

## Case Report

# Delayed lipogranuloma of the cheek following autologous fat injection: report of 2 cases

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**Abstract:** We presented 2 cases of lipogranuloma of the cheek following autologous fat injection. Facial autologous fat injection for soft tissue augmentation is a frequently used technique in the field of plastic surgery. Although this procedure was thought to be a safe procedure without foreign body reactions, there had been several case reports on lipogranuloma following autologous fat injection, especially into the periorbital area. In our cases, we experienced delayed lipogranulomas of the cheek area and successfully treated them with perioral excision.

**Keywords:** Lipogranuloma, cheek, facial autologous fat injection

## Introduction

Lipogranuloma is a granulomatous inflammatory reaction in the reticular dermis and subcutaneous tissue associated with injection of lipids or oil-like substances [1, 2]. It is well described in the urology literature, but is rare in the head and neck area. In the head and neck area, facial autologous fat injection can cause lipogranuloma formation [3-5]. Facial autologous fat injection is a commonly used technique for facial augmentation and recontouring [6]. Although autologous fat injection is thought to be a safe technique, it can cause unexpected complications, such as hematoma, paraesthesia, abnormal contour, skin necrosis, and infection [7]. Facial lipogranuloma following autologous fat injection is a rare clinical entity, particularly in the cheek area. To the best of our knowledge, delayed lipogranuloma formation of the cheek have not yet been reported in the medical literature. In this report, we describe 2 cases of lipogranuloma of the cheek following autologous fat injection into the midface.

