

Structural Rhinoplasty for Congenital Aplasia of the Cartilaginous Nasal Septum: A Case Report

Katrina Rose G. Baluyot^{1*}, Fatima Iris V. Ogario¹, Leireen Joy M. Vasquez¹, Roberto C. Vasquez¹

¹Philippine Academy of Aesthetic Surgery – Training Management Group, Metro Manila, Philippines.

Correspondence: Katrina Rose G. Baluyot; Philippine Academy of Aesthetic Surgery – Training Management Group, V Building, 1108 Marquez Street corner Jaguar Street, Gatchalian Subdivision, Las Piñas City, Metro Manila, Philippines; Email: krgbaluyot@yahoo.com

Received: 7 August 2026; Accepted: 12 October 2026; Published: 30 October 2026

ABSTRACT: Congenital aplasia of the cartilaginous nasal septum is an extremely rare condition. We present the case of a 22-year-old Filipina who sought aesthetic correction of a flattened nose. Physical examination revealed a short nose with a low dorsum, lack of tip projection, right alar notching, perialar flattening, a shortened columella, and an acute nasolabial angle. Cranial radiography showed no congenital craniomaxillofacial anomaly. The patient underwent open structural rhinoplasty with a septal extension graft (SEG) using polycaprolactone (PCL) mesh and dorsal augmentation using expanded polytetrafluoroethylene (ePTFE). Intraoperatively, complete absence of the cartilaginous nasal septum was confirmed. Postoperatively, the patient demonstrated satisfactory aesthetic and functional outcomes, with improved patient-reported quality-of-life scores. This case highlights the surgical management of congenital cartilaginous nasal septal aplasia using structural rhinoplasty with a PCL mesh SEG and reports the resulting aesthetic and patient-reported outcomes.

Keywords: Congenital aplasia, Cartilaginous nasal septum, Structural rhinoplasty, Septal extension graft, Case report

INTRODUCTION

Congenital aplasia of the cartilaginous nasal septum is an exceedingly rare craniofacial anomaly, with only a limited number of cases reported in the literature [1-3]. The nasal septum is composed of cartilaginous, bony, and membranous components that collectively provide structural support to the external nose, maintain dorsal projection, and contribute to nasal airflow and function. Absence of the cartilaginous septum may result in loss of nasal support, leading to deformities such as saddle-nose deformity, tip underprojection, and functional impairment [1].

Most septal defects encountered in clinical practice are acquired and may result from prior septal surgery, trauma, infection, inflammatory disease, chemical injury, or substance abuse [1]. In contrast, congenital defects of the nasal septum are exceptionally uncommon, occurring as isolated anomalies or in association with other craniofacial abnormalities. Diagnosis relies on careful clinical evaluation and may be

supplemented by imaging studies to assess associated craniofacial anomalies and guide surgical planning [4].

Reconstruction of congenital septal deficiencies remains challenging because of the need to restore both structural support and nasal aesthetics. Reported surgical approaches include the use of autologous cartilage or bone grafts [2], such as costal cartilage and iliac bone grafts, as well as allogenic and alloplastic materials for septal reconstruction and dorsal augmentation. The choice of reconstruction depends on the extent of the defect, available donor tissue, and surgeon preference. We present the case of a 22-year-old Filipina with congenital aplasia of the cartilaginous nasal septum who underwent structural rhinoplasty using polycaprolactone (PCL) mesh as a septal extension graft and expanded polytetrafluoroethylene (ePTFE) for dorsal augmentation. This report highlights the diagnosis and surgical management of this rare anomaly and contributes to the limited literature on reconstructive options for congenital absence of the cartilaginous nasal septum.

CASE PRESENTATION

A 22-year-old Filipina presented to our clinic seeking aesthetic correction of a flattened nose (**Figure 1**). Her medical history revealed no maxillofacial trauma, nasal or midfacial surgery, previous medical treatment for nasal problems, intranasal substance use, or recreational drug use. She was born via uncomplicated vaginal delivery. Her family reported that the nasal deformity had been present since birth and persisted throughout her growth. There was no family history of a similar condition.

