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Original Research Article

Safety and efficacy of intraoperative Mitomycin C in pterygium

Araf Ali*, Ourfa Ashraf, Sheikh Sajjad

Department of Ophthalmology, Sher-I-Kashmir Institute of Medical Sciences, Medical College and Hospital, Jammu and Kashmir, India

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***Correspondence:**
Dr. Araf Ali,
E-mail: aerafali52@gmail.com

ABSTRACT

Background: Pterygium recurrence rate after simple surgical excision is high. Many adjunctive treatments have been used to reduce the recurrence rates of pterygium development. This study was designed to evaluate the results of intraoperative use of Mitomycin C in patients with single recurrence of pterygium.
Methods: this was a hospital based prospective study conducted in the department of ophthalmology SKIMS-MCH, Srinagar from January 2021 to December 2021. 30 eyes of 30 patients who had single recurrence of pterygium after excision underwent pterygium excision along-with concurrent use of intraoperative 0.04% Mitomycin C. Postoperative follow up was done for a period of 6 months.
Results: A total of 30 eyes of 30 patients were taken (16 males patients and 14 female patients) with 16 right eyes and 14 left eyes. Recurrence was seen in 3 patients, two males and 1 female at 4 weeks, 6 weeks and 8 weeks respectively. The side effects encountered were ocular discomfort, foreign body sensation, chemosis and hyperaemia.
Conclusions: Intraoperative use of Mitomycin C in treatment of recurrent pterygium is safe and effective procedure.

Keywords: Pterygium, Mitomycin C, Pterygium recurrence

INTRODUCTION

Pterygium is a common ocular surface disorder. Pterygium is a fibrovascular overgrowth of the subconjunctival tissue, triangular in shape, that encroaches onto the cornea in the medial and lateral palpebral fissure.[1] The risk factors for development of pterygium are immune mechanism, genetic predisposition, and chronic environmental irritation, which include UV (ultraviolet) rays, hot and dry weather, wind, dusty atmosphere, and the period of exposure to such conditions. However, the most common risk factor involved is the increased time of exposure to UV rays of the sunlight, followed by chronic eye irritation from dry and dusty conditions.[2]

The reported prevalence rate of pterygium varies between 0.3 to 29 percent depending on geographical location. The highest prevalence has been reported in the "Pterygium belt" described by Cameron, which lies between 37° north and south of the equator. In India, the prevalence ranges from 9.5% to 13%.[3] It is more commonly found in rural parts of the country.[4]

Recurrence of pterygium is attributed to the reactivation of the inflammatory process, which is present in the primary form. Surgical trauma also serves as an enhancer of the inflammatory response. Proliferative cytokines and growth factors (including vascular endothelial growth factor or VEGF) can increase after surgery if the limbal stem cells remain activated, and fibroelastic tissue is also involved.[5] This leads to enhancement of fibrovascular proliferation and an acceleration in metalloproteinase synthesis that destroys the Bowman membrane and the stromal collagen that leads to progression of pterygium. Various treatment approaches have been advocated,

including pterygium excision combined with chemotherapeutic agents such as Mitomycin C, Thiotepa, intralesional Bevacizumab, or the use of beta radiation, or cover the region with amniotic membrane graft transplantation or conjunctival autograft. In our study, we have combined pterygium excision by bare sclera technique with the use of Mitomycin C intraoperatively in patients with a single recurrence of pterygium.

METHODS

It is a non-randomized prospective study. This study was conducted in the department of ophthalmology SKIMS-MCH, Srinagar from January 2021 to December 2021. 30 eyes of 30 patients who had single recurrence of pterygium after excision underwent pterygium excision along-with concurrent use of intraoperative 0.04% Mitomycin C.

Inclusion criteria

Inclusion criteria for current study were; those patients were included in the study who had the first recurrence of pterygium and pterygium growth on the cornea for a minimum of 2 mm from the limbus.

Exclusion criteria

Exclusion criteria for current study were; patients with a history of ocular trauma, connective tissue disorders, systemic vasculitis, glaucoma, and diabetes mellitus were excluded from this study.

Procedure

All surgeries were performed on an outpatient basis at SKIMS hospital. The surgery technique was as follows: after topical anesthesia (4% lignocaine (lidocaine)) and subconjunctival injection of 0.5 ml of 2% lignocaine with 1:200 000 adrenaline (epinephrine) into the body of the pterygium, the head of the pterygium was removed from the cornea with avulsion technique, and the body of the pterygium was dissected and excised with scissors. The scleral bed was cleared with a crescent blade and a small surgical sponge soaked with 0.2 mg/ml Mitomycin C solution was placed on the bare scleral bed with the conjunctival layer draped over the sponge. After 180 seconds, the sponges were removed and the ocular surface was irrigated with 100 ml of a balanced salt solution. Tenon's capsule was separated from the overlying conjunctiva and excess tenons are excised. On the next day, patients were put on topical low dose antibiotic steroid which was later tapered over a period of 4 weeks. The follow-up was done on day 1, 2 weeks, 4 weeks, 2 months, 4 months, and 6 months of follow-up.

RESULTS

Thirty eyes of thirty patients having a single recurrence of pterygium were operated on with six months follow up, 16 patients were males and 14 patients were females. The age of patients ranged between 25-65 years (Table 1).

Table 1: Demographic characteristics.

Variables	N (%)
No. of eyes	30
Right eyes	16 (53.33)
Left eyes	14 (46.66)
Mean age±SD (range) (years)	44.96±11.29 (25-65)
Sex	
Male	16 (53.33)
Female	14 (46.66)
Type of occupation	
Outdoor	18 (60)
Indoor	12 (40)

About 10 patients complained of photophobia, foreign body sensation, and ocular pain which resolved by 2 weeks following surgery. No other complication was observed in the 6 months of the follow-up period. Recurrent pterygium developed in 3 eyes (10%) of which 2 were males and 1 female developed at 2, 4, and 6 months respectively (Table 2). Recurrence was defined as regrowth of conjunctival fibrovascular tissue encroaching into the corneal limbus more than 1 mm.

