

# Prevalence of Facial Asymmetry and Correction Methods for Rhinoplasty in Individuals with Deviated Nose: A Brief Review

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## ABSTRACT

**Background:** Surgeons frequently perform rhinoplasty on individuals who have facial asymmetry. Patients' discontent following rhinoplasty has been linked to facial asymmetry. On the other hand, correction of a deviated nose is a tough procedure, and it is not the same as septal deviation correction. Surgeons, who often perform rhinoplasty for deviated nose in people with asymmetrical faces, focus primarily on correcting nasal defects and overlook such facial asymmetry.

**Aim:** We aimed to summarize and review the prevalence of facial asymmetry in patients subjected for rhinoplasty for deviated nose correction.

**Methods:** A systematic search was conducted covering PubMed, Scopus, ISI, and Google Scholar using related key words and MeSH (Medical Subject Headings) terms from 2000 until November 2021 for English published articles.

**Results:** The majority of subjects had more facial asymmetry such as chin deviation, nasal deviation, and face breadth. Facial asymmetry is typically found in patients undergoing rhinoplasty for a deviated nose, and its presence frequently results in the failure to achieve a straight-looking nose.

**Conclusion:** Patients considering rhinoplasty frequently have facial asymmetries, and careful attention should be devoted to these elements in both surgical planning and patient counseling. In order to create facial harmony and apparent symmetry after rhinoplasty, it is critical to center the nose on the midlabellar to mid-bow Cupid's line.

**Keywords:** Rhinoplasty; Facial asymmetry; Asymmetrical face; Deviated nose

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## INTRODUCTION

Over the last 20 years, rhinoplasty has transitioned from adjuvant method that involves lowering or splitting the osseocartilaginous structure toward preserving native morphology with cartilage-sparing surgical techniques and strengthening of affected areas to correct shape deformities and restore structural support as one of the most common cosmetic surgical intervention in the field of plastic surgery <sup>1</sup>. With 352,555 cases performed in 2020, one of the five most commonly done aesthetic procedures was rhinoplasty in the USA [American



Society of Plastic Surgeons (ASPS)]. Correction of a deviated or crooked nose is a difficult task that necessitates the use of a variety of surgical procedures in order to achieve a straight vertical nose and a functional airway. Asymmetry can be identified while treating this defect<sup>2</sup>. A multimodal examination of a rhinoplasty patient includes a nasal history, inspection of the nasal airway, and a nasofacial analysis, all of which are important in identifying the optimal surgical technique to achieve facial harmony and improved aesthetics<sup>1,3</sup>. Both the look and function of the nose are influenced by the nasal septum. Nasal deviation is widespread, and its correction necessitates a concentrated, physically based treatment<sup>4</sup>.

Traditional procedures for repairing a deviated nose include septal correction, separation of both upper lateral cartilages from the septum, and bony pyramid manipulation after osteotomies; however, autogenous cartilage grafts are now employed for almost every component of the nasal skeleton, including repositioning, strengthening, re-contouring, and rebuilding<sup>5</sup>. Facial asymmetry frequently results in the inability to build a straight-looking nose<sup>6</sup>. The influence of facial asymmetry on nasal deviation is a well-known but little-understood aspect of cosmetic surgery and rhinology<sup>7</sup>.

In the current review study we aimed to collect and review articles discussing prevalence and characteristics of facial asymmetry in patients with deviated nose subjected for rhinoplasty.

## METHODS

This systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) standards. A literature search was conducted of peer-reviewed articles covering different databases (PubMed, Scopus, ISI, and Google Scholar). Search terms were a combination of both keywords and MeSH terms including [(“Rhinoplasty” OR “deviated nose”) AND (“facial asymmetry” OR “asymmetric face” OR “asymmetrical face”)].

All the studies were entered in reference management EndNote software and then duplicates were removed followed by excluding the articles with undesired title and/or abstracts, conferences and abstracts, non-English studies (Figure 1).