General physical examination revealed a healthy-appearing adult in no apparent distress, with no evident craniofacial abnormalities. External nasal examination showed a short nose with supratip depression, a lack of tip projection, right alar notching, perialar flattening, vertical shortening of the columella, a low dorsum, and an acute nasolabial angle. Cranial x-ray showed no congenital anomalies in the craniomaxillofacial region (**Figure 2**). Computed

tomography (CT) was requested but was not performed because of financial constraints.

The patient completed two questionnaires to assess her quality of life in relation to her nasal condition. Her score on the Nasal Obstruction Symptom Evaluation (NOSE) scale was 0, indicating no self-reported nasal obstruction symptoms (**Supplementary Table S1**). Her score on the Rhinoplasty Outcomes Evaluation (ROE) questionnaire was 29.2%, indicating substantial dissatisfaction with her nasal appearance and rhinoplasty-related quality of life (**Supplementary Table S2**, See Supplementary). The NOSE and ROE score were scheduled for reassessment at the 6-month follow-up.

The preoperative diagnosis was overhanging ala, right alar notching, an underprojected nasal tip, and a low dorsum. Structural rhinoplasty using PCL mesh and dorsal augmentation with ePTFE through an open approach was planned. Informed consent for the publication of this case report and the accompanying clinical photographs was obtained from the patient.



Figure 1. Preoperative views: frontal (A), lateral (B,C), basal (D), and oblique (E,F).



Figure 2. Cranial X-rays: anteroposterior (A) and lateral (B) views.

MANAGEMENT AND OUTCOME

Preoperative preparation

The patient was placed in a supine position (**Supplementary Figure S1**), and intravenous sedation was administered. Standard aseptic and antiseptic preparation was performed, followed by sterile draping. Local anaesthesia was infiltrated. Vestibular hair removal and topical mupirocin application were performed. Conchal cartilage was harvested from the right ear via a posterior approach while preserving the perichondrium.

Surgical Procedure

Overhang correction was performed via sail excision of the right ala. An inverted-V columellar incision and bilateral marginal incisions were made. Intraoperative findings revealed a thin and weak right lower lateral cartilage (**Figure 3A & 3B**) and complete absence of the cartilaginous nasal septum (**Figure 3C**). Two pieces of PCL mesh were inserted to construct a septal extension graft (SEG) and secured to the anterior nasal spine and vomer (**Figure 3D & 3E**). The mesh was covered with conchal cartilage. Tip reconstruction and dorsal augmentation

with ePTFE were subsequently performed, followed by placement of supportive grafts (**Figure 3F**). **Figure 4A & 4B** illustrate the SEG design using PCL mesh and its attachment to the anterior nasal spine and vomer.

Post-procedure

The incisions were closed using Vicryl and nylon sutures, and a Denver splint was applied. The patient tolerated the procedure well. The postoperative course was uneventful, with no complications observed (**Figure 5**). The patient returned seven days after surgery for removal of the external splint and sutures (**Figure 6**). At the six-month follow-up, improvements in nasal projection, length, and contour were observed (**Figure 7**). The patient completed the NOSE and ROE questionnaires again postoperatively to assess her quality of life and satisfaction after surgery. The NOSE score remained at 0 before and after surgery, indicating no self-reported nasal obstruction symptoms (**Supplementary Table S3**). The ROE score improved from 29.2% preoperatively to 87.5% postoperatively, indicating improved patient satisfaction with the surgical outcomes (**Supplementary Table S4**).

