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Original Research Article

Evolution of aesthetic rhinoplasty: an analysis of surgical techniques and outcomes at the Dr. Eduardo Liceaga General Hospital of Mexico (2019-2025)

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ABSTRACT

Background: Rhinoplasty is a highly sought-after surgical procedure that has evolved with the concepts of function and aesthetics, achieved through precise modification of bony and cartilaginous structures using both open and closed approaches. To analyze the surgical techniques employed in aesthetic rhinoplasty between 2019 and 2025 at the Hospital General de México Dr. Eduardo Liceaga (HGM).
Methods: A retrospective, descriptive, observational study was conducted on 300 patients who underwent rhinoplasty. Demographic data, type of rhinoplasty (primary/secondary), surgical approach (open/closed), incisions, osteotomies, grafts and complications were organized and analyzed within an excel table. Patient satisfaction was assessed via telephone surveys.
Results: The sample was predominantly female (65%) with a mean age of 34.5 years. The majority underwent primary rhinoplasty (82%). Open and closed approaches were distributed almost equally (52% vs. 48%). The complication rate was 12%, with no significant differences between the two approaches. Overall satisfaction was high (8.5/10 for function and 8.0/10 for aesthetics), with a slight trend toward greater aesthetic satisfaction with the open approach.
Conclusions: The choice between open and closed approaches should be based on nasal anatomy, patient goals and the surgeon's experience. Both techniques produce satisfactory results, underscoring the importance of minimizing complications to improve patient perception.

Keywords: Advantages, Open vs closed, Rhinoplasty, Techniques

INTRODUCTION

Rhinoplasty is one of the oldest and most in-demand surgical procedures in the field of facial surgery, reflecting an evolution guided by concepts of function and aesthetics.[1] Its history is rooted in the pursuit of anatomical and functional perfectionism, achieved through the precise modification of bone and cartilage structures to obtain predictable and minimally invasive results.[2] The increased demand has driven continuous study of the most used techniques, promoting debate between open and closed approaches, fuelled by technological advancements and progress in anatomical and biomechanical understanding.[3] In 2020 it was projected that 352,555 cosmetic rhinoplasties were conducted in the United States by board-certified plastic surgeons, making it the most common plastic surgery procedure conducted.[4] Rhinoplasty is estimated to represent approximately 21.6% of all plastic and aesthetic surgical procedures performed worldwide, according to data from the International society of aesthetic plastic surgery.[5] The open approach technique was introduced in 1930 by Rethi and involves exposing the nasal pyramid and septum through an incision in the columella.[6] This technique

allows for direct visualization of nasal structures, facilitating the correction of complex cases, secondary post-resection deformities and preserving tissues while providing more precise structural control.[7] In contrast, the closed approach is a subcutaneous technique that has gained popularity due to its less invasive nature, as well as reduced surgical time and postoperative complications, such as hematomas (0.2%), infections (0.2%) and pulmonary complications (0.1%).[8] This study aims to analyze both surgical techniques used in aesthetic rhinoplasty over the past six years (2019-2025), a period that has seen a notable increase in scientific publications and the incorporation of innovative practices. Additionally, it evaluates the impact of these advances on the surgical approach adopted by the plastic, aesthetic and reconstructive surgery service of the hospital general de México Dr. Eduardo Liceaga. Furthermore, the study seeks to contribute to trends based on the analysis of data from performed surgeries, promoting safer, more predictable nasal procedures that align with contemporary social and cultural expectations.

METHODS

A retrospective, descriptive, observational study was conducted by analyzing the database of patients treated at the Hospital General de México Dr. Eduardo Liceaga from 2019 to 2025. A total of 300 patients diagnosed with nasal deformity were selected, the data was structured as an Excel Table, which facilitated filtering, sorting and summarizing the key findings for further analysis. These patients had attended the plastic, aesthetic and reconstructive surgery service and had complete clinical records. Patients who had not undergone rhinoplasty procedures were excluded.

Of the 300 patients diagnosed with nasal deformity reported in the database, those who underwent rhinoplasty were selected, without discriminating between primary or secondary procedures. The inclusion criteria considered were deformity documented by computed tomography and age between 18 and 65 years. For the analysis of variables, aspects such as the type of approach (open or closed), incision modality (step, V, inverted V or W), performance of internal or external osteotomies, obtaining a graft for nasal projection (septal graft, rib cartilage, auricular cartilage graft), type of tip graft (Sheen, Shield or Peck) and the use or non-use of a radix graft (fascia, SMAS or dice cartilage) were evaluated.

