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Rhinoplasty: why do I not use morphing?

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Abstract. Recent years have seen the emergence of software for pre-operative morphing in rhinoplasty. However, a number of issues persist, such as price, time investment, limited number of modifiable variables, reduction of complexity, false expectations, informed consent, medico-legal implications and classical ENT practice. The use of pre-operative morphing cannot be recommended yet.

Definition

Morphing means transformation and, more specifically in the context of photography, the transformation of an image of one object into an image of another, in particular using computer-generated animation. In aesthetic surgery, morphing refers to the pre-operative modification of pictures to show the desired outcome.

Morphing Programs

A number of software programs are available for morphing.

Morpheus photo morpher®
(www.morpheussoftware.net)
60 USD

Fantamorph®
(www.fantamorph.com)
100 USD

Photoshop® (Adobe)
(www.photoshop.com)
800 EUR full version

MarketWise 7.0 Professional®
(United Imaging USA)
(www.unitedimaginusa.com/marketwise/index.html)
10.000 USD full version

The evolution of morphing software

Over the past decade, there has been an impressive evolution in morphing software: availability, functionality and practicality have improved considerably and prices have fallen substantially.

Scientific literature about morphing

The scientific literature about morphing is extremely limited.

Most information about morphing in the context of aesthetic surgery and rhinoplasty is selective, commercial, and available from the websites of aesthetic surgeons. Access to these biased websites is very easily found, increasing and rapidly changing.

Objective data are scarce. Information via PubMed is almost non-existent. A search based on "morphing" and "rhinoplasty" reveals only two recent publications.[1, 2] Altogether, at present, there are fewer than ten publications in international peer-reviewed journals dealing with morphing in facial plastic surgery and the majority are retrospective studies.[3-7] There are also a few older studies.[8-10]

Price

The complete Photoshop® software still costs over € 800, while Fantamorph® and similar soft ware is available for 100 USD. In fact, prices may vary between € 30 and € 10,000.

Availability

A number of years ago, it was quite difficult to obtain the software but access to these programs is now very easy.

Time consumption

A considerable time investment is needed to get started and to learn to use the software, even though it has become very user-friendly. The amount of time required for each individual patient is also considerable. The time required

includes not only the actual time for the morphing (back-office or with the patient) but more importantly the time needed to explain the limitations, to take precautions, and to warn patients. Given the limited number of indications for morphing, the benefit-invested time ratio is low.

Experience required

Morphing also requires practice and experience. Since it does take time to get used to the software and the morphing, a substantial annual caseload is needed to use the software efficiently and without expending excessive amounts of time.

Reimbursement, nomenclature

By contrast with other systems for pre-operative planning, as in orthodontics and major maxillofacial surgery, there is no nomenclature for morphing or pre-operative planning in rhinoplasty. There are similar problems in ENT nomenclature, as in olfactory testing, for example.[11-12]

False expectations

The temptation is to aim for superb results. This may result in false expectations, and therefore to disappointment with real, or realistic, outcomes.

Surface versus structure

Morphing shows only surface (skin) changes. This does not necessarily reflect the desired or unexpected changes, or surgical procedures in either the soft tissue envelope or the bony and cartilaginous supporting structures.

At present, morphing is confined to the surface (profile) and it does not reflect the complexity of the soft tissue envelope or the supporting components such as cartilage and bone.

Simplicity versus complexity

While it looks easy to modify one element in morphing, this does not reflect at all the surgical complexity required to achieve this goal and sometimes even disregards the impossibility of certain changes given anatomy, individual variability and complexity of the tissues.

Morphing may give the impression that everything is possible and reversible, and that a result is static. Minor modifications can be depicted easily with morphing but are much more difficult in real life. While morphing can always be reversed if the result in not satisfactory, surgery can never be reversed if the outcome is not the desired one.

Medico-legal implications

Morphing may lead to "objective" but unrealistic expectations, and so the medico-legal risks always have to be considered. In particular when morphed photographs are given to patients, they may be considered to represent a promise, an engagement to deliver a certain result.