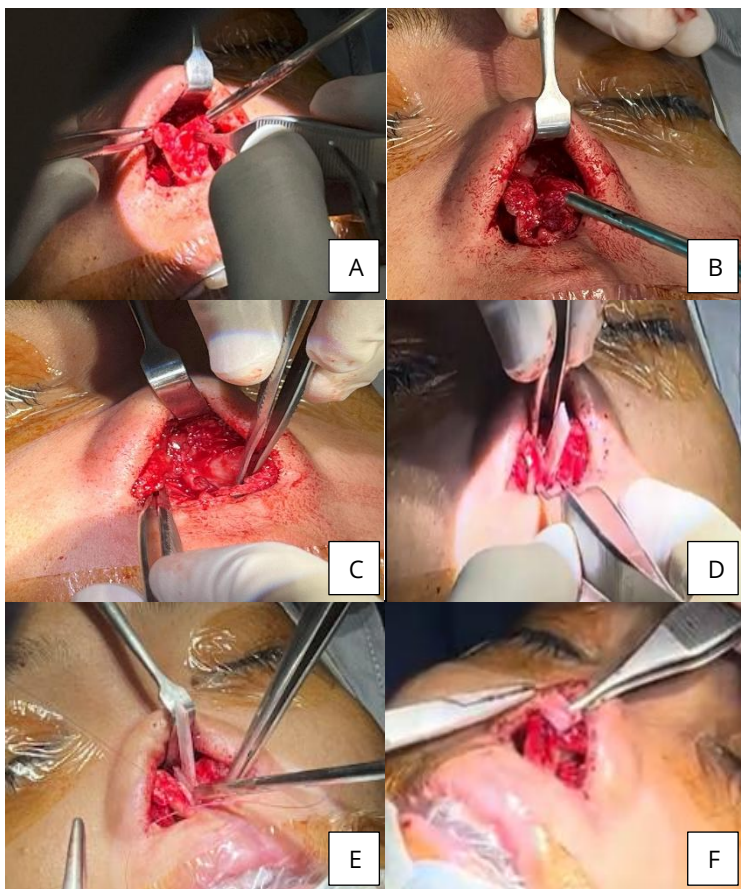


Figure 3. Intraoperative findings of thin and weak right lower lateral cartilage (**A**), exposure of the upper lateral cartilage (**B**), absence of the cartilaginous nasal septum (**C**), placement of PCL mesh as a SEG (**D**), fixation of PCL mesh using 5-0 polydioxanone (PDS) sutures (**E**), and placement of an onlay graft (**F**).

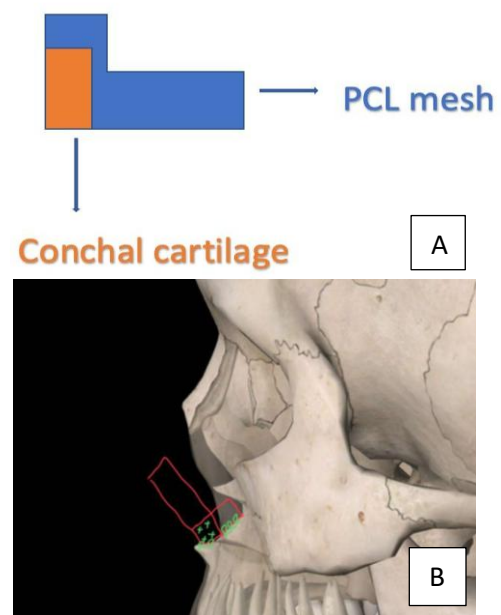


Figure 4. Schematic illustration of the SEG design using PCL mesh (**A**), and its attachment to the anterior nasal spine and vomer (**B**).

