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Unilateral Choanal Atresia

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We report a 24-year-old male, known case of right hemifacial microsomia and microphthalmia with right eye prosthesis who presented to ENT clinic with history of unilateral nasal blockage and rhinorrhea since birth. Physical examination and CT scan imaging confirmed the diagnosis of unilateral bony choanal atresia.

He had right endoscopic transnasal repair of the choanal atresia and Mitomycin C application. A palatal perforation complicated the procedure which required surgical repair. The patient was discharged on antibiotics and nasal douches.

Six months follow-up revealed a patent nasal airway and complete healing of the palatal perforation. No dilatation was required.

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Choanal atresia is defined as narrowing or imperforation of the nasal choana preventing the communication between the posterior nasal cavity and the nasopharynx[1-5]. It can be associated with other craniofacial anomalies, such as CHARGE syndrome which is the most commonly associated abnormality[1,3]. Choanal atresia could be unilateral or bilateral.

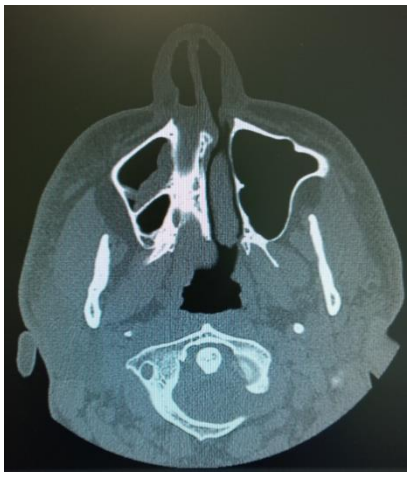
Bilateral choanal atresia could lead to fatal neonatal asphyxia and therefore requires an emergency intervention. On the other hand, unilateral choanal atresia patients present with unilateral nasal obstruction and rhinorrhea. They usually present later in childhood and some cases present in adulthood[1].

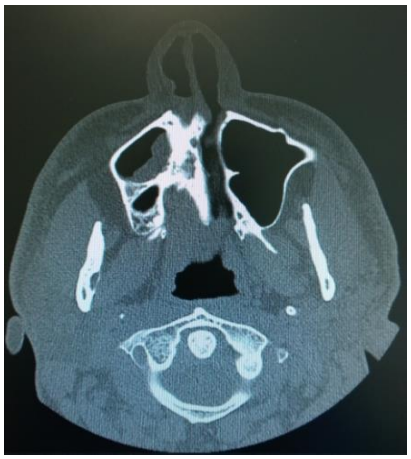
The aim of this report is to demonstrate the unusual late presentation of unilateral choanal atresia, which has been managed surgically.

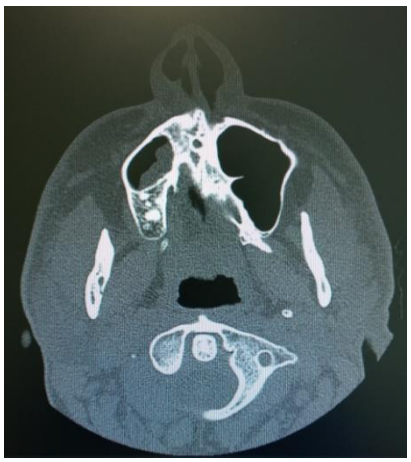
THE CASE

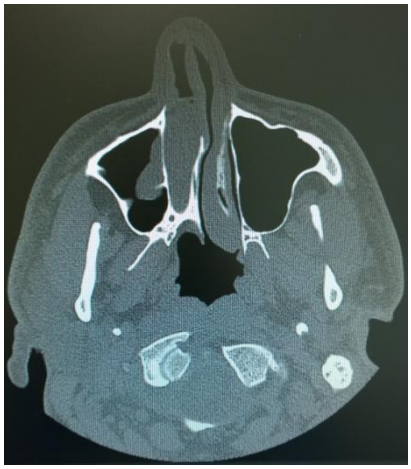
A twenty-four-year-old male presented to the ENT clinic with history of persistent thick whitish nasal discharge from the right nostril since birth. He had no major medical illness, but he had right eye prosthesis. His right eye was underdeveloped and he had eye prosthesis for cosmetic reasons. On examination, thick whitish discharge was seen in the right nostril. Nasal fiberoptic examination revealed a complete blockage on the right side and a deviation of the nasal septum to the left side.

