European Journal of Ophthalmology / Vol. 19 no. 3, 2009 / pp. 478-480

Fungal scleral keratitis and endophthalmitis following pterygium excision

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PURPOSE. *The authors report a case of fungal scleral keratitis and endophthalmitis as a complication of pterygium surgery.*
METHODS. *Case presentation.*
RESULTS. *A 46-year old woman underwent pterygium excision with topical use of intraoperative mitomycin C. By day 21 after excision, scleral melting was followed by fungal keratitis. Endophthalmitis ensued, which rapidly progressed, despite surgical and medical interventions. The eye was finally enucleated to prevent fungaemia. Pathology revealed a highly disorganized eye with disruption of scleral collagen in the area of scleral melting.*
CONCLUSIONS. *Fungal keratitis and scleral melting are rare but devastating complications of pterygium surgery with adjuvant use of mitomycin C. (Eur J Ophthalmol 2009; 19: 478-80)*

KEY WORDS. *Enucleation, Fusarium, Mitomycin, Pterygium, Sclerokeratitis*

Accepted: October 23, 2008

Case report

A 46-year-old woman underwent nasal pterygium excision in her left eye with adjunctive use of topical mitomycin C (MMC) in a concentration of 0.02%. The MMC-soaked sponge was placed on the bare sclera for 60 seconds followed by copious irrigation.

The surgical excision and the patient's initial postoperative course were uncomplicated. By the 14th postoperative day, the woman noticed ocular pain and redness in her left eye. On day 21, the patient returned for follow-up and was found to have visual acuity of light perception. Slit lamp examination revealed scleral necrosis and thinning nasally, in the area of the pterygium excision. The central cornea was relatively clear with an area of thinning nasally. The limbus and adjacent sclera at this site were noted to be relatively avascular. Significant anterior chamber inflammation with hypopyon and vitritis were evident.

The patient was admitted the same day for a combined pars plana vitrectomy, intravitreal antibiotic injection, and scleral patch graft. Gatifloxacin (400 mg IV qd), vancomycin (500 mg IV bid), moxifloxacin (0.5% drops qh), vancomycin (25 mg/mL drops qh), and prednisolone (1% drops qh) were administered. Subsequent vitreous cultures yielded coagulase-negative staphylococcus species.

Within 4 days after the vitrectomy, the cornea showed a diffuse infiltrate with an overlying central epithelial defect. The scleral patch graft remained intact. The anterior chamber continued to show significant inflammation.

By day 7 after the vitrectomy, there appeared to be minimal improvement and a corneal scraping was performed in an attempt to further isolate an organism. Initial staining on this sample indicated yeast, and systemic fluconazole was initiated. At this time, the cornea was completely opaque. B scan ultrasound revealed echoes in the vitreous consistent with diffuse infiltrates. Culture results on the corneal scraping suggested fusarium species infection and topical nystatin drops hourly were initiated. In addition, systemic fluconazole was changed to systemic voriconazole and the patient was weaned from prednisolone drops.

By day 10 after the vitrectomy, despite broad spectrum antimicrobial treatment, both topically and systemically, the patient's condition continued to deteriorate.

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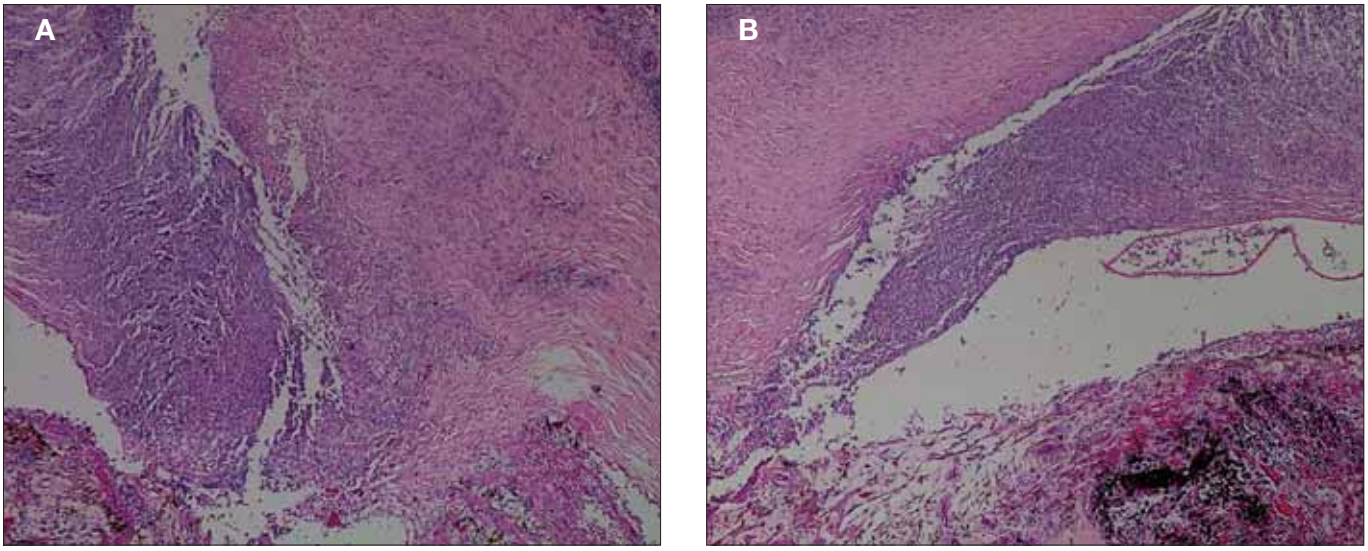

