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Polymethylmethacrylate-induced foreign body granuloma in the left lower lip

KEYWORDS

Polymethylmethacrylate;
Foreign body
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Lip augmentation

Polymethylmethacrylate (PMMA) is a kind of injectable but nonresorbable dermal filler that can be used for cosmetic augmentation of the lip.^{1,2} Here, we reported a case of PMMA-induced foreign body granuloma that presented as a submucosal mass at the left lower lip of a 43-year-old female patient.

This 43-year-old female patient was referred by a local dentist to our oral mucosal disease clinic for evaluation and treatment of a submucosal mass at the left lower labial mucosa for more than 4 months. The soft tissue mass was non-tender but firm on palpation. It measured approximately 1.0 cm in greatest dimension. The clinical diagnosis by the local dentist was a mucocele. The patient was further referred to an oral surgeon for surgical excision of the mass. After discussing with the patient and obtaining the signed informed consent, the submucosal mass was totally excised under local anesthesia. The removed soft tissue specimen was sent for histopathological examination. Microscopically, it showed numerous round, sharply circumscribed, empty vacuoles almost identical in size and shape embedded in the dense fibrous connective tissue stroma with a mild lymphocytic infiltrate (Fig. 1A and B). On the high-power view, some of the round vacuoles were found to be surrounded by epithelioid cells and few multinucleated giant cells intermingled with a sparse lymphocytic infiltrate (Fig. 1C, D, E and F). After checking the atlas of foreign materials provided by the American Academy of Oral and Maxillofacial Pathology, these round,

transparent, well-demarcated vacuoles of foreign bodies were identified as the PMMA microspheres.³ Therefore, the above-mentioned characteristic findings finally confirmed the histopathological diagnosis of a late-onset PMMA-induced foreign body granuloma.^{1–3} After questioning the patient, she remembered the injection of some-kind of nonresorbable dermal filler (possibly ArteFill) for cosmetic augmentation of her thin lower lip 2 years ago.

Both the hyaluronic acid and PMMA are injectable dermal fillers that are used for cosmetic soft tissue augmentation.^{1–4} The hyaluronic acid is a resorbable dermal filler but the PMMA is a nonresorbable dermal filler.^{1–4} ArteFill, an improved, next-generation derivative of Artecoll, is the first Food and Drug Administration (FDA)-approved permanent dermal filler for use in the USA in 2006.¹ ArteFill consists of PMMA microspheres suspended in a 3.5 % solution of bovine collagen containing 0.3 % lidocaine. When measured by volume percent, Artefill consists of 20 volume percent PMMA microspheres and 80 volume percent of bovine collagen. If ArteFill is injected beneath the skin wrinkle, the PMMA microspheres with their exceptional surface smoothness can stimulate fibroblasts to encapsulate each individual one of the 6-million microspheres contained in 1 mL of ArteFill. The bovine collagen in Artefill is merely a carrier substance that prevents the PMMA microspheres from agglomerating during tissue ingrowth. The 20 volume percent of nonresorbable PMMA microspheres in ArteFill provides the scaffold for the 80 %

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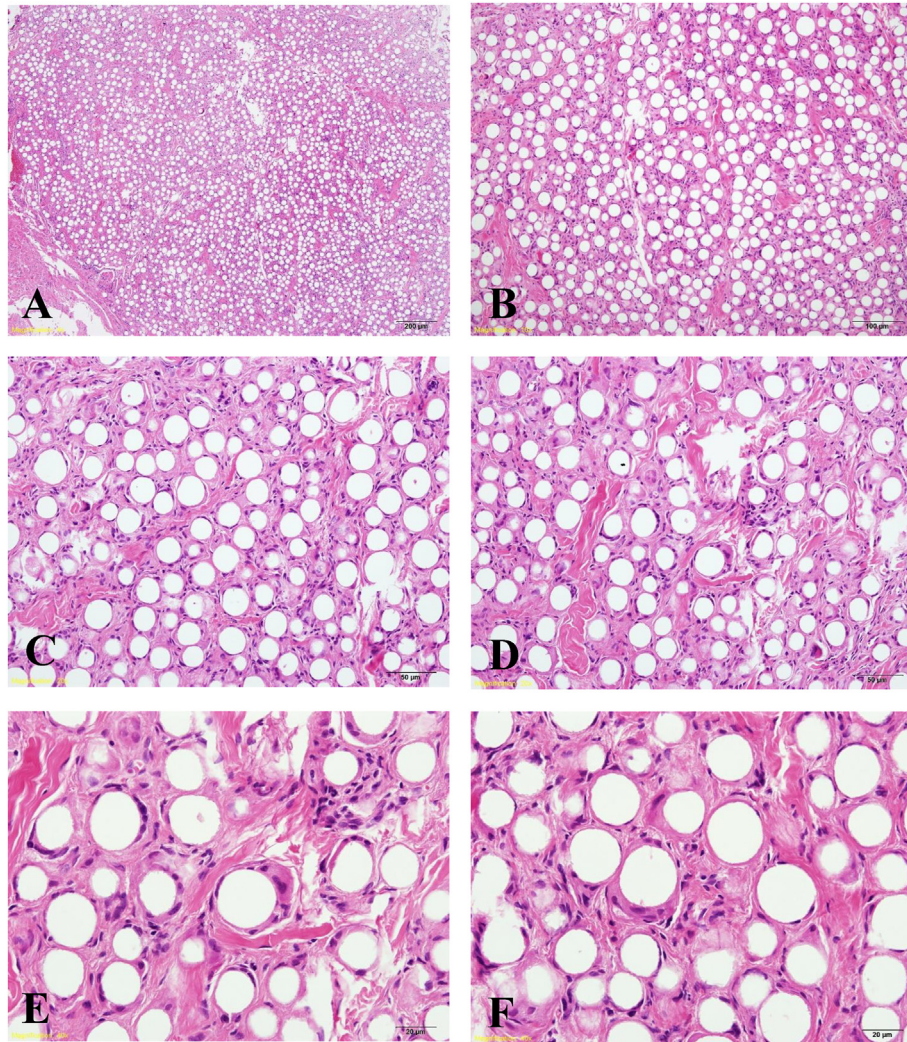


Figure 1 Histopathological photomicrographs of our case of polymethylmethacrylate (PMMA)-induced foreign body granuloma. (A and B) Low- and medium-power photomicrographs showing numerous round, sharply circumscribed, empty vacuoles almost identical in size and shape embedded in the dense fibrous connective tissue stroma with a mild lymphocytic infiltrate. (C, D, E and F) High-power photomicrographs demonstrating that some of the round vacuoles were surrounded by epithelioid cells and few multinucleated giant cells intermingled with a sparse lymphocytic infiltrate. (Hematoxylin and eosin stain; original magnification; A, 40 × ; B, 100 × ; C and D, 200 × ; E and F, 400 ×).

volume of connective tissue deposition, and finally the bovine collagen is resorbed and replaced by the human collagen. The ArteFill dermal filler materials beneath the skin wrinkle act like a splint and prevent the possibility of its further folding, thereby allowing the diminished thickness of the corium in the skin wrinkle to recover. The ArteFill dermal filler is indicated for correcting the skin wrinkles and defects, thus it can be used for enhancement of the vermillion border or the philtrum and treatment of horizontal forehead lines, deep nasolabial folds, and perioral lip lines. However, if the Artefill is used inappropriately, it may have some potential side effects including skin telangiectasis, hypertrophic scarring, granuloma formation, and formation of dislodged nodule (which is similar to the submucosal mass in the present case). When the dislodged nodule is excised completely, no recurrence is found thereafter.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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