

14. Kridel RW, Scott BA, Foda HM. The tongue-in-groove technique in septorhinoplasty: a 10-year experience. *Arch Facial Plast Surg* 1999;1:246–256
15. Byrd HS, Andochick S, Copit S, et al. Septal extension grafts: a method of controlling tip projection shape. *Plast Reconstr Surg* 1997;100:999–1010
16. Perkins K, Shah A, Patel A, et al. The effect of nasal tip rotation on upper lip length. *Aesthet Surg J* 2016;37:504–510

A Rare Cause for Recurrent Implant-Related Inflammation of Orbit: Dacryocystitis

Zehra Betül Gümüş, MD* and Nazim Gümüş, MD†

Abstract: Ultra-thin porous polyethylene has been widely preferred in orbital blow out fracture repair for many years as a safe and stable material. Delayed complications related to the implant in orbital blow out fracture repair are very rare and usually begin as a periorbital inflammation. Infections and tissue reaction to the foreign body are regarded as main causes for implant-related inflammation of which symptoms may vary among the patients and may involve subacute and chronic eyelid swelling, skin redness, pain, conjunctival injection, proptosis, and acute orbital inflammation.

Presented here is a patient of recurrent periorbital inflammation who underwent orbital floor repair with ultra-thin porous polyethylene sheet which was complicated by dacryocystitis in the late follow-up period.

Key Words: Dacryocystitis, inflammation, Medpor, orbital floor

Among various alloplastic materials, ultra-thin porous polyethylene has been widely preferred in orbital blow out fracture reconstruction for many years as a safe and stable material. Its long-term durability and safety have been well known, making the porous polyethylene sheet a good choice for orbital floor repair. It has unique properties as having pure polyethylene with only 1 manufacturing process and pore size (150–200 μm) through which vascular proliferation and consequently implant vascularization may occur. Antiinflammatory cells come through into the pores and locate around the implant, making the implant resistant to possible infections.¹

It has some advantages over the other materials such as being stable and biocompatible, abundant, resilient, nonresorbable, economical in many countries, and easy to use and adjustment.²

From the *Ophthalmology Department of Health Sciences, University Adana City Hospital, Adana; and †Plastic, Reconstructive, and Aesthetic Surgery Department of Mersin University Medical Faculty, Mersin, Turkey.

Received July 19, 2018.

Accepted for publication August 17, 2018.

Address correspondence and reprint requests to Nazim Gümüş, MD, Mersin Üniversitesi Tıp Fakültesi, Plastik Rekonstrüktif ve Estetik Cerrahi ABD, Mersin, Turkey 33343; E-mail: gumus1970@mersin.edu.tr

The authors report no conflicts of interest.
Copyright © 2019 by Mutaz B. Habal, MD
ISSN: 1049-2275

DOI: 10.1097/SCS.00000000000005059

However, it is not free of complications in the early or late stages of implantation. Infection, hematoma, seroma, subcutaneous palpation, and deformation of the contour, displacement, extrusion through the skin and compression of nerves and of other important structures may be occurred in the early stages of orbital floor reconstruction with ultra-thin porous polyethylene. Delayed complications related to the implant in orbital blow out fracture repairs are very rare and usually begin as a periorbital inflammation.^{3,4}

Implant-related inflammation symptoms vary among the patients in the late period, which may involve subacute and chronic eyelid swelling, skin redness, pain, conjunctival injection, proptosis, and acute fulminant orbital inflammation such as orbital cellulitis and intraorbital abscess as a single sign or a few together. Infections and tissue reaction to the foreign body are regarded as main causes for implant-related inflammation; however, some predisposing factors serve as precipitating causes of periorbital inflammation after alloplastic implant placement such as dental surgery, upper respiratory infection, implant migration into the maxillary or ethmoid sinus, rhinoplasty, snorting cocaine, fistulous tracts between implant capsule and the maxillary sinus, and paranasal sinus infections.^{3–6}

Presented here is a patient of recurrent periorbital inflammation who underwent orbital floor repair with ultra-thin porous polyethylene sheet which was complicated by dacryocystitis in the late follow-up period.

