PRESERVED AMNIOTIC MEMBRANE GRAFT AFTER BARE SCLERA TECHNIQUE WITH MITOMYCIN C FOR PTERYGIUM SURGERY

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ABSTRACT

Objective: *To study the effect of amniotic membrane graft combined with mitomycin C in pterygium treatment.* ***Design:*** *Retrospective, noncomparative, interventional case series.* ***Participants:*** *Twenty-one eyes of 20 patients with pterygium and recurrent pterygium without symblepharon. The number of prior surgeries was 1 – 2 times.* ***Intervention:*** *Patients were treated by bare sclera technique and mitomycin C eye drops, and preserved amniotic membrane graft.* ***Main Outcome Measures:*** *Recurrence rate of pterygium and complications of treatment.* ***Results****: twenty eyes (95.24%) of 21 eyes showed no recurrence, it means the recurrence rate was 4.76%. The study did not show the scleral and corneal complication during observation period 30 – 50 weeks.* ***Conclusion****: Preserved amniotic membrane graft, and mitomycin C eye drops were a safe and effective for bare sclera technique of pterygium surgery.*

Keywords: *pterygium, bare sclera technique, amniotic membrane graft, mitomycin C*

INTRODUCTION

Pterygium and recurrence pterygium are a challenging ocular surface disorders that often resistant to conventional surgery. Although various surgical approaches had been performed, the recurrence rate is still high and incidence range up to 55% (Shimazaki and Tsubota, 2003). Prevalence of pterygium is 2% to 5% in the United States and the simplest technique, the bare sclera technique, is associated with recurrence rate of 37% to 91% (Donnenfeld, 2003). Pterygium is degenerative diseases of conjunctiva and it should be removed surgically (Vaughan, 1992).

Subconjunctival fibrosis is a big problem in the treatment of pterygium and recurrent pterygium, sometimes following with symblepharon after conventional surgery. The new approaches surgery was introduced that are conjunctival autograft transplantation, limbal autograft transplantation, amniotic membrane transplantation and anti metabolites drug had been performed but the recurrence rate is common, with an incidence range still high.

Astudillo et al (1995) had mentioned several surgical techniques of pterygium surgery. One of the popular pterygium surgery is a pterygium resection or bare sclera excision, the other surgery we had performed was conjuntival graft or conjunctival flap. There are two kinds of conjunctival graft the first is conjunctival free autograft and the second is the conjunctiva sliding flaps.

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Due to high incidence of recurrences, the adjunctive treatment was introduced such as beta irradiation, chemotherapy or antimitotic agents such as thiotepa, mitomycin C for pterygium surgery and recurrent pterygium surgery but there are a lots of scleral complications.

Kim and Tseng (1995) introduced transplantation of preserved human amniotic membrane for surface reconstruction in severely damaged rabbit cornea (Buratto, 2000). Many surgical techniques exists to manage pterygium, but none has proven completely successful in preventing reccurence (Seng E.T. and Donald Tan, 2003).
Due to my experience of the high recurrence rate of pterygium surgery in my clinic; I introduced my technique of the new pterygium surgery with a bare sclera technique, mitomycin C eye drops and preserved amniotic membrane graft without stitch and the result of study.

MATERIALS AND METHODS

Twenty-one consecutive eyes of 20 patients with 18 eyes pterygium and 3 eyes recurrent pterygium treated by bare sclera excision with mitomycin C 0.02% - 0.04% eye drops during surgery for 3 minutes. I used the preserved amniotic membrane graft without stitch and antibiotic-corticosteroid eye drops during two weeks after surgery were enrolled. This study was performed from January 2002 to June 2003 in my private clinic Surabaya. A review of these patients was made in retrospective study and all patients were treated

by the author. Written informed consent was obtained from each patient after the purpose and potential risks of the procedure were explained. Patients with follow up period of < 6 months or pseudopterygium were not included. Patients consist of 14 males and 7 females, with a mean age of 52.4 ± 7.2 years with range from 42 years to 64 years. Eighteen eyes (85.71%) had not the previous pterygium surgery; and two eyes (9.52%) had one time previous pterygium surgery, and one eye (4.76%) had two time previous pterygium surgery. The previous surgical methods were bare sclera technique and application of mitomycin-C during and after surgery.

