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SHORT COMMUNICATION

Case report

Scleromalacia following trabeculectomy with intraoperative mitomycin C

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ABSTRACT: Purpose. *To report the development of scleromalacia in pediatric age as a complication of trabeculectomy with the adjunctive use of intra-operative mitomycin C.*
Patients*. Reported are 2 patients who developed scleromalacia following trabeculectomy combined with intra-operative 0.4 mg/ml mitomycin C application for 5 minutes for refractory glaucoma in aphakic bullous keratopathy and penetrating keratoplasty.*
Results. *Scleromalacia localised in the surgical area developed in 2 young patients. Scleromalacia remained stable in both patients after 6 and 24 months follow-ups.*
Conclusions. *It is suggested that this procedure be done more selectively, especially in young patients, with a shorter application time and using a lower concentration. (Eur J Ophthalmol 1999; 9: 63-5)*

KEY WORDS: Trabeculectomy, Mitomycin C, Complications, Scleromalacia

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INTRODUCTION

Mitomycin C is an antibiotic isolated from *Streptomyces caespitosus*. In trabeculectomy, mitomycin C applied intraoperatively at the filtration site, improves the success rate of the procedure by reducing fibrosis in eyes at a high risk of failure with routine operations (1, 2). Using topical mitomycin C in pterygium surgery has demonstrated rare but serious complications related to local ocular toxicity, such as scleral and corneal ulceration, corneal perforation, scleromalacia, and scleral calcification (3). The safety of intraoperative mitomycin C application in glaucoma filtration surgery is not well known because of the relatively short clinical experience.

We report 2 patients who developed scleromalacia following trabeculectomy combined with intraoperative mitomycin C application which was indicated for uncontrolled refractory glaucoma.

Case Reports

Case 1

A 10-year-old white boy with traumatic cataract resulting from blunt injury had undergone lens aspiration and anterior vitrectomy on June 4, 1991 in the right eye. He developed aphakic bullous keratopathy and secondary glaucoma postoperatively. His visual acuity was hand movements and intraocular pressure (IOP) was 59 mm Hg. Because of uncontrolled refractory glaucoma despite maximum medical therapy, we performed trabeculectomy combined with intraoperative mitomycin C on September 15, 1993 in the right eye. After a limbal based conjunctival flap was prepared, a 4x4 mm scleral flap of 1/3 scleral thickness at the 1 o'clock position was dissected. A surgical sponge measuring 4x4 mm was soaked with 0.4 mg/ml mitomycin C solution and placed under

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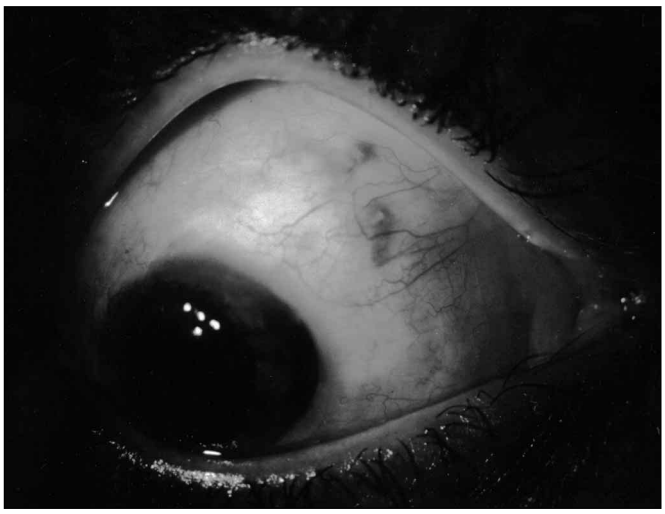

Fig. 1 - *Case 1. Slit-lamp photograph shows the scleral necrosis and uveal bulging with clear graft.*

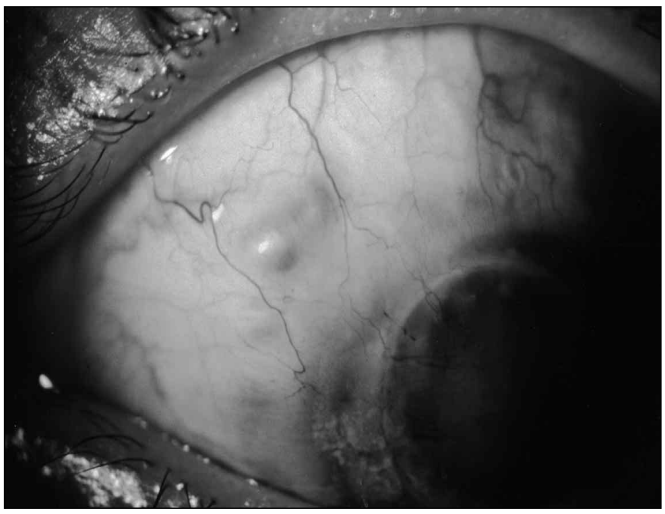

Fig. 2 - *Case 2. Slit-lamp photograph shows uveal bulging secondary to scleral necrosis with failed graft.*

