forms the choanae (posterior nares). Failure of this rupture results in choanal atresia or it may be due to persistence of epithelial cells. The latest concept is that there may be medial growth of vertical and horizontal process of palatine bone or a misdirected mesodermal flow that leads to this anomaly.3

The present case report describes one such case treated successfully with transpalatal single step surgery.

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A 17-year-old male presented to ENT Department of Holy Family Hospital in September 2007 with history of left sided nasal discharge, nasal blockage, frontal headache and decreased hearing in the left ear. There was a history of feeding difficulties on breast feeding in infancy. On clinical examination of nose and throat, unilateral CA of left side was diagnosed as there was no nasal patency, failure to pass rubber catheter from left nostril to oropharynx and failure to appear methylene blue drop from left nasal cavity to oropharynx. Diagnosis was confirmed with 0° telescope. On right side there was enlarged inferior turbinate and nasal cavity was patent. The left tympanic membrane was dull. Tuning fork tests showed conductive hearing loss on left side. The right ear was normal. Secretory otitis media was diagnosed on the left side. He had no other sibling and there was no history of any other congenital anomaly in the family. He had been operated for dacryocystorhinitis in the right eye at the age of 5 years in the same hospital. There was also a coloboma of lower right eyelid. Cardiac, surgical and eye consultations were done and associated congenital anomalies were ruled out.

CT scan showed thick bony atresia of left posterior choana with slight medial displacement of left lateral bony wall (Figure 1). The right posterior choana was normal. Repair was done by transpalatal approach under general anesthesia; incision was made at gingivopalatal margin and palatal flap was raised. Hard palate was drilled upto the level of bony atretic plate, which was also drilled. Mucoperiosteal flap was replaced. Endotracheal tube was used as stent (Figure 2) and was removed after 6 weeks.

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At that time nasal cavity was examined with 0° telescope. There were no granulations and the cavity was patent. Secretory otitis media was treated medically and improved. Postoperative CT scan showed patent nasal airway on left side. Follow-up after one month revealed some adhesions in left nasal cavity, which were broken with unipolar cautery and splints were placed for one week. Two subsequent follow up examinations with 0° telescope did not reveal any granulation and nasal cavity remained patent.

**DISCUSSION**

In case of CA, bony atretic plate is seen in 90% of cases and membranous in only 10%. Bony atretic plate is usually thin. In the present case, atretic plate was also bony but it was thick and there was also medial growth of vertical process of palatine bone as seen on CT scan. Associated congenital lesions are more common with bilateral (60%) as compared to unilateral (40%). Commonly involved syndrome associated with it is CHARGE syndrome that includes coloboma of eyelids, heart defects, atresia of choana, retarded growth, genital hypoplasia and ear deafness. In this case coloboma of lower eyelid was the sole associated congenital anomaly. Bilateral CA always presents as respiratory emergency, as neonate is an obligate nasal breather at birth. Unilateral CA presents somewhat later and sometimes may not become apparent until adulthood, as happened in this case. He presented when he developed complications of sinusitis and secretory otitis media. Unilateral nasal discharge, unilateral nasal blockage and feeding difficulties are common presenting symptoms.

Only the flexible nasopharyngoscopy or endoscopic with telescope confirms the diagnosis. Axial CT scan and MRI of nose and para-nasal sinuses are the current investigation of choice, it differentiates between bony and membranous atresia and defines surgical plane. Presenting symptoms of the patient were similar to previous studies and we diagnosed this case clinically with the help of 0° endoscope and confirmed the case with CT scan.

Essential aim of treatment is creation of patent nasal airway. Bilateral atresia is treated as respiratory emergency. Immediate therapy consists of keeping the infant mouth open by means of oral airway or rubber nipple (McGovern), which is tied in place, intubation can be done but tracheostomy is rarely required. In unilateral atresia, there is seldom any urgency in presentation and surgery can be undertaken as a planned procedure.

Various types of surgical repairs are used. There are five approaches to repair choanal atresia: transpalatal, transeptal, sublabial, transantral and transpalatal. An underlying problem with all these repairs is that a large surface area is left uncovered with mucosa, develop granulations and stenosis. All techniques have their own pros and cons but transpalatal approach has high success rate in bony atresia, giving better visualization and preferable in older children. There is some risk of damaging neurovascular bundle and palatal perforation and can be used after failure of other approaches. We also used the same approach for better exposure, higher success rate in bony atresia and also because the patient was adult and tooth eruption had completed.

Endoscopic transnasal repair with or without powered instruments offers excellent visualization. Laser (carbon dioxide, potassium titanyl phosphate; KTP) have been employed successfully for repair of membranous atresia and for removal of granulations. It should not be used for bony atresia because it produces lot of heat to vaporize bony plate, which damages adjacent structures. Stent should be used postoperatively.

Postoperative care includes suctioning, dilatation of stenosed part and removal of granulations. This case did not require even a single dilatation and no granulations were formed postoperatively because of regular suctioning.

In short, best repair for choanal atresia is not clearly defined. First attempt can be done with transnasal approach and stenting. Transpalatal approach can be used primarily in unilateral choanal atresia and has high success rate without any complication.

**REFERENCES**