Lower eyelid swelling as a late complication of Bio-Alcamid filler into the malar area

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Abstract
Purpose: To report the late complications associated with permanent filler injections into the malar area for rejuvenation.
Methods: A retrospective case series of three patients who presented with lower eyelid swelling several years following injection of polyalkylimide (Bio-Alcamid) into the malar area.
Results: All patients presented with lower eyelid swelling which developed as a result of spontaneous migration of filler to the lower eyelid. Iatrogenic migration of the filler from the lower eyelid following a trial to remove resulted in an abscess formation which further complicated the removal.
Conclusions: Lower eyelid swelling may be one of the late complications associated with the permanent fillers into the malar area. An attempt at removal of filler by aspiration or bimanual expression may result in late migration of the product and the development of eyelid swelling.

1. Introduction

Age-related volume loss, increased skin laxity, fat loss, fat redistribution, and diminished support from underlying muscle and bone result in observable—and sometimes profound—changes in the aging face. Soft tissue volume loss, particularly in the periorbital and malar areas, is one of the hallmarks of the aging face (Friedman, 2005).

The increasing number of individuals seeking medical solutions for their aging skin or for purely aesthetic and cosmetic indications has led to the recent popularity of many different types of dermal and subdermal fillers. Malar area augmentation is one of the most common usages of these fillers.

The characteristics of an ideal filler include being inexpensive, safe, painless to inject, hypoallergenic, long lasting, reliable (i.e., produces consistent and predictable results), natural feeling under the skin, and easily injectable. In addi-
tion, it should have a short recovery time and a low risk of complications without the need for harvesting from other sites (Brandt and Cazzaniga, 2007). The pharmaceutical industry has responded by providing the cosmetic surgeon with an increasing number of options to meet the increasing demands of consumers.

The purpose of this report is to resent our experience of dealing with late complications of fillers for the facial rejuvenation.

2. Methods

A retrospective case series of three patients who developed lower eyelid swelling several years following soft tissue augmentation of the malar area with injectable fillers. Information obtained included age, gender, types of fillers used, time and site of injections, past medical history, any prior procedures performed before presentation, and complete ophthalmic examination findings.

3. Results

3.1. Case 1

A 45-year-old female presented with a 3-month history of spontaneous, nonpainful left lower eyelid swelling. The patient had undergone augmentation of the malar area on both sides with polyalkylimide (Bio-Alcamid) injection 4 years earlier. There was no history of other surgeries.

Examination revealed diffuse, non-tender, firm mass of the right lower eyelid area without any skin changes (Fig. 1A). The rest of the ophthalmological evaluation was unremarkable for both eyes. The mass was found to be anterior to the orbital septum. The lesion was removed through a subciliary incision. Histopathological examinations of the removed mass revealed foreign body giant cell reaction around the filling material. Postoperatively, the patient developed mild lower eyelid retraction (Fig. 1B).

3.2. Case 2

A 32-year-old woman presented with a 4-month history of diffuse swelling over the right lower eyelid, which had slightly increased in size recently. The patient had polyalkylimide (Bio-Alcamid) injections over the malar area 5 years prior to presentation. A few weeks earlier, the patient underwent aspiration of the part of the polyalkylimide (Bio-Alcamid) material which had migrated from its original place at the malar area. There was no history of any previous surgeries or other injectable fillers.

Examination revealed diffuse, non-tender, firm mass of the right lower eyelid, without any skin changes (Fig. 2A). The rest of the ophthalmological examination was unremarkable. The mass was found anterior to the orbital septum which was removed through a subciliary incision.

Histopathological examination of the removed mass revealed foreign body giant cell reaction around the filler material (Fig. 3). Postoperatively, the patient was doing well at the 6-month follow-up (Fig. 2B).

3.3. Case 3

A 38-year-old woman underwent bilateral augmentation of the malar area with injection of polyalkylimide (Bio-Alcamid). Two years later, she noticed some swelling at the right lower eyelid area. A trial aspiration of the area was performed. Three

Figure 1  (A) A 45-year-old female presented with spontaneous, nonpainful left lower eyelid swelling 4 years following injection of polyalkylimide (Bio-Alcamid) into malar area of both sides. (B) Six months following removal of the mass through a subciliary incision with development of mild lower eyelid retraction.

Figure 2  (A) A 32-year-old female presented with nonpainful right lower eyelid swelling a few weeks following a trial of aspiration with a needle to remove part of the polyalkylimide (Bio-Alcamid) material that had moved from its original place in the right malar area. (B) Six months following removal of the mass through a subciliary incision with very good eyelid position.
days following the attempted aspiration, she developed severe pain and swelling in the lower eyelid and was referred for further management.

Severe tenderness and swelling with abscess collection over the right lower eyelid was found upon examination (Fig. 4A). Drainage of the abscess was performed through stab incisions, and the drained pus revealed *Staphylococcus aureus* from cultures. The patient was treated with oral amoxicillin with clavulanic acid (Fig. 4B) and responded well.

4. Discussion

As the skin ages, the dermis gradually loses its major natural constituents: collagen, elastin, and hyaluronic acid. Collagen acts as the major support protein for the skin; elastin allows skin to stay firm and elastic and to resist wrinkles; hyaluronic acid helps to trap water and add volume and shape to the skin, giving it its plumpness (Elson, 1995; Lupo, 2006). Soft tissue augmentation with dermal fillers can successfully address some of these signs of aging by filling soft tissue defects, scar formation, or disease process. Soft tissue augmentation with dermal fillers has gained widespread acceptance as an alternative to more aggressive, invasive treatment of the aging face (Murray et al., 2005). Dermal fillers, which can be matched appropriately to the cosmetic defects when, injected with proper techniques, and implanted at the optimal depth may provide excellent cosmesis with little or no downtime (Monheit, 1992).

