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ORIGINAL ARTICLE

A 20-Year Experience in Microsurgical Treatment of Choanal Atresia☆

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KEYWORDS
Choanal atresia;
Congenital;
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Transnasal approach

Abstract
Introduction and objectives: Choanal atresia is the most common congenital nasal anomaly. Diagnosis is confirmed by endoscopic examination and computed tomography. The definitive treatment is surgical, and different surgical techniques and approaches are used. We describe our experience in transnasal microsurgical treatment of congenital choanal atresia.
Methods: We retrospectively evaluated 49 patients with congenital choanal atresia operated in the Department of Respiratory Endoscopy over a period of 20 years. The clinical variables analysed were type of atretic plate, age at diagnosis and surgery, associated malformations, maternal history of hyperthyroidism treated with methimazole during pregnancy, mode of airway stabilisation before surgery, surgical technique, complications, and outcome.
Results: Mixed bilateral choanal atresia was the most frequent (29 cases). Its incidence was higher in females (61.2%). Almost 51% of patients showed associated malformations, and 7 had a history of maternal hyperthyroidism treated with methimazole during pregnancy. The surgical procedure consisted of a transnasal microscopic approach and placement of a silicone endonasal stent for one to 12 weeks. Thirty-five patients required revision after surgery. Nine patients had complications. Suitable nasal ventilation was achieved in 46 patients (93.9%). One patient died of causes unrelated to the surgery. Two patients with permeable choanae remain with tracheotomy.
Conclusion: The transnasal microsurgical repair with endonasal stent proved to be a safe and effective procedure.

PALABRAS CLAVE
Atresia de coanas;
Congénita

Experiencia de 20 años en el tratamiento microquirúrgico de la atresia de coanas

Resumen
Introducción y objetivos: La atresia de coanas es la anomalía congénita nasal más común. El diagnóstico se confirma mediante examen endoscópico nasal y tomografía computarizada de

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Tratamiento microquirúrgico; Abordaje transnasal

macizo craneofacial. El tratamiento definitivo es quirúrgico, existiendo diferentes técnicas y vías de abordaje. Presentamos nuestra experiencia en el tratamiento microquirúrgico transnasal de la atresia de coanas congénita.
Métodos: Se evaluaron de forma retrospectiva 49 pacientes con atresia de coanas congénita intervenidos quirúrgicamente en el Servicio de Endoscopia Respiratoria durante un periodo de 20 años. Las variables analizadas fueron el tipo de placa atrésica, la edad en el momento del diagnóstico y de la cirugía, las malformaciones asociadas, el antecedente materno de hipertiroidismo tratado con metimazol durante el embarazo, el modo de estabilización de la vía aérea previa a la cirugía, la técnica quirúrgica utilizada, las complicaciones y los resultados.
Resultados: La atresia de coanas mixta bilateral fue la más frecuente (29 casos), siendo la incidencia mayor en el sexo femenino (61,2%). El 51% presentaba malformaciones asociadas. Siete pacientes tenían el antecedente materno de hipertiroidismo tratado con metimazol durante el embarazo. El procedimiento quirúrgico consistió en un abordaje transnasal con microscopio y colocación de stent intranasal de silicona durante una a 12 semanas. Treinta y cinco pacientes requirieron revisión posquirúrgica. Nueve pacientes presentaron complicaciones. Se logró ventilación nasal adecuada en 46 pacientes (93,9%). Un paciente falleció de causa no relacionada a la cirugía. Dos pacientes con coanas permeables permanecen con traqueotomía.
Conclusión: La reparación microquirúrgica transnasal con colocación de stent intranasal resultó ser un procedimiento seguro y eficaz.

Introduction

Blockage of the nasal passages in newborns is a potentially fatal condition due to their necessarily nasal breathing. The most common congenital causes are choanal atresia (CA), dermoid cyst, glioma, encephalocele and congenital stenosis of the piriform aperture.[1]

CA is the most common congenital nasal anomaly. It is estimated that its incidence is 1 case per every 8000–10 000 live births,[2] and it is more prevalent among females (2:1).[3] It can appear in isolation or as part of multiple malformation syndromes such as CHARGE (acronym for coloboma, heart defect, atresia choanae, retarded growth, genital hypoplasia, ear abnormalities).[4,5] Bilateral cases manifest as respiratory distress from the moment of birth. Unilateral atresia is manifested as respiratory failure and unilateral rhinorrhea and may go unnoticed. The diagnosis is suspected by the absence of airflow in the nostrils and inability of a nasogastric tube to advance, and is confirmed by nasal endoscopic examination and computed tomography (CT) scan of the craniofacial complex. In most cases, the plates are mixed (bony and membranous components), and less often, bony.

The definitive treatment is surgical, through various possible techniques and surgical approaches. Surgical repair with transnasal endoscopic technique provides an excellent visualisation of the posterior nasal defect and has currently become the procedure of choice due to its safety and effectiveness, displacing the transpalatine approach.[6,7]

We describe our experience in the transnasal treatment of congenital CA using microscopy and placement of an intranasal stent.

Method

We retrospectively evaluated 49 patients undergoing surgery for congenital CA at the Respiratory Endoscopy Service over a period of 20 years (May 1992–May 2012).

The variables analysed were gender, location and type of atretic plate, age at diagnosis, associated malformations, maternal history of hyperthyroidism treated with methimazole during pregnancy, mode of airway stabilisation prior to surgery, age at surgery, surgical technique, duration of the nasal stent, need for other treatments, complications, follow-up time and evolution.

We performed a thorough prior assessment of patients by endoscopic examination of the nasal passages with a flexible fiberscope (2.2 mm or 3.5 mm) or a rigid endoscope (2.7 mm), and CT scan of the craniofacial complex to evaluate the characteristics of the lesion: laterality, thickness, bone and/or membranous component. All images were digitally documented.

A total of 8 patients had undergone surgery previously at other institutions (7 cases of transnasal approach with an endoscope and 1 case of palatal approach).

The surgical procedure consisted of a transnasal approach using microscopy. Under general anaesthesia, after placing a gauze soaked in vasoconstrictor (adrenaline 1:1000), both nostrils were visualised with a 0° 2.7 mm rigid endoscope. A protective gauze was placed in the nasopharynx. The affected nostril was approached under 300× microscopy. Following the bottom of the nasal fossa, the choana was opened medially and inferiorly. The incision of the mucosa was carried out with CO_2 laser (5 W continuous mode) or cold instrumentation. Once the nasal mucosa covering the atretic plate was removed, the plate and the posterior part of the vomer were extracted with microsurgical instrumentation (ear curette or drill). The edges of the neochoana were smoothed and the bone surface was covered with mucosa.

All patients underwent placement of a silicone stent (Foley probe number 12–18) as a support for the intranasal lumen for 1–12 weeks. The time of removal of the nasal tutor was based on laterality and type of atretic plate; it was shorter in unilateral CA and longer in bony plates. In unilateral cases the tutor was placed on the affected side, fixed to the columella by a transfixing point. In bilateral cases,