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## FEATURE ARTICLE

### **Anatomy is Destiny**

The importance of anatomical knowledge in Aesthetic Medicine



## ANATOMY IS DESTINY

Mr Dalvi Humzah & Anna Baker RGN NIP give insight into the importance of anatomical knowledge when practising in Facial Aesthetic Medicine.

**Anatomy is one of the fundamental foundations in providing safe and effective interventional treatments.**

Without a “road- map” one could be easily lost when treating any part of the human body. So, what are we looking for when we read anatomical papers in aesthetic medicine? Perhaps, it is not what we’re looking for, but what we SHOULD be looking for in the literature, to guide us towards safe practice? If we look at this statement more deeply, there are many limitations associated with anatomical studies, which are key

concepts in the historical teaching of anatomy.

Traditional anatomic studies relied on small cohort numbers which limited the study of what is now recognised as variations in anatomical details not only between individuals but also ethnic differences. Early anatomical studies were performed on specimens in varying states of “decomposition”, following this, further studies were based on tissue embalmed with formalin; this succeeds in preserving tissue for repeated anatomical study, but can distort fascia and key structures giving them an inaccurate and stiff appearance. This is of considerable importance when attempting to visualise and understand the complex anatomy of the head and neck.

The temple is an area which

demonstrates this concept, as it has been inconsistently described, through a limited body of literature. Many of the early findings originated from formalin studies, giving an inaccurate description of topographic landmarks, the layers of fascia, location and presence of fat pads as well as plane(s), and location of vessels. In addition, the nomenclature for the fascial planes in the temple is also inconsistently described, which is evident in more recent papers. These are significant hurdles for the aesthetic medical clinician to overcome in trying to determine “what is accurate?” We examined the data extracted from our large cohort cadaveric study of the temporal fossa, comparing the anatomy of formalin tissue with unembalmed tissue, in an attempt to understand the anatomy in more detail and establish safe injection techniques. The findings

showed a wide variation in the number and location of fat pads, as well as the presence and number of fascia. These variations were commonly observed in the formalin specimens, which accounts for inconsistencies that are reported when comparing these specimens with unembalmed tissue.

For example, the bifurcation of the superficial temporal artery was frequently absent and the parietal branch was often not present, which was noted within the formalin and unembalmed specimens. The anastomosis of the superficial temporal artery with the supratrochlear and supraorbital vessels was noted in most specimens, but not all, which reinforces the level of caution and anatomical knowledge needed to avoid complications.

There is no room for complacency in assuming that facial anatomy will always follow a text book; many anatomical drawings are inaccurate and do not represent the true anatomy as artists strive to "reveal" as much anatomy in one single drawing by altering the relationship between anatomical structures. The concept of 'danger zones' is a flawed theory, as it is apparent that there are extensive vascular anastomoses throughout the facial region, with every anatomical region posing a risk, when being treated with non-surgical injectables.

## Anatomy teaching

Within our anatomical teaching, we have collectively performed over 500 clinical facial dissections and continue to come across unusual anomalies that are infrequently described within the literature.

'The eye sees what the mind knows,' resonates well with the required level of training, skill and expertise to accurately locate through clinical dissection, anatomic structures most relevant to the medical practitioner. This is also important in applying the ability to be able to critically appraise the current anatomical literature.

Studying anatomy at degree level, and beyond, allows for a deep appreciation of the fundamentals of tissue based teaching, relevant legislation (The Human Tissue Act, 2004) as well as advanced skill in performing and facilitating clinical dissection. This is

imperative for academic teaching in this highly specialised area.

Previously anatomy was taught to surgeons and the dissections mirrored surgical exposure that would be relevant to the regional operation being planned. In the era of non-invasive cosmetic interventions, it is imperative for the medical practitioner to fully appreciate the topographic relationships of anatomical structures and be able to "navigate" through the tissue planes in a "blind" manner.