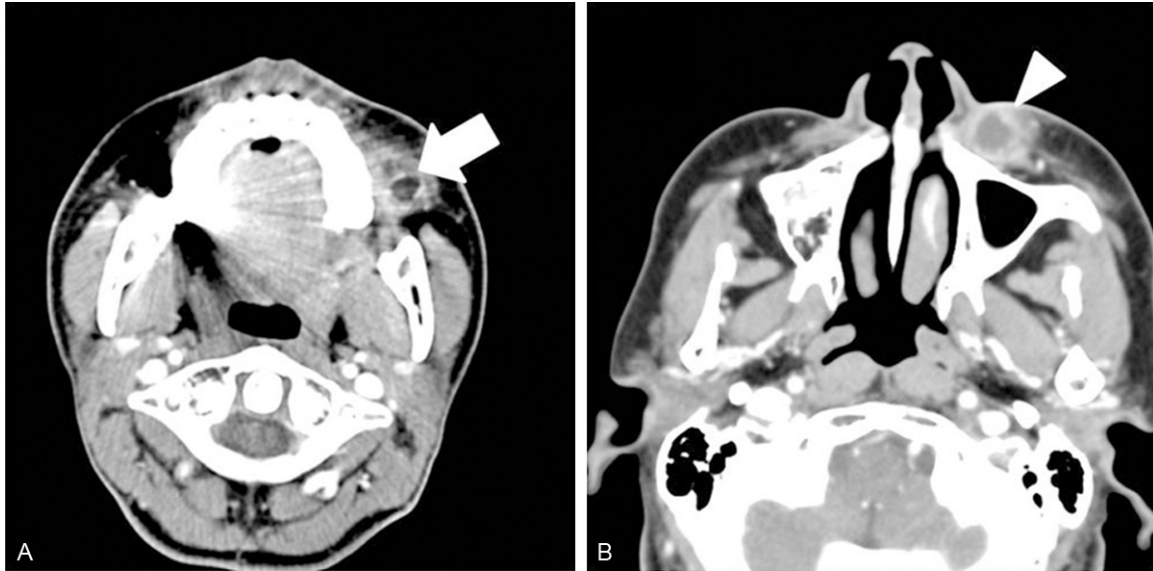
## Case report

### Case 1

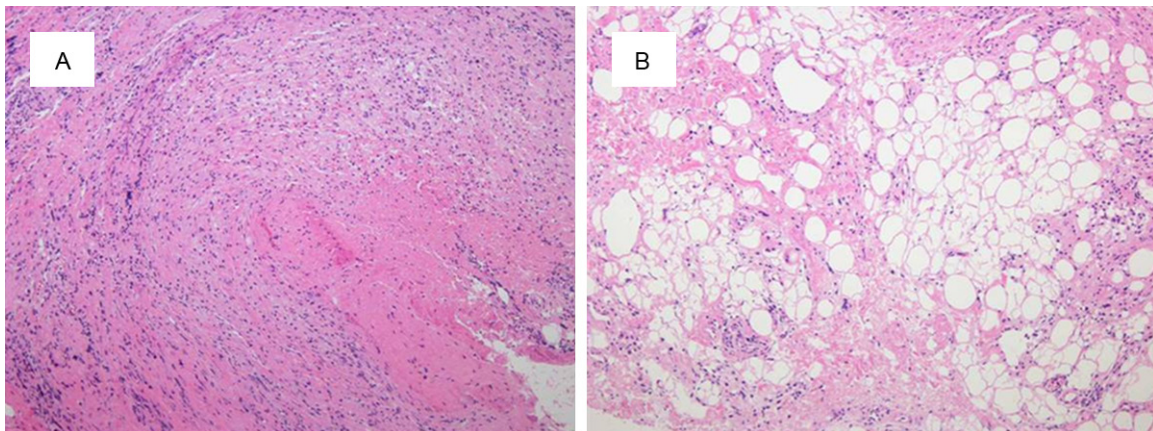
A 37-year-old female patient visited our department because of a palpable mass in the left

cheek. She received autologous fat injection into both cheeks for cosmetic purposes at an esthetic clinic about 18 months ago. One year after that procedure, swelling of the injection site was noticed, and a round and firm subcutaneous mass was identified in the left cheek after the swelling improved. At the local clinic, she received intralesional steroid injection and was given massage therapy for several months; the mass decreased in size. After that, however, a mass reappeared and enlarged. On physical examination, there was a 1.5-cm sized, round, firm mass in the left cheek. There was neither pain nor tenderness at palpation. Enhanced computed tomography scan revealed a 9-mm, peripherally enhancing low-density mass in the buccal fat pad of the left cheek (**Figure 1A**).

Surgical excision via the intraoral approach was done. A 3-cm horizontal incision was made in the buccal mucosa. A multilobulated diffuse cystic mass firmly attached to the surrounding tissue. The mass and most of the surrounding inflammatory tissue were clearly excised. Histopathologic examination showed the characteristic features of lipogranuloma. Numerous, variable-sized, round- to oval-shaped empty spaces containing lipid materials were identified. These spaces were surrounded by histiocyte-prominent foreign body-type giant cell reactions with



**Figure 1.** A. Preoperative computed tomography scan of Case 1. An axial image shows a peripherally enhancing ill-defined mass with low-density mass (white arrow) in the buccal fat pad of the left cheek. B. Preoperative computed tomography scan of Case 2. An axial image shows an irregular-shaped, peripherally enhancing low-density mass (arrow head) in the subcutaneous fat layer of the left cheek. The mass is surrounded by diffuse inflammatory tissue, and its overlying skin is thickened.



**Figure 2.** Histopathologic findings of Case 1 show the characteristic features of lipogranuloma. A. Chronic granulomatous inflammatory cells are infiltrated. B. Numerous, variable-sized lipid vacuoles are surrounded by histiocytes and foreign body-type giant cells. There are prominent histiocytic and foreign body-type giant cell reactions with the areas of fibrosis and fat necrosis (A. H&E stain,  $\times 40$ , B. H&E stain,  $\times 100$ ).

the areas of fibrosis and fat necrosis (**Figure 2**). At a 2-year follow-up, there was no evidence of recurrence.

