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Case Series

Clinical Profile and Surgical Outcomes of Unilateral Mixed Choanal Atresia in Adolescents: A Case Series

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Abstract:

Choanal atresia is a congenital narrowing or complete occlusion of the posterior nasal apertures (choanae) on one or both sides which occurs due to failure of canalization of posterior nasal passage during embryonic development. This case series describes the clinical presentation, diagnosis, surgical management and outcomes of adolescent patients with unilateral mixed choanal atresia.

Keywords: Mixed Choanal Atresia, Embryonic Development, Nasobuccal Membrane, Nasal Blockage.

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Introduction

Choanal atresia is a congenital malformation of the nasal cavity characterized by occlusion of posterior nasal apertures (choanae). It occurs due as a result of persistence of nasobuccal membrane, which should be ruptured embryologically at about 7th week. It is more common in females and the average incident is 1/8000 live births. About 60% cases are unilateral. Unilateral choanal atresia rarely leads to respiratory distress and therefore, it may not be diagnosed during neonatal period. While Bilateral choanal atresia can lead to respiratory distress and cyanosis after birth and thus requires urgent intervention. Occlusion of posterior choanae can be bony type, membranous type or mixed type. Choanal atresia can also be associated with congenital anomalies like CHARGE SYNDROME (Coloboma, Heart anomalies, Atresia of choana, Retarded growth, Genital hypoplasia, Ear anomalies)

Materials and Methods

A case series study of 5 adolescent patients diagnosed with unilateral mixed choanal atresia was conducted at GG hospital Jamnagar during the period of 4 years from May 2022 to April 2026. The study included three male patients and 2 female patients. None of the patients have features suggestive of CHARGE syndrome or other congenital anomalies. All the patients were having chief complain of unilateral nasal blockage and same unilateral side nasal discharge since childhood. The patients were not having any past history of any trauma or any operative intervention in childhood.

Diagnosis was established clinically by nasal endoscopy and confirmed with computed tomography of the paranasal sinus. All patients underwent endoscopic transnasal choanoplasty with post operative stenting. Patients were followed for 6 months post operatively to assess choanal patency, symptom relief and post operative complications.

Nasal endoscopy finding of a patient with left sided choanal atresia. It was suggestive of complete occlusion of left posterior nares (fig. 1) with minimal mucoid discharge on left side, while on right side posterior choanal opening was patent with clearly visualized nasopharynx.

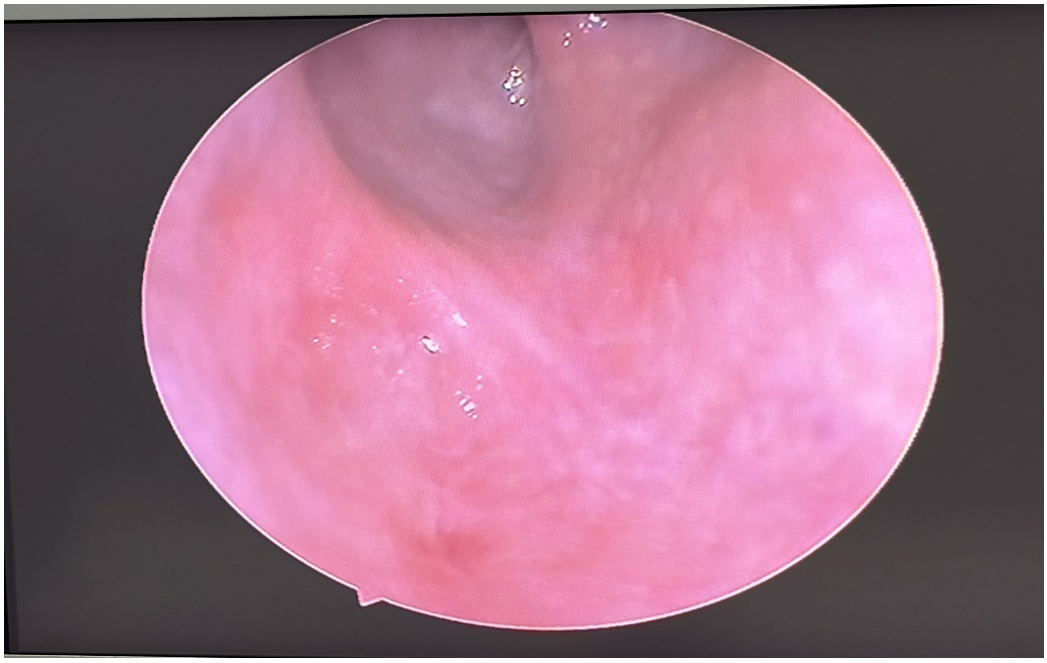

Figure 1: Left side complete atresia of posterior choanae

The contrast enhanced computed tomography scan was suggestive of complete atresia on left side with mixed component (osseous and membranous) (fig 2) and the left bony choanal aperture at pterygoid plate level measures 3.5mm as compared to 12mm on right side.