The teaching needs to be provided by tutors well versed in anatomical exposure that is relevant to non-interventional aesthetic procedures. The demonstration should also allow the practitioner to develop the necessary skills and reflective learning of these practical skills. The techniques of dissection and demonstration required are very different to those required by facial surgeons and non-surgical practitioners – the anatomy demonstrator needs to be aware of this to ensure the best learning experience is delivered. These are important in that not only is it important for the practitioner to learn anatomy and techniques; the trainer /demonstrator should have appropriate training skills and both be able to put their experience forward as part of their revalidation.

The advantage of independent training courses allows for open discussion and consideration on a variety of injectable products, in relation to achieving a low risk and most effective treatment outcome. Sponsored training may allow the clinician to understand the salient anatomy in relation to a specific product, but this may be limited to conveying information from a very specific perspective. The underlying objectives may not prioritise learning above commercial sponsorship which may inadvertently impede the overall learning experience.

Whilst anatomical texts are of some use in defining surface topographic anatomy, they have a significant limitation in aesthetic medicine in accurately conveying the 3-dimensional planes in which structures reside. For clinicians undertaking injectable treatments, this is paramount, as the effective outcome of treatment resides on the most appropriate product being placed in the correct plane, with an appropriate technique. Cadaveric dissection is acknowledged in current literature as being the only gold standard learning method which allows clinicians to visualise placement of product, in relation to surrounding structures and to critically consider the outcome. With this in mind, clinical facial dissections are best performed in a layer by layer approach, as this is the concept most relevant to aesthetic clinicians. This also allows some insight into the variability of facial anatomy; reinforcing to the clinician the limitations of the literature through critical appraisal. We promote the practise of learning the skills used in non-surgical interventions on specimens and then visualising the placement before attempting to perform the technique(s) on patients.

The majority of clinicians performing injectable procedures are placing product blindly in the face, as they can only approximately gauge topographically where structures reside.

It is important to note that it is comparatively recently that many pivotal studies, (often within the last 5-7 years), have given us exceptional insight into understanding age related changes in facial anatomy. Anatomical data is continually emerging, shedding increasing light on the ethnic anatomy and ageing of the face; clinicians are wise to keep abreast of such publications to ensure their understanding is accurate and current. Some of the most insightful current published data is originating



from China and Korea, however, the findings are not based upon Caucasian subjects. These findings are useful for demonstrating key ethnic variations, for example the location of the modiolus, as well as the morphology of the risorius muscle within this population, compared to that of a Caucasian. The position of important vascular structures (e.g. the facial artery) has been shown to follow a variable path and in some individuals, lies in the nasolabial fold; this is of paramount importance to any practitioner injecting in this area.

Journals such as Plastic & Reconstructive Surgery, increasingly throw the spotlight onto anatomy for non-surgical treatments and provide clinical papers online, free of charge for non-subscribers. Many of these papers offer high quality supplemental media of injection techniques on a variety of products, supported by dissections, which are an invaluable learning tool. New technologies (CT Scans / MRI) allow anatomical studies to be performed with "virtual" dissections and allow a greater understanding of the relationships between the facial skeleton and soft tissues.

These studies provide us with further insight into "live" in vivo anatomy, this combined with visualisation of the products used and placement will give us views of the interaction of soft tissue and products.

## Learning and sharing

We have a unique situation in the UK with a number of different medical specialities and professionals performing aesthetic injectable treatments; we have a wealth of experience and knowledge to share and draw from as a community, which provides an effective teaching and learning environment.

As practitioners from a medical background, we do not enter this speciality with an intrinsic awareness of the ageing face. Anatomy syllabuses in medical schools have a pathological context, as the subject is taught from the basis of disease and treatment. In aesthetic medicine, this has limitations, in that we need to understand the ageing and morphological changes, to enable us to select the most appropriate modality to correct them. Equally, facial analysis cannot be performed accurately without understanding the 3-dimensional changes which are well described within the literature.