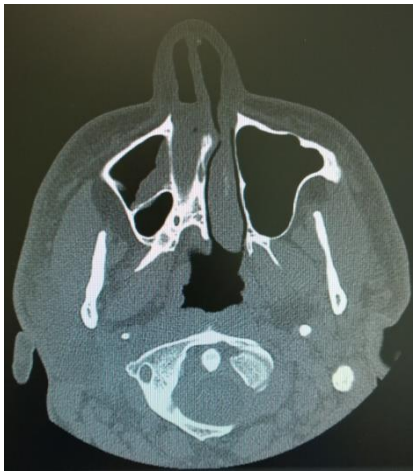
CT revealed unilateral choanal atresia on the right side. It was mixed type of stenosis, see figures 1-5.











Figures 1-5: CT Sinus Axial View: Right Side Choanal Atresia (Mixed Type)

Under general anesthesia, 0^{o}, 4 mm nasal endoscope was used; local infiltration of lignocaine with 1:100,000 adrenaline to the atretic plate was administered with a spinal needle. Superiorly based mucoperichondrial flap was raised. Using diamond burr circumferential, dilatation of the choana was performed. The bony edges were smoothened with a bone nibbler and a patent choana was achieved. The diameter of the newly created choana was approximately equal to the diameter of an endotracheal tube size 6. The superiorly based mucoperichondrial flap was carefully placed to cover the exposed bone. Posterior bony septectomy and anterior cartilaginous septal spur excision from the left nasal cavity were performed. Closure was achieved with Vicryl 4-0. Mitomycin C soaked in cottonoid pledget was applied to the new choana and left for 5 minutes followed by insertion of BIPP pack on the right side. No stenting was used.

A perforation 0.5 x 0.5 cm was seen in the soft palate postoperatively, see figure 6. The perforation was repaired with mattress suture in 3 layers using Vicryl 3-0 and NGT was inserted on the second day, see figure 7. The patient was discharged on oral amoxicillin with clavulanic acid, analgesics and nasal douches.

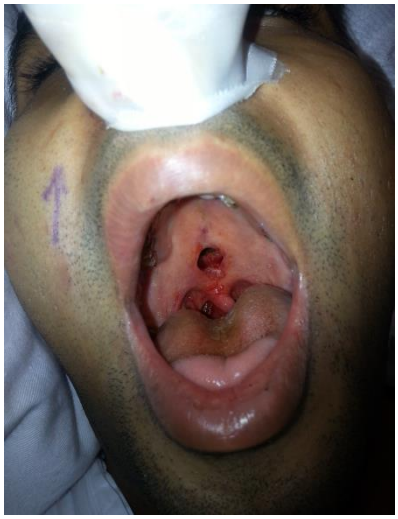


Figure 6: Soft Palate Perforation

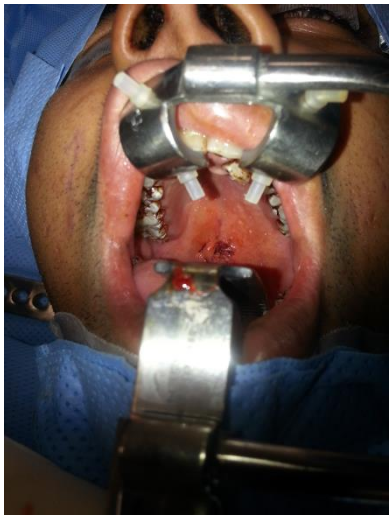


Figure 7: Soft Palate Perforation Repair

Fiberoptic endoscopic examination after one week revealed thick mucus on the right side. The nasal cavity had healed adequately. The patient was advised to continue on nasal douches.

Follow-up for two months revealed only thick mucus in the right nostril, see figures 8, 9 and 10. Six months postoperatively, the patient had right patent nasal airway and slight mucus production.