Fig. 1 - (A, B) *Histology demonstrates corneal and scleral necrosis, with extensive infiltrate. The tectonic graft (corneal button) is evident just above the necrotic recipient cornea.*

The patient was referred to our tertiary care center (Louisiana State University Eye Center) at this point. Slit lamp examination was significant for severe conjunctival injection, a scleral patch graft nasally with loose sutures, and corneal melting evident nasally. The cornea was completely infiltrated and opaque and some uveal prolapse was visible as well. A large tectonic graft was placed over the entire cornea the same day to prevent perforation. Biopsy of the excised cornea was positive for fusarium species, seen on pathology and in culture.

Within 2 days, visual acuity deteriorated to no light perception. The hypopyon grew to fill the entire anterior chamber and a B scan suggested funnel shaped retinal detachment with dense vitreous debris. The eye was enucleated to prevent fungemia on day 13 after vitrectomy. Pathologic examination of the globe revealed areas of marked necrosis and disorganization of the sclera and adjacent cornea (Fig. 1)

DISCUSSION

Topical MMC has become a common medical adjunct to ophthalmic surgery, used to reduce the recurrence rates of pterygium (1). The drug is either applied locally on the sclera at the site of the excised pterygium or used as topical drops postoperatively for a short cycle treatment, significantly reducing the recurrence rate.

Nevertheless, a wide array of complications has been reported from its use (2-4). Rubinfeld et al (3) described a series of 10 patients who experienced serious vision-threatening complications, including severe secondary glaucoma, corneal edema, corneal perforation, corectopia, iritis, sudden onset mature cataract, scleral calcification, incapacitating photophobia, and pain. One of the 10 patients experienced corneal perforation.

Dougherty et al (2) and Dadeya et al (4) reported several cases of corneoscleral melting after pterygium surgery using low dose of MMC in patients having no predisposing conditions to ulceration or poor wound healing, such as the patient in our case. Hsiao et al (5) reported on four cases of infectious scleritis after pterygium surgery that ended with enucleation of the globe, but MMC was not used on that occasion. Fungal sclerokeratitis after pterygium removal is not uncommon (5-7).

To our knowledge, the combination of corneoscleral melt combined with a superimposed fungal keratitis/scleritis in the setting of pterygium surgery using low dose intraoperative MMC has not been reported. The progressive nature of the infection, leading to the need for enucleation, made it possible for us to correlate the clinical findings to those seen histologically.

In our case, we are questioning if the MMC application led to a delayed sclerocorneal necrosis. The fungal infec-

tion appears to have occurred subsequently, likely an opportunistic infection thriving in the avascular necrotic tissue. Although there is no clear evidence that the use of MMC is the causative factor for the sclerokeratitis, it is plausible that scleral necrosis and the avascular milieu increased the risk of fungal keratitis, although the concentration and the exposure time of MMC were moderate. This mechanism also appears to apply to beta irradiation and chemotherapeutic agents, such as thiotepa, which have also been used as adjunctive therapy in pterygium surgery.

Sullivan et al (6), Kumar et al (7), and Margo et al (8) reported on cases of fungal scleritis/keratitis after pterygium excision combined with beta irradiation of the scleral bed. In the case reported by Sullivan et al, the fungal infection occurred 20 years after the excision and the patient was noted to have a chronic avascular zone in the area of the pterygium surgery, predisposing the patient to infection. In the cases reported by Kumar et al and Margo et al, enucleation was also required and the pathology was similar to our case. This is not surprising, given that MMC is an alkylating agent that acts by forming covalent linkages with guanine residues and that its mode of action mimics that of ionizing radiation.

This case underscores the potentially devastating complications of pterygium excision with adjuvant use of MMC, even in low doses. We concur with previous authors in calling for the judicious use of this powerful agent.

The authors report no proprietary interests or funding.

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