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Case Report Open Access

Subconjunctival Bevacizumab Injection for Corneal Neovascularization in Interstitial Keratitis

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Abstract

We describe the use of subconjunctival Bevacizuamb as an adjunct in the treatment of viral interstitial keratitis in a 17-year-old boy. He presented with a 3 months history of gradually progressive diminution of vision. The presenting visual acuity was 20/120 in the right eye and counting fingers close to face in the left eye. Examination revealed bilateral disc shaped stromal edema with leash of blood vessels entering the superior quadrant of the cornea. Subconjunctival injection of 0.1 mL (2.5 mg) of commercially available Bevacizumab (100 mg/4 mL; Avastin) was given under topical anesthesia along with initiation of topical steroids in the form of Betamethasone 0.1%. After 2 weeks of injection there was a remarkable reduction in corneal edema as documented by AS-OCT with improvement in visual acuity. We report here our experience with subconjunctival injection of bevacizumab for corneal vascularization in a patient with interstitial viral keratitis.

Keywords: Bevacizumab; Interstitial keratitis; Corneal neovascularization

Introduction

Interstitial Keratitis is a non-ulcerating inflammation of the corneal stroma without involvement of either the epithelium or endothelium. The prolonged inflammation due to the presence of a blood vessel can result in persistent edema; leading to scarring of this layer resulting in decreased vision later. Bevacizumab has been reported as a treatment for angiogenesis in age-related macular degeneration and proliferative diabetic retinopathy [1]. It has been shown to be nontoxic to corneal cells of human origin *in vitro*, and studies have reported the use of subconjunctival bevacizumab for ocular surface neovascularization in rabbit model [2]. We report here our experience with subconjunctival injection of bevacizumab for corneal vascularization in a patient with interstitial viral keratitis. Not only it resulted in the early resolution of corneal edema, but it prevented the occurrence of recurrences.

Case Report

A 17-year-old male presented with gradual onset, progressive blurring of vision associated with pain, watering, photophobia in both the eyes (right eye>left eye) from 3 months. He had a prior history of similar episode about 1 year ago, which improved with some topical treatment by a private practitioner. On examination, the best-corrected visual acuity in right eye was 20/120 and counting finger close to face in the left eye. Intraocular pressure was within normal limits in both the eyes. On slit lamp bio-microscopic examination of the cornea, paracentral disciform stromal edema of size 2.5 mm × 2.5 mm with sectoral intra-stromal neovascularisation was seen (Figure 1a). The increased corneal thickness can be documented by AS-OCT (Figure 1b). Left eye also showed central disciform lesion of size 6 mm × 7 mm with indistinct margins, involving the visual axis, with intra-stromal vessels superiorly (Figures 2a and 2b). Corneal sensation examined in the uninvolved cornea was decreased in both the eyes. Fundus examination was within normal limits. There was no history of trauma or any ocular surgery. Provisional diagnosis of viral stromal keratitis was made and treatment in the form of topical steroids (betamethasone 0.1%) was initiated. Along with the conventional treatment, which included oral acyclovir 400 mg, 5 times a day and topical steroids, subconjunctival injection of 0.1 mL (2.5 mg) of sterile, undiluted, commercially available Bevacizumab (100 mg/4 mL; Avastin) was given under topical anesthesia with prior proparacaine hydrochloride instillation. Sub-conjunctival injection was given under slit lamp bio-microscopy at the limbus, adjacent to the pathologic blood vessels in the superior quadrant in both eyes. At 2 weeks, the best-corrected visual acuity improved to 20/80 in the right eye and 20/120 in the left eye. The stromal edema decreased significantly as documented by AS-OCT (Figures 3 and 4) along with regression of the new vessels. No intraocular inflammation or complications were observed throughout this period. No recurrence was noted at the end of last follow up (3 years). The authors believe that Bevacizumab is a useful adjunct in early regression of stromal edema as well as in decreasing the recurrences in a patient of viral interstitial keratitis.

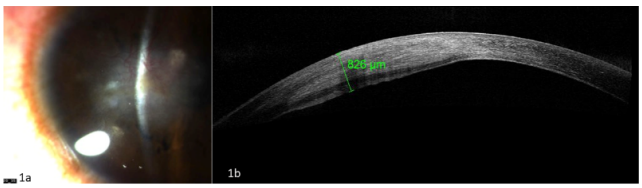

Figure 1: (a) Slit lamp bio-microscopic image of the right eye of a patient of interstitial keratitis, showing paracentral disciform stromal edema of size 2.5 mm × 2.5 mm with sectoral intra-stromal neovascularization (b) AS-OCT of the right eye of a patient of interstitial keratitis showing increased corneal thickness.

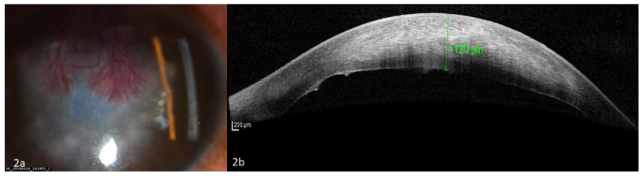

Figure 2: (a) Slit lamp bio-microscopic image of the left eye of a patient of interstitial keratitis, showing central disciform lesion of size 6 mm × 7 mm with indistinct margins with intra-stromal vessels superiorly; (b) AS-OCT of the left of a patient of interstitial keratitis showing increased corneal thickness.

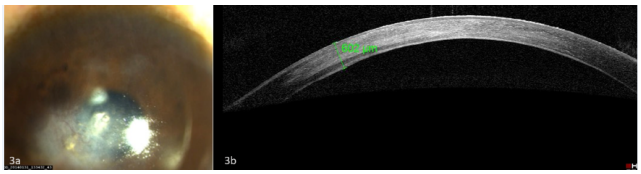

Figure 3: (a) Slit lamp bio-microscopic image of the right eye of a patient of interstitial keratitis with complete resolution of edema with ghost vessels (b) AS-OCT of the right eye of a patient of interstitial keratitis showing decreased corneal thickness.

Figure 4: (a) Slit lamp bio-microscopic image of the right eye of a patient of interstitial keratitis showing corneal scarring with ghost vessels

Discussion

Bevacizumab is a full-length recombinant humanized monoclonal antibody against the VEGF molecule. VEGF's role in the pathophysiology of corneal neovascularisation has been shown in experimental models. Manzano et al. showed that topically administered bevacizumab limits corneal neovascularization after chemical injury in a rat model [3]. Erdurmus et al. reported on the efficacy of subconjunctival bevacizumab injection in two patients with corneal neovascularization [4]. This case showed that the subconjunctival bevacizumab is well-tolerated and caused dramatic regression of the corneal neovascularisation secondary to viral insult. The mechanism by which it decreases the incidence of recurrences is not described in literature but the authors justify that this may be due to complete regression of immature new vessels. Conventionally, topical steroids are used in the treatment of interstitial keratitis and it takes generally 6 weeks for complete healing.

Conclusion

The use of subconjunctival Bevacizumab hastens the resolution of corneal edema. Whether the regression of blood vessels due to Bevacizumab is of widespread clinical importance in the treatment of viral interstitial keratitis; needs to be studied in a randomized clinical trial with a larger sample size and longer follow-up. Bevacizumab may be used in the future, as an adjunct for the treatment of corneal neovascularisation caused by viral stromal keratitis.

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