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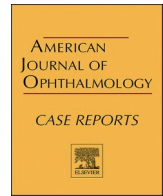
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Elderly woman with a bleb leak

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ABSTRACT

Purpose: To describe a unique incidence of inadvertent filtering bleb creation after intravitreal injections.

Observations: An 84-year-old woman with a history of wet age-related macular degeneration requiring intravitreal injections presented with a Seidel-positive conjunctival cyst. The cyst was in an area where she had received multiple injections and was suspected to be an inadvertent filtering bleb secondary to a full-thickness scleral hole created by these injections. She underwent surgical closure of the fistula and repair of the bleb.

Conclusions and Importance: This case emphasizes the importance of recognizing this potential complication of intraocular injections and outlines steps that should be taken to prevent poor outcomes and vision loss.

1. Introduction

Aqueous leakage from a conjunctival filtering bleb is a known complication of glaucoma filtration surgery. Bleb leaks in patients without prior glaucoma surgery have been reported due to the creation of an inadvertent filtering bleb, occurring particularly after cataract surgery. This has become less common since the introduction of phacoemulsification and clear corneal incisions.¹⁻⁵ Most cases result from superior scleral incisions with internal wound gape, which prevent wound healing and permit aqueous to filter into the subconjunctival space.^{1,4} We present herein a case of an inadvertent bleb created after intravitreal injection with subsequent complications.

2. Case report

An 84-year-old woman presented to the Bascom Palmer Eye Institute's emergency room with one week of left eye pain and blurry vision. She had a diagnosis of wet age-related macular degeneration

(AMD) bilaterally and had received an intravitreal ranibizumab injection 4 weeks prior in the same eye. She had cataract surgery 4 years ago in the left eye, no other intraocular surgeries and no history of ocular trauma. She denied a history of glaucoma. Her medical history included hypertension, diabetes mellitus type 2, osteoarthritis and hypothyroidism.

On examination, her best-corrected visual acuity was count fingers in the right eye (secondary to advanced wet AMD) and 20/50 in the left eye. Her intraocular pressures (IOP) were 20 mmHg in the right eye and 8 mmHg in the left eye. Slit lamp exam was unremarkable in the right eye. Slit lamp evaluation of the left eye demonstrated a thin avascular superior conjunctival cyst with no associated mucopurulent infiltrate and a Seidel-positive leak (Fig. 1A and B), measured approximately 1.4mm from the limbus. An underlying round scleral hole was illuminated through the thin leaking bleb. This sclerostomy was noted 3mm superior to the limbus. Her anterior chamber was deep with trace cell and 1+ flare, but there was no vitritis. Fundus exam revealed healthy optic nerves with cup-to-disc ratio of 0.3 and 0.4 in the right and left

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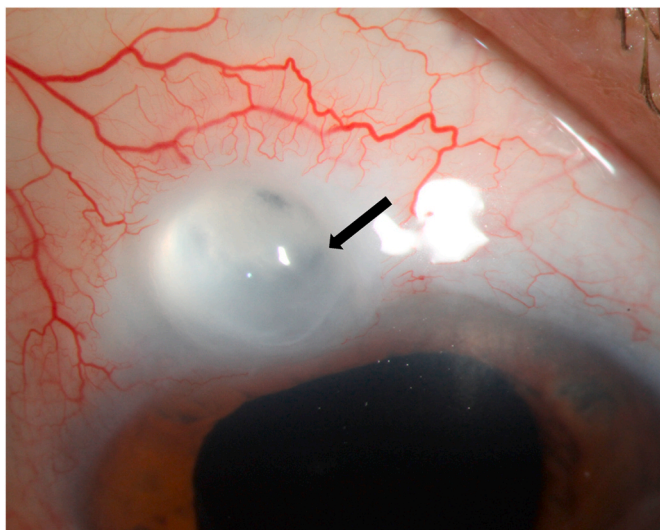


Fig. 1A. Slit lamp photograph of the superior conjunctival filtering bleb with a scleral fistula (black arrow).

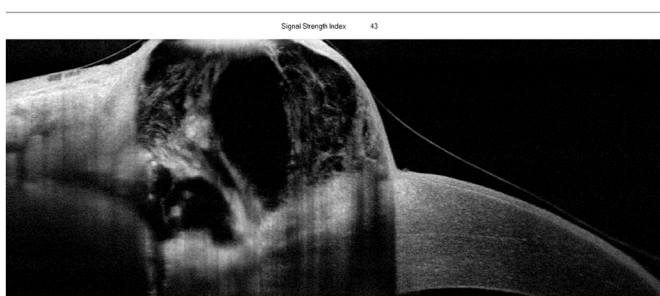


Fig. 1B. Anterior-segment optical coherence tomography (AS-OCT) confirmed presence of a scleral fistula.

eyes respectively, and bilateral central macular scars with retinal pigment epithelial mottling. Anterior-segment optical coherence tomography (AS-OCT) confirmed presence of a full-thickness scleral hole.

