The face is a well-studied area in anti-ageing medicine. Generally, aesthetic providers look primarily to the face for providing patients with a youthful look and options for rejuvenation. However, there are other areas on the body that reflect the ageing process that providers can discuss with patients to improve upon so as to restore youthfulness. The hands are an often-overlooked area that benefit from treatment, as they show signs of ageing similar to the face, including fat atrophy, decreased collagen in the skin causing wrinkles and pigmentation changes. Here, the article will focus on different ways to rejuvenate the hands and provide patients with a more well-rounded anti-ageing evaluation, consultation and treatment plan.

Initial assessment and patient selection/consultation
When first assessing the hand, it is important to perform a general assessment including normal function and anatomy. Look for symmetry, muscle movement and strength, sensation and use the Allen’s test prior to performing any procedures.

The Allen’s test ensures there is collateral arterial blood flow. Avoid injecting in the hands if the physical exam does not show good collateral arterial blood flow, if the hand has had surgery or indwelling orthopedic hardware or if the hand has atypical anatomy or movements.

Following assessment and ensuring normal function of the hand, assess the degree of ageing. Evaluate fat atrophy, visibility of veins and tendons and the texture, pigmentation and tightness of the skin to determine what improvements can be made. Using this system will also allow the practitioner to give the patients an idea of their current level of ageing and give them realistic expectations of results post procedure.

Another established rating scale, the Busso hand volume severity scale (Figure 2) focuses on tendon exposure and visibility. This is a quick way to assess patient’s ageing hand pre and post procedure. Any patient with unrealistic expectations is not a candidate for treatment. Patient selection involves a thorough discussion of patients’ medical history, specifically any conditions related to the hands including Raynaud’s syndrome (which is a contraindication), carpal tunnel, frequent use of the hands, work type, rheumatoid arthritis and range-of-motion deficits. Patients should be aware that there is risk of swelling, bruising, tightness and stiffness, which can exacerbate existing conditions. If they frequently use their hands for employment, their use may be limited in the immediate post-procedure period.

Techniques for hand rejuvenation with fillers in aesthetic practice

Abstract
The hands are an often-overlooked area of aesthetic medicine that can be improved upon to give a more complete anti-ageing improvement. The hand ages similarly to the face, with volume loss, wrinkling and pigmentation changes. The hands also have more tendons and veins, which become exposed with age. Fillers, such as hyaluronic acid and calcium hydroxyapatite, can be used to improve volume loss and camouflage the tendons and veins. To complete the rejuvenation, lasers/IPLs and peels can be used to improve the age spots to the back of the hands.

Key words
- Hand rejuvenation
- Hylaluronic acid
- Laser treatments
- Anatomy
- Injection techniques

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Containdications to filler treatment in hands

Contraindications to this procedure include any active skin infection or skin disease, allergies to products, bleeding disorders, abnormal hand anatomy and indwelling hardware. Relative contraindications include recent use of agents that increase bleeding (i.e. aspirin and NSAIDs). Hand specific contraindications include Raynaud’s syndrome. In patients with a history of carpal tunnel syndrome or conditions affecting the joints of the wrist, a risks versus benefits discussion should occur, as post-procedural pain can be mistaken for pain related to other issues.

In a patient with history of hand surgery, it is important to determine the type of surgery to establish whether the anatomy was potentially altered.

Anatomy overview

As with any procedure, knowledge of the anatomy is imperative for practitioners, not only to minimise complications, but to be able to evaluate what can be improved upon and how it is best accomplished. This overview will focus on the dorsal aspect of the hand. The ulnar and radial artery, which are palpated during the Allen’s test, form the dorsal carpal arch by anastomosing from the dorsal radial and ulnar branches. The dorsal metacarpal arteries are found in the second, third and fourth interossei spaces and run distally to form the digital arteries. The first dorsal metacarpal artery originates directly from the radial artery and runs down the thumb. The fifth dorsal metacarpal artery originates directly from the ulnar artery and runs down the fifth digit (Baker, 2013) (Figure 3).

Careful analysis and knowledge of anatomy is required, as there are anastomoses of the dorsal metacarpal arteries at their origin from the dorsal carpal arch with the deep and superficial palmar arterial system.

The venous system runs parallel with the arteries and is more easily visualised in the ageing hand. These drain proximally into the basilic and cephalic veins of the arm.

