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Case Report

Rhinoseptoplasty as Surgical Management in a Case of Agenesis of the Middle Nasal Crura

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Abstract

The medial crura are fundamental components of the inferior lateral cartilages of the nose. Their function is to provide structural support to the nasal tip, maintain its projection and shape, and contribute to both nasal ventilation and aesthetics. Agenesis of these structures is a rare condition, with limited evidence in the literature.

We present the case of a 25-year-old female patient who underwent open rhinoseptoplasty due to functional and aesthetic concerns. During the surgical procedure, bilateral agenesis of the medial crura was identified as an incidental finding. The surgical technique used to correct this congenital malformation is described, utilizing autologous cartilage graft.

The literature mentions many possible causes, although these are not fully established. This anomaly may go unnoticed until adulthood and be discovered incidentally during nasal procedures. This case highlights the importance of considering rare idiopathic congenital malformations in patients with nasal symptoms, as well as the need to document such findings to improve future diagnostic and therapeutic approaches.

Keywords: Agenesis of Middle Crura; Congenital Nasal Malformations; Rhinoplasty; ANSA Banner

Introduction

Congenital nasal abnormalities are rare, with an incidence of approximately one per 20,000 to 40,000 live births [1]. Their etiology remains incompletely understood; it is believed that neural crest cells, which normally migrate toward the facial prominences and differentiate into mesenchyme [2], exhibit deficiencies in development and migration. This impairment prevents the proper formation of nasal cartilage, an essential component for providing structural support to the nasal tip [3]. Another hypothesis suggests that the etiology may be related to a disruption in the signaling pathways involved in the formation of the medial and lateral nasal crura during the seventh week of fetal development, although this theory has not yet been fully elucidated [4]. This malformation may result in nasal tip ptosis, nasal valve collapse, and consequently nasal obstruction, leading to functional and aesthetic impairment.

In 2013, the American Society for Aesthetic Plastic Surgery reported that embryological defects are classified into three main

categories: division, gap, and segmental loss. A division defect is characterized by a loss of continuity of the alar cartilage, resulting in two separated ends. The term gap refers to a cartilaginous absence measuring 1 to 4 mm compared to the contralateral side. Segmental loss, on the other hand, involves a defect greater than 4 mm [3].

Rhinoplasty is a complex procedure that requires meticulous planning to achieve satisfactory outcomes. Therefore, a thorough preoperative evaluation is essential for all patients undergoing this intervention. Such assessment allows the surgeon not only to understand the patient's anatomy but also to identify potential surgical challenges, thereby facilitating more accurate operative planning [5]. Among the factors to be considered prior to surgical scheduling are skin thickness, nasal projection, and overall nasal structures, which vary according to each individual's race and genetic background. Increased skin thickness may complicate both surgical intervention and the diagnosis of underlying anatomical anomalies [6]. Magnetic resonance imaging is the imaging modality of choice for evaluating cartilaginous structures, as other techniques, such as computed tomography, do not allow adequate visualization of cartilaginous agenesis [7].

The technical approach must be tailored to the specific anatomical anomalies of each patient, which vary depending on the degree of involvement. Reconstructive treatment of nasal crura agenesis is based on the use of autologous cartilage grafts. Septal cartilage is the first-line option when available, as it provides adequate rigidity and size [8]. As the severity of the congenital defect increases, reconstructive complexity also increases; nevertheless, correction of these anomalies is essential to restore nasal function and maintain structural integrity [3].

Case Report

A 25-year-old female patient with no significant past medical history presented to the otorhinolaryngology department of a tertiary-care hospital in Mexico City with an eight-month history of bilateral nasal obstruction, predominantly on the right side, in addition to aesthetic dissatisfaction. Physical examination revealed a deviated nasal septum with a right inferior septal crest involving Cottle areas II–IV, terminating in a spur in contact with the lateral nasal wall, as well as inferior turbinate hypertrophy. These findings were confirmed by computed tomography of the nose and paranasal sinuses (Figure 1). Based on these findings, functional rhinoseptoplasty was indicated.