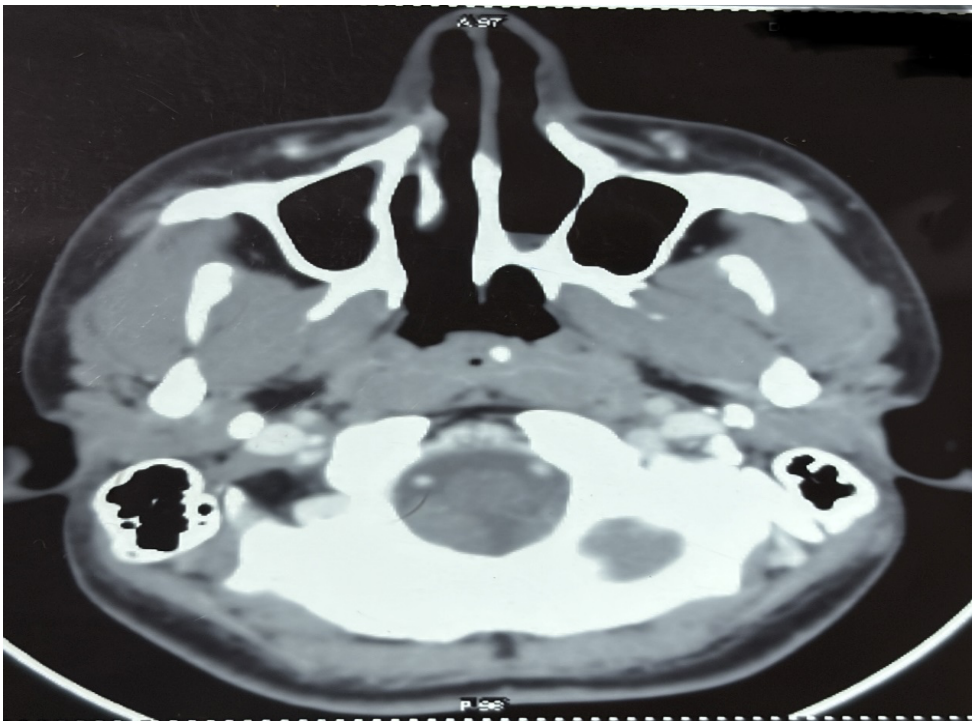

Figure 2: Left side complete atresia with mixed component (bony & membranous)

Based on the clinical findings, examination and investigations, the patient undergone Left sided Transnasal Endoscopic Choanoplasty under general anesthesia. After elevating mucosal flap over posterior part of septum and nasal floor, membranous part of atresia was widened with the help of sickle knife (fig 3), while bony part of atresia was removed with the help of drill (fig 4). Choanal aperture was widened with clear view of nasopharynx (fig 5). Nasal stenting was done on left side by nasopharyngeal airway. Post operatively after 2 weeks, nasal stent was removed and nasal endoscopy was done. The posterior choanal opening was widely found open with clear view of

nasopharynx having approximately 70-80% of adenoids. The patient complained relieved post operatively and was able to breath on both sides. The patient was advised nasal saline irrigation daily to prevent crusting. The patient was evaluated on follow up visits and was having no complain of nasal obstruction on left side and was able to breathe on both side equally. Fig 6 shows the pre operative and post operative view of posterior choanal aperture