In recent years, the number of available filling agents—both permanent and non-permanent types—has increased dramatically. The readily availability of several agents has improved the range of options for physicians and patients. Non-permanent (resorbable) fillers, such as collagen and hyaluronic acid products are the most commonly used soft tissue augmentation products. These products are generally well tolerated and require a performance of skin test for tolerance to collagen obtained from bovine tissue. Total resorption of these products occurs over a period of 3–12 months, depending on the patient. As a consequence, repeat injections are required at frequent

Figure 3  Histopathology the removed mass from the second patient was found to have foreign body giant cell reaction (yellow arrows) around the filling material (violet) (hematoxylin and eosin stain, ×10).

Figure 4  (A) A 38-year-old woman presented with right lower eyelid abscess few days following a trial of aspiration with a needle to remove part of the polyalkylimide (Bio-Alcamid) material that had moved from its original place in the right malar area. (B) Three months following drainage of the abscess and treatment with two weeks course of systemic antibiotics.
intervals to ensure that the patient benefits fully from the correction.

Injectable fillers have been used for lip enhancement and malar augmentation and for the correction of depressed facial scars, nasolabial folds, marionette lines, tear troughs, and glabellar frown lines. Treatment is tailored to the patient’s individual needs so as to achieve maximal benefit, minimize risk, and obtain the desired correction longevity.

Injectable soft tissue fillers are generally injected into the dermal layer because of the presence of fibroblasts in the extracellular matrix and vasculature allows the incorporation of dermal layer because of the presence of fibroblasts in the extracellular matrix and vasculature allows the incorporation of material by the host (Cohen, 2008; Sherman, 2009). Because of implant nodularity and palpability, some materials can be placed in the subcutaneous layer instead (Homiecz and Watson, 2004).

Hyaluronic acid fillers (labeled as some as the “key to the fountain of youth”) have gained in popularity as dermal filling agents for soft tissue augmentation for three reasons (Brandt and Cazzaniga, 2007). First, hyaluronic acid fillers have a positive effect on soft tissue augmentation. Hyaluronic acid, the most prominent glycosaminoglycan in the skin, potently binds to water. When it is injected into the skin, hyaluronic acid volumizes, softens, and hydrates the skin by stabilizing intercellular structures and producing a viscoelastic network for collagen and elastin fibers to bind together. Second, the risk of allergy is remote with hyaluronic acid because it is identical in all species. Third, hyaluronic acid fillers are considered long lasting because they are effective for approximately 6–12 months (Beasley et al., 2009).

Even with excellent technique, minor adverse effects can occasionally occur with the injection of almost any dermal filler. Some of these adverse effects include burning at the injection site, itching, pain, erythema, edema, bruising, or hematoma formation which tend to occur soon after injection and are usually temporary. They may be managed with ice packs, warm compresses, or watchful waiting. In rare cases, erythema may persist and require treatment.

Major adverse effects associated with the dermal fillers can be avoided with proper technique and care. For example, bleeding can be decreased by having patient refrain from taking all blood thinner medications for 10 days before treatment (Rao et al., 2005).

Other major adverse effects include the appearance of palpable nodules and delayed-onset granulomas which can be decreased by linear threading, which reduces the risk of nodules (Lowe et al., 2005; Lemperle, 2006). Triamcinolone acetonide may be administered to treat these granulomas (Lemperle, 2006).

The permanent fillers available contain polyacrylamide (Aquamid), polyalkylimide (Bio-Alcamid), and collagenes combined with polymethylmethacrylate or hydroxethylmethacrylate. These fillers have to be injected in the subcutaneous or supraperiosteal plane. Because of the serious complications associated with the injection of permanent fillers have limited their use.

Polyalkylimide, a nonresorbable polymeric material, is composed of apyrogenic water (96%) and an alkylimide–amide group (4%). When polyalkylimide is injected, it becomes enclosed within a thin collagen capsule. The few studies investigating the physical and biological characteristics of polyalkylimide have recently reported that it is (1) a completely biocompatible substance, (2) absolutely nontoxic and nonallergenic, and (3) easily injectable (Ellis and Sardesai, 2008; Ramirez et al., 2005). When administered properly, polyalkylimide may be suitable for soft tissue augmentation and correction of tissue deficiencies in posttraumatic injuries, surgical scars, and congenital facial and body microgenia, and for cosmetic applications (Ellis and Sardesai, 2008; Ramirez et al., 2005). Polyalkylimide should be injected into subdermal fat or connective tissue. However, if it is not injected in the subdermal preperiosteal plane at the initial treatment, migration may subsequently occur (Ross and Malhotra, 2009; Karim et al., 2006; Schelke et al., 2009). Aspiration and bimanual expression are performed to remove the migrated product; however, this process may precipitate long-term migration of the product (Ross and Malhotra, 2009; Schelke et al., 2009).

In summary, the diagnosis and treatment of lower eyelid swelling that occurs late following the injection of polyalkylimide represent challenges for many clinicians. Our patients presented with unusual complications, including abscess formation, migration, and persistent swelling, several years following injection of polyalkylimide into the malar area. However, migration of the product does not typically occur because of its hydrophilic and endoprosthetic nature. These complications are more likely to happen after an attempt has been made to remove the product, resulting in the disruption of the collagen capsule surrounding the filler.

References


