

LETTER

Non-inflammatory nodule formation after hyperdiluted calcium hydroxyapatite treatment in the neck area

Dear Editor,

Calcium hydroxylapatite (CaHA, Radiesse) is a bio-degradable, bio-stimulatory soft tissue filler.¹⁻⁵ It is approved to correct moderate-to-severe wrinkles and folds and soft tissue volume loss in the face. In recent years, subdermal injections of hyperdiluted CaHA have been used as a collagen stimulator rather than

a volumizing agent to improve skin laxity and firmness. CaHA shows a high safety profile compared with more invasive rejuvenation procedures, low complication rates and is generally well tolerated.⁶ In this case report we present the diagnosis and management of nodules arising from treatment of the neck with hyperdiluted CaHA.

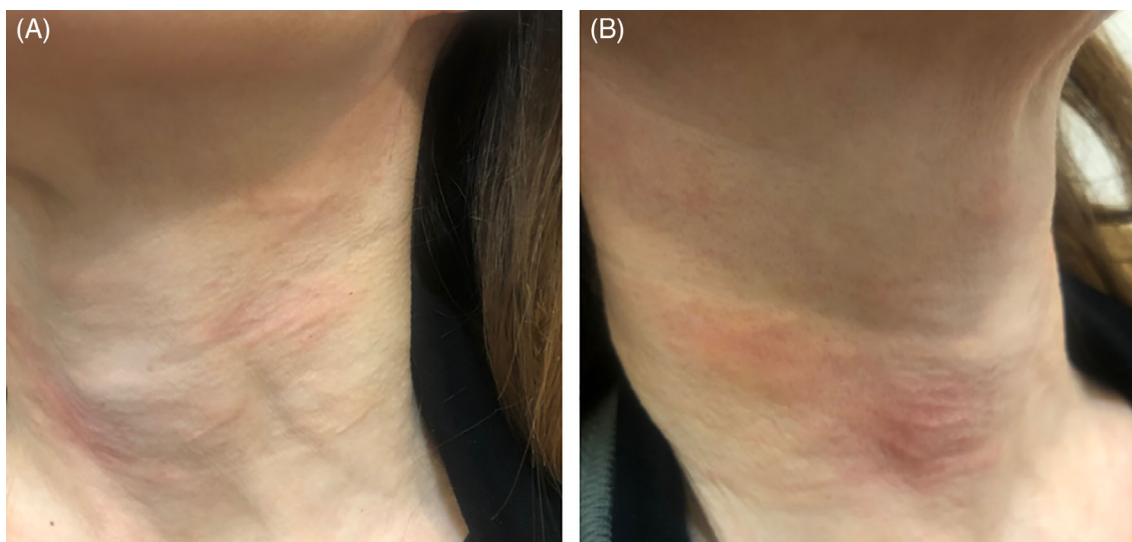


FIGURE 1 A, B, Direct after treatment

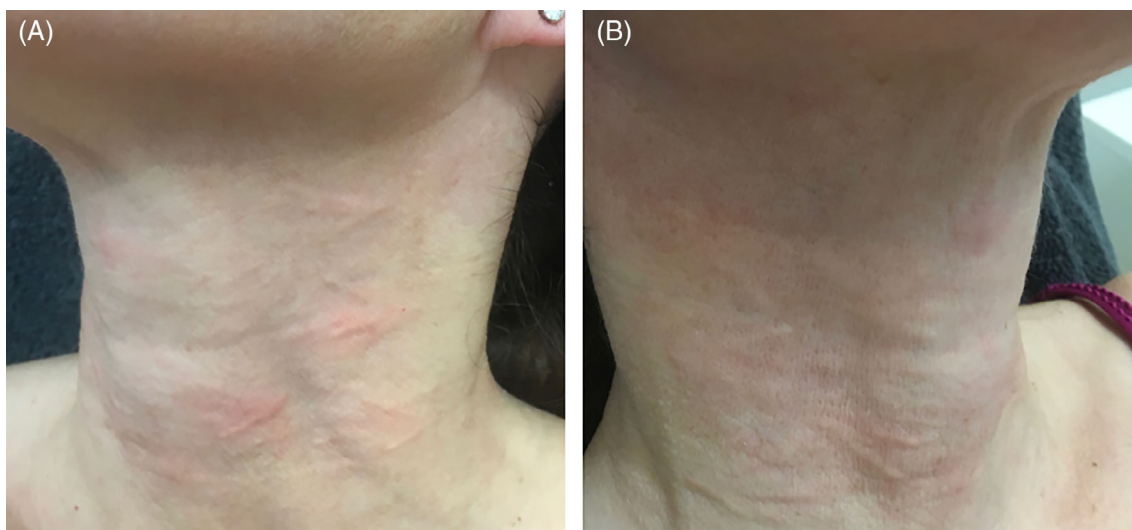


FIGURE 2 A, B, One week post-treatment

A 45-year-old healthy female was referred to our clinic for a second opinion due to nodules after two treatments with CaHA in her neck area. A first treatment, 11 months earlier, had given some improvement but also resulted in multiple small bumps that lasted for 5 months. This was done using a 1:2 dilution of CaHA, injected with a needle. For her second treatment, she was treated according to the consensus guidelines using 6 cc of hyperdiluted CaHA (1:4 dilution with lidocaine/saline solution) by the fanning method in multiple subdermal lines using a 25 Gauge cannula. First a test spot was performed. After that no issues occurred. A few days later the entire area was treated. Immediately after the treatment linear thickening and erythema following the course of the injected material was observed (Figure 1).

One week later the patient presented with raised erythematous lines in the treated area (Figure 2). No (other) signs of inflammation

were present. The CaHA filler could not be identified using ultrasound imaging. Over four subsequent days respectively totals of 0.6, 1.6, 1.5 and 1.5 mL saline were injected intralesional followed by intense massage in an attempt to break up the product. Following this, high-intensity focused ultrasound was attempted.

One month later she came to our clinic, the injected areas had become more erythematous, indurated and more pronounced (Figure 3). Again no product could be visualized with ultrasound.

As differential diagnosis we considered: (a) Non-inflammatory nodules following too superficially injected CaHA; (b) Inflammatory nodules after CaHA. We started with triamcinolone cream 0.1%, and with oral prednisone 40 mg once daily for 7 days. Unfortunately, almost no effect was seen. Literature shows some evidence that sodium thiosulfate (STS, 12.5 g/50 mL) could be an effective dissolving agent for CaHA. Therefore, we injected intralesional STS in