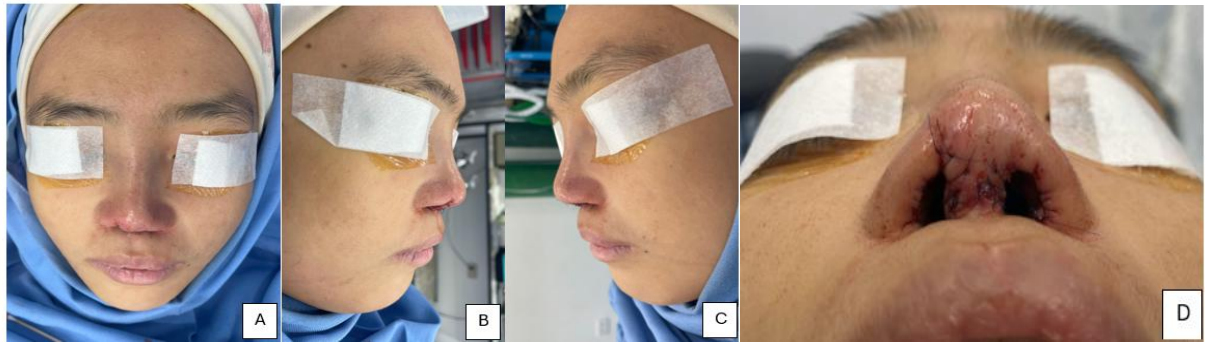


Figure 5. Immediate postoperative views: frontal (A), lateral (B,C), and basal (D).

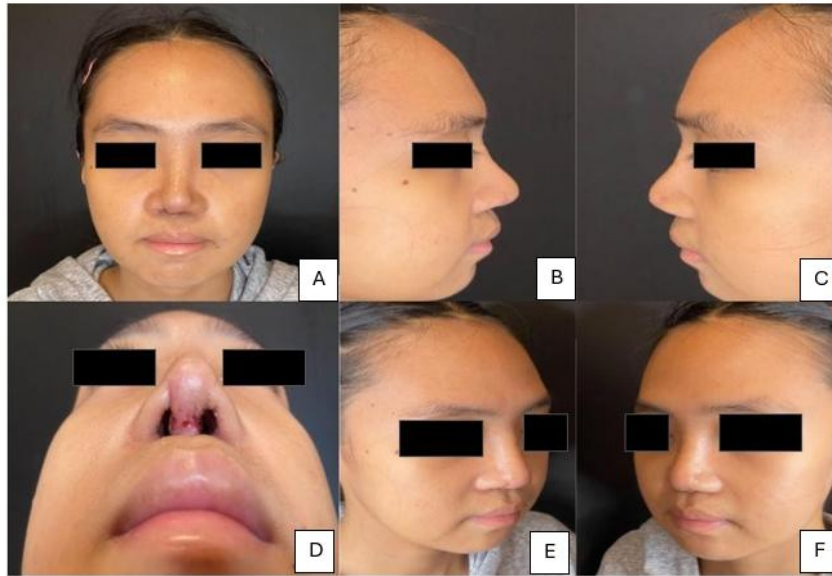


Figure 6. Removal of sutures: frontal (A), lateral (B,C), basal (D), and oblique (E,F) views.

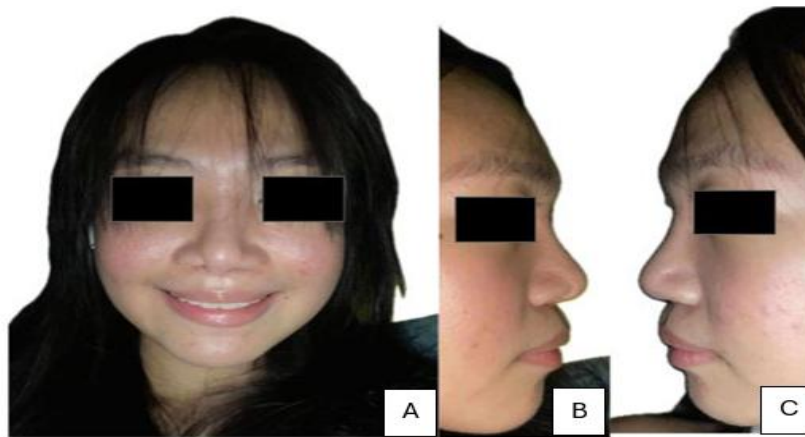


Figure 7. Six-month postoperative views: frontal (A) and lateral (B,C).