The mechanism of action of mitomycin C in the prevention of pterygium recurrence seems to be inhibition of fibroblast proliferation at the level of the episclera by inhibiting DNA synthesis (Donnenfeld, 2003).

Surgical methods

All of the surgery was performed topical and subconjunctival anesthesia with xylocaine 2% solution. The dissection was started from apex of pterygium to the body and fibrotic tissue, capsule tenon was removed to exposed corneal stroma and sclera. The body of pterygium was cut on both side edges of the body and in the pterygium's basis. The bleeding was cauterized and the fibrotic tissue was extensively dissected to expose sclera and corneal stroma. Mitomycin C 0.02% - 0.04% was used during surgery for 3 minutes and irrigation was performed with balanced salt solution. Amniotic membrane graft was placed over the entire excised area with the epithelial side facing upward without suture. At the end of surgery the antibiotic and corticosteroid eye drops were given and the eye patch was used for two days. In the third day after surgery the eye was opened and antibiotic-corticosteroid eye drops was used for two weeks and mitomycin C eye drops 0.02% to 0.04% was used for one time intraoperatively.

The patient follow up was performed at third day, one week, and every month after surgery. Routine ophthalmic examination was performed including visual acuity, intraocular pressure, biomicroscopy, retinal examination, and complication of the treatment such as infection, corneal edema, iritis, scleral necrosis, scleromalacia, scleral melting, and scleral abscess.

RESULTS

Three days after surgery the surgical area epithelialized very well especially cornea, sclera, but the epithelization of conjunctiva was not complete. The amniotic membrane dissolved and the patients complained a foreign body sensation, minimal tearing, without pain, and another objective symptom such as conjunctival injection and edema conjunctiva are minimal. One eye shows recurrent pterygium after 42 weeks observation, the recurrence rate is 4.76%. My study did not found scleral melting, corneal melting, corneal ulcer, scleral ulcer, conjunctival granuloma and iritis.

Table 1. Patient's data and Surgical outcome

No:	AGE SEX	EYE	TYPE	A.R.READING PRE OP	A.R.READING POST OP
1.	52/M	OD	II	S+3.25 C-3.50 x 10°	S+1.50 C-2.25 x 5°
2.	54/M	OD	III	S+5.25 C-4.50 x 15°	S+1.75 C-2.00 x 0°
3.	62/M	OS	III	S+4.75 C-4.00 x 25°	S+1.50 C-2.00 x 10°
4.	48/F	OD	III	S+4.50 C-4.25 x 10°	S+1.75 C-2.25 x 0
5.	42/M	OS	II	S+3.50 C-3.00 x 20°	S+1.25 C-1.50 x 0°
6.	52/F	OS	III	S+4.50 C-3.50 x 170°	S+1.75 C-1.50 x 0°
7.	49 / F	OS	III	S-4.75 C -3.75 x 170°	S-3.75 C -1.75 x 175°
8.	59/ M	OD	III	S+2.50 C -3.75 x 10°	S+ 1.75 C – 1.50 x 5°
9.	64/ M	OD	III	S+ 2.50 C -4.00 x 15°	S+1.50 C -1.50 x 0°
10.	58/ F	OD	III	S+3.00 C-5.00 x 20°	S+2.75 C – 1.25 x 5°
11.	54/ M	OS	III	S+2.00 C -3.00 x 10°	S+1.50 C -1.00 x 0°
12.	52/ F	OD	III	S-1.50 C-2.00 x 160°	S- 1.00 C– 1.50 x 175°
13.	47/ M	OD	III	S-2.50 C-3.50 x 25°	S-1.75 C-2.00 x 5°
14.	48/ M	OD	III	S-2.50 C-3.00 x 5°	S-2.00 C-1.50 x 0°
15.	50/ M	OS	II	S+2.25 C-2.50 x 165°	S+2.00 C -1.75 x 170°
16.	54/ M	OS	III	S+2.00 C-2.75 x 15°	S+1.50 C-1.75 x 5°
17.	49/ F	OS	III	S+2.25 C-2.00 x 5°	S+2.50 C-1.25 x0°
18.	46/ M	OS	II	S-2.75 C -3.00 x 25°	S-1.50 C- 1.00 x 10°
19.	54/ F	OD	III	S+4.00 C -4.50 x 165°	S+2.00 C-2.25 x 170°
20.	58/ M	OD	III	S+2.00 C-3.50 x 10°	S+1.50 C-1.75x 5°
21.	56/ M	OS	III	S+4.00 C-4.00 x 175°	S+3.00 C-2.50x 0°

