Epithelial Downgrowth Complicating Evisceration With Orbital Implant Exposure

We describe an unusual case of implant exposure with epithelial downgrowth into the scleral pouch following evisceration. The patient's clinical course and treatment as well as a histologic analysis of the excised scleral pouch are detailed. Excision of the implant and scleral pouch followed by diamond-shaped dermis-fat graft replacement was eventually required. The internal aspect of the sclera was completely covered with nonkeratinized stratified squamous epithelium. Epithelial downgrowth following evisceration is a rare complication that should be considered when orbital implant exposure occurs or when cysts overlying the sclera are discovered. Epithelial downgrowth needs to be adequately treated to allow for successful socket reconstruction and ocular prosthesis retention.

Evisceration is a common ophthalmic procedure that has historically been used for cases of severe ocular trauma, cosmetic improvement of a disfigured eye, endophthalmitis, and blind, painful eye.1 Evisceration is considered a safe and effective procedure with few postoperative complications. Reported complications include prolonged postoperative pain and swelling, hemorrhage, suppurative, necrosis and extrusion of sclera, orbital cellularitis, meningitis, extrusion of implants, and sympathetic ophthalmia.2-3 We present a case of epithelial downgrowth into the scleral pouch following evisceration. To our knowledge, it is only the third case described in the peer-reviewed literature and the first case described since 1965.2-3


Figure 1. Large anterior orbital conjunctival cyst with underlying area of orbital implant exposure in October 2002, occurring 18 months following scleral patch graft and approximately 2 years following the original evisceration.

Report of a Case. In October 2000, a 28-year-old white man had a blind, painful right eye. The patient had sustained a penetrating injury by scissors to the right eye at 2 years of age. The patient did not have details of the original injury or treatment, and the previous records were not available. Ophthalmic examination in October 2000 showed significant retinal scarring with stromal haze of the cornea in the right eye and an unremarkable left eye. Uncomplicated evisceration of the right eye with removal of the cornea and intraocular contents was performed in standard fashion 1 month later. The internal aspect of the sclera was swabbed with alcohol, and a 20-mm silicone implant was inserted. Histopathologic analysis of the excised cornea showed band keratopathy and endothelial decompensation with evidence of a previous, healed, full-thickness corneal wound. The intraocular contents showed uveal tissue, atrophic retina, and mature bone consistent with osseous metaplasia of the retinal pigment epithelium.

Postoperative follow-up at 1 week and 1 month showed healthy conjunctiva and socket, and the patient was fitted for an ocular prosthesis 2 months later. Examination 1 month after this showed a 5- to 6-mm area of centrally located orbital implant exposure. One week later, in March 2001, the patient underwent right orbital implant reinsertion with scleral patch graft reinforcement and conjunctivoplasty. Histologically, the excised conjunctival tissue revealed epithelial thickening and scarring with chronic inflammation. Examination 1 week and 1 month postoperatively revealed no implant exposure and well-healed conjunctiva. Vaulting of the ocular prosthesis was advised to provide a better fit.

Eighteen months following the scleral patch graft (2 years following the original evisceration), the patient reported displacement of the prosthesis. On examination, a fairly large anterior orbital cyst was noted (Figure 1). Excision of the cyst was performed in October 2002. The cyst was noted to be thin walled, containing a predominantly clear, slightly mucinous fluid. A 3- to
4-mm defect in the sclera was noted directly beneath the cyst, and this was repaired by trimming the scleral edges and suturing the sclera to completely cover the implant. Microscopical evaluation of the excised cyst was consistent with an epithelial inclusion cyst.

Two months later, in January 2003, an additional 2 × 2-mm cyst was noted more inferiorly in the right socket, and a new central area of implant exposure was noted as well (Figure 2). Removal of the implant and residual scleral pouch was performed with a dermis-fat graft for socket reconstruction in February 2003. Good volume augmentation of the right socket was achieved with no complications thus far. The patient has maintained well-formed fornices, good motility, and a well-positioned prosthesis (Figure 3).

Histopathologic Analysis. Gross examination of the excised scleral pouch revealed a 2.2-cm portion of tan/gray soft tissue with an opening anteriorly. Microscopical examination of the scleral pouch showed that the inner surface of the sclera was completely lined by nonkeratinized stratified squamous epithelium (Figure 4).