DISCUSSION

The nasal septum develops through a complex sequence of midfacial embryogenesis. Nasal development begins during the fourth week of gestation with the formation of the nasal placodes adjacent to the frontonasal prominence. By the fifth week, the medial and lateral nasal processes surround the developing nasal pits, which deepen to form the primitive nasal cavities. As the nasal cavities expand, the frontonasal process contributes to the formation of the nasal septum. By approximately the eighth week, the cartilaginous nasal

capsule surrounds the developing nasal cavity and subsequently undergoes partial endochondral ossification. The quadrangular septal cartilage and upper and lower lateral cartilages remain cartilaginous in the mature nose [1,5]. Disruption of this developmental process may result in a spectrum of congenital nasal abnormalities, ranging from partial nasal hypoplasia to absence of individual nasal structures or, in severe cases, complete arhinia [2].

Congenital defects of the nasal septum are particularly uncommon, and current knowledge is derived largely from isolated case reports and small case

series. Hammoud et al. noted that only a small number of cases involving the absence of the quadrangular cartilage had been reported and described an adult patient with an absent cartilaginous septum and bilateral middle turbinates [1]. Fijałkowska and Antoszewski likewise identified three patients with absence of the quadrangular septal cartilage among 13 patients with isolated nasal underdevelopment [2]. These reports underscore both the rarity and variable clinical expression of congenital septal aplasia.

The differential diagnosis includes congenital and acquired causes of septal deficiency and saddle-nose deformity. Acquired defects may occur following nasal surgery, trauma, cauterization or chemical injury, intranasal drug use, infection, and inflammatory or granulomatous disease [1,3]. In the present patient, the deformity had been noted since birth and persisted during growth, with no history of maxillofacial trauma, nasal or midface surgery, intranasal substance use, or treatment for a previous nasal disorder. No clinical or intraoperative findings suggested prior destructive or inflammatory disease. Binder syndrome was also considered because it may present with a flattened nasal profile; however, the patient's normal maxillary and nasal bone development and balanced midface profile were not consistent with the characteristic maxillary hypoplasia and midfacial retrusion described in Binder syndrome [2]. Taken together with the intraoperative finding of complete absence of the cartilaginous septum, these findings supported a congenital rather than acquired etiology.

Congenital absence of nasal structures may occur in isolation or alongside other congenital abnormalities. Abdulkadir et al. described congenital absence of the nasal septum in a newborn with multiple craniofacial and systemic anomalies, suggesting a possible syndromic association [6]. These findings highlight the importance of considering possible syndromic associations, particularly when additional craniofacial, developmental, or systemic abnormalities are present. In such cases, multidisciplinary assessment, including genetic evaluation when clinically indicated, may be considered. The present patient had no evident associated craniofacial abnormalities or family history of a similar condition. However, genetic testing was not performed; therefore, an underlying genetic association cannot be excluded.

Diagnosis relies on a detailed history and careful external and intranasal examination, supplemented by imaging when available. CT helps define the extent of septal absence, assess the bony septum and other internal nasal structures, identify associated craniofacial abnormalities, and guide surgical planning [1]. In the present case, cranial radiography showed no evident craniomaxillofacial anomaly. CT was requested but not performed because of financial constraints. In the absence of CT imaging, the patient's clinical history and physical examination findings guided the preoperative assessment and surgical planning, while the complete

absence of the cartilaginous nasal septum was confirmed intraoperatively. Although this represents a limitation of the preoperative evaluation, the case demonstrates how clinical findings can guide surgical planning when cross-sectional imaging is unavailable.

