Non-surgical Rhinoplasty

In the first of their two-part article, Mr Geoffrey Mullan and Mr Ben Hunter discuss the relevant anatomy for successful non-surgical rhinoplasty.

What is rhinoplasty?

Rhinoplasty is the permanent reshaping of a nose using surgical techniques that involve reshaping the nasal cartilages and sometimes nasal bones. Reshaping or trimming these structures in a reduction rhinoplasty or augmentation rhinoplasty, with cartilage and bone from the ear and ribs, allows for significant restructuring of the nasal anatomy.

Surgical rhinoplasty procedures are in the top 10 most popular procedures for women and men in the UK, with 4,205 procedures recorded by the British Association of Aesthetic Plastic Surgeons in 2015.

Although surgical intervention has been indicated as popular among many patients, non-surgical rhinoplasty (NSR) can offer an alternative for those that require revision surgery such as saddle deformity, alar cartilage collapse or dorsal unevenness, who do not wish to subject themselves to the risks associated with surgery. NSR has many attractions, despite being a temporary treatment. The soft tissue augmentation can give a very natural contour, even in thin-skinned patients, without the complications of surgery. For patients, the main attractions of NSR are that there is very little downtime compared to a surgical approach, a lower risk of complications, as well as its affordability.

NSR involves the use of soft tissue augmenters such as hyaluronic acid (HA). These injectable products can be used to correct deformities that would otherwise require significant surgery, with minimal social downtime and a high cost. The use of fillers in the nose is a more subtle treatment that allows for a limited augmentation and correction of some defects and can also give long lasting results of an average of 13.5 months, however there are reports of up to 30 months.

An interesting observation in NSR is that by adding volume to the nose, an NSR is always going to make the nose slightly larger. It is important that this is acknowledged and explained to the patient in the consultation so that they understand the procedure and outcomes. In contrast, the majority of surgical rhinoplasties or ‘reduction rhinoplasties’ are performed with the aim of refining or removing perceived imperfections or making noses smaller, although this is not exclusively so.

Although the nose can be generally treated safely, due to the nature of the blood supply in the nasal region, the short direct arteries and the anastomoses involved, it is essential that the practitioner is well educated on the anatomy and how to avoid complications if they occur.

Even the best surgeons have experienced contractures and rotational deformities post surgery and injectable products can be useful tools for post-surgery complications. It must be noted that the post-surgery nose has a higher risk of complication due to altered anatomy and blood supply, so extra caution must be taken and the presence of a graft of any sort should be looked at as a contraindication in most cases.

What product should be used?

Treatment of this region is well described in literature, historically the use of autologous fat, silicone, poly-tetrafluoroethylene and calcium hydroxyapatite are commonplace. However, over the last seven to eight years with advances in the plastication methods involved in forming longer lasting HAs with more cohesive structures, HA has become the mainstay of most NSRs. HA has low immunogenicity, is malleable, durable and has the advantage of being easily reversed with the use of hyaluronidase.

Collagen and calcium hydroxyapatite can also be used and have different fluid characteristics compared to hyaluronic acid that can be advantageous in forming a more rigid structure and is favoured by many practitioners. However, they are more difficult to correct if there are complications as they need to be physically removed and cannot be easily reversed by simply injecting a dissolving agent such as hyaluronidase.

Nose anatomy

There is no perfect nose, as every face is different with features of different shapes and sizes. However, there are some proportions that are accepted as being the guide to normal features, which can help to assist in assessing the nose in terms of proportions. These average proportions hold true with minor variations across both sexes and broadly across races also. All attempts to classify racial features or the ‘classic’ European, African or Asian nose have always failed. This is simply due to the variation of any particular feature in any group, having too large a range to be statistically significant.

There is an array of terms to describe specific points of the nose and a quick revision of these will help practitioners to clarify an approach to NSR. There is no perfect nose, as every face is different with features of different shapes and sizes. However, there are some proportions that are accepted as being the guide to normal features, which can help to assist in assessing the nose in terms of proportions.

Figure 1: The three thirds of the face

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Nasal dorsum: also called the nasal bridge, it refers to the superior surface of the nose. It is made up of the upper two thirds of the nose, the middle cartilaginous part and the upper bony part.

Alar cartilage: provides the structure and support for the lower third of the nose. This pair of cartilages, also referred to as the lower lateral cartilages, form a domed arch. They make up the nasal tip and columella. The perfect width of the nose should correspond to the intercanthal distance, which is the same as the width of the alar base (Figure 1).

Nasal tip: is formed at the point where the two curved lower lateral cartilages come together to form the most forward point of the nose. The tip is divided into the tip lobule, supra-tip lobule and infra-tip lobule.