Comment. Epithelial downgrowth (or “ingrowth”) is a destructive process that may occur following penetrating trauma or surgery. Epithelial cells have a tendency to grow and cover surfaces that provide an adequate source of nutrition. Intraocular epithelial downgrowth into the anterior chamber, around the pupillary border, into the vitreous space, and onto the peripheral retina has been described. The downgrowth usually occurs as a sheet or membranous layer of epithelial cells, or occasionally as epithelial cystic downgrowths. Epithelial downgrowth is well documented in the scientific literature following various ocular procedures, including laser in situ keratomileusis, scleral buckling procedures, goniotomy, penetrating keratoplasty, and traumatic wound dehiscence, as well as following a case of long-term exposure of a hydroxyapatite orbital implant. However, its incidence following eversion is exceedingly rare. To date, only 2 articles about this, both by Wolter, have been published in the peer-reviewed English-language literature. The patient in the initial article by Wolter developed epithelial downgrowth that mimicked tumorlike growth 20 years after evisceration without an orbital implant. Histologic examination of the excised mass revealed the old scleral pouch covered with scar tissue and overlying conjunctiva as well as several small cysts. In the second article by Wolter, the scleral pouch enclosing a polyethylene orbital implant had become progressively larger over several months, eventually revealing several cysts containing clear fluid. In both cases, the inside surface of the scleral pouch was covered with nonkeratinized stratified squamous epithelium. Wolter's articles, particularly the latter, bear great similarity to our case.

In our case, we feel that the epithelial downgrowth most likely occurred after the orbital implant became exposed. The implant exposure may have been related to the tight fit of the prosthesis, which allowed it to rub against and wear away the conjunctiva overlying the sclera, leaving the directly underlying avascular sclera devoid of a nutritional supply. When devoid of an overlying nutritional supply, the sclera may “melt” away, yielding a

Figure 2. Recurrent orbital implant exposure visible through the ocular prosthesis (January 2003).

Figure 3. Good volume replacement of the socket following dermis-fat graft insertion.
potential portal of entry for epithelial cells to grow inside the intact scleral pouch. While the scleral defect was repaired promptly after implant exposure was noted, the repeated recurrence of implant exposure suggests that the downgrowth had likely already occurred. This patient also had a history of previous penetrating ocular trauma, which may also be associated with epithelial downgrowth. However, the corneal specimen obtained during the original evisceration revealed no histologic evidence of epithelial downgrowth. Additionally, alcohol, a known epithelial toxic agent, was used to swab the sclera during the evisceration. Regardless of the cause of epithelial downgrowth in this patient, it should be recognized that such a process can occur, albeit infrequently, following evisceration, and it should be considered a possibility in unusual cases of implant exposure. Surgical correction of implant exposure in such cases should include attention to treatment of epithelial downgrowth, if suspected, to allow successful socket reconstruction and ocular prostheses. This case, removal of the implant and scleral pouch followed by placement of a dermis-fat graft was ultimately effective. Other treatment options described for ocular epithelial downgrowth have included irradiation, cryotherapy, laser photocoagulation, surgical excision, and, more recently, 5-fluorouracil.

A larger study analyzing the excised sclera of patients who have developed recurrent implant exposure following evisceration may be useful in determining a more accurate incidence of epithelial downgrowth following evisceration. While only 2 cases have been described in the peer-reviewed English-language literature prior to ours, the actual incidence may be higher. Awareness of the potential complication of epithelial downgrowth following evisceration is important, especially considering the implications discussed in this article.

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Trauma-Induced Extrusion of an Ex-PRESS Glaucoma Shunt Presenting as an Intracocular Foreign Body

A 61-year-old non–English-speaking woman went to an outside emergency department after falling and hitting her head on the edge of a piece of furniture. She complained of decreased vision and pain in the left eye. A computed tomographic scan demonstrated intraocular air with a metallic foreign body in the left eye (Figure 1). The woman was referred to our institution for further evaluation.

We were unable to obtain additional history from the patient owing to a language barrier. Visual acuity was 20/80 OD and 20/200 OS. Intraocular pressure was 10 mm Hg OD and 12 mm Hg OS. The anterior segment examination revealed inferonasal loss of the iris stroma in both eyes, which was consistent with iris colobomas. Two millimeters above the left superior limbus, there was a Seidel-positive wound through which a smooth piece of metal was protruding through both conjunctiva and sclera. On further inspection, a dislocated Ex-PRESS shunt (marketed by Optonol Ltd, Zug, Switzerland; and in the United States by CIBA Vision, Duluth, Ga) was suspected (Figure 2A). The posterior segment examination revealed bilateral inferonasal colobomas.