CLINICAL REPORT

A 32-year-old man was admitted to our emergency clinic, complaining of blunt trauma to his face and right orbit. Periorbital ecchymosis, edema, diplopia, restriction of eye movements, and enophthalmos were found on the physical examination of right orbit, suspecting an orbital floor fracture necessitating surgical repair. Computed tomography (CT) studies in the axial and coronal planes were obtained after the examination and right orbital floor fracture, orbital content herniation into maxillary sinus, and severe volume discrepancy with the left intact orbit were determined. Also there was anterior wall fracture of left maxillary sinus, requiring surgical repair by using mini-screw and plate. Ophthalmologic examination was obtained in the preoperative period.

In the operation, orbital floor was explored by the way of a sub tarsal incision located a pre-existing wound. Subperiosteal area was meticulously dissected along the orbital floor after incision of the periosteum of the inferior orbital rim, and both orbital floor fracture area and herniated soft tissues were seen. Entrapped orbital contents were lifted out of the fracture site and repositioned. Bony defect area was measured as 1.7 cm². An ultra-thin sheet of porous polyethylene, Medpor (Porex Surgical Inc, College Park, GA), was placed over orbital floor fracture to repair the bony defect after it was soaked in antibiotic solution containing 1 g ceftriaxone in 50 mL saline. Implant was in sizes of 0.85 mm thick, 27 mm wide, and 36 mm long. A forced duction test was performed to control eye movements and any entrapment of orbital content and then incisions were closed in the usual manner (Fig. 1A). Accompanying facial fractures were repaired by using titanium mini-plate systems to provide rigid internal fixation.

One year later the operation, he came to our clinic with complaints of eyelid swelling, skin redness, and conjunctival injection. On his clinical, radiological, and ophthalmological examinations, there was no reason or predisposing factor obtained from findings to explain clinical appearance, so it was regarded as an implant-related inflammation and he was given intravenous antibiotic treatment and cold compress application for 10 days. Periorbital inflammation subsided in a few days; however, some swelling persisted in the lower eyelid (Fig. 1B).

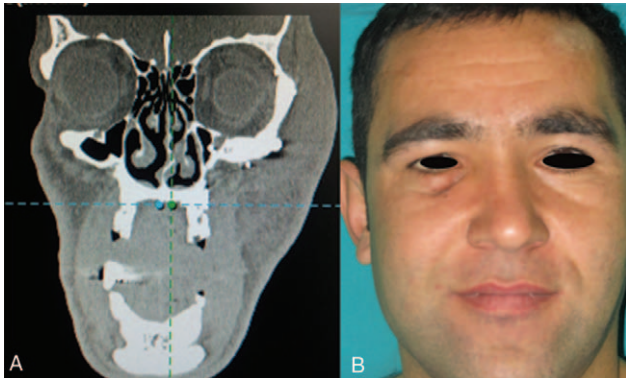


FIGURE 1. (A) Computerized tomography of the repaired right orbital floor fracture with a thin layer of porous polyethylene sheet. (B) Appearance of the lower lid following the first inflammatory attack. Note that some lower lid edema persisted.

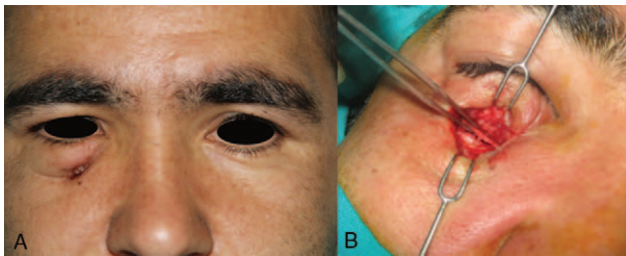


FIGURE 2. (A) Extrusion of the implant from sub tarsal incision scar. (B) Explantation of the porous polyethylene sheet in the operation.