FIGURE 3 One month after treatment



FIGURE 4 Two months after treatment



FIGURE 5 Six months after treatment

three sessions (0.2, 0.3 and 0.3 mL, respectively).⁷ Again, no improvement was seen. After this, the patient was treated four times with thermo-mechanical ablation (Tixel on mode 12/600). This resulted in a slight improvement (Figure 4). Meanwhile, a biopsy and histological investigation demonstrated no significant infiltration but did show several CaHA particles, supporting the diagnose of non-inflammatory nodules following superficially injected CaHA.

Now, 6 months later, the nodules are slowly disappearing but still visible (Figure 5).

Effective results have been shown using hyperdiluted CaHA in the neck area. Should CaHA nodules occur they resolve within a few weeks without intervention in most cases. In this case, subcutaneous tissue necessary for the spread of CaHA was virtually absent. Therefore even at a 1:4 dilution the CaHA was confined to the tunnels made with the canulae. Judging by this, we believe that hyperdiluted CaHA must therefore be used with great caution in the neck area and should be used only in patients' with medium to thick skin types.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest.


DATA AVAILABILITY STATEMENT

No data available.

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REFERENCES

- de Almeida AT, Figueredo V, da Cunha ALG, et al. Consensus recommendations for the use of hyperdiluted calcium hydroxyapatite (Radiesse) as a face and body biostimulatory agent. *Plast Reconstr Surg Glob Open*. 2019;7(3):e2160.
- Goldie K, Peeters W, Alghoul M, et al. Global consensus guidelines for the injection of diluted and hyperdiluted calcium hydroxylapatite for skin tightening. *Dermatol Surg*. 2018;44(Suppl 1):S32-S41.
- Shi XH, Zhou X, Zhang YM, Lei ZY, Liu T, Fan DL. Complications from nasolabial fold injection of calcium hydroxylapatite for facial soft-tissue augmentation: a systematic review and meta-analysis. *Aesthet Surg J*. 2016;36(6):712-717.
- Casabona G, Nogueira Teixeira D. Microfocused ultrasound in combination with diluted calcium hydroxylapatite for improving skin laxity and the appearance of lines in the neck and décolletage. *J Cosmet Dermatol*. 2018;17(1):66-72.
- Yutskovskaya YA, Kogan EA. Improved neocollagenesis and skin mechanical properties after injection of diluted calcium hydroxylapatite in the neck and décolletage: a pilot study. *J Drugs Dermatol*. 2017;16(1):68-74.
- Kadouch JA. Calcium hydroxylapatite: a review on safety and complications. *J Cosmet Dermatol*. 2017;16(2):152-161.
- Robinson DM. In vitro analysis of the degradation of calcium hydroxylapatite dermal filler: a proof-of-concept study. *Dermatol Surg*. 2018;44(Suppl 1):S5-S9.