This study complies with the ethical guidelines established for data collection and publication. All patients treated at the hospital provided informed consent for the use of their clinical history data for medical research purposes at the time of admission. Due to its retrospective nature and limitations on the population attending revisions at our hospital, a telephone questionnaire was developed for clinical data collection. The initial consultation included questions about the presence of postoperative complications; if answered affirmatively, the description of these complications was further detailed. Additionally, patient satisfaction in functional and aesthetic aspects was evaluated.

RESULTS

Demographic analysis and baseline characteristics of the study population

The study cohort, comprising 300 patients undergoing rhinoplasty at the Hospital General de México Dr. Eduardo Liceaga between 2019 and 2025, showed a gender distribution bias toward females (65%), while 35% were male. This female predominance is consistent with trends reported in the literature, where aesthetic rhinoplasty is more often sought by young and middle-aged women. The mean age of the sample was 34.5 years (SD±9.2), ranging from 16 to 62 years.

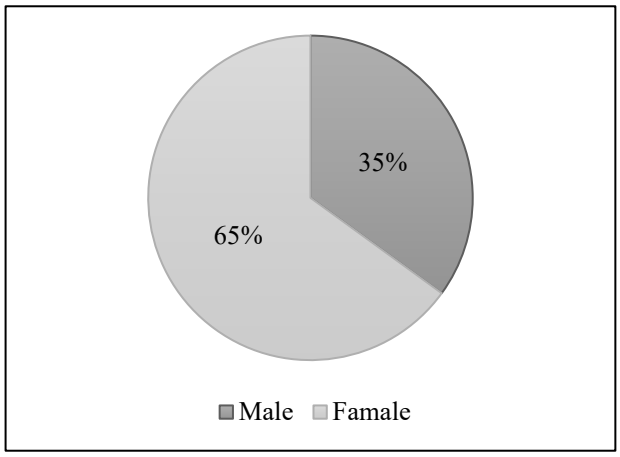

Figure 1: Distribution of patients by sex.

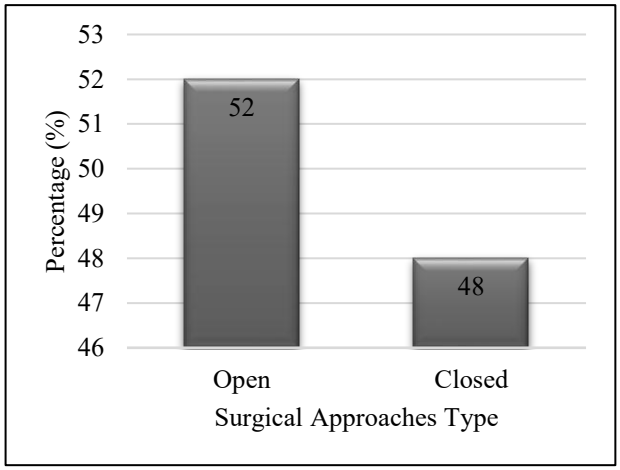

Figure 2: Distribution of surgical approaches.

The largest proportion of patients was concentrated in the 25-35 age group (45%), followed by the 36-45 age group (25%). This pattern suggests that the demand for rhinoplasty is higher in individuals searching aesthetic and functional corrections in early adulthood. The low

prevalence of pre-existing comorbidities (8%) indicates that most patients were relatively healthy, which may positively influence postoperative recovery and reduce the risk of complications.

Types of rhinoplasties performed and surgical characteristics

Regarding the types of rhinoplasty, 82% (n=246) of the procedures were primary, while 18% (n=54) were secondary or revision procedures. This proportion highlights the importance of primary rhinoplasty as the initial procedure to correct nasal deformities, while also underscoring the need for secondary procedures to address unsatisfactory results or complications from previous surgeries. In terms of surgical approach techniques, the nearly equal distribution between open approach (52%, n=156) and closed approach (48%, n=144) reflects the ongoing controversy and debate in the surgical community about which is the most appropriate approach.

