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**Figure 3.9** Schematic drawing of product injection at the frontal concavity with a sharp needle. Please maximize all periosteal boluses to 0.025 mL each.



**Figure 3.10** Marking of the area.

7. Advance the needle to the periosteum with an angled approach of approximately 45° with the bevel down (**Figure 3.12**).
8. Aspiration with a primed needle will always give negative results so aspiration should be avoided and negative aspiration (no blood in the hub) should never be regarded as proof of being extravascular.
9. Change position of nondominant fingers to give pressure on supratrochlear arteries.
10. Softly touching the periosteum, inject a maximum 0.025 mL of periosteal bolus.
11. Partially retract, without exiting the skin, reorient and readvance the needle to the periosteum.
12. Inject an additional bolus of max 0.025 mL.
13. Repeat as needed.
14. Exit the needle and repeat every 0.5 cm until full correction.
15. Even out the product with purposeful molding.



**Figure 3.11** Tenting the skin, bevel down.



**Figure 3.12** 45° to the periosteum, 0.025 mL bolus.

#### AFTERCARE

After injection, the frontalis muscle might be temporarily relaxed due to the lidocaine in the product. Also, transient distension of the veins can be observed due to increased pressure in the area. Swelling might be uneven in the forehead so the patient should be advised that any swelling is to be expected and is temporary, but can last up to five days. Swelling might also descent into the eyelids.

#### ADDITIONAL TREATMENTS FOR OPTIMAL RESULTS

Thin to medium thickness soft tissue fillers can be used for dermal treatment of wrinkles, while keeping in mind that the wrinkles here are dynamic and will also benefit from pretreatment with botulinum toxin. Ideally, a hyaluronic acid filler with a low visco-elasticity, but high cohesivity should be used, preferably in an intradermal (blanching) technique, indicating papillary dermis placement, to correct forehead wrinkles. For intradermal injections, a sharp needle should be used, as nontraumatic cannulas do not penetrate the dermis readily. Subsequently, arterial danger zones have to be considered, and care should be taken that the needle tip does not proceed through the dermis, but rather remains intradermal [4]. Subcutaneously, medium-thickness fillers can be used for volumizing the frontal concavity. Caution should be taken as important danger zones are present in this area: the supraorbital artery (medial branch), the supratrochlear artery, the central forehead artery and their branches.



**Figure 4.15** Place multiple boluses of max. 0.1 mL.



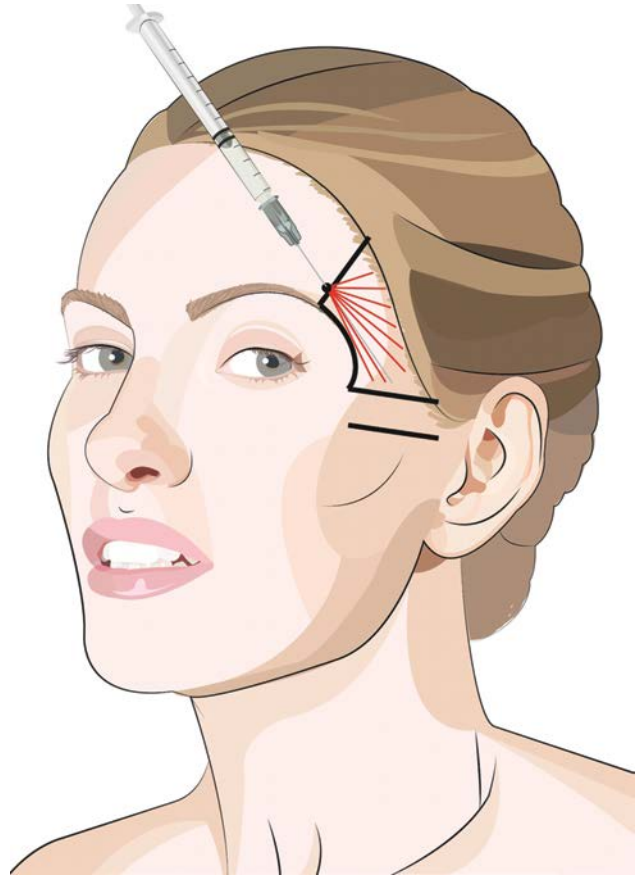
**Figure 4.16** If necessary, make a second entry point

#### TEMPORAL HOLLOW (INTERFASCIAL CANNULA TECHNIQUE; TEMPORAL CREST ENTRY POINT) – THE AUTHOR'S PREFERRED TECHNIQUE

For the injection point, see [Figure 4.17](#).