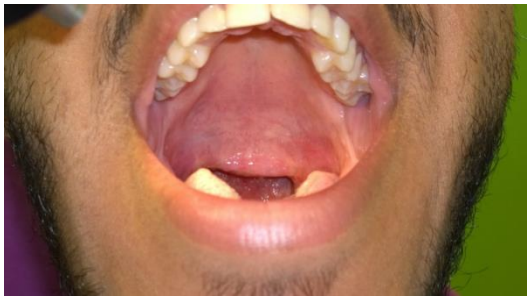
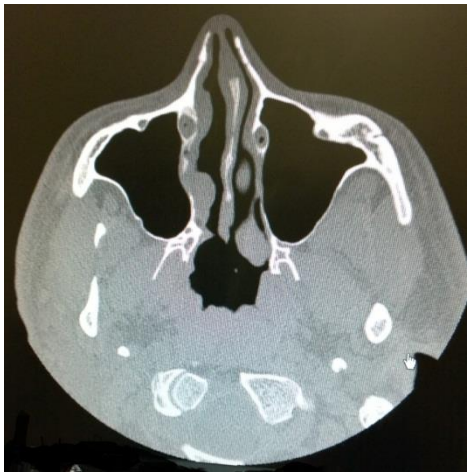
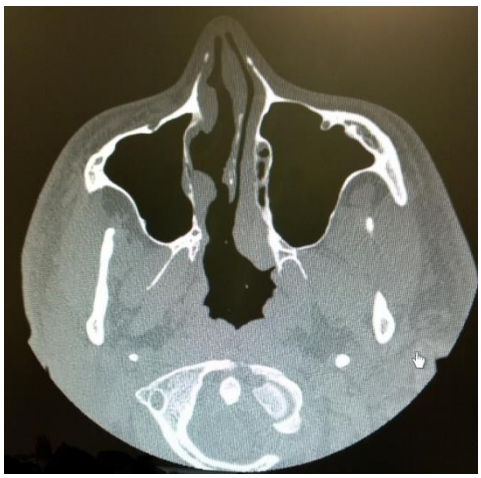


Figure 8: Healed Palatal Perforation





Figures 9-10: CT Sinus Axial View: Patent Right Nasal Airway

DISCUSSION

Choanal atresia was first reported in 1755. The incidence rate of choanal atresia is 0.82 cases per 10,000 individuals; it could be unilateral or bilateral[6]. In most cases, choanal atresias are unilateral with the right side being predominant. Studies found that the ratio of unilateral to bilateral choanal atresia is 2:1 with an increasing risk in twins and females. Five percent of cases have monogenic syndromes or other conditions, mostly associated with CHARGE syndrome[6].

The defect could be bony, membranous or mixed[3]. Pathophysiology theories behind the defect include: "Persistence of the buccopharyngeal membrane, failure of the bucconasal membrane of Hochstetter to rupture, medial outgrowth of vertical and horizontal processes of the palatine bone, abnormal mesodermal adhesions forming in the choanal area and misdirection of mesodermal flow due to local factors"[6].

Unlike bilateral choanal atresia, unilateral choanal atresia is not an emergency. Usually, patients present at an older age. However, persistent rhinorrhea necessitates repair of unilateral choanal atresia to improve the quality of life[5].

Endoscopic nasal examination and CT scan are essential to confirm the diagnosis[1]. CT scan could exclude pyriform aperture stenosis, nasolacrimal duct cyst, nasal foreign body, turbinate hypertrophy, septal deviation, antrochoanal polyp or nasal tumor from choanal atresias[4]. The main disadvantage of CT scan is the high radiation exposure, especially if used on pediatric patients[4].

Transmaxillary, transeptal, transpalatine, transnasal, sublabial, paralateronasal and endoscopy could be used to treat choanal atresia[1]. The transpalatine approach was widely used in the past; it provides a large surgical field, easy to repair and better success rate[1-3]. Although, the technique is associated with long surgical duration, more bleeding and a risk of bucconasal fistula, palatine dysfunction, facial growth disorder and restenosis[2,3]. Unlike the transpalatine approach, the transnasal approach provides a narrow exposure. This limits the possibility to form a mucosal flap and carries a risk of injury to the Eustachian tube and skull base[2]. The first endoscopic transnasal approach performed in the treatment of choanal atresia was in the 1990s. This technique has been widely used later due to its high success rate, its safety and lack of postoperative scars[1]. The advantage of this approach is that it provides a clear vision of the operative field and therefore accurate removal of the stenosis. Unlike the transpalatine approach, it is associated with minimal bleeding. Postoperatively, it has a shorter recovery period and hospitalization[2].

The use of Mitomycin C is controversial; Newman et al found insignificant difference if used in post-surgical repair in 31 patients[7].

Temporary stent was mainly used in transpalatine approach. It was kept for an average of two months. In 2004, Schoem concluded that in endoscopic nasal surgery stent is not required[8]. Stents could be a nidus for infection, which could lead to restenosis[2]. In our study, no stent was used.

CONCLUSION

Unusual late presentation of choanal atresia was presented. The patient was managed with endoscopic transnasal repair of the choanal atresia and mitomycin C application. He was discharged on oral antibiotics, analgesics and nasal douches. Six months follow-up revealed a patent nasal airway. No dilatation was required.

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