#### Case 2

A 52-year-old female patient presented with a 3-month history of painless swelling in the left cheek. One year prior to this presentation, she had received autologous fat injection into both cheeks for cosmetic purposes at another esthetic

clinic. Physical examination revealed a 2-cm, round, firm, erythematous swelling in the left cheek. There was neither pain nor tenderness at palpation. On an enhanced CT scan, a 1-cm, irregular-shaped, peripherally enhancing low-density mass was noticed in the subcutaneous fat layer of the left cheek (**Figure 1B**). The overlying skin was thickened. Surgical excision was done with the same technique. Histopathologic examination showed the typi-

cal features of lipogranuloma with foreign body reactions. After surgery, the mass and swelling resolved. There was no recurrence or complication at a 18-month follow-up.

### Discussion

Facial autologous fat injection has been popular in clinical practice during the past decade. Generally, autologous fat injection provides excellent results and few serious complications [8, 9]. We described 2 patients with delayed buccal lipogranuloma formation following autologous fat injection who underwent surgery and had uneventful postoperative course.

Two different mechanisms have been proposed for the etiology of lipogranuloma. One is an exogenous mechanism through foreign body reactions to lipid or oil-like substance which result from inability of the body to metabolize exogenous lipids in the tissue interstitium; the other is endogenous degeneration of lipids secondary to allergic reactions and/or trauma [10]. The etiology of lipogranuloma in our patients is difficult to unravel. Since our patients did not have any events related to endogenous lipogranuloma formation, their mechanisms seem to be exogenous.

In general, lipogranuloma is formed at the site of injection. However, there have been several cases in which lipogranuloma developed through tissue plane or lymphatic spread distant from the injection site. Periorbital lipogranuloma following fat injection into the forehead is relatively common. In such cases, migrating lipogranuloma formation occurs by gravity and facial muscle movement. The extremely thin skin of the periorbicular area is another factor for migrating lipogranuloma formation [4, 5]. However, fat tissue injected into the cheek does not migrate easily, and cheek skin is not so thin as periorbital skin. Therefore, lipogranuloma in this area may not frequently occur.

Cryopreservation of harvested fat tissue can lower the viability of fat cells, consequently increasing risk of foreign body reactions and inflammation. Injection may also facilitate migration of cryopreserved fat tissue to the area distant from the injection site [3].

When making a diagnosis of lipogranuloma, it is important to consider patient history related

to lipid deposition or trauma. In cases of fat injection, the site and frequency of injection as well as cryopreservation of fat tissue should be considered. In our cases, lipogranuloma was formed at the site where the procedure had been undertaken. Fat tissue was injected once immediately after being harvested.

Radiologic imaging studies, such as CT and MRI, can help make a diagnosis. On nonenhanced CT scans, lipogranuloma appears as an irregular-shaped, ill-defined mass with multiple locules of fat deposits. The lesion appears heterogeneously isointense on both T1- and T2-weighted images. Multiple, speckled, or nodular well-defined foci are scattered within the lesion, which demonstrate high signals on T1-weighted images and intermediate signals on T2-weighted images, corresponding to fatty tissue [9]. However, a definite diagnosis lipogranuloma can be established by histological examination of excised specimens. Histopathological examination shows numerous, variable-sized microcysts containing lipid materials with surrounding prominent granulomatous inflammatory cell infiltration, such as histiocytes, lymphocytes, and foreign body-type giant cells. It also has the areas of fibrosis and fat necrosis [11].

In patients with lipogranuloma, conservative treatment with anti-inflammatory agents or steroids may be effective, and local injection of steroids is also efficient. However, surgical removal should be considered in failure cases [5, 12]. Surgical approaches for the removal of lipogranuloma depends on its location. Most of the lipogranulomas secondary to facial autologous fat injection can be completely removed by the external approach [12-14]. Like our cases, lipogranuloma formed in the cheek, removal via the intraoral approach is worthy of consideration.

In summary, lipogranuloma formation following facial autologous fat injection is a rare condition, but a high level of clinical suspicion is necessary in patients with history of fat injection. A definite diagnosis of lipogranuloma can be made by its characteristic histological features. Although conservative treatments, such as systemic administration or intralesional injection of steroids, have been recommended as the treatment of choice, surgical excision should be considered in failure or recurrent cases.

**Disclosure of conflict of interest**

None.

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