

defined for multiple SN in our series (we define as ‘signature pattern’ the occurrence of multiple lesions sharing the same dermoscopic appearance, i.e. the same pattern, in a given individual).⁵

None of the mutations previously described in sporadic and multiple SN were detected in our lesions. Given the limited number of lesions in our series, our results can be considered in line with previously published literature on sporadic SN^{2,3}. Thus, it is not possible to exclude that different genetic alterations may be responsible for the lesions in this particular subset of patients.

Further studies are needed, involving a wider genetic analysis, in order to give a contribution to the identification of the underlying epidemiological and genetic background of multiple SN.

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Ultrasound-guided hyaluronidase injection in cosmetic complications

Editor

Cosmetic procedures have increased rapidly in the last decade and in the USA it is estimated that hyaluronic acid injection is the second most common procedure after botulinum toxin injection.¹

Hyaluronic acid seems to be safe; however reported complications have included palpable nodules or papules that persist over time, the Tyndall effect (i.e. bluish discoloration of the skin), hypersensitivity, tissue necrosis, infections, bacterial biofilms and granulomas.²

Therefore, the usage of hyaluronidase, a soluble protein that produces enzymatic degradation of glycosaminoglycans and hydrolyses hyaluronic acid and is used for treating complications of hyaluronic acid injections,³ has been growing exponentially. Thus, off-label injections of hyaluronidase have been reported for the successful treatment of nodules, granulomas and the Tyndall effect.^{4–6}

The injection of hyaluronidase in the skin is reported to present an immediate action that lasts between 24–48 h, with a half-life of 2 min and is metabolized in the liver and kidneys.³ The dosage usually used goes from 5 to 75 units and some authors have suggested that 5 units of hyaluronidase would be needed to break down an injection of 0.1 mL of 20 mg/mL hyaluronic acid.³

Ultrasound has been rapidly growing for studying frequent dermatologic conditions which include the detection and identification of cosmetic fillers.^{7,8} On sonography, hyaluronic acid has been described as round or oval-shaped, anechoic pseudocystic deposits.⁸

To our knowledge, to date there are no reports on the actual effect of hyaluronidase with real-time imaging modalities. Therefore, we performed an ultrasound-guided injection of hyaluronidase in two cases with persistent palpable nodules after injection with hyaluronic acid. Both cases signed an informed consent for performing the procedure which took place under the Helsinki principles of medical ethics.

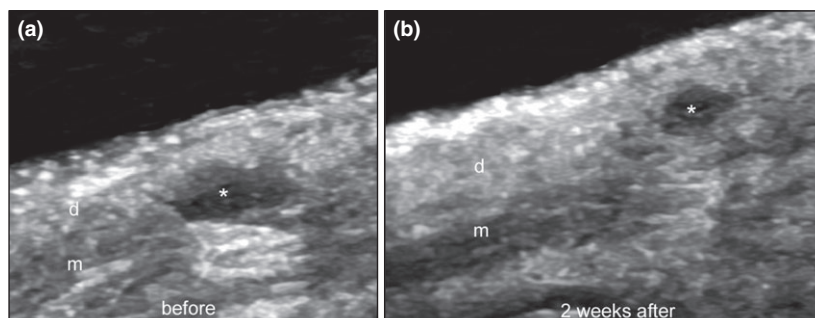


Figure 1 (a, b) Hyaluronidase ultrasound monitoring in case 1 (transverse views, right aspect of the lower lip). (a) Before injection and b. Two weeks after injection, demonstrating a significant decrease in the size of the hyaluronic acid deposit (*). Abbreviations: d, dermis; m, lower lip orbicularis muscle.

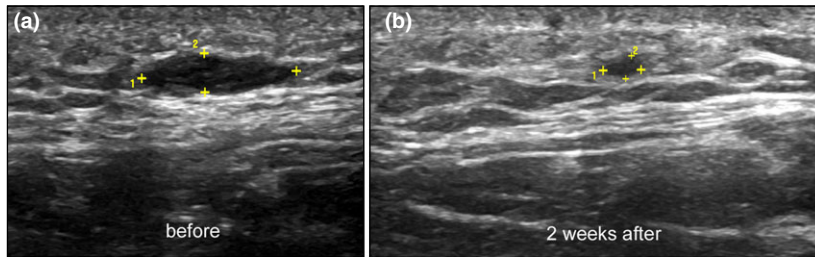


Figure 2 (a, b) Hyaluronidase ultrasound monitoring in case 2 (transverse views, left cheek). (a) Before and (b) Two weeks after injection, showing a significant reduction in the size of the hypodermal hyaluronic acid deposit (*).

The first case was a female patient (43 years old) who presented two palpable nodules on the right aspect of the lower lip 8 months after the injection of 0.5 mL of hyaluronic acid (Restylane® Perlane®, Q-Med, Uppsala, Sweden). On ultrasound, both nodules showed an oval anechoic pseudocystic appearance and were located in the dermis. The nodule in the lateral location measured 3.4 mm (transverse axis) × 1.4 mm (thickness) × 2.7 mm (longitudinal axis) with a volume of 0.7 mL. The other dermal nodule was located more medially and measured 1.6 mm (transverse axis) × 1.2 mm (thickness). We performed an ultrasound-guided injection of 10 units of hyaluronidase in the larger, laterally located nodule. Then, we performed a sonographic follow-up 2 weeks later, showing that the injected nodule had reduced its size by 67%, measuring 2.3 mm (transverse axis) × 1.3 mm (thickness) × 1.4 mm (longitudinal axis) with a volume of 0.2 mL. The neighbouring non-injected nodule had not modified its size or morphology.

The second case is a male patient 40 years old who presented a palpable nodule in the left cheek after a 1-mL hyaluronic acid injection (Juvederm Voluma®, Allergan, Pringy, France) 1 year before. On sonography, the nodule was located in the hypodermis and measured 8.4 mm (transverse axis) × 2.1 mm (thickness) × 3.9 mm (longitudinal) with a volume of 3.6 mL. Two weeks after the ultrasound-guided injection with hyaluronidase (10 units), the nodule had reduced its volume by 94%, measuring 1.9 mm (transverse axis), 1.2 mm (thickness) and 1.8 mm (longitudinal axis) showing a volume of 0.2 mL (Figs 1 and 2; Videos S1 and S2).

Hyaluronidase seems to be an effective agent to significantly reduce the size of the nodules produced by the injection of hyaluronic acid; however, small remaining deposits can be detected after the procedure and may last for 2 weeks and perhaps more. Ultrasound is a non-invasive and helpful tool for pointing out the exact location of the cosmetic filler deposits, allowing a safe procedure and monitoring of the treatment.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Video S1. Before ultrasound-guided injection of hyaluronidase in case 1.

Video S2. During the ultrasound-guided injection of hyaluronidase in case 1.

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Pneumocephalus as a fatal complication of scalp angiosarcoma

Editor

Angiosarcoma is a malignant vascular neoplasm, usually occurring at the head and face of elderly people. Clinical appearance is variable with bruise-like patches, violaceous nodules and ulcers.¹ Surgical excision with wide margin and other treatments such as