

Dermal fillers: a brief background and overview for injectors

Going back to basics and visiting one of the backbones of the medical aesthetics sector, Alexandra Mills Haq details important information on dermal fillers

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Since the emergence of ageing baby boomers, the influx of dermal fillers has been an exponential one. Differing types of technology have provided the

aesthetic practitioner with the ability to provide natural, long-lasting and reproducible results, with minimal downtime, safely and at an affordable price. The use of dermal fillers for soft

tissue augmentation with the synergistic use of botulinum toxin and a variety of complementary procedures has become the mantra for rejuvenation. Despite the various economic woes of the past decade, the non-surgical aesthetic industry has only seen stepwise growth (Klein and Elson, 2000).

In this summary, the types of fillers that are readily available will be outlined, as well as some practical tips that the practitioner should adhere



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to so as to ensure a higher chance of achieving optimal results.

Categories of fillers

Dermal fillers can be broadly divided into two categories, based on the longevity of the product, as well as their origin. In terms of longevity, dermal fillers can be temporary, semi-permanent or permanent. Temporary fillers stay in the tissue for less than 1 year, and semi-permanent fillers for up to 1–2 years. On the other hand, permanent fillers are substances that remain in the tissue more than 2 years. However, this article will not be discussing permanent fillers.

The source of the filler is as important to understand as the patient's preference. Many patients now tend not to want animal-derived products.

G' prime

In the UK in the past, the earliest temporary dermal fillers that were commonly used were either of bovine or human origin. Now, synthetic hyaluronic acid (HA) fillers constitute the majority of dermal fillers used in clinics on a daily basis. HA is a naturally occurring substance that is found in the skin, and it helps the dermis to maintain a cushioning effect and stay hydrated. HA fillers are typically soft and gel-like. The G' prime of a filler is extremely important when assessing the HA filler's physical property in terms of projection and lifting capacity. Traditionally, Saypha Volume Plus, Restylane Lyfte, Puresense Ultradeep and Stylage XL have the highest recorded G'prime levels when assessed in in vitro experiments. HA fillers are temporary, lasting 6–12 months or longer before the body gradually and naturally absorbs the particles through a process of degradation by intrinsic hyalase, which exists in the dermis. Importantly, the level of cross-linking used to stabilise the HA chains that make up the foundation of the HA filler defines longevity in large part. A balance between the level of crosslinking and viscoelasticity is crucial in creating a product that feels natural when injected in the skin. Most HA fillers are now infused with lidocaine to help minimise discomfort during and



Dermal fillers can be used to treat the neck and décolletage

after treatment. The injection depth of the HA filler depends on the type that is used and can be placed either superficially, at a medium depth in the dermis, in the deep dermis or in the subcutaneous (Matarasso et al, 2006).

Approved fillers

The UK Medicines and Healthcare products Regulatory Agency (MHRA) and or the US Food and Drug Administration (FDA) have approved HA fillers that include Saypha products: Rich, Filler, Volume and Volume Plus; Restylane products: Restylane, Restylane Kiss, Restylane Lyft, Restylane Refyne and Restylane Defyne; Juvéderm products: Juvéderm XC, VOLUMA, VOLBELLA and VOLLURE; Teoxane products: Global, Deep, Ultra Deep, Kiss and RHA 1–4; IBSA HA-Derma products: Profilho or Aliaxin; and Belotero products: Soft, Balance, Intense and Volume (Matarasso et al, 2006).

Semi-permanent dermal fillers

Semi-permanent dermal fillers undergo slower degradation and show greater retention in situ and last longer, usually between 1–2 years. Unlike HA dermal fillers, semi-permanent fillers tend to be injected in the deep dermis or the subcutaneous. Each of the semi-permanent fillers show an ability to induce regional fibrosis with the

deposition of both type I and type II collagen. The composition of each filler listed within this range is quite different and examples approved by the regulatory authorities include Radiesse (calcium hydroxylapatite); Sculptra (Poly-L-lactic acid) and Ellanse (polycaprolactone) (Naoum and Dasiou-Plakida, 2001).

Treatment areas

The plethora of dermal fillers available to the practitioner allows them to be used in the rejuvenation of facial areas, as well as the neck and hands in certain cases (Vedamurthy and Vedamurthy, 2008):

Facial areas

- ▶ Wrinkles and folds
- ▶ Lip augmentation
- ▶ Depressed scars: postsurgical, traumatic, post-acne, chickenpox and other diseases
- ▶ Enhancement of facial contours: malar, temporal regions, jawline and profiling
- ▶ Periocular melanoses and sunken eyes
- ▶ Dermatological diseases: angular cheilitis, dermal atrophy and lipodystrophy
- ▶ Earring ptosis, atrophic earlobes
- ▶ Nasal depressions and dorsum deviation.

Non-facial areas

- ▶ Neck
- ▶ Décolletage

- ▶ Hands
- ▶ Corns and calluses: to reduce contact points, pain and risk of ulcer formation.

Contraindications

There are several contraindications that must be determined and excluded prior to using any of the aforementioned dermal fillers.

Absolute contraindications

- ▶ Hypersensitivity to products
- ▶ Unrealistic expectations

Relative contraindications

- ▶ Keloidal tendency
- ▶ Patients with autoimmune disease

To achieve a successful outcome, several rules need to be adhered to and reinforced at all times in the clinic to reduce the potential of adverse events or poor patient satisfaction occurring. These fundamentals include a full and detailed patient assessment, an understanding of whether the treatment expectations can be met, being aware of areas of special anatomical consideration (glabella, periocular, lip and or nasolabial folds). This should be followed by patient preparation, using good aseptic technique, appropriate regional anaesthesia and injection technique and comprehensive aftercare (Vedamurthy and Vedamurthy, 2008). The application of these principles will reduce the possibility of complications, some of which can be transient or, worse

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still, lead to permanent disfigurement. Examples of complications are listed below (Vedamurthy and Vedamurthy, 2008).

Early complications

- ▶ Hypersensitivity reactions
- ▶ Haematomas and ecchymoses
- ▶ Infections: reactivation of herpes simplex
- ▶ Non-hypersensitivity-related swelling
- ▶ Acneiform eruptions
- ▶ Erythema: transient or permanent
- ▶ Skin necrosis (pressure or from vascular occlusion)
- ▶ Embolism (blindness)
- ▶ Tyndall effect.

Late complications

- ▶ Implant migration
- ▶ Telangiectasia
- ▶ Granulomas
- ▶ Lipoatrophy
- ▶ Hypertrophic scarring
- ▶ Sterile abscess.

Conclusion

Dermal fillers are an extremely powerful tool within the aesthetic armamentarium. It is critical that anyone using these devices is appropriately trained, understands the limitations and indications of use and can deal with the potential complications that can occur. As the population ages and more patients search for more natural, effective and safe treatments, one thing is certain: that, despite the burgeoning range of available dermal fillers, nothing will supersede validation through an evidenced-based approach. More relevant clinical trials need to be conducted to determine better ways of using dermal fillers in clinical scenarios, in particular, when using combined options including neurotoxins (Naoum and Dasiou-Plakida, 2001).

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