Mid-face Rejuvenation

Mr Dalvi Humzah and Anna Baker detail the anatomical features of the mid-face and how to successfully rejuvenate the area.

Abstract
With age, the mid-face changes due to a combination of re-modelling of the maxilla and pyriform aperture, volumetric and positional changes of the superficial and deep mid-facial fat pads, and changes in skin tone and texture. It is widely accepted that these changes significantly influence many of the visual changes in the lower face. These may be effectively treated with a variety of injectable techniques to rejuvenate the mid-face. The current literature concerning the pertinent anatomy for mid-facial rejuvenation is therefore discussed within this article.

Introduction
In recent years, the way we analyse and plan the non-surgical approach to the mid-face has changed dramatically. The focus has shifted away from treating visible lines/folds as they present, and is now centred on treating the age-related changes at the root cause. The restoration of a dynamic and harmonious volume distribution is a key factor in non-surgical rejuvenation of the mid-face. There is a growing body of literature demonstrating the multifactorial nature of facial ageing. These indicate that facial analysis and subsequent rejuvenation should initially address such anatomical changes. An understanding of the anatomical changes associated with ageing is required to formulate effective strategies to rejuvenate the ageing mid-face.

Key words
Mid-face, dermal filler, anatomy, injection techniques

Bony changes
The most significant age-related change that the face undergoes concerns the underlying skeletal structure. It has been demonstrated that the facial skeleton in males and females undergo predictable patterns of bone resorption in defined anatomical regions. Shaw et al. undertook a comprehensive study comprising 120 subjects using computed tomography to analyse these changes. The maxillary angle (measured from the superior to inferior maxilla, at the articulation of the inferior maxillary wing and alveolar wing), decreased significantly with age for both male and female subjects. The maxilla has also been shown to recede more medially and inferiorly. While the pyriform angle showed no significant change with increasing age, the pyriform aperture area increased significantly in ageing males and females. These changes are pivotal in the context of the ageing face as they represent a decreasing and weakening foundation on which the soft tissue structures reside. It has also been proposed that the mid-cheek is more susceptible to ageing, in view of the natural posterior incline of the mid-cheek skeleton from the relative prominence of the infra-orbital rim. Some individuals may also possess a congenitally weak or inadequate skeletal structure, which may be the primary cause of premature ageing. It is important for the practitioner to understand these changes as these have implications on the impact of subsequent soft tissue descent, and how that may be corrected with dermal filler.

Deep fat compartments
Morphological changes of the facial fat compartments result in the loss of smooth contours and shadowing that is evident in the ageing mid-face. Gierloff et al. consolidated findings from Rohrich and Pessa, in which they describe data from computed tomographic scans of 12 unembalmed specimens. The deep medial cheek (DMC) fat compartment is noted to have a medial and lateral component. The medial component is triangular in shape and was noted to be present in six specimens in this small cohort study. It was located beneath the nasolabial compartment and extended medially. The medial component of the DMC fat does not lie immediately on the periosteum of the maxilla. In some individuals, the lateral part of the DMC fat may demonstrate a lateral extension, located beneath the superficial medial cheek fat and the lateral boundary in the buccal fat pad. Gierloff et al. also found the sub-orbicularis oculi fat (SOOF) to have a medial and lateral component in the majority of analysed specimens. The medial component lies approximately 3mm inferior to the lower orbital rim, immediately above the periosteum of the maxilla. The inferior portion overlaps the lateral part of the DMC fat, and the medial part of the SOOF is covered by the nasolabial and medial cheek fat. The lateral component of the SOOF is located under the lateral orbital compartment and the middle cheek fat. It lies above the prominence of the zygoma but does not reach the superior aspect of the zygomatic arch. It lies parallel to the medial...
It has been demonstrated that the facial skeleton in males and females undergo predictable patterns of bone resorption in defined anatomical regions of the face. The SOOF (subcutaneous orbital fat) and nasolabial fold are key areas that undergo predictable resorption patterns that can affect aesthetic outcomes. The SOOF is composed of the subcutaneous orbital fat, which is lateral to the nasolabial fold, and the nasolabial fat, which is inferior to the nasolabial fold. Both of these fat compartments are dynamic and can be affected by age and weight changes. The authors conclude that the use of fillers and other aesthetic treatments should be approached with caution, as they can exacerbate these natural resorption patterns and may result in an unsightly outcome. The study findings demonstrate the importance of understanding the anatomy of the face and the potential risks associated with aesthetic treatments. Therefore, practitioners should be aware of the natural aging process and the potential for exacerbation of pre-existing conditions when considering aesthetic treatments. The authors also emphasize the importance of clear communication with patients about potential risks and outcomes of aesthetic treatments.
SOOF, which is of key importance in terms of minimising the risk of complications. Product inadvertently placed into the SOOF may precipitate malar oedema. With this in mind, a cannula approach, supraperiosteally, will ensure that product remains in a safe plane. Vectors may be placed using a cannula approach, commencing at the zygomatic arch, supraperiosteally, to provide structural support to restore lateral definition along the zygoma. If the soft tissue descent extends to the medial cheek, further vectors may be placed within the subdermal plane. The advantage of using a bio stimulatory product, such as calcium hydroxylapatite, allows a tightening effect in the soft tissues, due to the neo collagenic effect of the calcium microspheres. Suitable products would require a good lifting capacity, such as volumising hyaluronic acid dermal fillers. An advantage of a cannula approach in the mid-face means there may be less chance of compromising significant anatomical structures, such as the transverse facial artery and branches of the facial nerve, which reside at a deeper plane at this anatomical region, and are deep to the SMAS.