##### Step-by-step technique

1. Disinfect and mark the temporal crest, the lateral orbital rim and the zygomatic arch. Determine the area of maximum depression.
2. A zygomaticotemporal nerve block may be considered. Inject approx. 0.5–1 mL of lidocaine 2% deep to the lateral orbital rim at the fusion point of the zygomatic arch; please see block anesthesia in [Chapter 1](#).
3. Check for pulsations and avoid hitting the superficial temporal artery and veins.
4. Approximately 1 cm superior to the orbital rim, mark the entry point just medial to or at the medial border of the temporal crest.
5. Anesthetize subcutaneous with 1% lidocaine with adrenalin and advance the needle further to the periosteum of the frontal bone at the temporal crest to anesthetize deeper.
6. Create a prehole with a 23 G needle.
7. Use CaHA product with slightly reduced viscosity to reduce the risk of lumpiness (e.g., 0.3 mL lidocaine per 1.5 mL CaHA syringe).
8. Introduce the cannula and advance it to the periosteum of the frontal bone ([Figure 4.18](#)).



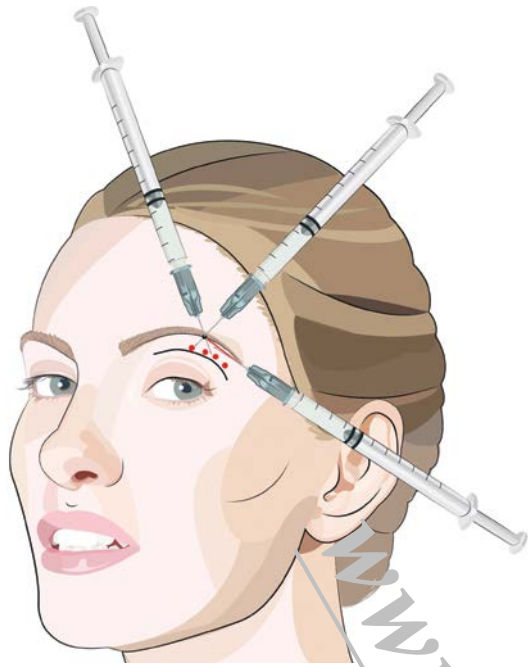
**Figure 4.17** Schematic drawing of CaHA injection with blunt cannula in the interfascial space, temporal crest entry point. The black lines mark the temporal crest, lateral orbital rim and upper border of the zygomatic arch. The red lines retrograde injection of CaHA.



**Figure 4.18** Entry point just medial to the temporal crest: advance to frontal bone.

9. Advance it over the periosteum through the temporal crest. As the anatomical layer of the periosteum and the deep temporal fascia are continuous, the cannula will now be positioned between the deep temporal fascia and the temporoparietal fascia ([Figure 4.19](#)).
10. Place multiple retrograde linear threads of approximately 0.1 mL per thread or consider injecting





**Figure 5.2** Schematic drawing of sharp needle multilevel injection technique of the lateral brow lift using subcutaneous retrograde linear threads and periosteal boluses. The black line represents the supraorbital rim. The red line represents a subcutaneous retrograde linear thread and the red circles represent supraperiosteal boluses.

6. With two retrogrades, inject a total of 0.05 mL (Figure 5.3).
7. Remove the needle from the skin.
8. Apply direct pressure to the injected area to prevent bruising of this well-vascularized area (Figure 5.4).
9. Move the brow upward with the nondominant fingers. Place the thumb at the lower border of the supraorbital rim to prevent the needle from entering the orbit.
10. Below the hairline, at the peak of the brow, advance the needle straight to the periosteum of the orbital rim, just medial to the peak of the brow.