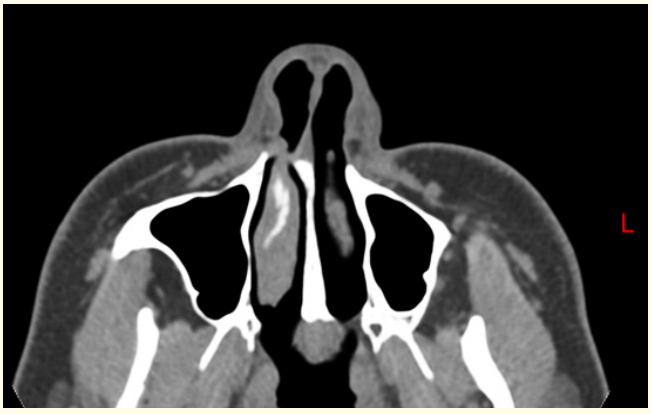


Figure 1.1

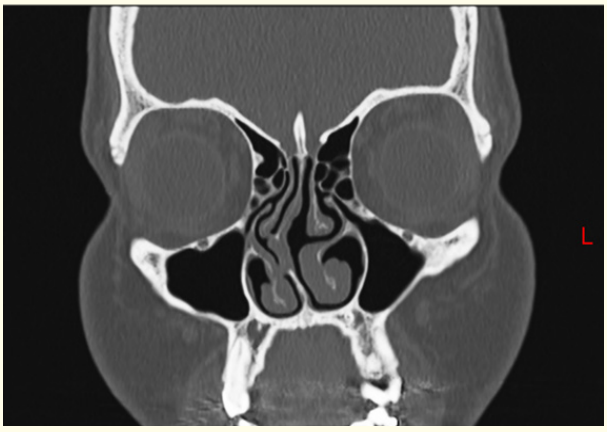


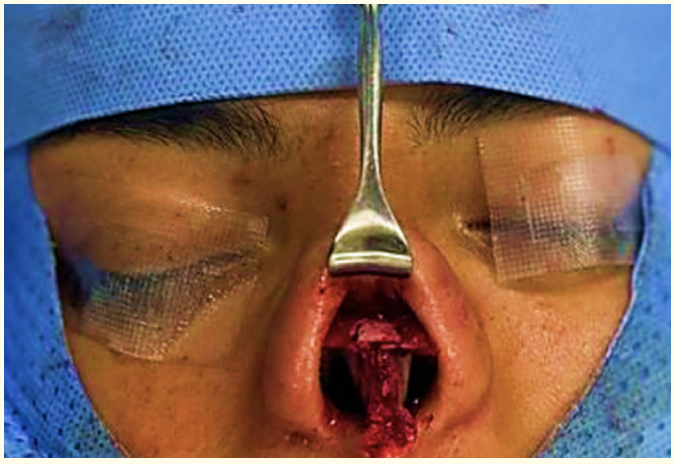
Figure 1.2

Figure 1: CT scan showing right-sided contact septal deviation with two osseous spurs and inferior turbinate hypertrophy.

Figures 1.1 and 1.2. CT scan images demonstrating right-sided contact septal deviation with two osseous spurs and inferior turbinate hypertrophy**.**

Following turbinoplasty and septoplasty, an open rhinoplasty approach was performed. During dissection of the lower lateral cartilages, congenital agenesis of the medial crura was identified

(Figure 2). In view of these findings, nasal reconstruction was carried out using an ANSA banner–type graft harvested from the nasal septum, which was adapted and secured to the medial crura region. Interdomal and transdomal sutures were placed, and cephalic trimming of the lower lateral cartilages was performed. Subsequently, a Peck graft was placed, and an osseous humpectomy was performed using a rasp. The hemitransfixion incision was closed, transseptal sutures were placed, and the marginal and transcolumellar incisions were closed. The patient was discharged on the same day without postoperative complications.

