



CASE REPORT

Late Onset Foreign Body Reaction due to Poly-L-Lactic Acid Facial Injections for Cosmetic Purpose

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The safety and efficacy of Poly-L-lactic acid (PLLA) as an injectable facial volumizer for the treatment of lipoatrophy and facial rejuvenation has been widely proven. We experienced a remarkable case of deep-seated nodules on both the cheeks of 57-year-old female 18-months after administration of PLLA filler injection for cosmetic purpose and performed a skin biopsy. With hematoxylin and eosin stain, the nodule showed non-caseating granulomas consisting of histiocytes with central foreign bodies in the dermis. This case report represents the late-onset foreign body reaction due to PLLA facial injections. (**Ann Dermatol 32(6) 519~522, 2020**)

-Keywords-

Foreign-body reaction, Granuloma, Poly-L-lactic acid

INTRODUCTION

Correction of aging changes and contour deformities has been a general issue for decades. Various materials have been used as tissue augmentation agents by administering into the tissues. Cosmetic fillers are mainly classified into four categories; the calcium hydroxyapatite-based agent,

the poly-L-lactic acid (PLLA) agent (Sculptra[®]; Dermik Laboratories, Paris, France), the collagen-based filler with polymethyl methacrylate crystals, and hyaluronic acid-based fillers¹.

Considering the stability of PLLA and ease of procedure, PLLA filler injection is often performed for the management of facial aging. PLLA filler has been approved by the United States Food and Drug Administration as the first injectable facial volumizer for the treatment of lipoatrophy in 2004. During the last decade, PLLA filler has been utilized for various purposes such as restoration of lipoatrophy in patients infected with human immunodeficiency virus or correction of facial lines or wrinkles and augmenting depressed parts of the face. The mechanism of action involves the stimulation of collagen and the synthesis of other connective tissues. As the PLLA filler is biodegradable in nature, the duration of correction remains for 1 to 2 years². However, despite its noted efficacy, many side effects have also been reported². Herein, we describe a case of formation of nodules due to foreign body reaction followed by injection of PLLA filler.

CASE REPORT

A 57-year-old female patient presented with asymptomatic skin-colored firm nodules on both the cheeks, which had persisted for one month. She had a history administration of PLLA filler (Sculptra[®]) injection for restoration of facial volume at these sites 18 months back.

Physical examination revealed multiple, bilaterally distributed, well-marginated, round-shaped, and firm skin-colored nodules on both the cheeks (Fig. 1).

Histopathological examination of the cheek revealed non-caseating granulomas consisting of histiocytes with central foreign bodies in the dermis. The translucent, long, and spiky particles were considered as filler constituents lo-

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cated in the foreign body-type multinucleated giant cells. Granulomas were surrounded by chronic inflammatory cells, which were predominantly lymphocytes accompanied by reactive dermal fibrosis. The histopathological features were supportive of foreign body reactions (Fig. 2).

The patient was treated with two courses of 20 mg/ml triamcinolone intralesional injections in the lesions at a 2-weeks interval. Subsequent to treatment, complete disappearance of the palpable nodules was observed. No recurrence of the lesions was observed for 2 years. We received the patient's consent form about publishing all photographic materials.

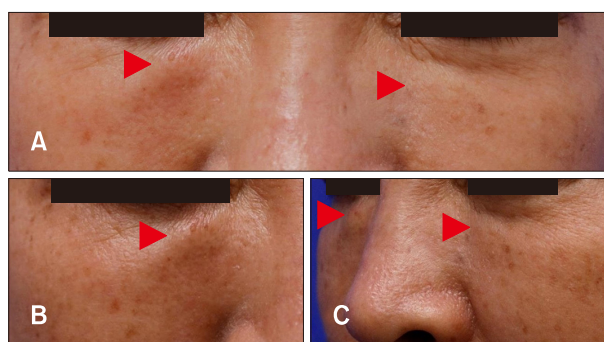


Fig. 1. (A) Skin colored nodules symmetrically distributed on both the infraorbital areas of the face. (B) Close-up view of ill-demarcated, oval-shaped, and firm nodules on the right infraorbital area. The right nodule is slightly erythematous to orange colored and larger than the left one. (C) Side view of the lesions which are showing protrusion. Lesions are indicated as red arrowheads.