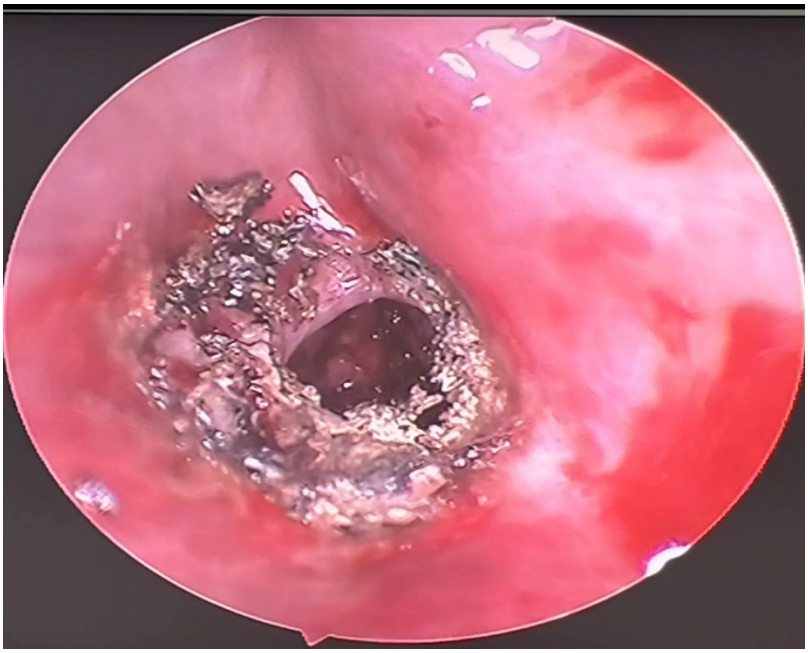

Figure 3: Membranous part of atresia opened and widened

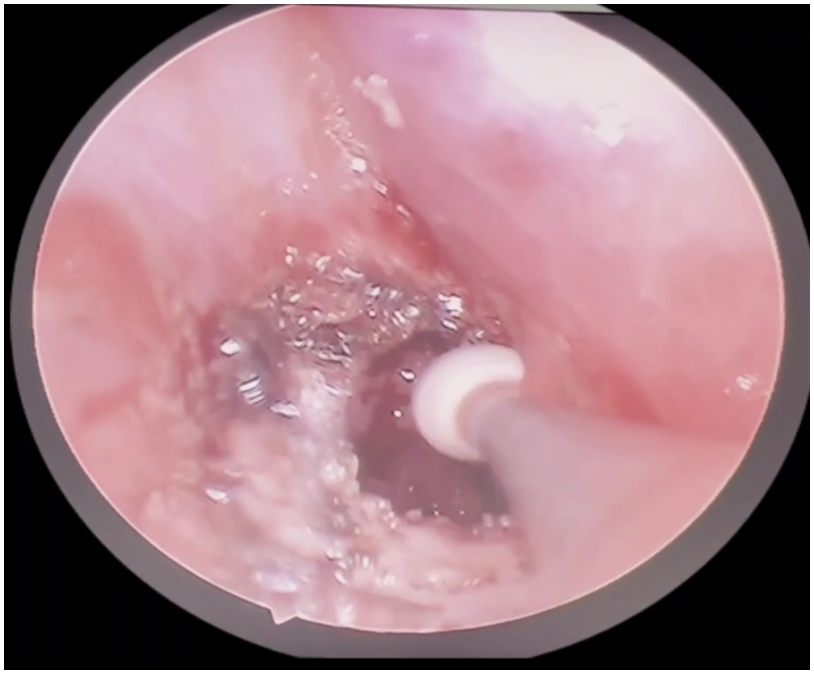

Figure 4: Bony part of aperture removed with the help of drill

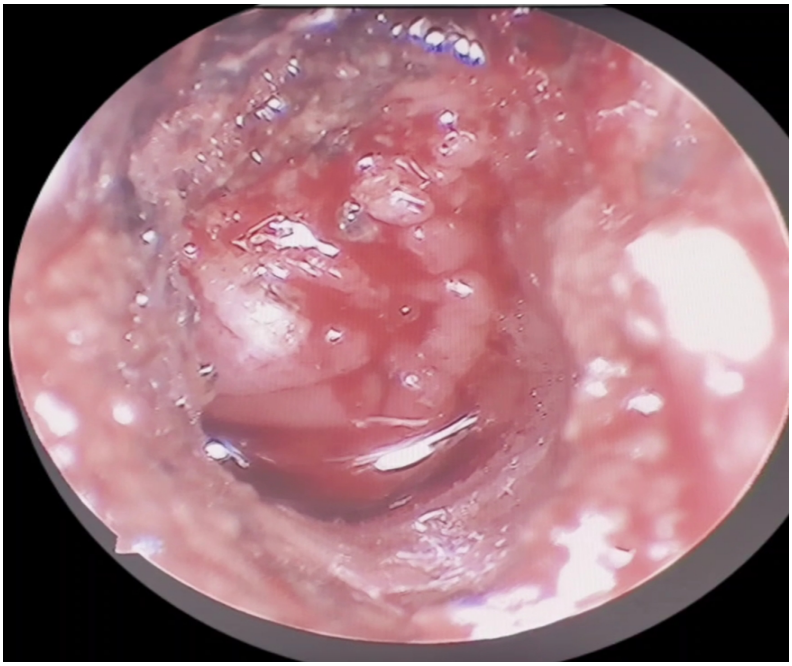

Figure 5: Widened left side posterior choanal aperture with clearly visualized nasopharynx having approx. 70-80 % Adenoids.