Note:
Case 5: recurrence 42 weeks after surgery
Case 6 and 12: one patient.
Case 12 and 17 had one time previous surgery
Case 10 had two times previous surgery

DISCUSSION

A pterygium is a distinctive wing-shaped fibrovascular tissue growth in the interpalpebral bulbar conjunctiva that extends onto the cornea to varying degrees (Rapuano CJ. et al., 2000). Although they are usually found nasally, pterygia may be located temporally or even nasally and temporally in the same eye. The treatment of pterygium is surgical and there are a lots of the surgical technique available and the recurrence rates still frequent and the complications of surgery is varied widely depends on the procedure. There are several techniques of pterygium surgery that is bare sclera with adjunctive treatment, excision pterygium with conjunctival closure and excision pterygium with amnion graft.

One of the modality adjunctive therapy is mitomycin C. The purpose of the use mitomycin C is to reduce the recurrence rate in the pterygium surgery. Ophthalmologist applicates mitomycin C eye drops preoperative, intraoperative and postoperatively. However, very little is known about the side effect of this drug. The complication of mitomycin C described to dated are punctate keratitis, chemosis conjunctiva, delayed conjunctival wound healing, conjunctival granuloma, scleral melting, and corneal melting. The author selects intraoperative mitomycin C application in this study to prevent the complication. The recurrence rate of bare sclera technique is 40% - 50% and the recurrence rate of pterygium excision with conjunctival transplantation is 2% - 5% (Sutphin J.E., 2003). The author has tried to avoid difficulties of conjunctival transplantation surgery and bare scleral condition to used preserved amnion graft to cover the wound after pterygium excision. The preserved amnion graft was ready to use and available at Dr. Soetomo hospital Surabaya with a very cheap price. My study shows 4.76% recurrence rate, this result is comparative with the study of Sutphin (2003) of pterygium excision with conjunctival transplantation about 2% - 5% recurrence rate. Kazuo Tsubota (2003) stated no recurrence in the study of amniontic membrane transplantation with conjunctival autograft for pterygium excision.

Salomon (2004) stated the long-term safety of mitomycin C in pterygium surgery should be assessed in association with the surgical method used and with regard to the inclusion criteria of patients. The present data demonstrate a lack of long-term damage to the sclera at the operated site with possible localized the severe complication of mitomycin C. Nowadays they are avoiding their previous technique of leaving 3 mm of bare sclera. This is the same with my technique to avoid bare sclera with preserved amniotic membrane covers the sclera, cornea and conjunctiva until a very good epithelization.

My study did not note the scleral melting and the corneal complication. This result is the same with the state of Shimazaki (2003). The study of Costa (2004) did not observe significant difference in the incidence of postoperative complication between group with mitomycin C and group without mitomycin C. This study noted the decrease of astigmatism after surgery (improvement) by auto refractometer examination.

CONCLUSION

Preserved amnion graft provides good therapeutic for pterygium surgery to cover the surface of sclera, cornea and conjunctiva after bare sclera technique with intraoperative mitomycin C.

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