the scleral flap for 5 minutes. After careful irrigation of the surgical area with balanced salt solution, the procedure was completed as a standard trabeculectomy. Following surgery, the IOP was kept under control by topical antiglaucomatous therapy, and the patient underwent PK on November 24, 1994. One month after PK, his visual acuity was 20/400 and IOP was 34 mmHg; the corneal graft was clear, *but we noticed two scleral meltings and uveal bulgings secondary to sclera necrosis measuring 1x2 mm diameter on the upper nasal sclera approximately 6 mm above the limbal area* (Fig. 1). The patient did not have any refractive error prior to trauma, and systemic evaluation was negative for systemic diseases that may predispose scleral thinning. At 6 months follow-up, scleral thinning was stable, and the patient underwent seton implantation because of uncontrolled glaucoma. The patient's last visual acuity was 20/400 and IOP was 32 mmHg, with the administration of timolol maleate twice daily and oral acetazolamide 125 mg three times daily.

Case 2

A 9-year-old white girl was referred to our department for PK because of traumatic corneal scarring resulting from a penetrating injury. Primary repair and lens aspiration had been undertaken 9 months previously. The patient underwent PK and anterior vitrectomy on July 17, 1992 in the left eye. Visual acuity was 20/400 and IOP was 35 mmHg *at the first postoperative month visit*, and antiglaucomatous therapy was begun. Because of uncontrolled glaucoma despite maximum medical therapy, we performed trabeculectomy with intraoperative mitomycin C on December 16, 1993. The same procedure as described in the first case was performed at the 11 o'clock position. One week postoperatively, the patient's visual acuity in the left eye was 20/400 and IOP was 16 mmHg. The bleb was avascular and diffuse. *Six months later, the filtering bleb became flat and despite additional medical therapy, which consisted in timolol maleate twice daily and acetazolamide 125 mg 3 times daily, IOP ranged from 25 to 30 mmHg*. Because of the uncontrolled glaucoma, graft failure developed. On September 9, 1994, 10 months after the filtering procedure, we noticed an area of scleromalacia *measuring* 2.5 x 2.5 mm diameters, 2 mm above the limbal area and on the upper nasal sclera. There was another scleral thinning area localized on the temporal sclera 3 mm above the limbal area (Fig. 2). Because the glaucoma was uncontrolled, *180 degrees of cyclotherapy was performed inferiorly* on December 21, 1994, but the glaucoma persisted. Scleromalacia was stable at 24 months follow-up and the patient's last visual acuity was 20/400, and IOP was 24 mm Hg, with additional timolol maleate administered twice daily. The patient did not have any known refractive error prior to trauma, and past medical history and systemic evaluation were negative for systemic diseases.

DISCUSSION

Results from reported clinical series in humans suggest that mitomycin C improves the success rate of filtration surgery in high risk patients *such as those with aphakic and pseudophakic glaucoma, secondary glaucoma and glaucoma with previous surgery* (1, 2). Khaw et al (4), reported that 5-minutes intraoperative applications with the concentration of 0.4 mg/ml mitomycin C, resulted in prolonged inhibition of Tenon's capsule fibroblasts in culture at least 30 days, and recommended this concentration in patients who have prolonged, aggressive healing response. Palmer (1) used 0.2 mg/ml concentration of mitomycin C with a success rate of 84% in high risk patients, and reported that the procedure is less successful in eyes with previous surgery.

The 2 cases reported here were aphakic and traumatised eyes in pediatric age group and trabeculectomy combined with intraoperative mitomycin C was not successful in controlling IOP. We applied 0.4 mg/ml of mitomycin C under the scleral flap for 5 minutes. We observed the development of scleromalacia 10 and 15 months after trabeculectomy localized mainly in the surgical area; the scleromalacia did not progress. These patients did not have any concomitant external or systemic disease which might predispose them to the development of postoperative scleral thinning. To our knowledge, the only case with scleral thinning has been reported by Mermoud et al (5). They reported the development of slight scleral thinning in one patient in a series of black patients who underwent trabeculectomy with intraoperative mitomycin C (0.2 mg/ml) application.

Serious complications following trabeculectomy with the intraoperative *use of* mitomycin such as ocular hypotony, cystic bleb, infection, conjunctival leak have been reported to be related to the dosage and the duration of the intraoperative applicaton of mitomycin C (2,5). Megevand et al (2) suggested that 2-minute intraoperative application of 0.2 mg/ml mitomycin C was effective with a success rate of 88%, and fewer complications.

We suggest that further clinical studies are required to determine the optimal concentration of mitomycin C as well as the most effective exposure time in order to avoid complications. Although the advantages of mitomycin C appear to be considerable, the long term complications remain unknown. We suggest that mitomycin C should be gently applied in severely traumatized eyes, especially in pediatric age groups when necessary.

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