The patient was started on topical antibiotics and scheduled for surgical bleb revision 2 days later. On post-operative day 1, the patient's vision was stable at 20/60. IOP was 12 and the conjunctiva was Seidel negative with good conjunctival closure over the site of the prior bleb leak. The patient's eye continued to improve at post-operative month 1.5 with vision 20/40, IOP 10 and deep and a quiet anterior chamber (Fig. 2).

3. Discussion

While inadvertent bleb formation has been described following cataract surgery, this is to our knowledge the first case of inadvertent bleb formation documented following intravitreal injection. The patient's outside records indicated that a filtering bleb was noted 1.5 years after her cataract surgery, which was performed with phacoemulsification and clear corneal incisions. In this case, we believe the patient's bleb formed after multiple intravitreal injections in the same and nearby locations. Our patient presented with a thin and avascular bleb. Though avascularity would not be expected with inadvertent blebs, it has been postulated that anti-vascular endothelium growth factor (VEGF) injections can decrease bleb vascularity by preventing formation of new blood vessels, leading to ischemia and predisposing to thin blebs.⁶ The patient otherwise denied a history of connective tissue disease or uveitis, which could contribute to conjunctival thinning.

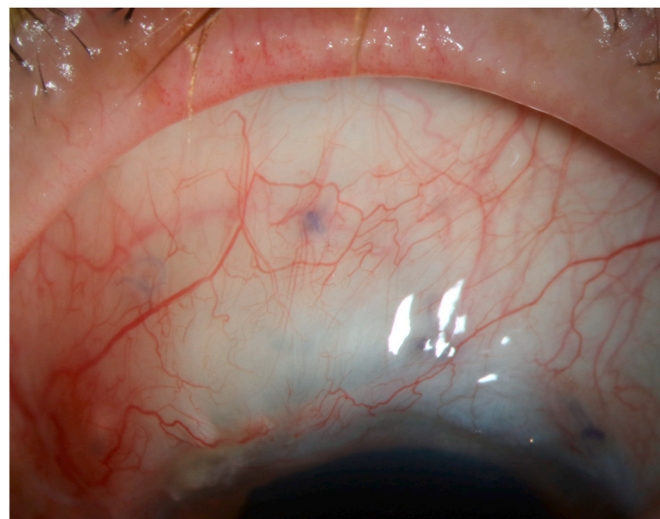


Fig. 2. Slit lamp photograph 1.5 months after surgical revision shows resolution of inadvertent conjunctival bleb.

Despite the atypical presentation, this case should be treated similarly to a bleb leak after trabeculectomy. The eye should be evaluated for blebitis and endophthalmitis and the treatment decisions should be based on clinical findings.

In uncomplicated initial leaks, conservative measures can be tried, such as aqueous suppressants, pressure patch or bandage contact lens and prophylactic antibiotics.^{7,8} However, aqueous suppressants and irritating antibiotics, such as gentamicin, are unlikely to resolve a brisk bleb leak. In very elevated blebs, a bandage contact lens may not adequately appose the area of leak and can in fact cause further damage to the bleb from mechanical rubbing, thereby preventing the epithelium from healing over the leak.

When bleb leaks are complicated by vision loss, hypotony or shallow anterior chamber, additional measures should be taken to seal the leak.⁷ A variety of techniques have been described, including trichloroacetic acid, laser, cryotherapy, adhesives, autologous blood injection, compression sutures and surgical bleb revision.^{2,7,9} Topical antibiotics should be used if there is concern for blebitis. If there is concern for endophthalmitis, a vitreous tap with intravitreal injection of antibiotics and fortified antibiotics should be started. Surgical revision is recommended if there are associated complications, a persistent leak or no improvement with conservative measures.^{7,8,10}

The goal of surgical revision is to close the fistula. Several methods have been described with good success.⁹ In this case, we used a corneal patch graft to cover the fistula. Using this technique, a conjunctival peritomy is made around the bleb to isolate the unhealthy avascular conjunctiva. A paracentesis is made and viscoelastic may be injected into the eye in case the anterior chamber shallows during surgery. The conjunctiva involved in the bleb is excised, exposing the scleral fistula, which can be closed directly or by suturing a patch graft or scleral flap, followed by conjunctival closure.

Finally, physicians performing frequent intravitreal injections should consider techniques to prevent this complication from occurring. A simple practice is to vary the location of the injection placement, reducing the risk of causing mechanical stress to the same site and structurally weakening the local sclera.

4. Conclusion

This case illustrates a unique complication of an inadvertent bleb in an eye following intravitreal injection. It particularly demonstrates the potentially devastating consequences of an inadvertent bleb, including blebitis or endophthalmitis. It is important to recognize this as a

potential complication of injections and when identified, begin appropriate steps for management. Physicians performing frequent injections may consider varying their injection placement to reduce the risk of this complication.

4.1. Patient consent

No patient identifying information was included in this manuscript, therefore patient consent was not obtained.

Declaration of competing interest

All authors have no conflicts of interest regarding any of the products or material discussed in this article.

Acknowledgments and Disclosures

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