## RESULTS AND DISCUSSION

### *Prevalence of facial asymmetry in individuals with deviated nose*

The anomalies present in deviated nose might change greatly from one patient to the next, as evidenced by the literature study. As a result, there was no universal approach that could be applied to every situation<sup>8</sup>. Facial asymmetry could influence methods for correcting deviated nose. We have collected papers evaluating the prevalence of facial asymmetry in patients with deviated nose<sup>1,2,6,7,9-13</sup>. Rohrich et al.<sup>9</sup> performed a study to evaluate the prevalence of facial asymmetry in a patients seeking rhinoplasty using a preoperative picture database of individuals chosen at random for initial rhinoplasty evaluation. Three blinded cosmetic surgeons subjectively examined 100 individuals, 78 women and 22 men, ranging in age from 18 to 65 years, for nasal deviation, face breadth, chin deviation, and facial height using previously published facial analysis methodologies<sup>14</sup>. The same 100 patients were then objectively assessed for the same parameters in Adobe Photoshop CS2 using the measurement tool (Adobe Systems, Inc., San Jose, Calif.). After evaluation, it was discovered that 42% of all patients checked had left nasal deviation, while 32% of subjects had right nasal deviation. When tested objectively, however, 44% had left nasal deviation and 33% had right nasal deviation. For left deviated nasals, there was a 95.45% consistency between subjective and objective data, and a 96.97% consistency between subjective and objective data for right deviated nasals. Subjectively, left chin deviation was identified in 49 % of all patients, while right chin deviation was found in 17%. When tested objectively; 50% had left chin deviation and 20% had right chin deviation. Between left-deviated chin subjective and objective data, and right chin–deviated subjective and objective data, there was a 98% and 85% agreement, respectively. The majority of participants experienced left facial broadening, with 100% agreement between subjective and objective data on the left side and 97.3% agreement on the right side. In addition, the majority of the participants were found to have left-sided facial shortening (61% of all subjects). For left facial shortness, there was a 98.39% consistency between qualitative and quantitative information,

