



ABSTRACT

Clinicians employ several techniques to augment lips with hyaluronic acid (HA) filler. To the best of our knowledge, however, no previous study has documented the use of a 4-mm 30-gauge needle in this context. This paper describes the anatomical rationale behind and practical application of such a needle applied very superficially in the vermilion border during lip augmentation. Using a 4-mm 30-gauge needle facilitates precise HA placement into the safer subcutaneous plane of the lip and lowers the pressure needed to extrude the filler, which might optimize patient comfort. This technique aims to increase the safety and predictability of lip augmentation with HA fillers. Credit is owed to Dr. Jean Louis Sebah, who provided the inspiration to use the described needle for this evidence-based technique.

KEY WORDS: Hyaluronic acid, lip augmentation, 4-mm 30-gauge needle, safety

Lip Augmentation Using Hyaluronic Acid Filler and a 4-mm Needle: A Safer, More Natural, and Predictable Approach

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The lips, which are highly vascularized and dynamic, are predominately supplied by the superior and inferior labial arteries. The course and distribution of these arteries and their collaterals are highly variable. Papers describing the topography, distribution, and patterns of the lip vasculature have highlighted areas that may be more prone to complications during dermal filler injections.^{1–3} Arguably, therefore, the vessel depth and tissue planes are constants that clinicians can use to ensure a lower probability of a vascular accident.

Broadly, labial arteries can exist in one of three anatomical locations: submucosally on the nonkeratinized, or "wet," side, intramuscularly between the superficial and deep layers of the orbicularis oris muscle, or subcutaneously on the keratinized, or "dry," side.³ For simplicity, we use the mucosal-cutaneous junction (i.e., the wet/dry border) to delineate these positions.

The submucosal position is the most likely to bear the labial arteries, followed by the intramuscular and subcutaneous planes. A study of 26 cadavers (50% female) revealed that the superior and inferior labial arteries in the upper lip ran between the oral mucosa and the orbicularis oris muscle (i.e., submucosal plane) in 69.2 percent of the specimens.¹ The same group also reported that, in 193 Caucasian

cadavers (56.5% female), the labial vessels were submucosal in 78.1 percent, intramuscular in 17.5 percent and subcutaneous in 2.1 percent of specimens, respectively.³ A study of 25 Turkish male head cadavers located the superior labial artery ran in the submucosal position in 50 percent of specimens and intramuscular in the remaining 50 percent. Dissection revealed no subcutaneous superior labial arteries.⁴

Several studies have assessed the depth of the superior and inferior labial arteries to date (Table 1).^{5–7} Furthermore, Lee et al² reported that the mean depths of the superior labial artery at the vermilion border ranged from 3.3 to 3.9 mm; pursuing superficial injection (<4 mm) only in the vermilion border is essential to avoid vascular injury. The average depth suggests an increased likelihood of complications when using the standard 13-mm needle that is usually prepacked with hyaluronic acid (HA) fillers. Given the rarity of serious complications with HA fillers, a prospective study is impractical and clinicians need to rely on the precautionary principle.

Based on anatomical observations, the vermilion borders of both lips are safe for the superficial injection of fillers. All areas of the lower lip are safe, reflecting the ascending arteries' small size. Tansatit et al¹ suggested

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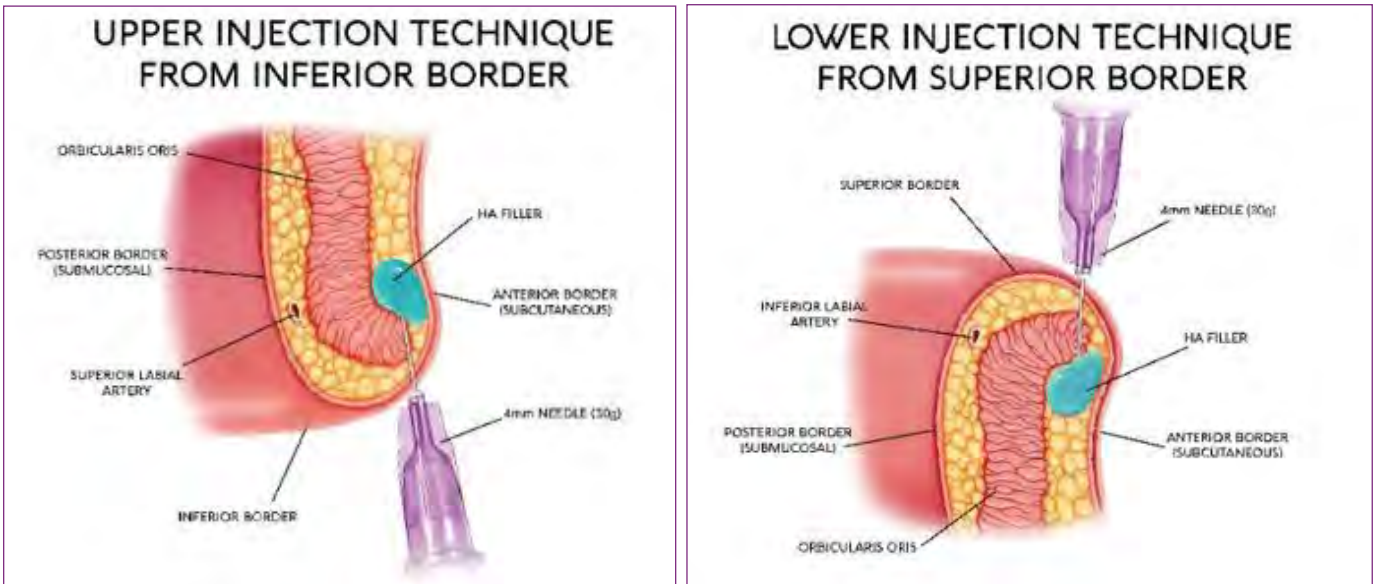