A number of techniques are described to restore a youthful eminence to the anterior mid-face. Augmentation of the DMC fat compartment is increasingly acknowledged to be an effective approach to enhance anterior facial projection. The aim of correction involves an approach to place a viscous dermal filler at the superolateral portion of the maxilla, requiring minimal product volume to effectively improve the appearance of the nasolabial fold, nasojugal groove, as well as lifting the nasolabial. The volume of required product may vary depending upon the type of product used. In addition, this deep approach will also provide structural support to the maxilla and soft tissues, without compromising any anatomical structures, by using a cannula or needle approach. A subtle correction is advised, as over-treatment may result in an unnatural and disproportionate anterior fullness. This technique may be further complemented by effacing nasolabial shadowing at the pyriform aperture, using a perpendicular approach with a bolus at the alar. This will add structure to the bony changes at the pyriform and support the soft tissues, without compromise to the alar/sill artery, which resides superficially, in the subcutaneous plane. Lee et al consolidated earlier studies analysing the depth and anatomical location of the facial artery. The location in the nasolabial region has been inconsistently described. The findings from Lee et al indicate that the location may be superior, inferior and along the nasolabial fold, which is a key consideration for practitioners involved in augmenting this region. Placing product intradermally along the nasolabial fold will not compromise the artery. An injectable technique designed to place the product intradermally is the blanching technique, for use with cohesive polydensed hyaluronic acid. We recommend a 30g needle, placed almost parallel to the skin at an angle of approximately 10-12 degrees is used. Multiple punctures are placed closely together, creating small beads and multiple punctures are repeated until the wrinkle has been effaced. It is important to note that the blanching technique is only suitable for cohesive polydensed matrix hyaluronic acid due to the unique tissue integration properties.

Conclusion
A detailed and meticulous analysis of the face is imperative to ensure that the treatment plans achieve a balanced and harmonious result. The practitioner requires an advanced anatomical understanding to appreciate the multifactorial age-related structural changes to the facial skeleton. Anatomical literature will continue to evolve to shape our understanding of the ageing face and practitioners are advised to remain abreast of new findings.

Anna Baker is a dermatology and cosmetic nurse practitioner. She works alongside Mr Dalvi Humzah and is the coordinator and assistant tutor for Facial Anatomy Teaching. Baker has a postgraduate certificate in applied clinical anatomy, specialising in head and neck anatomy. Mr Dalvi Humzah is a consultant plastic, reconstructive and aesthetic surgeon and medical director of AMP Clinic in Oxfordshire. He also runs the award-winning Facial Anatomy Teaching course and the Aesthetic Clinical Training Course. Mr Humzah worked as a consultant plastic surgeon in the NHS for 10 years and teaches nationally and internationally.

Anna Baker will be on the ‘Forehead, Temple and Brow’ panel, Mr Dalvi Humzah will be on the ‘What to do with the Mid-face’, ‘Enhancing the Eye’, ‘Perioral Area and Lips’ and ‘Lower Facial Contouring: Chin and Submental Region’ panels at the Aesthetics Conference and Exhibition 2016. To find out more, visit www.aestheticsconference.com/programme

Reproduced from Aesthetics | Volume 3/Issue 5 - April 2016

REFERENCES


Further Reading