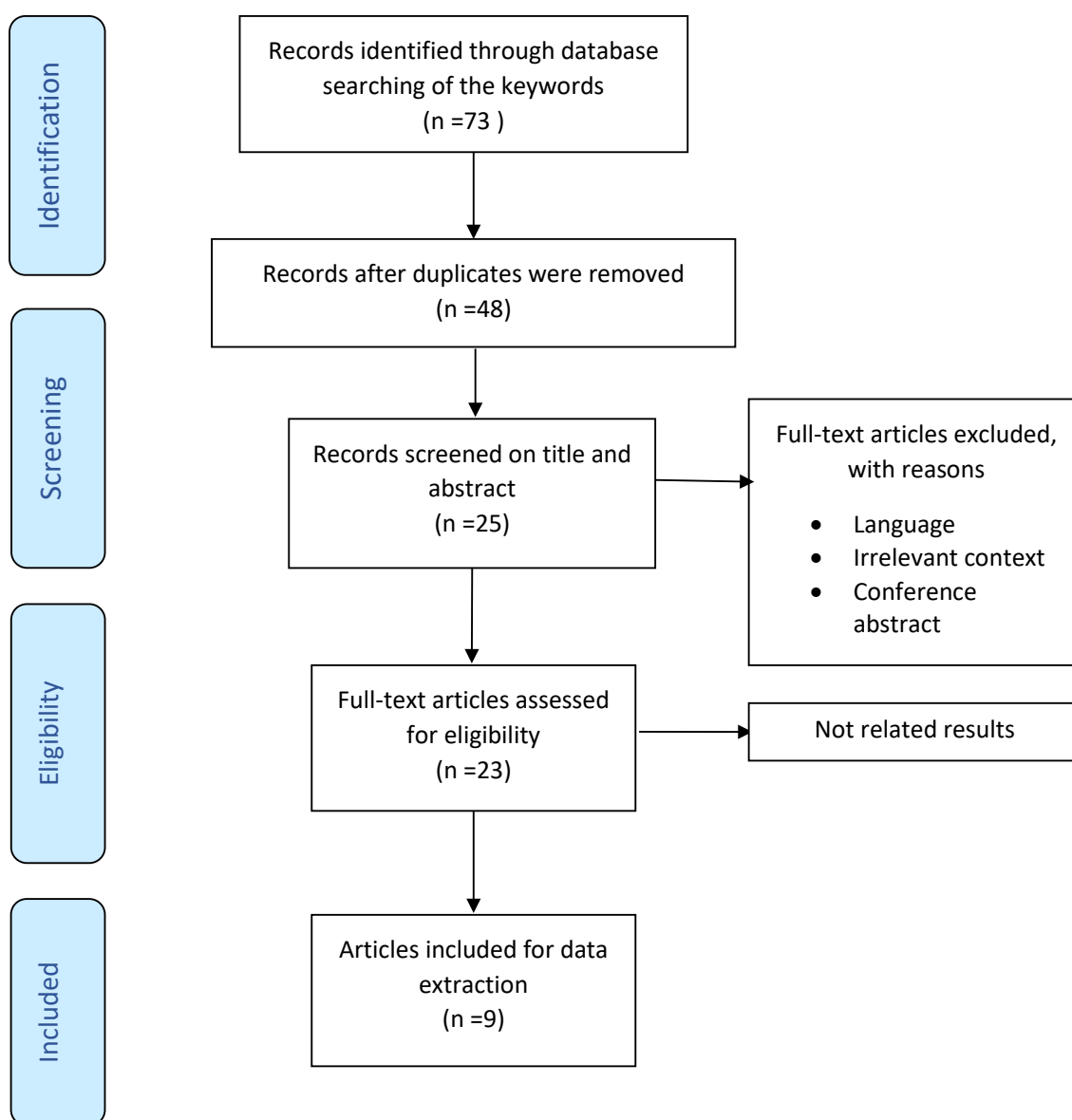


Figure 1: Flowchart of study selection

and for right facial shortness, there was a 97.37% consistency.

Yi et al. found that patients with a deviated nose exhibited more facial asymmetry (55%) than control patients (32%) in a retrospective examination of preoperative pictures of 152 patients who underwent rhinoplasty for a deviated nose ( $P = 0.04$ ), and mixed-type facial asymmetry was the most prevalent asymmetry linked with a deviated nose<sup>6</sup>. Jamil et al. in a study on 63 patients also reported higher prevalence of asymmetric (41 patients, 65.1%) faces than symmetric (22 patients, 34.9%) faces<sup>15</sup>. Hafezi et al. in a study of 5822 pre- and post- rhinoplasty