FIGURE 1. A) Upper and; B) lower injection technique

TABLE 1. Mean depth of the superior and inferior labial arteries in relation to the inferior, superior, anterior and posterior borders of the red lip

	MEAN DISTANCE FROM BORDERS OF RED LIP (MM)			
	Tansatit et al. ¹	Al-Hoqail et al. ⁵	Edizer et al. ⁶	Magden et al. ⁷
Superior labial artery from inferior border		6.9		6.7
Superior labial artery from anterior border	5.6	5.4		7.6
Superior labial artery from posterior border	4.5	3.2		3.2
Inferior labial artery from inferior border	2.3	7.1	6.4	
Inferior labial artery from anterior border		9.4	5.9	
Inferior labial artery from posterior border		4.4	4.8	

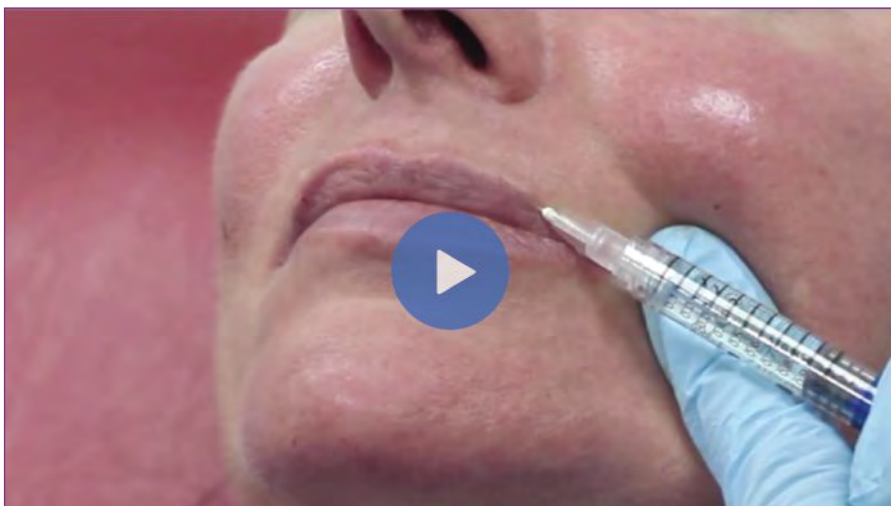
placing filler into the middle of the lip to avoid injection between the muscle layer and the mucosa. Cotofana et al³ concurred that injection into the subcutaneous plane is safer for lip augmentation and better to avoid superficial arteries than that in the midline of both lips.

Our search for a safer technique for lip augmentation was not satisfied by any of the available literature. Instead, the idea of an evidenced-based approach to a safer method of lip injection was inspired by watching Dr. Jean Louis Sebahg inject his patient with a 4-mm 30-gauge needle at the International Teoxane Expert Day in Paris, France, in October 2015⁸—a technique he has employed since at various conferences. We modified the use of this 4-mm 30-gauge needle to produce the technique described here.

A NEW TECHNIQUE

Based on anatomical information, we place filler very superficially in the vermillion border during lip augmentation. The filler's rheology means that inserting the tip of the 4-mm 30-gauge needle into the border and exerting pressure produces an antegrade run of HA. This technique (Video 1) reduces the number of entry points and, therefore, lip trauma.

Using a 4-mm needle to inject into the upper and lower lips from anteroinferior and anterosuperior positions, respectively (Figure 1), may allow for safer placement of HA fillers than administration into subcutaneous perioral



VIDEO 1. Click to view Video 1

fat. This, in turn, reduces the risk of intravascular injection. Clinicians injecting from the posterior or mucosal side of the lip promote a greater risk of injury to the labial vessels. Using a 13-mm needle further increases the chance of perforating the labial vessels.

Ongoing clinical experience using this technique suggests areas for further study. The presence of anterogradely running filler could arise from hydrodissection induced by the filler pressure. Possibly, the filler may run along a currently unidentified discrete anatomical tube or space. Anecdotally, in our experience using 4-mm technique, we have observed that the technique reduces pain. This probably reflects the lower pressure necessary to extrude the filler into the highly innervated lip tissue relative to as seen with the conventional approach. However, quantifying the reduction in pain requires further study.

CONCLUSION

Anatomical evidence suggests that injecting HA filler into the subcutaneous plane is safer

than administering it into the submucosal plane. The anatomical evidence also suggests that the midline may be a higher-risk area for adverse outcomes following the injection of HA fillers. Moreover, varying depths of the labial vessels suggest that using 4-mm needles constitutes a safer approach to lip augmentation using HA filler than when using 13-mm needles. Once again, we would like to credit Dr. Sebah for pioneering the use of the 4-mm 30-gauge needle in the context of lip injections.

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