

ORIGINAL ARTICLE

# Crooked nose: The asymmetric face



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## KEYWORDS

Crooked nose;  
Facial asymmetry;  
Rhinoplasty;  
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**Abstract** *Importance & objective:* Rhinoplasty for reconstruction of crooked nose continues to update over time to achieve the best results. It is not uncommon for surgeons to perform rhinoplasty in patients with facial asymmetry. The aim of the present study was to introduce a new method of assessment of crooked nose deformities and to evaluate the surgical outcomes of the corrective procedures through the assessment of deviation angles and the utilization of the quality of life (QoL) questionnaire by comparing patient satisfaction in both symmetric and asymmetric faces.

*Methods:* Patients were divided into 2 groups; the first group had rhinoplasty to correct crooked nose in patients without facial asymmetry, and patients in group 2 had rhinoplasty for crooked nose in patients with facial asymmetry. Preoperative and post operative analyses of the angles of deviation of the nose were performed. Visual Numerical Scale scores were performed using statistical analysis to assess changes of the quality of life as patient satisfaction for all patients.

*Results:* Survey responses were received from 50 patients. Group one included 30 patients and group two included 20 patients. Each group was further subdivided according to the type of deformity into C-shaped nasal deviations and I-shaped linear deviations. Data from all groups were obtained and statistically analyzed.

*Conclusions:* All patients in this study who had rhinoplasty for crooked nose either with or without facial asymmetry reported improvement in their disease-specific quality of life and a significant improvement of the nasal axis deviation.

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## Introduction

The term “crooked nose” is commonly used for all clinical conditions involving deviation of the nasal pyramid from the median line. This pathology is frequently found in clinical practice today as the result of blunt trauma from sports or car accidents. Neglected, or partially reduced, nasal fractures usually result in a crooked nose associated with surface depressions and irregularities. Crooked nose also may occur as a congenital or idiopathic deformity. Facial symmetry is typically

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considered highly correlated with facial attractiveness. Therefore, it is not surprising that facial deformities that diminish facial symmetry are concerning to patients, who often request reconstructive procedures to restore symmetry.<sup>1-5</sup>

For the patient the consequences are severe in both functional and esthetic terms, as great difficulty in nasal respiration is always combined with unsightly deformity that cannot be hidden. In general nasal axis deviations are classified into 3 categories; linear (I-shaped), C-shaped, or S-shaped. In the C-shaped crooked nose one side of the dorsum is concave, and the other side is convex. The dorsum and tip in an I-shaped crooked nose (linear) are shifted to one side of the vertical midline of the face.<sup>6,7</sup>

The clinical application of anthropometric and craniofacial measures was always limited to cases with congenital disfiguring deformities but with the expanding need to improve the facial esthetics these measures became of great significance in facial plastic surgery. Precise analysis of the crooked nose is the first step in determining the management strategy. However, prior to addressing the nose, facial asymmetries must be elucidated and considered. The simplest method to analyze the face is by drawing a vertical line from the exact midpoint between the medial canthi, and a horizontal line is drawn that passes through both medial canthi. From these 2 reference lines, facial asymmetries become obvious.<sup>8,9</sup>

A study by Munroe in 1994 of over 125 patients for whom asymmetric/deviated noses was the reason for rhinoplasty revealed 5 broad categories of facial asymmetries; (a) left-right difference in facial width, (b) left-right difference of left-right orbital level, (c) rotation displacement of upper jaw/piriform aperture, (d) isolated lateral placement of piriform aperture, (e) non-horizontal alar base, (f) more pronounced facial asymmetry sometimes associated with cheek flattening and slanting of the whole midface to one side. A spectrum of progressively severe asymmetries finally involves cranio-facial malformations such as palatopharyngoschisis and hemifacial microsomia which are beyond the scope of this article. Patients with the above mentioned asymmetries must be informed that it is impossible to achieve great results in terms of nasal axis correction before any corrective surgery.<sup>9,10</sup>

The aim of the present study was to introduce a new method of assessment of crooked nose deformities and to evaluate the surgical outcomes of the corrective procedures through the assessment of deviation angles and the utilization of the quality of life (QoL) questionnaire for comparison of patient satisfaction in both symmetric and asymmetric faces.

## 1. Methods

### 1.1. Ethical considerations

The study protocol was presented to the human subjects committee of ethics and an approval was obtained prior to the start of the study. The enrollment period was January 2012 through January 2014. All patients enrolled gave their written informed consent.

### 1.2. Study design and patient selection

The study was conducted on patients admitted for elective rhinoplasty, with the approval of the human subjects

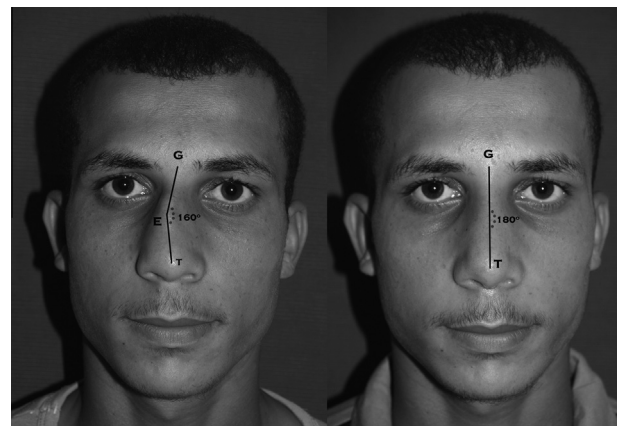
committee. This is a prospective observational outcomes study of patients desiring correction of nasal axis and septal deviation. Fifty patients were included in the present study. The patients were classified into 2 groups; the first group included 30 patients suffering from crooked nose without facial asymmetry (group A), and the second group included 20 patients suffering from crooked nose with detectable facial asymmetry (group B). Each group of patients was further subdivided into two subgroups; one with C-shaped nasal deformity and the other with I-shaped nasal deformity.

Exclusion criteria were as follows: being in need of nasal surgery other than rhinoseptoplasty (such as endoscopic sinus surgery, turbinate hypertrophy), rhinosinusitis, previous nasal surgery, septal perforation, recent nasal trauma, adenoid hypertrophy.

During the enrollment period, all of the patients who showed a symptomatic septal deviation were examined. Patients completed a questionnaire, and data such as history of previous trauma or surgery and any similar family history. Patient demographic data and side of the obstruction were noted. Simple grading of the septal deviation was obtained and recorded. All the patients were enrolled after a clinical examination and nasal endoscopy. All patients in both groups were evaluated by two methods.

The first method of evaluation is measuring the deviation angles. The deviation angles were measured using the Scion Image for Windows (Scion Corporation) used for numerical analysis of frontal (anterior) views images software. The deviation angles of the C-type crooked nose were measured as follows. First, a line is drawn from the glabella (G) to the most prominent point of the convexity (E). A second line is drawn from the most prominent point of the convexity (E) to the nasal tip (T), this line might be extended cephalically (A) to highlight the facial asymmetry if present. The angle between the GE and ET lines is defined as the C-type nose deviation angle. This angle is measured and documented. (Figs. 1 and 2)

The deviation angles of the I-type nose were measured as follows. First, the vertical midline plane from the glabella (G) to the middle point of the upper lip (C) was determined,



**Figure 1** G = Glabella, E = maximum angle of deviation, and T = nasal tip defining point. (Left) Male patient with crooked nose C-shaped deviation with an angle of 160° between GE and ET lines. (Right) Post operative image of the same patient with a straight nose (180° corrected nasal axis).

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