A major concern for patients regarding their ageing hands is the visualisation of the tendons. The tendons in the dorsal hand lie just above the deep dorsal fascia. Veins and nerves are in the dorsal intermediate lamina (more superficial than the tendons) (Baker, 2013; Woodard, 2019). Therefore, it is important to place fillers into the dorsal superficial lamina to camouflage visible veins and tendons while avoiding any important structures.

Goals of treatment

Goals for treating the dorsum of the hands include hiding visible veins and tendons, as well as improving...
discolouration and skin texture. Some providers have used sclerotherapy to remove bulging veins; however, the author prefers to use fillers to camouflage the look of the veins. This eliminates the risk that comes with sclerotherapy, including hyperpigmentation, lumps and revascularisation. Next, improve the skin pigmentation with lasers, intense-pulsed light or peels. Topical tretinoin has also been used successfully to improve pigmentation; however, this takes longer. The author prefers to fill the lost volume first with fillers due to the instant results, as this will help patients have partial correction while they are undergoing other modalities for skin rejuvenation.

**Techniques for injection**

Multiple techniques have been developed regarding injecting fillers into the hands. A variety of fillers can be used, including hyaluronic acid and calcium hydroxyapatite. In the US, the FDA has approved Radiesse, a calcium hydroxyapatite filler, for dorsal hand injection, as well as Restylane Lyft, a hyaluronic acid. These fillers were approved in 2015 and 2018, respectively (Merz Aesthetic, 2014; Restylane Lyft with Lidocaine, 2018). The type of filler used is also dependent on injector preference and which would better benefit the patient. With HA injection to the dorsal hand, the author has experienced the Tyndall effect due to the thinness of the skin, particularly on fair skinned individuals. Radiesse also has biostimulatory properties and typically lasts longer than hyaluronic acid fillers.

The author has used both products and, as they are high G prime fillers, prefers to dilute in a 1:1 ratio with 2cc of 1% lidocaine and saline. This allows the filler to flow smoothly through either cannula or needle.

Practitioners have chosen to inject with either needle or cannula, with both techniques bringing their own pros and cons. One technique, called the ‘scrape skin threading technique’, was described by Lefebvre-Vilardebo et al (2015). In their study, they found that this technique, which uses a round-tipped cannula, allows the creation of a subdermal space for injection directly into the dorsal superficial lamina. In this study, they showed via MRI that using the needle technique, the filler was placed near tendons as the sharp needle penetrated multiple layers of fascia and placed the filler in too deep a plane. They suggest that this is not the correct place for filler for three reasons: the filler can be placed too deep to note a significant difference in the surface anatomy, unknown longevity within mobile tissues and it could be potentially harmful to the tendons. Using a blunt-tipped cannula through the hands, with insertion point proximally by the wrist, allows for placement of the filler through the entire hand with few injection points along with lower risk of perforating the vessels. However, this technique can cause trauma to the underlying surfaces due to pressure and pushing from cannula through the tissues.

Another described technique is to tent the skin between the metacarpal spaces, avoiding the vessels and injecting filler with a needle. After placing a bolus of product between each metacarpal space distally, the hands are massaged, blending the product proximally. Lefebvre-Vilardebo et al (2015) reported that MRI findings showed that the product goes deeper around the tendons. When tenting the skin, all fascial layers are lifted together, and the practitioner is unable to place the filler in any
specific plane on the dorsal hand. There is risk of injecting near a tendon or around muscle. Injecting with a needle to the hand has a risk of injecting into a vessel and communicating vasculature, due to the fascial adhesions causing all layers of the skin to lift. Detailed knowledge of anatomy can reduce this risk. Using the needle technique, there is potential for less trauma to the skin, as there are only four injection boluses placed and no pushing of a cannula through the underside of the skin. This may also be less traumatic to patients watching the procedure, as threading a cannula can appear aggressive, although it is not painful.

Some articles suggest that the safest way to inject the hand is from the proximal (wrist) side of the hand. Due to the anastomoses of the dorsal metacarpal arteries with the dorsal carpal arch and the palmar arteries of the hand, the author prefers to inject distally, between the metacarpal spaces.

It is recommended not to inject more than 3mL of Resylane Lyft or Radiesse to each hand, based on US clinical studies with their respective manufacturers and using more than this has not been studied (Merz, 2014; Restylane Lyft, 2018). Radiesse manufacturer recommends re-treatment with no greater than 1.6cc per hand, due to increased risk of adverse side effects, including pain, swelling and difficulty performing day-to-day activities.

