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Original Article

Congenital choanal atresia- Endonasal endoscopic surgery- Bangabandhu Sheikh Mujib Medical University

Ali M I[1], Tarafder K H[2], Rahman S H[3], Begum R[4], Islam M N[5], Hosna A U[6], Mou S K[7]

Abstract:
Congenital choanal atresia (CCA) is the development failure of the nasal cavity to communicate with nasopharynx. It is an uncommon congenital anomaly of nose with an incidence of approximately 1 in 5000-7000 live births. Choanal atresia is caused by failure of resorption of the nasobuccal membrane during embryonic development. Choanal atresia has a significant association with CHARGE syndrome. Surgical intervention is recommended in the first weeks of life in bilateral cases because this is a life threatening condition. Diagnostic Ten cases of congenital choanla atresia (CCA) was admitted in the department of Otolaryngology & Head-Neck Surgery at Bangabandhu Sheikh Mujib Medical University (BSMMU) with the complaints of intermittent attacks of cyanosis, dyspnea, respiratory distress and history of inability to take feeds. On examination both babies had respiratory distress, mucoid discharge from both nasal cavities. A soft rubber catheter was passed into both nares revealed the diagnosis of CCA which was confirmed by flexible nasoendoscopy. CCA was managed with a nasopharyngeal airway. Surgery is the definitive treatment with two main approaches namely transnasal and transpalatal. We discuss successful management of ten neonates of CCA by endonasal endoscopic approach.

Keywords: choanal atresia, congenital.

1. Mohammad Idrish Ali
Consultant, Department of Otolaryngology Head & Neck Surgery, BSMMU, Dhaka. E-mail: - dridrishalient72@gmail.com
2. Kamrul Hasan Tarafder
Professor, Dept. of Otolaryngology Head & Neck Surgery, BSMMU, Dhaka
3. Sheikh Hasanur Rahman
Professor, Dept. of Otolaryngology Head & Neck Surgery, BSMMU, Dhaka
4. Rokeya Begum
Assistance Professor, Govt. Homeopathic Medical Collage Dhaka
5. Md Nazrul Islam
Consultant, Department of Pediatric Surgery
BSMMU, Dhaka
6. Asma Ul Husna
Assistant Professor, Dept. of Obstretics and Gynaecology, BSMMU, Dhaka, Bangladesh
7. Sabrina Khan Mou
Student (WMPH), Jahangirnagar University
Dhaka, Bangladesh

Correspondence to: Mohammad Idrish Ali
Consultant, Department of Otolaryngology Head & Neck Surgery
BSMMU, Dhaka. E-mail: - dridrishalient72@gmail.com
Mobile: 01712-790646

Introduction:

Congenital choanal atresia (CCA) is a rare malformation that causes airway obstruction in newborns and infants, with an incidence of 1 in 5000-7000 births. It seems to occur more commonly in females than males and ratio is 2:1 and is frequently unilateral and right–sided than bilateral.1 The atresia maybe classified as bony, mixed bony and membranous or purely membranous although the latter is rare. Nature of obstructing atretic plate has often been described as 90% bony and 10% membranous. Most of the cases of CCA are isolated malformations, but association with other congenital deformities as in CHARGE association which includes coloboma of the eyelid, heart disease retarded growth, genital hypoplasia, and ear anomalies.2 CCA is a medical emergency because maintain an airway and relieving the obstruction is a priority.3 Increased cyanosis and death may occur if appropriate treatments are not available. The immediate management of neonates presenting with intermittent cyanosis is the insertion of an oral airway and feeding via an oro-gastric tube.2,3 There are numerous methods for correcting this condition, commonly used methods are the transnasal, transpalatal, transeptal approach4 and the endoscopic transnasal approach.5

Methods:

This study included 10 patients diagnosed as congenital choanal atresisa: 7 females (70%) and 3 males (30%), 3 cases with bilateral CA and 7 cases unilateral. their ages ranged between 1 day to 18 years. All cases operated in the department of Otolaryngology & Head-Neck Surgery at Bangabandhu Sheikh Mujib Medical University (BSMMU), by the same surgeon at the period between January 2020 to December 2022 with a follow up period from 12 to 24 months. All neonatal cases were diagnosed clinically and referred by the attending and treating pediatrician. Childhood and young adult cases presented to our ENT clinic with unilateral nasal symptoms. Careful history was taken from the parents and patients. Complete ENT examination was conducted. All cases had CT scan to confirm the diagnosis, evaluate the type and thickness of the atresia plate and to detect any associated abnormalities in the septum, lateral nasal wall or base of the skull. preoperative blood investigation done and consents for the surgery and approval from the medical ethics of the hospital were taken.