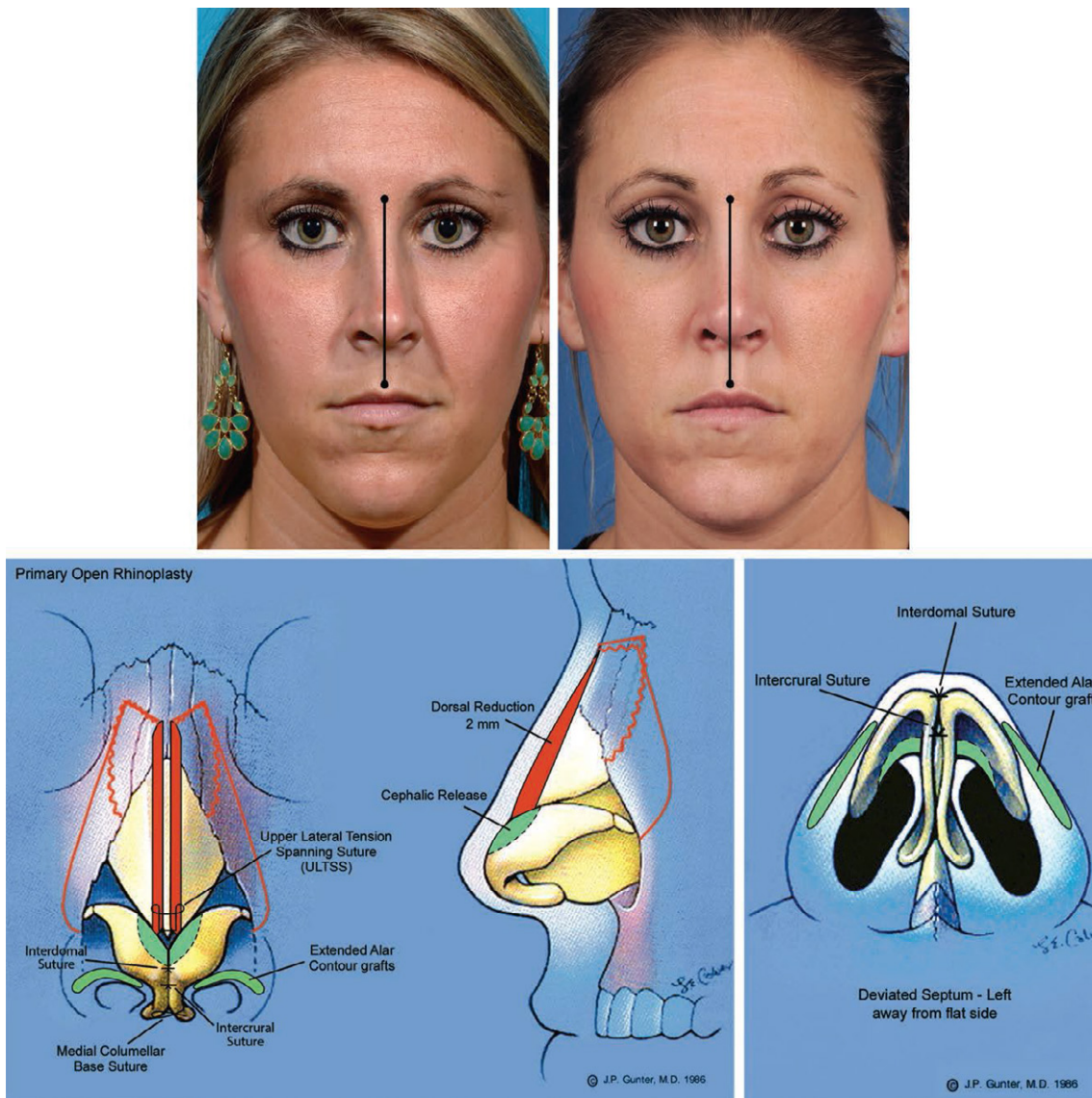
photographs related to 547 women and 124 men showed higher prevalence of facial asymmetry in subjects with deviated nose. They reported three groups: group A, face asymmetry and gross nose; group B, nose asymmetry and no facial asymmetry; group C, straight nose facial with asymmetry<sup>2</sup>. On the concave side of the nose, they found a considerable growth retardation of the midface and orbit. Pre- and postoperative nasal deviation angles revealed that 22 (34.9%) and 41 (65.1%) patients had symmetric and asymmetric faces, respectively, in a retrospective analysis of 61 rhinoplasty participants with crooked noses utilizing frontal

view pictures <sup>7</sup>. All of the patients' satisfaction scores were much higher after surgery; however, there was no significant difference in the mean aesthetic improvement between symmetric and asymmetric faces ( $P = 0.531$ ) <sup>7</sup>. They discovered that persons with asymmetric features and deviated noses may benefit from rhinoplasty in the same manner as symmetric patients do. Katira and Guyuron evaluated photographs of 100 rhinoplasty patients randomly and on anteroposterior images corresponding to the upper lateral cartilages, nasal bones, and nasal tip; the nasal deviation from the midpoint of the intercanthal distance was measured at standardized levels <sup>12</sup>. They discovered that 96 patients out of the 27 males and 73 females evaluated exhibited

quantifiable eyebrow asymmetry, with 96% of males and 96% of females having it. At least one level of nasal deviation was identified in all 100 participants <sup>12</sup>. Another research of 234 pre-rhinoplasty surgery pictures revealed that 97% of the individuals had severe facial asymmetry objectively and 38% of the subjects were subjectively asymmetrical <sup>13</sup>.

