

Preoperative Computer Imaging Before Augmentation Rhinoplasty

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Introduction

Morphing technology can be a valuable tool for helping patients understand the potential outcomes of rhinoplasty surgery and visualize the changes that can be made to the nose. However, patients must have realistic expectations about the procedure and understand that the results may vary from the images produced by the morphing programs¹. Rhinoplasty is a surgical procedure that involves reshaping the bones and cartilage of the nose to improve its appearance besides function. The procedure results can vary depending on the patient's anatomy, the surgeon's education and skills, and the specific techniques used during the surgery.

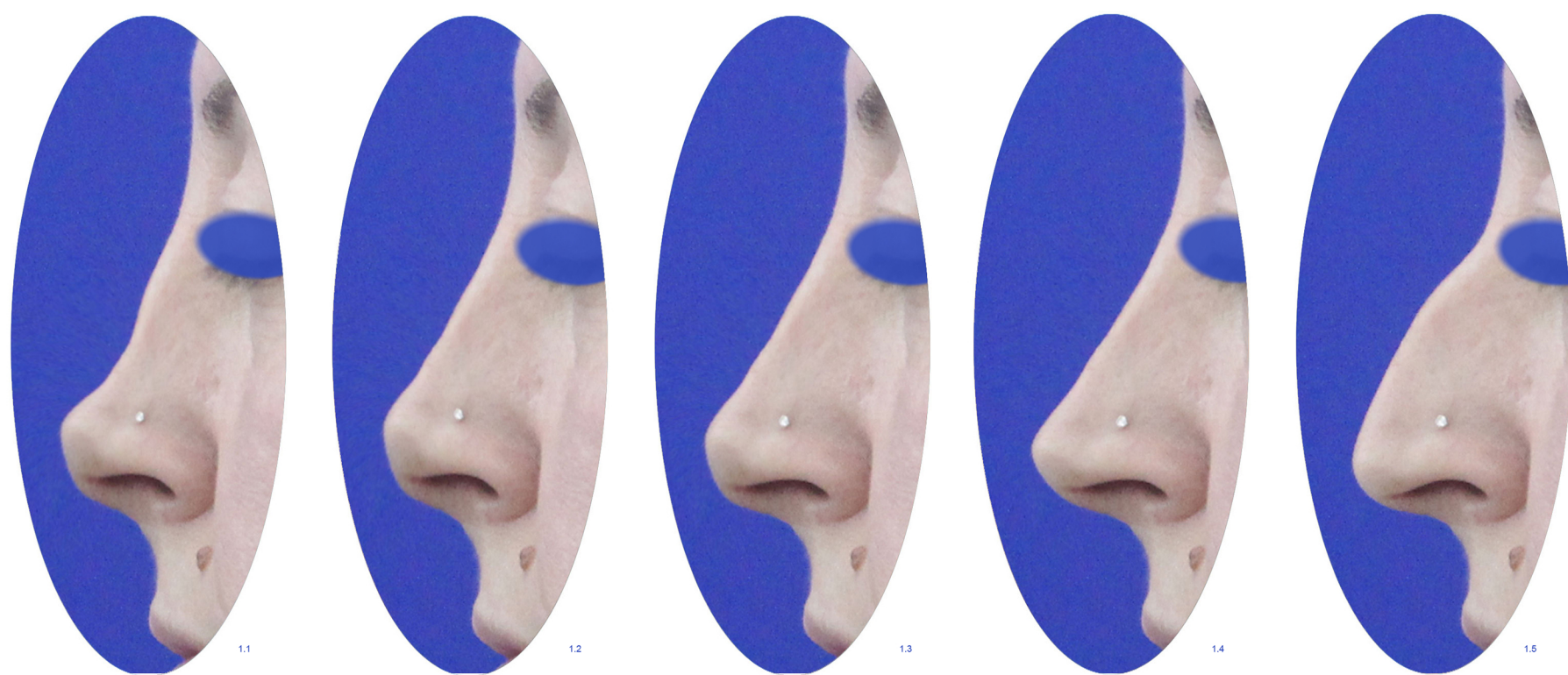
Effective pre-op consultations for rhinoplasty need open lines of communication between the physician and the patient. These discussions have benefited from computer imaging over the last three decades¹⁻⁷. Recent technology advancements and the limitations of a 2D medium (such as the inability to address face depth and nasal shape, leading to data loss⁸⁻¹⁰) have hastened the switch from 2D to 3D models in a computer simulation. The accessibility of 3D printing has also allowed the creation of patient-specific preoperative models for use in planning, rehearsal, and patient consultation¹¹⁻¹³.