Table 2: Recurrence rate.

Time post-operative (months)	Number of eyes
2	1 (Male)
4	1 (Female)
6	1 (Male)
Total N (%)	3 (10)

DISCUSSION

Pterygium removal is done by the Bare Sclera Technique which was described by D'Ombrain in 1948.[6] Bare scleral excision can be initiated by an incision around the conjunctival body of the pterygium or from the corneal apex.[7] High recurrence rates, between 24 percent and 89 percent, have been documented in various reports. Additional methods have been used to overcome the problem of recurrence, which include 5- FU, Thiotepa, intraoperative Mitomycin C, and postoperative Mitomycin C. Kareem et al reported the recurrence rate of 32% with bare sclera technique, which decreased to 8% when intraoperative mitomycin C was used, and 18% when intraoperative 5-FU was used.[8] Verma et al reported the recurrence rate as 48% with the bare sclera technique on the cases with recurrent pterygium and with the use of intraoperative mitomycin C it was around 3%.[9] The study of Yanyali et al showed that the recurrence rate was 57.8% with bare sclera technique and 21% when intraoperative mitomycin C used.[10] Whereas, Demirok et al found this rate to be 40% along with the bare sclera technique and 5.9% when intraoperative mitomycin C

was used.[11] Successful pterygium surgery has been a challenging task in the treatment of pterygium. Recurrence has an underlying mechanism that involves trauma, leading to inflammation and propagation of fibroblasts and deposition of extracellular matrix.[12]

Mitomycin C is an antineoplastic agent which inhibits DNA synthesis used to prevent fibroblast proliferation which is the main causative factor of pterygium recurrence. Thus the use of Mitomycin C has been found to be an effective method to prevent recurrence. However, topical Mitomycin C has been reported to cause a variety of complications which ranges from foreign body sensation, photophobia to severe ones like scleral thinning, necrosis, or secondary glaucoma. In our study, we encountered only mild complaints which were managed conservatively. One of the important complications associated with pterygium treatment is recurrence. Simple excision of pterygium is associated with a high recurrence rate and removal of the recurrent pterygium is more difficult as it is associated with the thin cornea and scar tissue. This study aimed to find the safety and effectiveness of mitomycin C in the treatment of recurrent Pterygium. During follow-up, recurrence was seen in 3 patients (10%) which is very less as compared to bare sclera excision were recurrence is as high as 60% as reported by Kareem et al and Verma et al. Our results are comparable with previous studies by Frucht-Perry et al where recurrence was reduced to 9%.

The concentration of mitomycin C used in our study is 0.02% (0.2 mg/ml) for 3 minutes. Cardillo et al have reported almost similar efficacy with 0.02% and 0.04%. It is recommended to use lower concentration to minimize complications. In the study conducted by Alemwork et al the prevalence of pterygium is more in middle and old age groups. In our study, most of the patients were in the age group of 30 to 55 years. So, the present study agrees with the earlier studies.

Limitations

One of the limitations of the study was number of patients included were comparatively small so proper assessment of side effects couldn't be found. Also, no comparative group was included in the study.

CONCLUSION

Mitomycin C is both safe and effective adjunct in the treatment of recurrent pterygium.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Rosenthal JW. Chronology of pterygium therapy. Am J Ophthalmol. 1953;36(11):1601-16.
2. Moran DJ, Hollows FC. Pterygium and ultraviolet radiation: a positive correlation. Br J Ophthalmol. 1984;68(5):343-6.
3. Ang LP, Chua JL, Tan DT. Current concepts and techniques in pterygium treatment. Curr Opin Ophthalmol. 2007;18(4):308-13.
4. Nangia V, Jonas JB, Nair D, Saini N, Nangia P, Panda-Jonas S. Prevalence and associated factors for pterygium in rural agrarian central India. The central India eye and medical study. PLoS One. 2013;8(12): e82439.
5. Zeng W, Liu Z, Dai H, Yan M, Luo H, Ke M, et al. Anti-fibrotic, anti-VEGF or radiotherapy treatments as adjuvants for pterygium excision: a systematic review and network meta-analysis. BMC Ophthalmol. 2017;17(1):211.
6. D'Ombrain A. The surgical treatment of pterygium. Br J Ophthalmol. 1948;32(2):65-71.
7. Alpay A, Uğurbaş SH, Erdoğan B. Comparing techniques for pterygium surgery. Clin Ophthalmol. 2009;3:69-74.
8. Kareem AA, Farhood QK, Alhammami HA. The use of antimetabolites as adjunctive therapy in the surgical treatment of pterygium. Clin Ophthalmol. 2012;6:1849-54.
9. Verma N, Garap JA, Maris R, Kerek A. Intraoperative use of mitomycin C in the treatment of recurrent pterygium. P N G Med J. 1998;41(1):37-42.
10. Yanyali AC, Talu H, Alp BN, Karabas L, Ay GM, Caglar Y. Intraoperative mitomycin C in the treatment of pterygium. Cornea. 2000;19(4):471-3.
11. Demirok A, Simsek S, Cinal A, Yasar T. Intraoperative application of mitomycin C in the surgical treatment of pterygium. Eur J Ophthalmol. 1998;8(3):153-6.
12. Peng ML, Tsai YY, Tung JN, Chiang CC, Huang YC, Lee H. Vascular endothelial growth factor gene polymorphism and protein expression in the pathogenesis of pterygium. Br J Ophthalmol. 2014; 98:556-61.

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