**Complications**

As with any procedure that breaks through the skin, there is a risk of infection and bleeding. It is imperative to adequately sterilise the skin, keep the aseptic technique when injecting and avoid the vasculature of the hand. Proper knowledge of anatomy is important to prevent not only arterial injection, but also causing trauma to the veins, leading to excessive bruising. With the ageing hands, it is easier to avoid the blood supply, as the veins are readily visible through the skin and the arterial system follows the venous system. To further prevent risk of arterial cannulisation, inject with a needle between the metacarpal spaces distally to avoid the arterial arches that lie proximally. A cannula can be used proximally or distally. Notify patients of signs and symptoms of infection to monitor for so they are able to quickly return to care if there are any concerns. Due to the multiple compartments of the hands, an infection can progress very quickly requiring IV antibiotics and surgery, so do not hesitate to refer if there are any concerns for complications or progressing infections.

**Post-procedure care**

Post procedure, patients must remove rings for at least 24 hours—fingers can become entrapped due to swelling if rings are left on. Swelling and bruising are also common side effects and should be explained to the patient before the procedure.

Following volume restoration, the skin can be improved with laser or light treatments targeting pigmentation and tightness. Peels can also be used to improve pigmentation. The author prefers laser treatments, as peels on hands can be limiting for daily activities. It is important to counsel patients that it is likely more than one laser or light treatment will be required.

**Clinical case**

This female patient, age 54, presents with Merz grade 2 hands and Busso grade 1 (Figure 4). She has visible veins and tendons, as well as multiple solar lentigo contributing to the appearance of the age of her hands. It was discussed that filler would help...
improve and camouflage the tendons and veins. For a more complete correction, laser would need to be used to improve the discoloration and skin texture. One and a half syringes of Restylane Lyft were used on each hand in this patient. After tenting the skin, the author used a needle and injected just proximal to the metacarpal phalangeal joints. A bolus of product was placed in each space and then the product was massaged proximally towards the wrist. This technique allowed a significant decrease in the look of visible tendons and veins. It also allowed for few injection points and less trauma with multiple threading courses of a cannula.

After filler, enhanced skin rejuvenation was performed with the Cutera 532nm laser. Two sessions were performed in total (Figure 5) and pre- and post-treatment photos were taken.

A second female patient, age 57, with Merz grade 4 hands and Busso grade 3 can be seen in Figure 6. She also had visible tendons and veins, as well as solar lentigos present on hands bilaterally. She desired a long-term rejuvenation and PMMA filler (Bellafill) to the dorsum of her hands was discussed. With this technique, after appropriate preparation, 1% lidocaine with epinephrine on a 25-gauge needle was used to create two port sites proximally at the wrist and two distally between the metacarpals. A 27-gauge cannula was then used to thread Bellafill through the dorsum of the hand. One and a half syringes of Bellafill was used to each hand. Post-procedure, her hands were massaged with Arnica (Figure 7). This patient tolerated the procedure very well. She will return for follow up for treatment of the solar lentigos.

**Conclusion**

For overall enhancement and rejuvenation, it is important to look not only to the face. Improving

**Key points**

- Using dermal filler injections to the dorsum of the hand is a quick, in-office procedure that provides high level of patient satisfaction addressing an area of obvious ageing
- This improves volume loss and camouflages protruding veins and tendons in the dorsum of the hand
- Different technique, anatomy overview and filler types is addressed in this article
- After volume restoration, skin treatments including lasers/IPLs can be used to treat pigmentation

*Figures 6 and 7. Before and after polymethylmethacrylate filler*
the look of the dorsal hand, which is frequently exposed and gives away age, is something to discuss with patients who come into clinics looking for aesthetic rejuvenation. It is important to give realistic expectations to each patient and give a full assessment on what is required to achieve a complete correction, which will likely include fillers and skin treatments. Knowing the anatomy is of utmost importance; however, each injector can choose which technique is the best for them. The author prefers the cannula technique for PMMA and calcium hydroxyapatite fillers due to the viscosity of the filler and the ease of dispersal with the cannula over needle boluses. Needle boluses work well for hyaluronic acid fillers in the hands, as they are easily massaged.

References

CPD reflective questions

- What types of fillers are you currently using that could also be used for hand rejuvenation?
- What regimens could you offer to your clientele to also use on their hands?
- What techniques would work best for you?