The choice between one or the other may depend on factors such as the complexity of the deformity, the surgeon's preference and the specific needs of the patient. Within the open approach, the step incision was the most used (40%), followed by the normal V (35%) and the inverted V (25%). This preference for the step incision may be due to its versatility and ease of access to nasal structures. Regarding osteotomies, internal osteotomies were more common (60%), which may be related to the pursuit of more precise and controlled results. The septal graft was the preferred technique for nasal tip projection and rotation (65%), due to its availability and biocompatibility, followed by the auricular cartilage graft (20%) and the rib graft (15%). The choice of the Sheen graft as the most common for the nasal tip (55%) suggests its effectiveness in creating a well-defined and aesthetically pleasing nasal tip, while shield (30%) and Peck (15%) grafts may be used in specific cases requiring greater support or refinement. Regarding the radix graft, it was used in 20% (n=60), with the SMAS (Submuscular Aponeurotic System) graft being the most used approach (50%, n=30), followed by the fascia graft (30%, n=18) and finally the dice cartilage (20%, n=12).

Analysis of postoperative complications

The overall rate of postoperative complications was 12% (n=36), which is comparable to rates reported in the literature. The most frequent complications were prolonged edema (4%), persistent ecchymosis (3%), irregularities of the nasal dorsum (2%), dehiscence of the columellar incision (1.5%) and persistent nasal obstruction (1.5%). The absence of major complications such as severe infections or septal perforations indicates high quality in surgical care and postoperative management. The lack of significant differences in the complication rate between the open and closed approaches (13% vs. 11%) suggests that the choice of approach is not a determining factor in the occurrence of complications, but rather that other factors such as surgical technique, the surgeon's experience and postoperative care may have a greater impact.

Patient satisfaction assessment

The high overall satisfaction rate (8.0 for functional satisfaction and 8.5 for aesthetic satisfaction) reflects the effectiveness of rhinoplasty in improving both nasal function and aesthetic appearance. The trend toward greater aesthetic satisfaction in the group undergoing the open approach, although not significant, may be related to the greater precision and control offered by this technique in reshaping the nose. The negative correlation between postoperative complications and patient satisfaction highlights the importance of minimizing complications to ensure patient satisfaction.

Table 1: Distribution of patients by age group.

Age group (in years)	Frequency (N)	%
Under 18	25	12.5
18–25	65	32.5
26–35	55	27.5
36–45	35	17.5
Over 45	20	10

Table 2: Frequency of incision type.

Incision type	Frequency (N)	%
Open	150	75
Closed	50	25

Table 3: Complication rates by approach type.

Complication rate (%)	Open approach	Closed approach
0–2% (mild)	2.5%	1.5%
2–5% (moderate)	1%	0.5%

DISCUSSION

Nasal morphology is a fundamental element in achieving facial balance, harmony and proportion, aspects that are significantly influenced by facial anthropometric measurements.[9] The purpose of rhinoplasty is to modify these proportions to achieve an optimal aesthetic and functional outcome. The choice between an open or closed approach may be determined by the disparity between the patient's current proportions and the desired ideal. Many authors highlight that the open approach offers advantages, especially in the ease of obtaining grafts and projecting the nasal tip, due to the better exposure of anatomical structures.[10]

However, the evaluation of postoperative symptoms and recovery are also crucial aspects in assessing surgical outcomes. The main purpose of the procedure is to improve both the function and aesthetics of the nose in this context, the patient's experience during recovery plays a determining role in the overall success of the intervention.[11] A more comfortable recovery, with less discomfort and fewer complications, not only increases patient satisfaction but also contributes to a positive perception of the result and a higher rate of success in surgery.[12] Therefore, while the chosen technique may influence certain aspects of the intervention, the importance of minimizing postoperative complications and optimizing the patient experience as key factors for satisfactory results should not be overlooked.

According to a randomized, double-blind study by Gholami et al and Vaezi et al no statistically significant differences were found between open and closed techniques in relation to postoperative edema, ecchymosis and deformities.[13] Although rhinoplasty is perceived as a safe and highly effective procedure, it is important to note that complications during the recovery phase can occur in both approaches.

