Case Report

Delayed Hematoma after Silicone Implant Forehead Augmentation

An earlier version of this report was presented at the Combined Otolaryngological Spring Meetings (COSM), San Diego, CA, USA, April 18–22, 2012.

Bryan Liming,1 Jeffrey Teixeira,2 and Joseph Shvidler1

1Department of Otolaryngology, Madigan Army Medical Center, Tacoma, WA 98431, USA
2F. Edward Hebert School of Medicine, Uniformed Services University of the Health Sciences, Bethesda, MD 20814, USA
Address correspondence to Bryan Liming, bryan.liming@us.army.mil

Received 8 October 2014; Accepted 22 October 2014

Copyright © 2014 Bryan Liming et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract We report the case of a 48-year-old female who presented to our clinic 8 years after silicone implant forehead augmentation with complaints of brow swelling, tenderness, and periorbital edema. Imaging revealed non-rim enhancing fluid collection and underlying bony ridges. Ensuing medical management included antibiotics which lead to resolution of the majority of her symptoms. The patient was then taken for elective removal of the implant with subsequent human acellular tissue matrix reconstruction. In this case report, we describe our decision making process as well as our intraoperative findings and review some of the literature regarding silicone implant complications. We believe this is the first case described of this complication with regard to alloplastic forehead augmentation.

Keywords facial augmentation; silicone implant; augmentation browplasty

1. Introduction

Alloplastic forehead augmentation has been rarely described in the literature [8], with limited mention of augmentation utilizing expanded polytetrafluoroethylene (ePTFE) implants, acrylic implants, and silicone implants. To our knowledge, there are no reports on complications of alloplastic forehead augmentation. Silicone implants used in other applications have been noted to have the propensity to develop capsule formation with subsequent subcapsular hemorrhage and infection. These other applications include duraplasty, orbital floor repair, malar augmentation, and chin augmentation. We will review the delayed complications that have been reported with regard to these applications.

2. Case presentation

A 48-year-old female presented on referral for evaluation after a 24-hour history of forehead pain, swelling, and periorbital edema. She reported a history of forehead augmentation in Korea eight years prior to this and endorsed intermittent painful swelling of the forehead since implant placement. She denied fever or history of trauma. The clinical examination demonstrated bilateral periorbital edema and tenderness to palpation over the forehead. There were no ocular abnormalities and visual acuities were normal bilaterally. A CT scan (Figure 1) was performed which demonstrated a fluid collection within the soft tissues of the forehead and regular ridging of the frontal bone. We initiated antibiotic therapy. She was reexamined at 48 h and was noted to have some improvement but continued to demonstrate persistent edema and tenderness. The antibiotics were continued for 10 days with continued improvement but not complete resolution. At this time, the patient was offered explanation of the implant versus continued observation. She elected to proceed with removal of the implant which posed a reconstructive challenge. The silicone implant and the surrounding fluid had acted as a tissue expander. The patient was happy with the augmented appearance of her forehead and removal of the implant without reconstruction would have given her an aesthetically undesirable result.

A partial trichophytic incision was used to access the implant. Dissection was carried down through the

Figure 1: Axial CT in bone (a) and soft tissue (b) windows showing bony ridges and small fluid collection.
pericranium where we encountered a thick fibrous capsule encasing the implant. On entry into the capsule, we discovered a collection of maroon viscous fluid with darker debris, identified pathologically as organized hematoma. This hematoma was evacuated and the implant was exposed and removed en bloc from the cavity. The implant was noted to be a solid piece of silicone with regular ridging (Figure 2). We noted granulation tissue on the deep surface of the periosteal portion of the implant capsule. Examination of the underlying frontal bone revealed two rows of ridges corresponding to those on the implant.

**Figure 2:** Implant exposed (a) and on back table (b).

We decided to remove the superior row of ridging with an osteotome as it was felt to be potentially cosmetically disfiguring. Reconstruction of the expanded cavity was carried out using a $6 \times 12 \times 1.04-2.8$ mm sheet of human acellular tissue matrix (Alloderm, Life Cell, NJ, USA) that was sculpted into an approximate shape and size as the explanted implant (Figure 3). Vertical cuts were made in Alloderm in order to facilitate draping over the curvature of the frontal bone. The incision was closed in a layered fashion and a pressure dressing was applied. At the 3-month postoperative appointment, the patient demonstrated no pain or discomfort and was aesthetically pleased with her forehead contour (Figure 4).

**Figure 4:** Preoperative (a) and 3-month postoperative (b) lateral views of forehead.

**3. Discussion**

This case represents a complication of alloplastic forehead augmentation secondary to hemorrhage and inflammation. Silastic dural substitutes have been reported to be associated with delayed hemorrhagic complications in various applications. In one report of two cases detailing delayed hematoma formation after silicone duraplasty [1], the length of time between initial implantation and development of complication was 3 to 9 years after implantation. In this report, on surgical exploration, both patients had evidence of clot formation between the dural implant and the fibrous capsule, consistent with operative findings seen in our patient. While our patient’s cultures did not demonstrate microbial growth, another report described a case of peri-implant hemorrhage complicated by *Acinetobacter* infection 32 years after implantation [6].

Silicone implants have also been used in the repair of orbital floor fractures and have been noted to have the propensity to form a peri-implant capsule in this setting also. In a series of 4 patients who presented in a delayed fashion (1 to 20 years) with complications of silicone sheet orbital floor repair [7], 3 patients had orbital mass effect from chronic inflammation and fibrosis while a fourth patient developed an abscess. An additional report described a periprosthetic hematoma requiring orbital exploration and implant removal 18 years after silastic implant repair [2].
With regard to facial aesthetic surgery, silastic malar implants have been used for many years. In one retrospective review of 60 patients over five years [3], the authors reported an overall complication rate of 16.7% with no report of hematomas, seromas, or bony resorption.

Silicone is a hydrophobic polymer that acquires a layer of host proteins upon implantation [5]. It provokes a foreign body reaction leading to development of a fibrous capsule. In situations where removal is necessary, this capsule facilitates explantation. It has been hypothesized, however, that the space between the fibrous capsule and implant is a potential space that can be filled with hemorrhagic fluid with disruption of the fragile capillaries in the fibrous capsule [4]. This may be caused by repetitive microtrauma to the implant and we believe that this hemorrhagic process can become secondarily infected and/or inflamed leading to granulation tissue formation which results in a cycle of repetitive hemorrhage, subsequent inflammation and/or infection, and recurrent acute exacerbation of symptoms. Based on our intraoperative findings, we suspect that the granulation tissue within the capsule intermittently bleeds leading to slow accumulation of hematoma. The increased pressure likely accelerated the underlying bony resorption and expanded the soft tissues of the forehead.

4. Conclusion

We believe that this case is the first reported case of delayed hematoma complicating an alloplastic forehead implant. The reconstructive challenge after explantation was due to the secondary bony resorption and tissue expansion. The potential for these complications must be considered when evaluating and counseling a patient for alloplastic facial augmentation. Soft tissue reaction and hematoma should be considered in a patient with a history of alloplastic facial augmentation who presents with delayed pain and swelling at the implant site.

Declaration The authors declare no funding or conflict of interests. The views expressed are those of the authors and do not reflect the official policy of the Department of the Army, the Department of Defense, or the U.S. Government.

References