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NEWS

DOPPLER ULTRASOUND FINDINGS IN FILLER-RELATED VASCULAR COMPLICATIONS: A MULTICENTRIC STUDY

PURPOSE

The global surge in the use of cosmetic fillers—particularly hyaluronic acid (HA)—has led to a significant rise in vascular adverse events (VAEs) in the face, including necrosis, blindness, and stroke. The facial vasculature is uniquely complex and extensively anastomosed, differing from territories such as the carotids or extremities, where Doppler criteria are well established. No such reference standards exist for the face. This study aimed to identify the most frequent Doppler ultrasound findings in filler-induced VAEs to support diagnosis and management as well as to evaluate their association with prior use of hyaluronidase, the enzyme commonly used for treatment.

METHODS AND MATERIALS

A retrospective, international, multicenter, cross-sectional study was conducted across four radiology, one dermatology, and one plastic surgery centers between May 2022 and April 2025. Patients presenting with clinical signs of facial VAEs following filler injections were evaluated using high-frequency color or power Doppler ultrasound and in some cases microvascularity software (echoangio). Data regarding Doppler findings, clinical signs, arterial involvement, and prior hyaluronidase use were extracted from records. Statistical analysis was performed using R software, with Fisher's exact test applied to assess associations ($\alpha<0.05$).

RESULTS

Among 100 patients, 93% were female, 98% had received HA fillers and 79% received hyaluronidase prior to Doppler evaluation. The most common color Doppler findings were absent flow in perforator vessels (42%), absent flow in major vessels (35%), compensatory flow (26%), string sign (18%), and increased peak systolic velocity (16%). No significant association was found between hyaluronidase use and specific Doppler findings ($p>0.05$). A moderate correlation was observed between absent flow in perforators and compensatory flow ($\Phi = 0.37$, $p = 0.0004$). Lateral nasal artery involvement was significantly associated with absent major vessel flow ($p = 0.0004$).

CONCLUSIONS

The most frequent color Doppler ultrasound findings in filler-related VAEs were absent flow in perforator and major vessels. Although no association was found between hyaluronidase use and Doppler patterns, significant correlations emerged between specific findings and arterial territories, suggesting that color Doppler ultrasound can provide relevant hemodynamic information to support diagnosis.

CLINICAL RELEVANCE/APPLICATIONS

Recognizing Doppler ultrasound patterns may help radiologists more precisely identify cosmetic filler-induced VAEs and support timely clinical decision-making.