**Correction methods for deviated nose with facial asymmetry**

After lowering nasal deviation, patients with facial asymmetry remained to perceive their nose as deviated, which could be owing to insufficient repair or newly discovered disharmony in the setting of an asymmetric face <sup>6</sup>. Accordingly, a deviated



**Figure 2:** A young female patient presents with a left nasal deviation and a right facial asymmetry that is broad and short <sup>9</sup>. (After Rohrich et al <sup>9</sup>)

nose is a developmental abnormality produced by a difference in the formation of the facial skeletal skeleton on opposite sides of the face. The objective anthropometric measures produced in this work might be relevant for preoperative face examinations. However, improvements in nasal symmetry following rhinoplasty have been shown to contribute to a sense that the face is more symmetrical<sup>11,13</sup>. The nose must always be in the center of an asymmetric face, regardless of chin location (Figure 2). This photo is an excellent example of how aligning the nose with this line improves overall facial harmony. A retrospective study of 61 rhinoplasty subjects with crooked nose facial soft tissue landmarks were used to assess anthropometric aspects of the face<sup>7</sup>. They discovered a robust correlation between the degree of objective facial asymmetry, particularly in anthropometric nasal parameters, and the subjective appraisal of a face as asymmetrical in patients seeking cosmetic rhinoplasty. This connection might be a role in individuals who want rhinoplasty, and it should be investigated in this population. Rhinoplasty induces objectively detectable changes in nasal symmetry, which correlate to changes in the perception of a face as symmetrical or asymmetrical on a psychophysical level<sup>11</sup>. According to them, the number of symmetrical faces increased from 42 to 62 following rhinoplasty, which was statistically significant. Previous research also has found a link between nasal septal deviation and face asymmetries; however, these investigations were done using either two-dimensional or three-dimensional photos<sup>2, 16</sup> or dental casts<sup>17</sup>. Furthermore, nasal septal deviation is frequently considered a categorical characteristic<sup>18</sup> or is only assessed in one area of the nasal septum<sup>16</sup>. In all three sections of the facial skeleton, researchers discovered significant levels of variation and directional asymmetry, (nasal, palatal, and lateral face). They claimed that the inequity in the location of the bilateral coordinate markers was not the cause of the asymmetry. Also, there was a substantial association between nasal septal deviation and localized asymmetries in the nasal and palate areas, while there was no link between septal deviation and lateral face asymmetries<sup>19</sup>. Nasal septal deviation was found to be connected to nasal floor asymmetry in the nasal area. The lateral deviation of the nasal floor in the posterior portion was particularly visible when compared to the front nasal floor. This conclusion is most likely due to

the strong physical and developmental relationship between the nasal septum and the nasal floor.

## CONCLUSION

Facial asymmetry have high prevalence in subjects with deviated nose. Rhinoplasty can increase the number of symmetrical faces significantly which would be associated with patients' satisfaction after surgery. Patients with facial asymmetry and deviated noses may benefit from rhinoplasty in the same manner that patients with symmetrical face do. To summarize, it is crucial to center the nose on the midglabellar to mid-bow Cupid's line following rhinoplasty in order to achieve face harmony and perceived symmetry.

## ETHICAL CONSIDERATIONS

This manuscript has no plagiarism. The results of the analysis were completely honest. Any data fabrication has been avoided. This article does not contain any studies with human participants performed by any of the authors.

## CONFLICT OF INTEREST

None

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