Management is usually individualized and ranges from observation to substantial structural reconstruction, depending on symptoms, anatomy, degree of deformity, functional impairment, patient age, aesthetic concerns, and available reconstructive tissue. Because congenital cartilaginous septal aplasia is exceptionally rare, there is no standardized reconstructive protocol. Previously reported surgical cases have used autologous cartilage or bone grafts for nasal reconstruction [2,3]. In contrast, Hammoud et al. described a patient who was managed conservatively for recurrent epistaxis, her main complaint, as she had no breathing difficulties and was satisfied with her nasal appearance [1].

Structural rhinoplasty aims to reinforce and reposition existing nasal structures to achieve stable aesthetic and functional correction, an approach particularly relevant in Southeast Asian noses, in which the lower lateral cartilages may provide limited structural support [7]. When substantial tip repositioning is required, a SEG can provide a stable framework for controlling projection, rotation, and length, as illustrated in **Figure 8**, alongside the spreader graft [7]. In the present case, complete absence of the cartilaginous septum eliminated the usual source of septal cartilage for the SEG, and the patient also required substantial tip projection and elongation. Therefore, two pieces of PCL mesh were used to construct the SEG, secured to the anterior nasal spine and vomer, and covered with conchal cartilage. The thin and weak right lower lateral cartilage was additionally reinforced with an alar conchal batten graft, while ePTFE was used for dorsal augmentation to harmonise the dorsum with the newly projected tip.

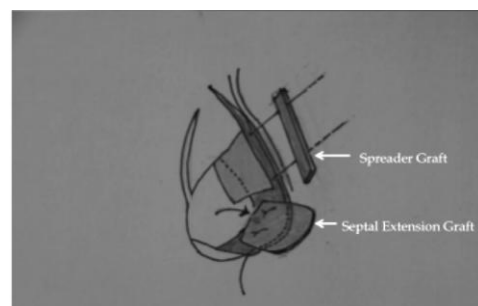


Figure 8. Schematic illustration of two structural support grafts used in rhinoplasty: the spreader graft and the SEG [7].

PCL mesh is a bioabsorbable scaffold that can provide temporary structural support while permitting tissue ingrowth. Its porous architecture allows ingrowth of chondroblastic and mesenchymal tissue, and coverage with cartilage has been recommended to reduce the risk of mucosal erosion and provide additional long-term support as the material is absorbed

[8]. PCL has been described in structural rhinoplasty when septal cartilage is small, weak, or inadequate for reconstruction [8]. In this case, this principle was extended to a patient in whom the cartilaginous septum was congenitally absent. At six months, improvements in nasal projection, length, and contour were observed, with no postoperative complications reported. Nevertheless, the relatively short follow-up period is an important limitation, particularly when evaluating a bioabsorbable implant, and longer follow-up is necessary to assess maintenance of structural support after progressive PCL degradation.

Patient-reported outcome measures provide an important complement to the surgeon's assessment after rhinoplasty because aesthetic procedures are strongly influenced by patient perception, expectations, and quality of life [9,10]. The NOSE scale is a validated patient-reported measure of nasal obstruction and has been used to evaluate functional outcomes following septorhinoplasty [11]. The patient's NOSE score remained at 0 before and six months after surgery, indicating no patient-reported nasal obstruction following the reconstructive procedure. The ROE questionnaire evaluates aesthetic satisfaction, nasal function, and psychosocial aspects of rhinoplasty outcomes [9,12]. In the present case, the ROE score increased from 29.2% preoperatively to 87.5% at six months, representing a 58.3-percentage-point increase and indicating greater patient-reported satisfaction after surgery.

CONCLUSION

Congenital aplasia of the cartilaginous nasal septum is an exceptionally rare anomaly that requires careful clinical assessment and individualized surgical planning. This case adds to the limited literature by documenting structural rhinoplasty using PCL mesh as a SEG in the absence of native septal cartilage. At six months, improvements in nasal projection, length, and contour were observed, with preserved self-reported nasal function. The substantial improvement in the ROE score further demonstrated increased patient-reported satisfaction following reconstruction. These findings suggest that PCL mesh may be a useful reconstructive option in carefully selected patients with inadequate or absent septal cartilage. However, a single case with six months of follow-up cannot establish long-term durability or comparative effectiveness. Longer follow-up is necessary to evaluate the maintenance of structural support following progressive PCL degradation.