Six months later the first inflammatory attack, the same clinical presentation took place again. Similarly, there is no specific finding in clinical and radiological evaluations to point out the cause of the inflammation, so similar treatment was performed and inflammation subsided. Three months after the second attack, acute periorbital inflammation and implant extrusion through sub tarsal incision scar developed (Fig. 2A).

Orbital implant was removed through pre-existing sub tarsal scar and sent to bacteriological culture (Fig. 2B). Periorbital inflammation subsided significantly in postoperative a few days and there was no sign for bacteriological growth in the culture (Fig. 3A, B). Nearly complete regression was occurred in the eyelid swelling and redness following 2 weeks period of implant removal; however, 4 months after another inflammatory attack developed over the periorbital area, which was due to dacryocystitis. Ophthalmological examination and dacryocystography revealed complete obstruction of nasolacrimal duct (Fig. 4A, B). Dacryocystorhinostomy opened

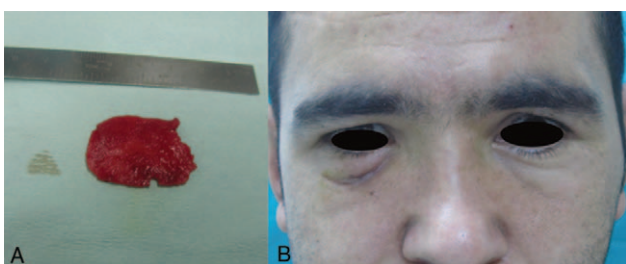


FIGURE 3. (A) Appearance of the implant after removal. There was no sign for significant infection. (B) The right lower lid 3 months after the implant removal.

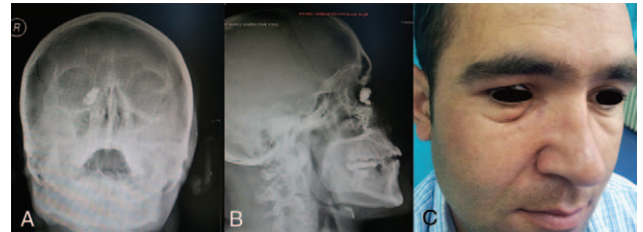


FIGURE 4. (A, B) Frontal and lateral views of the lacrimal drainage system on the dacryocystography showing complete obstruction in the nasolacrimal duct. (C) Three months after dacryocystorhinostomy operation.

the passage of the duct and solved the recurrent periorbital inflammation (Fig. 4C). In the 1-year follow-up, no recurrence was observed.

DISCUSSION

Porous polyethylene has been widely used in the bone reconstruction of the face as an effective choice among the other materials, which is highly biocompatible, flexible, and abundant biomaterial. Its porous structure makes vascularization possible through the implant, resulting in resistance to the possible infections after implantation of it. However, it is not free of infectious or inflammatory complications in the early or late period of the use.¹⁻⁴ Porous polyethylene sheet has been utilized in the repair of orbital blow out fracture with the advantages of ultra-thin and porous structures for at least 2 decades. Clinical consequences of blow out fracture such as enophthalmos, hypoesthesia, diplopia, restricted eye movement, reduced orbital volume, entrapped infraorbital nerve, and eye muscles have been successfully restored by using it in the repair.⁷

Acute orbital inflammation or delayed onset inflammation may take place after the placement of porous polyethylene sheet over orbital floor fracture, which is regarded as a rare clinical situation. However, similar outcomes of other alloplastic implants have been reported more than porous polyethylene.^{1,2} A retrospective study covering 1453 patients who underwent Medpor reconstruction, reported only 6 infection cases in different regions (0.41%), and 4 of the implants needed removal.¹ Kyung et al⁸ conducted a retrospective study of 485 patients with fractures of the medial wall and floor of the orbit, and did not report any cases of infection.