Cosmetic surgery is conducted to improve patients' psychological and social quality of life (QoL) and aesthetic enjoyment¹⁴. Therefore, it is in the surgeon's best interest to comprehend the patient's expectations, discuss the advantages and disadvantages of the procedure¹⁵, and use the appropriate patient-reported outcome measure (PROM)¹⁶. Xiao et al¹⁴ reported PROM's objective, questions, and interpretation to assist physicians and researchers in selecting the most appropriate PROM for measuring QoL following functional or cosmetic rhinoplasty¹⁴.

In the present study, we investigated the efficacy of morphing technology via the Adobe PhotoShop program and its "liquify" effect in patients planned to undergo augmentation rhinoplasty.

Patients and Methods

This study is conducted in the Otolaryngology Department of Eskişehir Osmangazi University according to the rules outlined in the Declaration of Helsinki. Ethics committee approval was taken from Bilecik Şeyh Edebali University, Non-Invasive Clinical Research Ethics Committee (Date: 23.02.2023, Number: 5). There is no need to take informed consent as because the data were evaluated retrospectively.



Subjects

The retrospective data for 100 consecutive augmentation rhinoplasty cases applied to the Otolaryngology Department of Eskişehir Osmangazi University were enrolled in our study. There were 64 females (64%) and 36 males (36%). The mean ages of the patients were 25.76±6.06 (Ranged from 18 to 44).

Exclusion Criteria

The study did not include rhinoplasty patients who required procedures other than augmentation, sinonasal polyps, sinonasal tumors, and patients with diagnosed psychiatric diseases and neurological disorders.

Preoperative Computer Imaging (PCI)

This stepwise systematic guide, designated as PCI, was developed to improve the planning for the reduction of rhinoplasty and to allow the patients to observe the steps of the procedure. A stepwise systematic guide for image editing (performed by C.C. Cingi) was developed for Adobe PhotoShop using only the "liquify" effect (Adobe PhotoShop 2023 licensed to Anadolu University).

The PCI involves the following steps for augmentation rhinoplasty:

A stepwise systematic guide for image editing was developed for Adobe PhotoShop using only the "liquify" effect.

Five steps were performed without discussing the procedure with the patient and looking directly at the monitor to limit the preparation period.

1- Augmenting the dorsum: The saddle at the nose's bridge is patients' most common source of worry. Hence, the initial step is to demonstrate the patient's outcome of a dorsal augmentation alone.

2- Lengthening the nose: When the dorsum is increased, it typically makes the nose seem too small in comparison. The nasolabial angle and nasal length should be modified in the second stage.

3- Adjusting the tip projection: The projection of the tip is the following variable to weak. Depending on the nose's pathology, the tip projection may need to be adjusted upwards or downwards.

4- Perfection of the nasal dorsum: At this stage, the dorsum is fine-tuned after having been straightened initially. After adjusting the tip projection, the height of the radix, the dorsal line, or the curvature is modified.

5-Exaggerating the tip projection and/or the dorsal

augmentation: Ultimately, this procedure guides the patient toward the fourth or third phase. Patients often choose out of having the tip projected, and the dorsal hump exaggerated after seeing this outcome. The conversation is completed at this time.

Methods

After performing the PCI before augmentation rhinoplasty, the patients were allowed to see the options for the final appearance of their noses. Therefore, PCI helped them to decide on their operations.

Statistical Analysis

The data collected in this study were analyzed using the SPSS for Windows 16.0 software (SPSS Inc., Chicago, IL, USA). Descriptive statistics (Mean, standard deviation, minimum, maximum, and defining the quartiles) were applied. A p-value ≤ 0.05 was considered statistically significant.

Results

One hundred consecutive augmentation rhinoplasty cases were enrolled in our study. They were 64 (64%) females and 36 (36%) males. After performing the steps for preoperative computer imaging (CS-PCI), the patients were allowed to see the options for the final appearance of their noses.

After applying CS-PCI before augmentation rhinoplasty, 71 patients (71%) accepted Step-4 (Step-4 perfection of the nasal dorsum: at this stage, the dorsum is fine-tuned after having been straightened initially. After adjusting the tip projection, the height of the radix, the dorsal line, or the curvature is modified), and 19 (19%) accepted Step-3 (Step-3 modifying the tip projection: the projection of the tip is the following variable to weak. Depending on the nose's pathology, the tip projection may need to be adjusted upwards or downwards). Furthermore, six patients (6%) requested additional changes during their operational planning. In 95% of the cases, the authors achieved the results agreed upon based on the preoperative simulation.

Conclusions

By PCI involving five steps for augmentation rhinoplasty²², the patients were allowed to see the options for the final appearance of their noses. Therefore, PCI helped them to decide on their operations. With the help of morphing technology (2D), it is possible to increase interpersonal communication effectively.