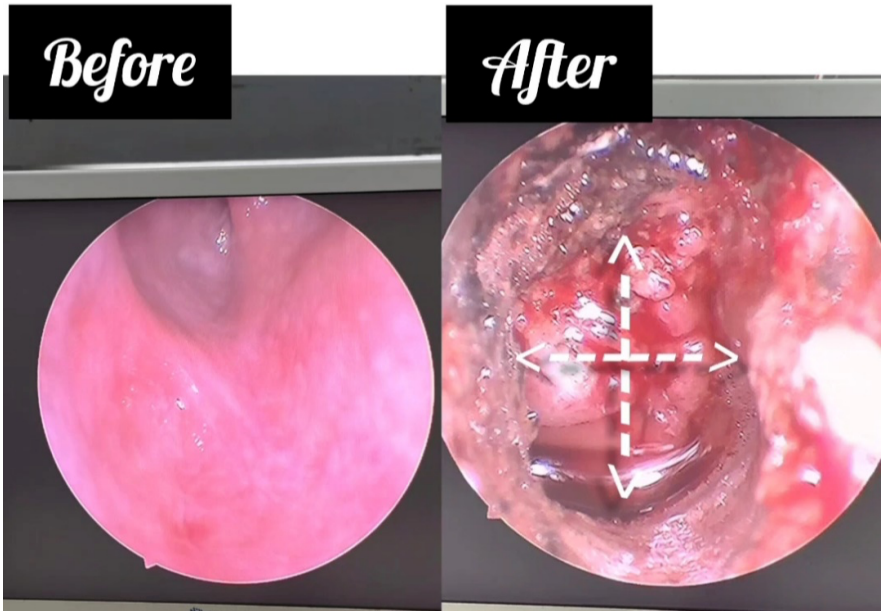

Figure 6: Pre operative and Post operative view of posterior choanae

Results

Five adolescent patients with unilateral choanal atresia were included in the study. There were three male and two female patients. All patients underwent endoscopic transnasal choanoplasty with placement of post-operative nasal stent. The procedures were completed successfully without major intraoperative complications. During the 6 month follow up period, all patients experienced significant improvement in nasal obstruction. However, restenosis developed in 2 out of 5 patients. The patients who developed restenosis were successfully managed with revision endoscopic choanoplasty with topical application of mitomycin C resulting in restoration of choanal patency at the final follow up.

Discussion

Choanal atresia occurs approximately 1 in 8000 live births. Females are more frequently affected than males. About 60% of cases are unilateral. Many theories have been proposed to explain the etiology of choanal atresia which includes the persistence of nasobuccal membrane, aberrant migration of neural crest cells, medial outgrowth of vertical and horizontal process of palatine bone. It is also necessary to emphasize the anatomical relationship

in choanal atresia, where the sphenoid bone forms the superior boundary, the pterygoid plates form the lateral boundary, vomer anchors the medial side, and the hard palate forms the inferior boundary. The main symptoms of unilateral choanal atresia is unilateral nasal obstruction, mucoid discharge from same side and unable to blow nose on same side. Computed tomography scan is essential providing a detailed evaluation of atretic component (bony or membranous), thickening of vomer bone, narrowing of posterior nasal aperture which helps us in detailed surgical planning. The objective of the surgery is to restore the airway passage and to make a patent airway. The most commonly used technique is transnasal endoscopic choanoplasty as it is less traumatic, has lower complication rate, demonstrate good visualization and have offer better post-operative recovery.

Conclusion

Transnasal Endoscopic Choanoplasty is better, safe and effective technique due to minimal invasion, better visualization which results in restoring airway passage and helps us to make a patent airway with no complications and with better post-operative outcome. Although restenosis occurred in two patients, it was successfully managed with revision surgery, supporting the role of close postoperative surveillance and timely intervention.

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