

Simple excision alone versus simple excision plus mitomycin C in the treatment of pterygium

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Ann Saudi Med 2007; (27)3: 158-160

BACKGROUND: Pterygium is a common ocular disorder throughout the world. The purpose of this study was to evaluate the efficacy of simple excision alone with or without topical mitomycin in the treatment of pterygium.

PATIENTS AND METHODS: This study was performed in two stages. In the first stage, from 1991 to 1994, 100 patients (group 1) were operated on with simple excision and in the second stage, from 1995 to 1999, 300 patients (group 2) were treated with the same procedure plus topical mitomycin (0.02% eye drops four times a day for 4 days after operation). All cases were followed for 5 years. The recurrence rate of pterygium in these two treated groups were compared.

RESULTS: The mean age of the subjects was 49 ± 13 years in group 1 and 47 ± 17 years in group 2. The clinical manifestations in these two groups were similar ($P>0.05$). After one year, relapse was seen in 21 cases (21%) in group 1 and in 3 cases (1%) in group 2. After five years, 31 cases (31%) in group 1 and 3 cases (1%) in group 2 had relapse ($P=0.0001$). The mean time to recurrence at five years for the simple excision group was 3.83 years (95% CI: 3.48 to 4.17 years) and for simple excision plus mitomycin C was 4.96 years (95% CI: 4.91 to 5.0 years) ($P<0.0001$).

CONCLUSION: Instillation of mitomycin C eye drops appears to be safe in the treatment of pterygium.

Pterygium is a common ocular surface disorder of the subconjunctival tissues. It creates symptoms of irritation, foreign body sensation and lacrimation, cosmetic disfigurement, and functional problems such as reduced visual acuity, diplopia and problems fitting contact lenses. A variety of surgical procedures have been described, but the recurrence of pterygium still remains a major complication. Recurrence rates vary from procedure to procedure. One of the major limitations of pterygium excision is the high rate of postoperative pterygium recurrence. The reported postoperative recurrence rate of pterygium excision alone ranges from 56% to 89%.¹⁻³ Simple excision is reported to be associated with recurrence rates 30% to 100%¹ and excision by the bare sclera technique has recurrence rates of 5% to 89%.^{2,3} Even conjunctival autografting to cover the bare sclera is associated with recurrence rates of 2% to 39%.^{4,5} Therefore, various adjuvant therapies have been used to prevent recurrence of pterygium after excision like irradiation, argon and excimer laser, thio-tepa and mitomycin C application. Various studies have reported the efficacy in reducing the recurrence rate fol-

lowing pterygium surgery.⁶⁻⁹ Although the recurrence rate has been reduced after use of mitomycin C, there are reports of serious vision-threatening complications following mitomycin C application.¹⁰⁻¹² In the present study we compared the efficacy, of simple excision versus simple excision plus topical mitomycin C for the treatment of pterygium.

PATIENTS AND METHODS

This prospective follow-up study was performed at the Department of Ophthalmology of Babol Medical University in Iran in two stages. In stage 1, from 1991 to 1994, 100 patients were treated with simple excision of pterygium and in stage 2, from 1995 to 1999, 300 patients were treated with simple excision plus mitomycin C 0.02% drops four times a day for 4 days. The demographic features and clinical manifestations of the patients were recorded. All cases were treated as outpatients. The ethical committee approved the study and all the patients gave their informed consent. Anesthesia was established with tetracaine eye drops. At first, the base of the pterygium was separated from the sclera

and then the corneal part was isolated using blade number 15. After the operation, the eye was covered by *Terramycin* ophthalmic ointment. In group 2, mitomycin C eye drops 0.02% (lyophilized mitomycin mixed into artificial tears), one drop four times per day for 4 days were applied after operation. Both groups were followed on day 7, 14, 30, and for intervals of every 6 months for 5 years. Data were analyzed with SPSS. The chi square test or Fisher's exact test were used to compare categorical variables between the two groups. Time to recurrence for the two groups was calculated using the Kaplan-Meier method with differences assessed using the log-rank test.