Surgical Technique:

Under general anesthesia with oral intubation, after decongestant nasal drops, we used storz rigid endoscopes with 0, 30, 70 degree 77 deflection angles. The endoscope was passed first into the nasal cavity to evaluate the size of the atresia and nasal cavity, nasal mucosa over the atretic plate was infiltrated with adrenaline 1:200,000 normal saline .incision was made longitudinally over the posterior septum just anterior to the plate using sickle knife. The incision was extended from its upper and lower ends horizontally over the atretic plate dissected from the posterior septum and the atretic plate laterally. The posterior bony septum was partially removed by dissector and Blakesley forceps, to make a common posterior opening. A long burr of a micro dill was passed along the floor of the nose to the level of the occluding plate. Since the atretic plate is almost always, thinnest and weak at the junction of the floor of the nose and posterior end of the septum, the burr should be hinged at this point. the perforating force should be safely directed downwards and medially, to avoid injury to the base of sphenoid. The bone of the atretic plate removed under endoscopic direct vision using curettes and back biting forceps, keeping in mind not to injure the posterior pharyngeal wall and the cervical spine. The nasal mucosa flap was rotated posteriorly to cover the raw area left by removal of the obstructing bone. stent Portex Polyvinyl inserted and sutured to the membranous part of the septum, behind the columella, left in place for 6 weeks. Regular suction was done several times/day and antibiotics were administered until removal of the stent. All cases were seen once per week tell the stent removed in the 6th week post-operative and in the same time second look under GA done then after that we saw the patient once per month.

Results:

10 patients involved in this study 7 females and 3 males. Age ranged from first day of birth to 18 years. All cases undergone Endoscopic management of congenital choanal atresia endoscopic surgery. Second look procedure was performed in all cases after 6 weeks at the time of stent removal with following findings in our cases: granulation tissues at the edges of the neochoana in 4 cases (40%) they were removed, polyps in 1 case (10%) which was removed. narrow choanal opening 1 case (10%) in this case rewidening the choana done by removal of excess bone. Follow up of the patients after second look no patients developed restenosis or any other complications.

Photographs

Stents in situ

After Removal of stents

Stents in Situ

After remove the stents

Discussion:

Congenital choanal atresia is a disease of nasal airway where no connection exists between the nasal cavity and the aerodigestic tract. It was first described by Johann Roderer in 1755.3 Current theories of choanal atresia is failed oronasal membrane rupture or abnormal migration of neural crest cells into the nasal vault.5,6

Chonal atresia will as an acute respiratory emergency at birth as newborns are obligate nasal breathers.7 Symptoms of airway obstructive and cyclical cyanosis are the classical signs of newnatal bilateral atresia. Choanal atresia can be unilateral or bilateral. choanal atresia presents very early in the life. Most patients with CCA are detected within the first month of life.

There are numerous ways to diagnosis choanal atresia. The simplest method is to pass soft rubber catheter into the nares. There is no air entry by cold spatula test. Radioopaque oil can be instilled into the nose and lateral radiograph showed the site of atresia. Flexiable endoscopy, choanography and CT scan can help in diagnosis.

The surgical treatment of congenital atresia is one of the more challenging endeavors within the realm of paediatric otolaryngology, clinical evaluation should include a complete physical examination to look for others congenital anomalies. Numerous methods for operation. Trans nasal, transpalatal, endoscopic transnasal Co2 laser resection.

Approach depend upon the age of the patient, size of the nasopharynx, thickness of atresia, bilateral vs unilateral use of postoperative stenting.8 We performed endoscopic transnasal approaches. Advantages of endoscopic approach are faster and easier, minimum blood loss, can performed in all ages, child can be immediately breast feed, less restenosis and discharge may be 3rd or 4th postoperative day, successful in upto 80% of the cases.9 Postoperative close follow revealed that both of them remained in stable condition and breast fed without difficulty and gaining satisfactory weight.

Conclusion:

The use of endoscope in choanal surgery is effective and excellent with good visualization of both the atretic plate and the tips of instruments working under illumination and also make a second look procedure more easy, which is mandatory especially in neonates and young children in order to assure complete patency of the neochoana, removal of any granulations and to drill excess bone in narrow choanae, thus decreasing the incidence of restenosis.

References:

1. Samadi DS, Shah UK, Handler SD. Choanal atresia: a twenty years review of medical co□ morbidity and surgical outcomes. Laryngoscope 2003:113:254-8.
2. Leclerc JE, Fearon B. Choanal atresia and associated anomalies. Int J Pediatr Otorhinolaryngol 1987;13:265-72.
3. Azar RH, Younis RT. Transnasal repair of choanal atresia using telescopes. Arch Otolaryngol Head Neck Surg 1995;121:517-20.
4. Samadi DS, Shah UK, Handler SD. Choanal atresia: a twenty years review of medical co□ morbidity and surgical outcomes. Laryngoscope 2003:113:264-8.

5. Heneger AS, Strom M. Choanal atresia: A new embryonic theory and its influence on surgical management. Laryngoscope 2009;92:913-21.

6. Dunham ME, Miller RP. Bilateral choanal atresia associated with malformation of the anterior skull base: embryogenesis and clinical considerations. Ann Otol Rhinol Laryngol 1992;101:916-9.

7. Stankiewicz JA. The endoscopic repair of choanal atresia. Otolaryngol Head Neck Surg 1999;103:931-7.

8. Kumar AMS, Naik AS, Praveen DS. Choanal atresia: Experience with transnasal endoscopic technique. Ind J Otolaryngol Head Neck Surg 2005;57:96-8.

9. Van Den Abbecle T, Francois M, Nancy P. Transnasal endoscopic treatment of choanal atresia without prolonged stenting. Arch Otolaryngol Head Neck Surg 2002;128:936-40.