Nasion: represents the median anterior tip of the naso-frontal suture.

Radix: is the nasal root that correlates with the upper termination of the nasal bridge at the glabellar base and is a soft tissue landmark that correlates with the deepest point of the nasal bone.

Rhinion: is the region that correlates with the junction of the bony upper nasal vault with the cartilaginous middle and is usually the typical high point of a nasal bridge hump.

Pronasale: is the most prominent part of the nasal tip.

Subnasale: represents the junction between the columella and philtrum.

Septum: the dividing wall between right and left nasal passages, deviation in this cartilage can cause a rotational deformity.

Nasofrontal angle: this is the angle formed between the nasal angle and the forehead (glabella) when viewed laterally with the apex correlating with the angle of the superior eyelash line (Figure 3). Ideally, it should be 115-130 degrees, however it is often less in Asian patients. It is commonly corrected in NSR and the dorsum should be raised with respect to the apex of this angle.

Nasolabial angle: is the angle between the columella and the lip assessed in association with the position of the columella. This is usually more open in females at 105-120 degrees compared to a more obtuse angle in men where 90-105 degrees is normal.

Arterial Anatomy

When performing NSR, it is vital that practitioners know and understand the arterial anatomy of the nose (Figure 4).

The dorsal nasal artery emerges from the orbit above the medial palpebral ligament and divides into two branches:

1. First branch crosses the root of the nose and anastomoses with the angular artery.
2. Second branch runs along the dorsum of the nose laterally supplying its outer surface towards the nasal tip and anastomoses with the contralateral dorsal nasal artery and the lateral nasal artery.

The lateral nasal artery arises from the facial artery and is superficial at the piriform recess (top of nasolabial fold); deep injections are a danger to this area. It supplies the alar and dorsal of the nose anastomosing with septal and alar branches. The superior labial artery gives off the columellar arteries that run up the columella ending and anastomosing in the tip with branches of the lateral nasal artery.

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Hanging columella: is an overgrowth of the nasal septum causing an overly-protruding columella.\(^\text{14}\)

**Inverted ‘V’ deformity:** is also a post-operative appearance and is due to the detachment of the upper lateral cartilages from the nasal bones. This leads to the upside down ‘V’ deformity at the junction of the upper and middle third of the nose.\(^\text{14}\)

**Conclusion**

Non-surgical rhinoplasty is a viable option in the sub-section of patients that do not need a reduction rhinoplasty. Requiring minimal downtime, it is also a useful tool to correct late onset complications following surgery or to treat very minor defects. Achieving treatment goals with NSR requires an in-depth knowledge of nose anatomy and the arterial system.

This article is the first of two on non-surgical rhinoplasty by Mr Geoffrey Mullan and Mr Ben Hunter. Their next article will detail techniques and complications and how to best manage these.

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**Common nasal deformities**

**Tip rotation:** refers to the tip position along an arc of rotation in the longitudinal field. An over-rotated tip has the tip rotated towards the nose, making it look perky and what many refer to as ‘Miss Piggy’. An under-rotated tip is rotated in the opposite direction and makes the nose look droopy and appear longer.\(^\text{14}\)

**Saddle nose deformity:** refers to damage to the middle cartilaginous middle vault that can leave a deep depression and clear step between the bony upper third at the thionin. The tip in the lower-third structure is supported by the arched alar cartilages, therefore, damage can leave a saddle-like depression between the two highpoints. Common causes of saddle nose deformity are trauma, over aggressive surgery, autoimmune disease and cocaine abuse.\(^\text{14}\)

**Tension nose deformity:** is an overgrowth of the dorsal part of the nasal septum and can cause a high, narrow appearance of the nose. This overgrowth of the nasal bridge can cause an over-projection of the nose.\(^\text{14}\)

**Polybeak deformity:** is a ‘hooked’ appearance of the nose following surgery. This occurs when the bony dorsum has been reduced, but the mid-third has not been lowered to correspond and gives a classic ‘parrot’s beak’ shape to the lower two thirds of the nose.\(^\text{14}\)

**Retracted columella:** is a common feature found in Asian noses and can be treated successfully with NSR. When viewed laterally, if the columella is not visible by at least 2mm it is deemed to be retracted. It is associated with mid-face hypoplasia and can be caused by over aggressive surgery, trauma or birth defect.\(^\text{14}\)

**Pinched lobule:** is due to over aggressive treatment of the alar cartilages either by over trimming or over tightening of the sutures in this area, which can cause the domes of the alar cartilages to collapse leaving a pinched nose.\(^\text{14}\)

**Bulbous tip:** occurs if the alar cartilages are very broad and arched, a cupping depression between the cartilage and the caudal position of the middle cartilage develops.\(^\text{14}\)

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REFERENCES