DISCUSSION

The PLLA filler is still a commonly used important agent, and it has known to facilitate correction of aging with minimal adverse events^{3,4}. The action of the mechanism of PLLA is as follows. After intradermal injection of PLLA, mannitol, carmellose, and xylocaine are reabsorbed rapidly between 24 hours to 3 days, and the PLLA spheres are left behind. Subsequently, the PLLA spheres undergo a process of biodegradation. PLLA is progressively hydrolyzed into monomers or oligomers⁵. Later, the remains of the hydrolyzed products of PLLA are subjected to phag-

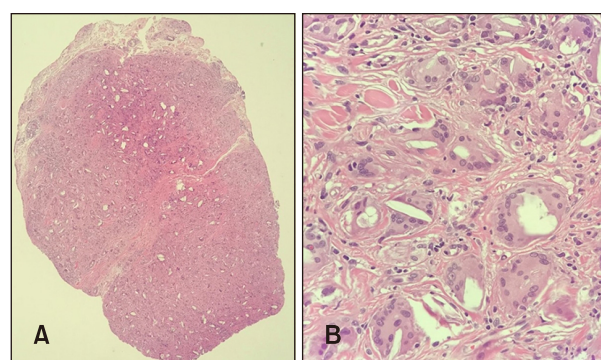


Fig. 2. (A) Histopathologic findings show multiple and scattered polymorphous foreign body reactive to fibrotic change in the dermis (H&E, ×40). (B) At higher power, non-caseating granulomas consisting of histiocytes, lymphocytes, and multinucleated giant cells with a central foreign body in the deep dermis can be visualized (H&E, ×400).

Table 1. Summary of reported cases of granulomatous reaction after poly-L-lactic acid injection for cosmetic purpose

| No | Study | Age(yr)/sex, nationality | Onset duration after injection | Treatment | Site of skin lesion |
|----|-------------------------------------|--------------------------|--------------------------------|---|---------------------|
| 1 | Apikian et al. ⁴ (2007) | 49/Female, Australian | 6 wk | Surgical excision | Infraorbital area |
| 2 | | 56/Female, Australian | 7 d | No treatment | Infraorbital area |
| 3 | | 57/Female, Australian | 6 wk | No treatment | Intraorbital area |
| 4 | Reszko et al. ⁸ (2009) | 62/Female, Caucasian | 12 mo | Intralesional triamcinolone injection, minocycline | Intraorbital area |
| 5 | Dijkema et al. ¹⁴ (2005) | 64/Female, Netherlander | 14 mo | surgical excision | Upper lip |
| 6 | | 44/Female, Caucasian | 6 mo | Surgical excision | Zygoma region |
| 7 | Kim et al. ¹² (2016) | 47/Female, Korean | 16 mo | 100% trichloroacetic acid peel | Lower eyelids |
| 8 | O'Daniel ¹³ (2017) | 50/Female, American | 16 mo | Oral corticosteroids, intralesional triamcinolone injection | Jawline |
| 9 | Present case | 57/Female, Korean | 18 mo | Intralesional triamcinolone injection | Infraorbital area |

ocytosis by macrophages⁶. PLLA acts as a stimulant for fibroblasts, thereby inducing synthesis of new collagen, which produces the cosmetic result⁷.

PLLA use has not always been free of complications. Short-term adverse reactions to PLLA injections reported in the literature include pain, edema, bleeding, ecchymosis, dyschromia, overcorrection, embolism, and localized cellulitis⁸. These side effects usually occur within days after injection and resolve spontaneously within 1 to 2 weeks. There have been cases of PLLA-induced granulomas in both orthopedics and general surgery⁸⁻¹¹. Persistent palpable subcutaneous papules or nodules at the injection sites characterize intermediate and late adverse reactions¹. There was one case of paraffinoma that clinically mimicked xanthelasma in both lower eyelids 2 years after PLLA injection¹². This patient showed well-demarcated yellowish plaque lesion and did not improve with intralesional injection of triamcinolone. Authors said 100% trichloroacetic acid peel was more effective. Another case of late-onset nodular reaction after PLLA injection was reported in the United States¹³. This late-onset nodule appeared 16 months post-initial injection and took over a year of treatment with oral corticosteroids and periodic intralesional steroid injections for nodules to resolve. Histopathologic examination was not performed in this case. Histologically subcutaneous nodules show deposits of PLLA with scarce inflammatory infiltrate. Late-onset nodules show PLLA fragments in partial dissolution located primarily within the foreign body giant cells and embedded in the fibrous tissue. Fibrosis is generally sparse. Chronic inflammatory infiltrate, macrophages, and variable degrees of necrosis have also been reported⁸. Reported cases of granulomatous reaction after poly-L-lactic acid injection were presented at Table 1^{4,8,12-14}.

Treatment options for late-onset subcutaneous nodules include intralesional steroids, systemic steroids, systemic antibiotics, intense pulsed light, 5-fluorouracil, allopurinol, and surgical removal⁸. In this case, intralesional triamcinolone (20 mg/ml) injection was found to be very effective. There are some reported cases of PLLA filler induced late-onset foreign body granulomatous reaction in Europe and America^{14,15}, but there have been rare reports in Korea. In addition, rapid improvement using triamcinolone intralesional injection is notable compared with previous reported cases. We describe the first case of a Korean middle-aged female with the development of multiple nodules, which histologically revealed foreign body granuloma formation following the administration of PLLA into the face for correction of rhytides and contour deformities for educational purpose; successful treatment was observed to be clinically meaningful. It is proposed that suffi-

cient warning by the performer before the injection of PLLA filler may be of importance based on the possibilities of occurrence of subsequent complications.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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DATA SHARING STATEMENT

Research data are not shared.

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