**Figure 5.3** Subcutaneous retrograde linear thread.



**Figure 5.4** Applying direct pressure to avoid ecchymosis.



**Figure 5.5** (a–d) Supraperiosteal boluses.

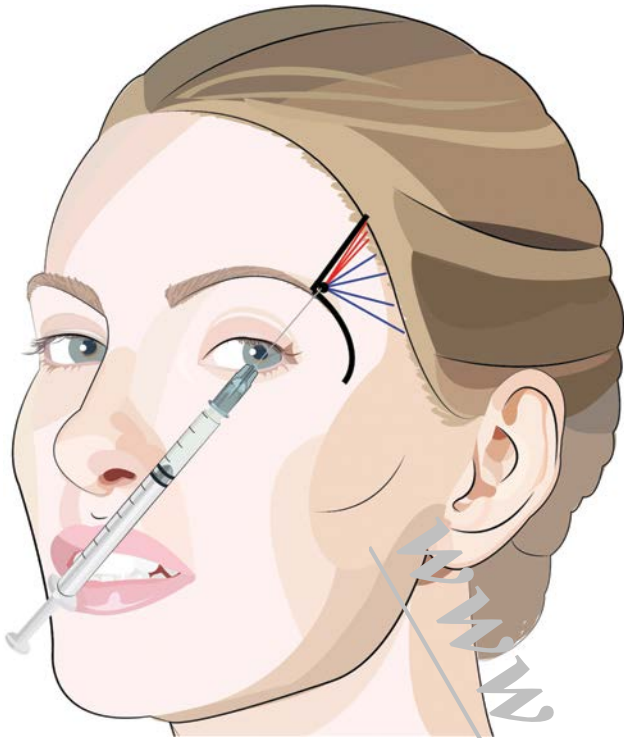
11. Without taking out the needle completely, inject four or five small boluses of 0.025 mL each with the needle in constant contact with the periosteum, “walking” over the periosteum towards the tail of the brow (Figure 5.5).
12. Keeping the brow pulled up with the nondominant hand, remove the needle and even out the product (Figure 5.6).

#### LATERAL BROW LIFT (SHARP NEEDLE MULTILEVEL TECHNIQUE 2)

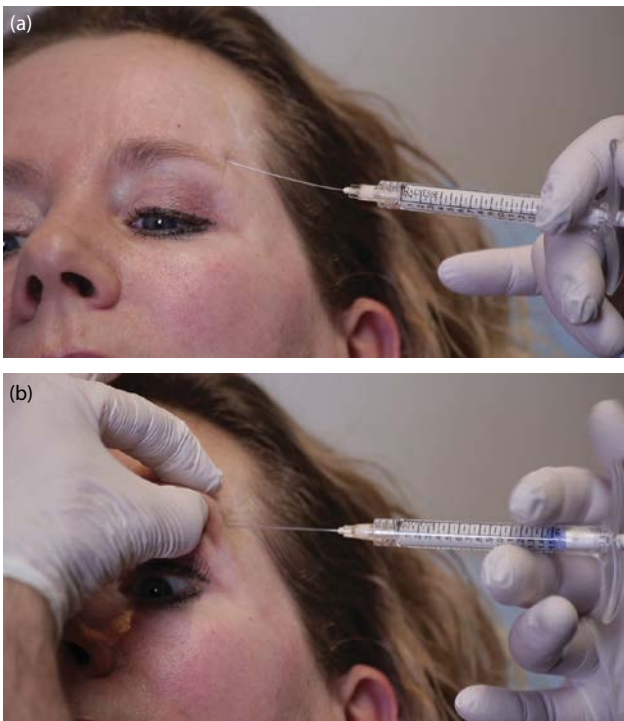
For injection placement, see Figure 5.7 (Video 5.2).

#### Step-by-step technique

1. Disinfect and mark the ideal position of the tail and the peak of the brow (Figure 5.8).
2. Use full viscosity (undiluted) CaHA or CaHA with up to standard dilution (0.3 mL lidocaine per 1.5 mL syringe).
3. Check for pulsations and avoid hitting the superficial veins.



**Figure 8.6** Schematic drawing of CaHA injection with blunt cannula in the submuscular layer of the lateral temporal crest. The black lines mark the temporal crest and lateral orbital rim. The red lines indicate retrograde linear thread injections of CaHA, the blue lines indicate possible additional retrograde injections in the temporal hollows (interfascial technique).



**Figure 8.7** Cannula is entered through the pre hole in the dermis (a) and advanced through the galea aponeurotica while lifting up the tissue with the non-dominant hand (b).