Some predisposing factors may give rise to the risk for infectious complications of implant in the late period of the implantation, which may serve as a precipitating cause for infection such as dental surgery, upper respiratory infection, implant extrusion into the maxillary sinus, implant migration, rhinoplasty, snorting cocaine, and paranasal sinus infections.^{4,9} If a periorbital inflammation is occurred in a patient who has an orbital implant, it seems to be helpful to first look at the presence of predisposing factors. When possible infection sources are found and treated effectively, periorbital inflammation can subside in a short time and implant may be protected and left in place without needing removal.

In this case, a recurrent periorbital inflammation developed in the late period of implantation. Although any specific predisposing factor could not be found in the clinical and radiological examinations, inflammation subsided with the medical treatment in a few days, but recurrence and finally implant extrusion occurred. Interestingly, after the removal of the implant, another inflammatory attack took place in the periorbital region, suggesting the presence of a source that was able to trigger the inflammation on occasion. Following the last recurrence, ophthalmologic examination detected a dacryocystitis and then dacryocystography revealed a

complete obliteration of the nasolacrimal duct which was possible cause for the recurrent inflammation.

Dacryocystitis is not a rare disorder of lacrimal drainage system arising from the inflammation of the lacrimal sac and nasolacrimal duct, which is caused by the microorganisms coming from the conjunctiva or the nasal mucosa and is associated with the functional or anatomical obstruction of the nasolacrimal duct. Collection of tear and mucous secretion in the sac makes a good environment for microorganisms' growth and infection.¹⁰ Dacryocystitis results in a recurrent infection in the lacrimal drainage system of which clinical signs can vary from only increased tear production and epiphora to apparent inflammation mostly in the lower lid and occasionally in the whole periorbital area.¹¹ In the presented patient, it seems that dacryocystitis caused a recurrent infection in the periorbital region and then complicated the orbital implant, leading to extrusion. Combination of antibiotic treatment and cold compress application was effective in subsiding the clinical symptoms of periorbital infection, which was similar to the medical treatment of the dacryocystitis; however, it was not enough to avoid the recurrence and finally, a dacryocystorhinostomy intervention was necessary to keep away the infection source.

In this case, recurrent dacryocystitis might occur only as a coincidence with the orbital implant, or arise from altered functions of orbicular muscle due to the trauma and surgery that can disturb the drainage function of nasolacrimal duct and sac, or take place as a result of medial implant migration to the nasolacrimal system, leading to obstruction. Whatever cause leads to anatomical or functional disturbance in the lacrimal drainage system, periorbital inflammation of a patient who had an orbital floor implant, may arise from dacryocystitis, so anatomical and functional properties of lacrimal drainage system deserve to be evaluated carefully to avoid the recurrence and removal of the implant.

REFERENCES

- de Moraes Ferreira AC, Muñoz XM, Okamoto R, et al. Postoperative complications in craniomaxillofacial reconstruction with Medpor. *J Craniofac Surg* 2016;27:425–428
- Han DH, Chi M. Comparison of the outcomes of blowout fracture repair according to the orbital implant. *J Craniofac Surg* 2011;22:1422–1425
- Kent SS, Kent JS, Allen LH. Porous polyethylene implant associated with orbital cellulitis and intraorbital abscess. *Can J Ophthalmol* 2012;47:e38–e39
- Aryasit O, Ng DS, Goh ASC, et al. Delayed onset porous polyethylene implant-related inflammation after orbital blowout fracture repair: four case reports. *BMC Ophthalmol* 2016;16:94
- Ng SG, Madill SA, Inkster CF, et al. Medpor porous polyethylene implants in orbital blowout fracture repair. *Eye (Lond)* 2001;15:578–582
- Lee S, Maronian N, Most SP, et al. Porous high-density polyethylene for orbital reconstruction. *Arch Otolaryngol Head Neck Surg* 2005;131:446–450
- Villarreal PM, Monje F, Morillo AJ, et al. Porous polyethylene implants in orbital floor reconstruction. *Plast Reconstr Surg* 2002;109:877–885
- Kyung H, Song SH, Kang N, et al. Medpor implant fixation using fibrin glue in blowout fracture surgery. *J Craniofac Surg* 2013;24:1781–1784
- Mauriello JA Jr, Hargrave S, Yee S, et al. Infection after insertion of alloplastic orbital floor implants. *Am J Ophthalmol* 1994;117:246–252
- Chakrabarti S, Dasgupta S, Banerjee M, et al. Role of histomorphology and chronic inflammation score in chronic dacryocystitis. *J Clin Diagn Res* 2016;10:EC01–EC03
- Costea CF, Dumitrescu GF, Turliuc MD, et al. A 16-year retrospective study of dacryocystitis in adult patients in the Moldavia Region, Romania. *Rom J Morphol Embryol* 2017;58:537–544

