



Transeptal Approach for Choanal Atresia 10 year experience

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ABSTRACT

Choanal atresia is the most common congenital nasal malformation. The definitive treatment is surgical, different techniques have been described, but the problem so far is the rate of restenosis and that the previously described techniques use stents to keep the neo choana permeabilized. The objective of this work is to present the surgical results of the transeptal approach for choanal atresia.

Methods Retrospective review of a surgical series, performed by the same surgical team. With the transeptal approach technique for choanal atresia, with the use of vascularized nasal flaps and without the use of stents. During the period 2013-2023

Results 28 patients were operated, age range 8 days to 12 years. Eighteen patients presented bilateral atresia. All patients at the last control were patent.

Conclusions This new technique allows the resolution of a frequent nasal pathology, from the moment of birth, with excellent, reproducible and permanent results over time.

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INTRODUCTION

Choanal atresia is the most common congenital nasal malformation. The definitive treatment is surgical, different techniques have been described, but the problem so far is the rate of restenosis and that the previously described techniques use stents to keep the neo choana permeabilized. The objective of this work is to present the surgical results of the transeptal approach for choanal atresia.

METHODS AND MATERIALS

Retrospective review of a surgical series, performed by the same surgical team. Twenty-eight pediatric patients who underwent surgical repair for choanal atresia at our institution between the years 2013 and 2023. The patients' medical records and surgical outcomes were comprehensively analyzed.

Outcome Assessment: Postoperative outcomes were assessed in terms of the restoration of choanal patency, complications, and any long-term sequelae. Statistical Analysis: Descriptive statistics were employed to summarize patient demographics, clinical characteristics, and surgical outcomes. Continuous variables were reported as means ± standard deviations, while categorical variables were presented as frequencies and percentages.



Figure 1. Team preparation.

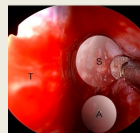


Figure 2. View of flap elevation and atretic p. S: sphenoid, T: septum, A: Atretic plate.

Surgical Technique¹: The surgical procedure employed a novel transeptal endoscopic technique, prioritizing the preservation of mucosal integrity and the creation of tissue flaps. Once the surgical team and equipment is available (Figure 1), a Killian incision is made and then bilateral mucoperichondrial and mucoperiosteal flaps are made until the entire atretic plate is exposed up to the sphenopalatine foramen (Figure 2). The upper limit of the elevation will be the anterior part of the body of the sphenoid and the lower limit will be the floor of the nasal fossa. Seeking maximum preservation of the mucosa (of the septum, atretic plate, nasal floor and sphenoid sinus). Then the atretic plate and adjacent structures are meticulously removed, with a 2.5 Curved Diamond DCR Bur (Medtronic). Then flaps are configured to cover the exposed bone, 2 flaps dependent on the posterior septal artery (Figure 3) and a flap with a posterior base (Figure 4). No stents or packing are use.

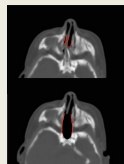


Figure 3. Diagrammatic representation showing mucosal flaps on an axial CT scan. The red lines represent the flaps dependent of posterior septal artery.

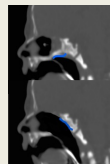


Figure 4. Diagrammatic representation showing posterior mucosal flaps on an axial CT scan. The blue lines represent posterior flaps.

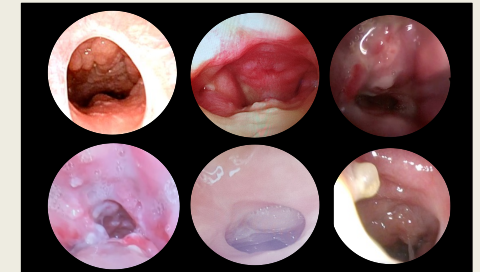
RESULTS

Table 1. Patients' Characteristics and follow-up.

Case	Gender	Associated Malformation / Syndrome	Complication	Laterality / Component	Follow up (y)
1	F	Hemangioma	-	B / B-M	10
2	M	Charge Syndrome	Viral pneumonia postop period.	L / B-M	10
3	F	Pfeiffer syndrome, ventricular septal communication	Postoperative respiratory failure after extubating, requires reintubation.	L / B-M	9
4	F	Transposition of great arteries, pulmonary valve stenosis	Intraoperative bleeding.	B / B-M	9
5	M	-	Intraoperative bleeding.	L / B-M	9
6	M	Chromosomal alteration, cleft palate	-	L / B-M	8
7	M	-	-	L / B-M	7
8	F	-	-	B / B-M	7
9	F	-	-	L / B-M	7
10	F	-	-	R / B-M	7
11	M	-	-	R / B-M	7
12	M	Tetralogy of Fallot	-	B / B-M	7
13	F	No	-	B / M	6
14	F	Ureterocele	Flap prolapse and stenosis	B / B	6
15	M	Charge Syndrome	Postoperative bleeding	B / M	6
16	F	-	Postoperative bleeding	B / M	6
17	F	Polymicrogyria	-	R / M	5
18	F	-	pressure ulcer external edge of the nose	B / M	5
19	F	Microcephaly dysmorphic syndrome	-	L / M	3
20	F	Charge Syndrome	-	B / B-M	3
21	F	Charge Syndrome	-	R / B-M	3
22	M	-	-	R	2
23	F	Charge Syndrome	Intraoperative Bleeding	B / B-M	1
24	M	-	-	B / M	1
25	F	Charge Syndrome	-	B / B-M	1
26	M	Charge Syndrome	-	B / B-M	1
27	F	-	-	R / B-M	1
28	F	-	-	B / M	0.75

Twenty-eight patients underwent choanal atresia repair between August 2013 and July 2023. Patient characteristics and surgical outcomes are presented in Table 1. Of the 28 patients, 18 were female, ranging in age from 9 days to 12 years. All cases were congenital, 15 were bilateral and 13 were unilateral. Fifteen patients had other congenital anomalies. No patients were stented postoperatively. In terms of operative success, all 28 patients have achieved surgical success (Figure 4).

Figure 4. Endoscopic view of 6 patients during the postoperative time.



DISCUSSION

We discuss the endoscopic technique of the transeptal approach for choanal atresia, both in unilateral and bilateral cases. This technique, while challenging, especially in neonatal patients, has shown excellent short-term and long-term results. There is no restenosis observed, eliminating the need for further reinterventions. Moreover, patients are extubated early and transition to oral feeding shortly afterward. Complications in our series are infrequent and primarily related to manageable bleeding. It is crucial to emphasize that these results are achievable through teamwork, appropriate instrumentation, and the expertise of surgeons specialized in this condition.

CONCLUSIONS

This technique allows the resolution of a frequent nasal pathology, from the moment of birth, with excellent, reproducible and permanent results over time.

REFERENCES

- Wormald PJ, Zhao YC, Valdes CJ, Pacheco AE, Ha TN, Tewfik MA, Wabnitz D, Shaw CK. The endoscopic transeptal approach for choanal atresia repair. Int Forum Allergy Rhinol. 2016 Jun;6(6):654-60. doi:10.1002/alar.21716. Epub 2016 Feb 16. PMID: 26879228.