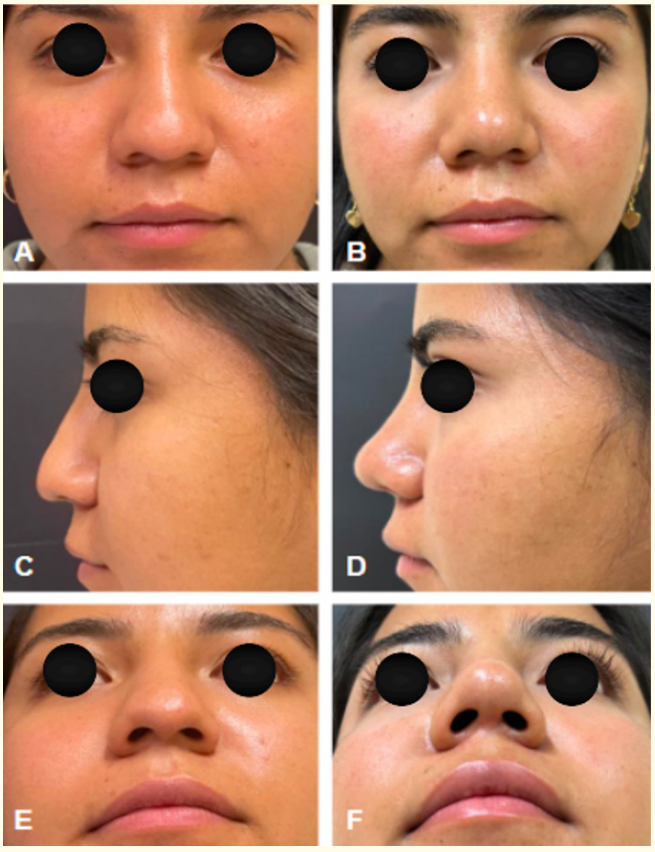


Figures 2. Placement of a left septal extension graft sutured to the lower lateral cartilage.

Postoperatively, improvement in nasal tip support, ventilation, and nasal projection was observed, resulting in favorable functional and aesthetic outcomes. The patient reported satisfaction with the surgical results (Figure 3).

Ethical Considerations

Written informed consent was obtained from the patient for the use of her clinical data and images. Ethical and confidentiality standards were strictly followed for the publication and dissemination of this case report.



Figures 3. Preoperative and postoperative clinical photographs.

Discussion

Agenesis of the medial crura is an extremely rare condition and therefore represents both a diagnostic and therapeutic challenge. These structures are essential for nasal tip projection and support, and they contribute to respiratory function by maintaining the patency of the internal nasal valve. Their absence may result in nasal tip ptosis, valvular collapse, and significant aesthetic deformity [9,10].

Most cases of congenital nasal anomalies are diagnosed during childhood and are often associated with syndromic conditions or other congenital malformations. However, some cases, as demonstrated in the present report, may remain undetected until adulthood and be incidentally identified during surgical procedures such as septoplasty [3,4]. This delay in diagnosis poses a clinical challenge. Clinically, asymmetry of the nostrils and nasal tip may be observed; the affected nostril is often narrower, the nasal dorsum may appear flattened or depressed, and the nasal tip may be bulbous with associated nasal valve collapse, frequently resulting in respiratory dysfunction manifested as nasal obstruction. Despite the presence of structural deformity, some patients may not report severe symptoms until the condition is discovered intraoperatively.

For this reason, careful evaluation of the nasal tip is essential in all patients undergoing rhinoplasty, with particular attention to asymmetries or signs of valvular collapse. When a congenital anatomical defect is suspected, patients should be counseled preoperatively regarding the potential need for additional grafts. Surgeons must remain vigilant for congenital deformities in order to plan the surgical approach appropriately.

In the case presented, the finding was incidental during functional surgery, highlighting the importance of comprehensive preoperative assessment. This report aims to address the limited existing evidence and to describe an appropriate surgical approach for this rare condition. Priority should be given to the use of available septal cartilage; when insufficient, auricular conchal cartilage may be used, and in more extensive cases, costal cartilage may be required [3,8]. Reconstruction using autologous grafts proved to be effective, with favorable clinical evolution and satisfactory functional and aesthetic outcomes.

Conclusion

Agenesis of the medial crura represents an uncommon but clinically significant challenge in nasal surgery, affecting both diagnosis and therapeutic management. Early recognition, combined with meticulous surgical planning, allows for the implementation of structural reconstruction techniques that effectively restore both respiratory function and nasal aesthetics.

Although congenital nasal anomalies are rare, they should be considered in the differential diagnosis of nasal tip deformities. Their etiological complexity and clinical variability necessitate an individualized approach. In particular, reconstruction of nasal support using structural grafts in cases of crural agenesis has demonstrated improvement in nasal ventilation, tip projection, and overall nasal stability.

Successful treatment relies on precise anatomical assessment, the use of appropriate autologous grafts, and an open surgical approach that enables safe and effective correction of these alterations, even in anatomically challenging scenarios.

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