RESULT

The mean age of the patients was 49 ± 13 years in group 1 and 47 ± 17 years in group 2. Fifty-three patients (53%) in group 1, and 159 patients (53%) in group 2 were males (Table 1). Pterygium in all cases in group 1 was unilateral. Pterygium in 290 cases in group 2 was unilateral and in 10 cases (8 males and 2 females) was bilateral. All pterygium originated from the nasal side. Photophobia, lachrimation and foreign body sensation were seen in all cases. Irregular strabismus was not seen in either groups. After treatment, all cases suffered from photophobia. Among 100 cases treated in group 1, recurrence was seen in 31 (31%), but recurrence was seen in 3 (1%) cases treated in group 2 ($P=0.0001$). After only one year, recurrence was seen in 21 (21%) cases treated with simple excision versus 3 (1%) treated with simple excision plus mitomycin C. After 5 years, recurrence was seen in 31% cases treated with simple excision but in 1% treated with simple excision plus mitomycin C (Figure 1). The mean time to recurrence at five years for the simple excision group was 3.83 years (95% CI, 3.48 to 4.17 years) and for simple excision plus mitomycin C was 4.96 years (95% CI, 4.91 to 5 years) ($P<0.0001$). Mitomycin C was well tolerated in all cases. Intraocular pressure, corneal edema, cataract and infection were not seen in any case. Scleral necrosis was seen in two elderly cases (65 and 70 years old) and both were treated appropriately.

DISCUSSION

We found that with simple excision, the recurrence rate was 31% and with excision of pterygium plus mitomycin C, the recurrence rate was 1%. In other studies, postoperative application of topical mitomycin C four times a day for two weeks or twice a day for five days decreased the recurrence rates to 0% to 11%.¹³⁻¹⁷ Prospective studies have also reported that single intraoperative scleral application of 0.1 mg/mL to 0.2 mg/mL mitomycin C

Table 1. Demographic features and clinical manifestations of the two groups.

Characteristics	Group 1 No (%)	Group 2 No (%)	P value
Sex			
Male	53 (53)	159 (53)	0.546
Female	47 (47)	141 (47)	
Clinical manifestation			
Unilateral	100 (100)	290 (96.7)	0.054
Bilateral	0 (0)	10 (3.3)	
Location of the lesion			
Nasal	100 (100)	300 (100)	1
Temporal	0 (0)	0 (0)	
Photophobia	100 (100)	300 (100)	1
Lacrimation	100 (100)	300 (100)	1
Foreign body sensation	100 (100)	300 (100)	1

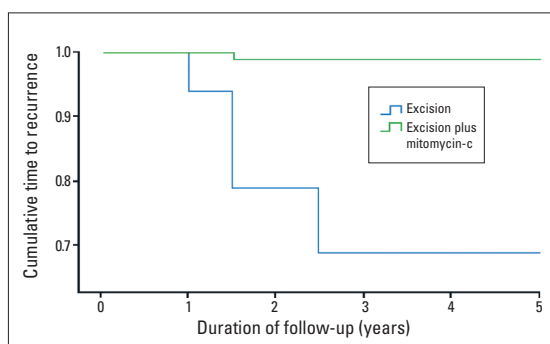


Figure 1. Kaplan-Meier survival curve depicting the time to recurrence among patients treated with simple excision alone or simple excision with topical mitomycin in the treatment of pterygium.

for 3-5 minutes reduced the recurrence rates to 3.3%-12%.¹⁸⁻²⁰ Mitomycin C is an antineoplastic antibiotic with radiomimetic properties that selectively inhibits DNA, RNA and protein synthesis.²¹ In the present study, the recurrence rate of 1% was compatible with the results reported in other studies,^{6-8,10,12,13,15,16} but relatively lower than the result (20%) reported by Gupta and Saxena in India.²² The low recurrence rate with mitomycin C in our study may be due to the older age of our cases or lack of environmental factors because the disease is more prevalent in a dry, dusty and smoky environment.³ However, following the pterygium surgery our patients were not exposed more often to environ-

mental irritants that might have initiated pterygium development. Postoperative or intraoperative application of mitomycin C has been associated with various postoperative complications.²²⁻²⁵ Minor complications like ocular pain, photophobia, lacrimation and foreign body sensation are common in mitomycin C-treated patients as we saw in our cases. In this study, we have not found any serious complications in patients who received mitomycin C except in two cases, in which scleral necrosis gradually resolved. We hypothesize that single-drop instillation of mitomycin C at the end of surgery has greater penetration through the epithelium as the fibrin complex in the wound is not formed yet and it is

likely to affect the entire population of potentially "pterygium proliferating cells". Additionally, this regimen is simple, quick, less toxic and independent of patient compliance. Whether the concentration of mitomycin in the eye drop and duration of the usage influence the outcomes of therapy or recurrence of pterygium should be clarified. In conclusion, mitomycin C 0.02% eye drops four times a day for 4 days after operation appear safe in the treatment of pterygium.

We are indebted to all personnel of the Department of Ophthalmology. We also give special thank to Dr. Roushan for his excellent comments on this manuscript.

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