Outcome evaluation

Morphing would be useful for outcome evaluation, but there is still no standardised, validated system. Outcome evaluation is currently based on questionnaires.[13]

Parameters

Most of the information about morphing in rhinoplasty is based on the lateral view, with changes in the height of the bony and cartilaginous dorsum, the length of the nose and the tip projection. The reduction of a bony or bony/cartilaginous hump is very easy to show and may be impressive but the added value is very limited.

Modification in frontal views, base views and ¾ views is much more delicate, much more difficult to deal with, and much more subtle and complex. For example, addressing the width of the nose, or the effect of a deviated or crooked nose, all issues that are frequently encountered, has still not become readily feasible with morphing.

True indications for morphing

The vast majority of septorhinoplasty procedures aim to restore normal nasal functioning and anatomy. In these cases, the added value of morphing is limited. It is only in operations for the purposes of major, purely aesthetic, refinements that morphing can enhance operative planning and discussions with the patient. However, in these cases, the most easily measurable parameters such as dorsal height, nasal length and tip projection are less relevant, while dorsal width and tip refinement are more relevant but also more difficult to address with pre-operative morphing.

Static versus dynamic

Healing after rhinoplasty is a dynamic and long process.

In addition to the progressive changes as a result of the healing process itself, one has to consider ageing as well.

Morphing, by contrast, gives a static view. This may give the patient the impression that the result of a rhinoplasty is static, definitive and acquired, and that it does not change in time.

Conclusion

Given the considerations set out here, I do not use morphing at present for the pre-operative planning of rhinoplasties.

References

1. Pahuta MA, Mainprize JG, Rohif FJ, Antonyshyn OM. Biometric morphing: a novel technique for the analysis of morphologic outcome after facial surgery. *Ann Plast Surg*. 2009;62(1): 48-53.
2. Hamilton GS 3rd. Morphing images to demonstrate potential surgical outcomes. *Facial Plast Surg Clin North Am*. 2010;18(2):267-282.
3. Mühlbauer W, Holm C. Computer imaging and surgical reality in aesthetic rhinoplasty. *Plast Reconstr Surg*. 2005;115(7):2098-2104.
4. Agarwal A, Gracely E, Silver WE. Realistic expectations: to morph or not to morph? *Plast Reconst Surg*. 2007;119(4):1343-1351.
5. Adelson RT, DeFatta RJ, Bassischis BA. Objective assessment of the accuracy of computer-simulated imaging in rhinoplasty. *Am J Otolaryngol*. 2008;29(3):151-155.
6. Punthakee X, Rival R, Solomon P. Digital imaging in rhinoplasty. *Aesthetic Plast Surg*. 2009;33(4):635-638.
7. Moscatiello F, Herrero Jover J, Gonzalez Ballester Ma, Carreño Hernández E, Piombino P, Califano L. Preoperative digital three-dimensional planning for rhinoplasty. *Aesthetic Plast Surg*. 2010;34(2):232-238.
8. Bronz G. Predictability of the computer imaging system in primary rhinoplasty. *Aesthetic Plast Surg*. 1994;18(2):175-181.
9. Vuyk HD, Stroomer J, Vinayak B. The role of computer imaging in facial plastic surgery consultation: a clinical study. *Clin Otolaryngol Allied Sci*. 1998;23(3):235-243.
10. Lee TY, Lin CH, Lin HY. Computer-aided prototype system for nose surgery. *IEEE Trans Inf Techol Biomed*. 2001;5(4):271-278.
11. Rombaux P, Collet S, Martinage S, Eloy P, Bertrand B, Negoias S, Hummel T. Olfactory testing in clinical practice. *B-ENT*. 2009;5 Suppl 13:39-51.
12. Lacroix J, Landis B. Future perspectives in small and taste disorders. *B-ENT*. 2009;5 Suppl 13:133-136.
13. Claes G, Claes J, Wuyts F. Outcome of septorhinoplasty: a comparison of patient and surgeon views. *B-ENT*. 2009;5(4):203-211.

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