ACKNOWLEDGEMENT

The authors thank the patient for providing consent for publication of this case report and the accompanying clinical photographs. The authors also extend their sincere appreciation to Dr. Roberto C. Vasquez for providing the clinical case that formed the basis of this report. The authors would also like to express their

sincere gratitude to Dr. Johannes F. Dayrit for his generous financial support toward the publication of this case report.

CONFLICT OF INTEREST

The authors declare no financial or personal conflicts of interest that could have influenced the work reported in this case report.

Supplementary Material

REFERENCES

1. Hammoud R, Azzam R, Emam F, Alhail M. Congenital aplasia of cartilaginous nasal septum: a case report. *Otolaryngol Case Rep.* 2022;25:100488. DOI: 10.1016/j.xocr.2022.100488.
2. Fijałkowska M, Antoszewski B. Nose underdevelopment - etiology, diagnosis and treatment. *Otolaryngol Pol.* 2016;70(2):13-8. DOI: 10.5604/00306657.1199344.
3. Tunçbilek G. Congenital isolated absence of the nasal cartilaginous septum. *J Plast Reconstr Aesthet Surg.* 2008;61:e1-4. DOI: 10.1016/j.bjps.2007.10.014.
4. Mohamed S, Emmanuel N, Foden N. Nasal obstruction: a common presentation in primary care. *Br J Gen Pract.* 2019;69(689):628-9. DOI: 10.3399/bjgp19X707057.
5. Steding G, Jian Y. The origin and early development of the nasal septum in human embryos. *Ann Anat.* 2010;192(2):82-5. DOI: 10.1016/j.aanat.2010.01.002.
6. Abdulkadir I, Musa S, Abdullahi FL, Hassan L. Congenital absence of the nasal septum in a Nigerian newborn with multiple congenital anomalies. *BMJ Case Rep.* 2020;13:e235845. DOI: 10.1136/bcr-2020-235845.
7. Yap EC. Principles of structural rhinoplasty in South East Asian noses. *Philipp J Otolaryngol Head Neck Surg.* 2014;29(2):41-4. DOI: 10.32412/pjohns.v29i2.437.
8. Yap E. Techniques in the safe use of polycaprolactone in structural rhinoplasty. *Philipp J Otolaryngol Head Neck Surg.* 2020;35(1):66-70. DOI: 10.32412/pjohns.v35i1.1267.
9. Esteves SS, Ferreira MG, Almeida JC, Abrunhosa J, Sousa CAE. Evaluation of aesthetic and functional outcomes in rhinoplasty surgery: a prospective study. *Braz J Otorhinolaryngol.* 2017;83(5):552-7. DOI: 10.1016/j.bjorl.2016.06.010.
10. Papadopoulos NA, Liebmann J, Kloeppel M, Henrich G, Machens HG, Staudenmaier R, et al. Quality of life after rhinoplasty: a prospective study. *Facial Plast Surg.* 2021;37(5):639-45. DOI: 10.1055/s-0041-1725174
11. Gerecci D, Casanueva FJ, Mace JC, Annen A, Barrett DM, Kim MM, et al. Nasal obstruction symptom evaluation (NOSE) score outcomes after

- septorhinoplasty. *Laryngoscope*. 2019;129(4):841-6. DOI: 10.1002/lary.27578.
12. Saraf A, Gupta N, Manhas M, Kalsotra P. Evaluation of quality of life after septorhinoplasty using Rhinoplasty Outcome Evaluation questionnaire. *Egypt J Otolaryngol*. 2023;39(1). DOI: 10.1186/s43163-023-00445-9.