**Figure 8.8** Cannula is advanced deep to the galea aponeurotica (a) and advanced just lateral to the temporal crest (b).



**Figure 8.9** Cannula is advanced in the interfascial space in the temporal area.

#### TEMPORAL CREST SMOOTHING CANNULA TECHNIQUE 2: INTERFASCIAL AND SUBGALEAL

See [Figure 8.10](#) for injection placement.

##### Step-by-step technique

1. Disinfect and mark the temporal crest, the supraorbital rim, the lateral orbital rim, and the zygomatic arch ([Figure 8.11](#)). Mark the C-shaped area to augment and take note of the trajectory of the superficial temporal artery.
2. A zygomaticotemporal and supraorbital nerve block may be considered; please see block anesthesia in [Chapter 1](#).
3. Use full viscosity (undiluted) CaHA or standard dilution.





**Figure 27.3** Stretch the skin in the direction of the cannula and inject retrograde.

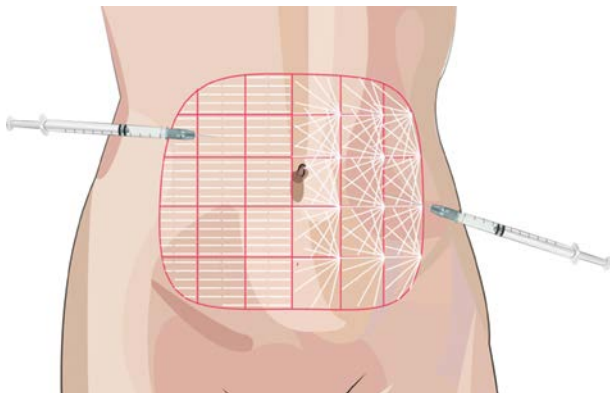
5. Start at the inferior entry point. Consider bending the cannula for ease of handling the syringe.
6. Stretch the skin in the direction of injection to control the correct depth of the cannula. Make sure the cannula is at the dermal–subdermal junction ([Figure 27.3](#)).
7. Slowly inject approximately 0.05–0.1 mL per retrograde injection in a fanning pattern with the bevel directed upwards.
8. Repeat until all of the marked skin has a thin layer of diluted CaHA.

#### ABDOMEN NEEDLE TECHNIQUE

For injection placement, see [Figure 27.4](#); for evaluation of the abdomen, see [Figure 27.5](#).

#### Step-by-step technique

1. Disinfect the abdomen.
2. Mark the area that needs to be treated ([Figure 27.6](#)).



**Figure 27.4** Schematic drawing of diluted CaHA at the abdomen using the sharp needle technique. The white lines indicate retrograde linear threads of diluted CaHA at the dermal–subdermal junction. On the right side of the patient the short needle (19 mm) technique is shown, on the left side the long needle (40 mm) technique is shown using squares of approx. 15–16 cm<sup>2</sup>.



**Figure 27.5** Evaluation of the abdomen shows mild laxity of the skin, which is accentuated when the patient is asked to bend forward.



**Figure 27.6** Markings on the patient before treatment. Landmarks are the lower border of the ribcage, the lateral sides of the abdomen and the bikini-line. Then mark squares of 4 × 4 cm.

3. Use 1.5 mL CaHA per 100 cm<sup>2</sup> surface area. In the schematic example shown, approx. 13–14 squares of 4 × 4 cm are used per side, equaling 208–224 cm<sup>2</sup>. This means that a total of approximately two to three syringes is necessary to treat the abdomen in this example.
4. Dilute CaHA between 1:1 and 1:3 (depending on severity of laxity) and use a 27 G, 19 mm needle or a 27 G, 40 mm needle.
5. Work from lateral to medial.
6. Stretch the skin in the direction of injection to control the correct depth of the needle. Make sure the needle is at the dermal–subdermal junction ([Figure 27.7](#)).
7. Slowly inject approximately 0.05 mL per retrograde injection. Use either the fanning technique (left side of patient in [Figure 27.4](#)) or retrograde linear threads (right side of patient in [Figure 27.5](#)).
8. Repeat until all the marked skin has a thin layer of diluted CaHA.

See also [Videos 27.1](#) and [27.2](#).

**Video 27.1** Cannula technique. (Jani van Loghem)

**Video 27.2** Needle fanning technique. (Pieter Siebenga)