Variability in Analysis of Nasal Tip Projection using Three Different Methods Compared to the Public Opinion

Young S. Paik, MD, Brandon T. Johnson, BS, C.W. David Chang, MD
University of Missouri Department of Otolaryngology – Head & Neck Surgery

Introduction

Attaining appropriate nasal tip projection is one of the vital steps involved in performing rhinoplasty procedures. Identifying the over- or under- projected nasal tip allows the rhinoplasty surgeon to incorporate maneuvers on the underlying anatomical support structures to produce appropriate change.1 The Simons, Goode, and Powell methods are objective measurement techniques described in the literature to help delineate nasal tip projection. Each of these methods, however, use different techniques, taking different anatomical landmarks of the face into account. Rhinoplasty procedures are generally performed for aesthetic concerns, and theoretically evaluated by the general public whom the patient encounters.

In this study, we aim to analyze and compare nasal tip projection with three commonly used methods in the literature to the public opinion. Additionally, we aim to identify whether the objective methods of determining nasal tip projection truly correlate with public opinion.

Materials and Methods

23 patients from the senior author’s (CWDC) Facial Plastic Surgery Clinic had their photo taken and nasal projection analyzed. This study was approved by the Institutional Review Board of the University of Missouri.

Analysis was completed using the Simons, Goode, and Powell methods. All measurements were taken 3 times, with the average being used. 64 first and second year medical students with no nasal analysis training (public opinion) were then asked to assess specifically the nasal projection of each patient as over-projected, under-projected, or ideal. Results of the 3 objective techniques were compared to public opinion.

For data analysis, descriptive statistics and group comparisons were performed with Cohen’s weighted Kappa statistical analysis for ordinal variables.

Results

The Simons method determined all patients to be over-projected. The Powell method determined 11 patients to be ideal, 3 over-projected, and 9 under-projected. The Goode method determined 6 to be ideal, 10 over-projected, and 7 under-projected. Public opinion found 12 to be ideal, 7 over-projected, and 4 under-projected. Utilizing the Cohen’s weighted Kappa statistical analysis, the Powell method most closely correlated with public opinion (\( p = 0.0005 \)) with 70% agreement. Additionally, descriptive statistics of the inter-rater variability amongst the public opinion was analyzed and confirmed to be minimal and appropriate to utilize means.

Discussion

Various methods have been proposed to measure nasal tip projection; however, none is considered the standard. A previous study tested these methods and compared them to the opinion of leading rhinoplasty surgeons.2 Another study compared these methods to the community with regards to overall facial attractiveness.3 Our study looked to evaluate specifically nasal tip projection and compare it to the public opinion directly.

Limitations of the study exist and include: small sample of patients, lack of optimal demographic diversity of the public opinion (first and second year medical students), and the public opinion raters may have inadvertently included other facial features in their assessment of nasal tip projection.

Conclusion

The Powell method most closely correlated with public opinion, and may be an appropriate objective method for assistance in analyzing nasal tip projection. The Goode method agreed less with the public opinion and the Simons method did not distinguish nasal tip projection as much since it tended to categorize all patients as over-projected.

References