A Successful Early Postoperative Shunt Plate Erosion Repair-Case Report

Abstract
An aqueous drainage shunt is a surgical option for refractory glaucoma. Conjunctival erosion over a shunt plate is a complication that frequently is recalcitrant to repair and requires explantation. This case illustrates a successful revision of an early postoperative shunt plate exposure repaired with a scleral patch graft with conjunctival repositioning as well as intensive medical immunomodulator therapy in a uveitic eye with glaucoma.

Keywords: Shunt plate erosion; Shunt plate revision; Uveitic glaucoma; Tacrolimus; Cyclosporine; Scleral patch graft

Introduction
An aqueous drainage shunt is a standard option for refractory glaucoma. Erosion of a portion of the implant through conjunctiva places the eye at risk for endophthalmitis. Aqueous shunt tube erosions are routinely repaired [1], whereas plate erosions are more problematic and often require explantation [1]. We report a case of successful revision of an early postoperative shunt plate exposure in a uveitic eye with glaucoma.

Case Presentation
A Caucasian male in his mid-sixties presented with bilateral high myopia with retinal detachments in both eyes within 1 year following cataract surgery. Besides scleral buckling, his eyes had undergone pars plana vitrectomy with retinotomy, membrane peeling and silicone oil placement with subsequent silicone oil removal in the right eye only. Visual acuity was 20/400 and intraocular pressure was 16 mm Hg in the left eye following the retinal re-attachments. A 250-mm Baerveldt shunt (Abbott Medical Optics, Santa Ana, CA) was placed in the superotemporal quadrant over the muscles and tautened to the buckle. Extensive undermining was done to ensure no tissue tension was present.

The patient denied eye rubbing. A revision was performed that day with a 180-degree limbal peritomy and tissue undermining was done to ensure no tissue tension was present. Although the distal tube was noted, the distal tube was covered (Figure 1).

At 4 months after surgery, the conjunctiva and anterior chamber remained quiet. The intraocular pressure initially ranged 22-27 mm Hg during the early postoperative period while on 3 glaucoma medications. After the tube opened 2 months following surgery, the intraocular pressure remained between 10 and 15 mmHg at each visit over the next 10 months while on 2 topical glaucoma medications, and then remained between 10 and 15 mmHg over the past 3 years while on 1 topical glaucoma medication. The patient had one mild anterior chamber inflammatory flare episode as evidenced by trace conjunctival injection and rare anterior chamber cells (2/hpf) three years after placement of the valve. The patient had one mild anterior chamber inflammatory flare episode as evidenced by trace conjunctival injection and rare anterior chamber cells (2/hpf) three years after placement of the valve. The patient had one mild anterior chamber inflammatory flare episode as evidenced by trace conjunctival injection and rare anterior chamber cells (2/hpf) three years after placement of the valve.

The shunt was well-covered on postoperative day 1. On postoperative day 5, a 5-mm-diameter circular exposure over his shunt plate was noted, although the distal tube was covered (Figure 1).

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Then a scleral graft (0.5x0.8 cm, Tutoplast, RTI Biologics, FL) was placed parallel and beveled against the plate ridge, thus also covering the proximal tube exposure. The conjunctiva was draped temporally to position the disrupted conjunctiva away from the shunt with closure of the hole and the peritomy with 8-0 Vicryl sutures. Postoperatively, the eye was managed with prednisolone acetate, 1% eight times daily gradually tapered over months to current topical steroid therapy, oral prednisone 40 mg daily tapered off over 2 weeks, doxycycline 100 mg twice daily for its anti-metalloproteinase action discontinued after 5 months, tacrolimus ophthalmic ointment, 0.03% three times daily tapered off over 9 weeks, and cyclosporine A, 1% in olive oil twice daily tapered off over 7 weeks to reduce surface inflammation. The conjunctival injection resolved in 1.5 months, and the anterior chamber inflammation gradually improved over the 3 month postoperative period, while the tube shunt remained covered.

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Abbreviations: cm: Centimeter; HPF: High Power Field; mg: Milligram; mm Hg: Millimeters of Mercury

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The patient with chronic uveitis presented with early postoperative plate erosion in the setting of increased conjunctival inflammation postoperatively. A mechanical contribution is also possible as reported in later shunt erosions [3,4]. Uveitis was reported to not significantly increase the chronic risk for shunt exposure [5]. However, early tube erosion in an inflamed eye was previously described [3]. The patch graft was positioned bevel and parallel to the shunt ridge as well as covered the adjacent shunt tube to reduce mechanical forces upon the transposed conjunctiva. The size was large enough to entirely cover the exposed portions. As in the original shunt placement, the conjunctiva was undermined widely to avoid erosion from traction. Although use of steroid to treat ocular inflammation can be complicated with elevated intraocular pressure; it is also important for preventing blockage of the shunt drainage due to inflammatory substances as well as reducing fibrosis in the sub-Tenon space. Careful follow up is essential to achieve this balance. The adjunctive use of steroid-sparing agents may help avoid an intraocular pressure spike, and reduce inflammation by other pathways.

Tacrolimus and cyclosporine A are immunomodulators that block T-cell activation by inhibiting calcineurin. Both are used as treatment for Thygeson’s superficial punctate keratitis, graft vs. host disease, Sjogren’s syndrome, and other severe ocular surface inflammations [6]. We report use of these immunomodulators and steroids as adjunctive therapy to reduce marked surface inflammation in a case of successful repair of early shunt plate erosion. Subsequent consultation with a uveitis specialist attributed the monocular chronic anterior uveitis to the past multiple surgical procedures in that eye with no evidence of posterior uveitis, autoimmune disease, or systemic inflammation. Topical low-dose steroid has prevented reoccurrence of flares.

Conclusion

Early erosion over a glaucoma shunt plate may be repaired by immediately covering the exposed implant with a collagenous human tissue graft, closing and transposing the eroded conjunctiva away from the shunt, and aggressively controlling the ocular inflammation.

Acknowledgement

Both authors had full access to all of the data in the observation and take responsibility for the integrity of the data and the accuracy of the data.

Conflict of Interest

None for both authors. Supported by an unrestricted departmental grant from Research to Prevent Blindness, N.Y. to the Vanderbilt Eye Institute (funding only).

References


Citation: Ling JD, Joos KM (2015) A Successful Early Postoperative Shunt Plate Erosion Repair-Case Report. Adv Ophthalmol Vis Syst 3(2): 00082. DOI: 10.15406/aovs.2015.03.00082