In keeping with a thesis that investigates rhinoplasty techniques, emphasizing the open and closed approaches in a period between 2016 and 2017, the current study expands upon this by analyzing a broader patient cohort.[14] Castro Lopez finds a nearly even distribution between open (53.74%) and closed (42.26%) approaches, which follows the trend of more contemporary approach. Both studies agree on the importance of surgeon experience in technique selection, highlighting that, even with evolving techniques, a surgeon's familiarity with an approach is paramount. A key difference lies in the data collection period and the expanded scope of analysis, allowing the current study to examine a more recent trends that were not captured within the timeframe of Castro Lopez's retrospective analysis.

In 2020, a retrospective analysis of 238 cases using the closed rhinoplasty technique reported a complication rate of 0.8%.[15] Comparatively, another study covering 4,500 procedures using the open approach reported a complication incidence of 0.7%.[16] Both sets of data show that, in terms of safety, both techniques have similar rates, suggesting that the choice of approach should not only be based on complication incidence but also considering other clinical and personal aspects. Within the clinical records of the plastic, aesthetic and reconstructive surgery service of the hospital general de México Dr. Eduardo Liceaga, the most frequent complications, in order of prevalence, include prolonged edema, persistent ecchymosis, deformities in the tip, irregularities in the nasal dorsum and occasionally, dehiscence of the columellar incision. Without statistically significant differences related to the type of approach, this reinforces the idea that the surgeon's experience, as well as preoperative planning, are determining factors in the results and postoperative complications.

Given that the published data and clinical experience did not demonstrate conclusive differences regarding safety, it was decided to complement the analysis with a survey directed to the plastic surgeons involved in the procedures. This questionnaire allowed evaluating surgical time, the perception of technical difficulty and overall satisfaction with each approach to identify, from clinical practice, which technique can be considered more efficient and appropriate. The results revealed a discrepancy in the choice technique: the open technique was associated with greater aesthetic satisfaction, facilitating better visualization of anatomical structures, especially in complex cases or secondary deformities and reducing the causes of dissatisfaction reported by patients, such as insufficient tip rotation, columellar drooping and deformities in the supra-tip area.

On the other hand, the closed technique prevailed in contexts where the preservation of sensitivity in the nasal tip, the absence of a columellar scar and a shorter postoperative time were priorities. Patients who underwent closed approaches reported higher levels of satisfaction related to rapid recovery and aesthetics without a visible scar, aspects that positively influence their psychological well-being and perception of results. While this study provides valuable insights into the study of both rhinoplasty techniques, several limitations warrant consideration. The retrospective design inherently restricts the ability to establish causality and is susceptible to selection bias. Furthermore, the reliance on telephone surveys for patient satisfaction assessment may introduce response bias and limit the depth of qualitative feedback.

Statistically, the sample size, though adequate for descriptive analysis, may not possess sufficient power to detect subtle but clinically meaningful differences between surgical approaches. Additionally, the single-centre nature of this study restricts the generalizability of findings to diverse patient populations and surgical practices. Future research should address these limitations through prospective, multi-centre designs incorporating validated outcome measures and larger sample sizes to enhance the rigor and breadth of the findings.

CONCLUSION

In conclusion, this study significantly advances our understanding of the comparative effectiveness of open versus closed rhinoplasty techniques by providing a detailed analysis of outcomes within a contemporary surgical practice. By meticulously examining a cohort of 300 patients, this research offers valuable insights into complication rates, patient satisfaction scores and factors influencing surgical choice that inform surgical decision-making and refine patient expectations. Furthermore, the detailed characterization of surgical techniques and postoperative experiences contributes to a more nuanced understanding of the factors that influence successful rhinoplasty outcomes, ultimately promoting improved surgical practices and enhancing patient care in this evolving field.

It is essential that the choice of technique results from a thorough evaluation of the nasal anatomy, the specific objectives of each patient and the surgeon's clinical experience. The formulation of a personalized plan not only increases the chances of success but also maximizes patient satisfaction and the quality of the aesthetic and functional outcome. In addition, this decision must be supported by solid training in both techniques, allowing the surgeon to adapt and manage diverse cases with versatility and precision.

Finally, the constant evolution in the field of nasal surgery, driven by technological advances such as digital simulation and three-dimensional preoperative planning, promises to expand therapeutic options and improve results even further. In this context, the competence to select and apply the most appropriate technique in each situation becomes a key element in maintaining standards of excellence in surgical practice in plastic, aesthetic and reconstructive surgery in Mexico.

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