Trichoepithelioma Misdiagnosed as Basal Cell Carcinoma

Kyo Joon Kang, MD, Bomie Florence Seo, MD, PhD,
Jongweon Shin, MD, PhD, Ho Kwon, MD, PhD,
Jun Hee Byeon, MD, PhD, and Sung-No Jung, MD, PhD

Abstract: Trichoepithelioma is a benign tumor which can be easily confused with basal cell carcinoma. Since both tumors are histologically similar, it is important to distinguish them correctly as the courses for treatment are very different. Basal cell carcinoma is malignant; therefore, it requires total surgical excision, including a wide healthy margin. In contrast, trichoepithelioma requires only simple excision. A study involving a 69-year-old woman with a simple mass on the nasal tip was described in this study. On examination, a single skin-colored, round protruding mass (approximately 0.5 × 0.5 cm) was observed. Simple excision was performed and basal cell carcinoma was diagnosed at the initial biopsy. However, clinically, we considered it to be a benign tumor; therefore, we sought a histologic reconfirmation. Consequently, trichoepithelioma was diagnosed on histopathologic examination. When a small, round protruding simple mass is histologically diagnosed to be a basal cell carcinoma, it is important to suspect trichoepithelioma and seek histologic reconfirmation.

Key Words: Basal cell carcinoma, misdiagnosis, trichoepithelioma

Trichoepithelioma is a benign tumor which can rarely transform into a malignant tumor, such as basal cell carcinoma.^{1,2} It is important to differentiate trichoepithelioma from basal cell carcinoma owing to the different treatment modalities that will be prescribed. Basal cell carcinoma is malignant and requires total surgical excision with a wide healthy surgical margin while trichoepithelioma requires only simple excision. Histologically, both conditions are similar and can be easily confused with one another.¹ Here we present a study of trichoepithelioma that was misdiagnosed as basal cell carcinoma.

CLINICAL PRESENTATION

A 69-year-old woman, with underlying diabetes and hypertension, was referred to an outpatient clinic with a simple mass on the nasal tip. On examination, a single skin-colored, round protruding mass

From the Department of Plastic and Reconstructive Surgery, Uijeongbu St Mary's Hospital, College of Medicine, the Catholic University of Korea, Gyeonggi-do, Korea.

Received May 26, 2018.

Accepted for publication September 2, 2018.

Address correspondence and reprint requests to Sung-No Jung, MD, PhD, Department of Plastic and Reconstructive Surgery, Uijeongbu St Mary's Hospital, College of Medicine, the Catholic University of Korea, 271 Chenbo-ro, Uijeongbu-si, Gyeonggi-do, 11765, Korea; E-mail: jsn7190@hanmail.net

The authors report no conflicts of interest.
Copyright © 2019 by Mutaz B. Habal, MD
ISSN: 1049-2275

DOI: 10.1097/SCS.0000000000005089