The concept of bone changes is not new to anthropologists but Shaw et al., (2011) robustly defined these changes in their large cohort (120 dentulous subjects), demonstrating the resorption region by region in the facial skeleton. These findings are pivotal in aesthetic medicine, significantly influencing facial analysis

and appropriate selection of the most appropriate treatment.

In addition, Rohrich & Pessa concluded in 2007 that the subcutaneous fat in the face can be distinctly partitioned into discrete units. During a clinical dissection, this cannot be determined without the use of a stain or contrast medium, the authors used methylene blue to delineate the boundaries of these units across the face. Again, these findings account for many of the superficial changes that manifest with age. Gierloff et al., (2012) developed these findings further exploring not only the superficial fat of the face, but also the deep fat compartments through CT scan with radiographic contrast, describing volumetric soft tissue changes.

These studies provide a greater understanding of the volume and positional changes of the facial fat pads with age.

## Conclusion

In line with current recommended educational standards, and in keeping with an academic level 7 ethos, we should be encouraging all medically qualified colleagues to foster a critically analytical approach to anatomy, from what we read and what is presented to us. Without this mindset, many inaccuracies are simply replicated and repeated, which



may be detrimental to patient safety.

Thinking more peripherally about the concepts of teaching in aesthetics, our ethos should not be to lead teaching sessions as a platform for showcasing the knowledge base of faculty, rather it should be focused towards empowering learners to recognise their own gaps in knowledge and facilitating the transition from what they don't know, to what they need to know, and beyond, to maximise a lifelong learning potential in this rapidly evolving speciality.

One of the most powerful statements that tutors can muster is voicing when they 'don't know' as this can be an



effective learning mechanism which can benefit all learners within a group session by motivating them to source information relevant to their own learning needs. We will always be faced with a widely mixed skill and knowledge level of clinicians across the sector and anatomical teaching must be adapted to individual learning needs accordingly, and equally, learners are encouraged to take steps to identify and meet these needs, to inform safe practice.

In the absence of a robust and recognised model of expertise in aesthetics, is it important to keep in mind, what constitutes an expert trainer in aesthetics?

In time, it is hoped that Aesthetics

becomes a designated speciality – perhaps as recognised Postgraduate Level 7 courses are available these could be joined together to produce a “training” pathway for aspiring Aesthetic Practitioners to achieve specialist status.

## References

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Mr Dalvi Humzah is a Consultant Plastic Reconstructive & Aesthetic Surgeon and has developed his aesthetic practice over 18 years to combine surgical and non-surgical procedures. He has a BSc in Anatomy and an MBA, is fully registered with the GMC and on their Specialist Register for Plastic Surgery. Dalvi has extensive experience in the management and treatment of non-surgical complications and is an internationally acclaimed expert facial anatomist. He has an active interest in teaching and training and has been a Tutor for the Royal College of Surgeons of England and is an examiner for the Intercollegiate MRCS for the Royal College of Surgeons of Glasgow. He is a Global Key Opinion Leader and has published extensively while actively teaching, training and lecturing nationally and internationally. Dalvi is the Director and Lead Tutor of Medicos Rx and has developed the Aesthetic teaching programme.

### Anna Baker RGN, INP, PGCert-Applied Clinical Anatomy



Anna Baker is a Cosmetic and Dermatology Nurse Practitioner who has been involved in developing Facial Anatomy Teaching with Lead Tutor, Mr Dalvi Humzah, since its inception in 2012. Anna has worked alongside Dalvi as a Cosmetic Nurse Practitioner for 5 years and has jointly run nurse-led cosmetic clinics with him. Anna has previously held a national injectable role for a group of cosmetic skin clinics and worked independently as a cosmetic nurse. With a keen interest in Facial Anatomical dissection, Anna holds a post-graduate certificate in Applied Clinical Anatomy-specialising in head and neck anatomy. Anna is undertaking an MA in Clinical Education at King's College London.

