

Conjunctival Autograft with Mitomycin C (MMC) in Primary Pterygium Excision

Khawaja Khalid Shoaib
Mughal Eye Hospital, Lahore

PJO – Official Journal of Ophthalmological Society of Pakistan
Volume 2023;39(4):342-345.
Doi: 10.36351/pjo.v39i4.1731



This work is licensed under a **Creative Commons Attribution-Non-Commercial 4.0 International License**.

ABSTRACT

Purpose: To evaluate role of conjunctival Autograft (CAG) with Mitomycin C (MMC) in primary pterygium excision.

Place and Duration of Study: Mughal eye hospital Lahore from 2020 to 2022.

Methods: Patients with primary pterygium were operated. Pterygium excision was followed by Mitomycin C (MMC) 0.02% application for 2 minutes under the conjunctiva at base of the pterygium and this was followed by CAG. Patients were followed up at 1 week, 1 month and 2 months to see recurrence and any side effects of MMC. Google sheets were used for recording data of pterygia.

Results: A total of 385 eyes of 316 patients with primary pterygium were included in the study. There were 209 males and 107 females. Mean age was 35 years (range 26 to 58 years). Follow up ranged from one month to 2 months. Four eyes (1%) had recurrence. It was noted that blood vessels of recurrent pterygium grew above or below the conjunctival graft on the side which was short. No complication of MMC was observed. There were 2 cases of graft dehiscence due to early breakdown of sutures.

Conclusion: Recurrence after pterygium excision can be reduced to minimum by application of MMC with CAG and it is a safe procedure. Recurrence mostly encroaches on the cornea from above or below the conjunctival graft. A large conjunctival graft is thus necessary to cover the pterygium area and prevent recurrence. MMC is safe. Suturing the conjunctival graft provides minimum chances of graft loss.

Key Words: Conjunctival Autograft, Mitomycin C (MMC), Pterygium, Recurrence of pterygium.

How to Cite this Article: Shoaib KK. Conjunctival Autograft with Mitomycin C (MMC) in Primary Pterygium Excision.

*Correspondence: Khawaja Khalid Shoaib
Mughal Eye Hospital, Lahore
Email: kkshoaib@gmail.com*

*Received: September 04, 2023
Accepted: September 26, 2023*

INTRODUCTION

The most commonly performed treatment for Pterygium is surgical excision. Recurrence, however, is a big problem in many cases. Various options have been exercised to prevent recurrence including Conjunctival autograft (CAG/CAU), Amniotic membrane graft (AMG), Mitomycin C (MMC), Cyclosporine and Aflibercept. MMC alone (used either pre, per or post operatively in the form of local

application or eye drops) has been used to decrease recurrence rate.¹ Now the latest trend is CAG which has been used alone or in combination.² There are no side effects/complications of CAG while MMC can cause scleral thinning and necrosis and/or corneal melting and ulceration. This study was designed to analyze overall success rate and complications of CAG with MMC in preventing recurrence after pterygium excision.

Methods: All patients with primary pterygia were included by convenient sampling. Recurrent and pseudo pterygia were excluded. Patients with primary pterygium underwent excision of pterygium head and fibro vascular tissue under the conjunctiva. It was followed by MMC 0.02% application for 2 minutes under the conjunctiva at base of the pterygium and this was followed by CAG. Patients were followed up at



Fig. 1: Lt photo: MMC soaked triangular sponge being introduced under the conjunctiva. 2nd from left photo: Final position of sponge at pterygium base, not visible. 2nd from Rt photo: Conjunctival graft being positioned. Right photo. Dehiscence of conjunctival graft.

1 week, 1 month and 2 months after surgery to see recurrence and any side effects of MMC. Care was taken not to touch cornea or 2-3 mm sclera near the limbus. After MMC application, thorough irrigation with ringer lactate solution was done.

RESULTS

There were 385 eyes of 316 patients with primary pterygium. Out of which 209 were male and 107 were female. Mean age was 35 years (range 26 to 58 years). Follow up ranged from one month to 2 months. Four eyes (1%) had recurrence. It was noted that blood vessels of recurrent pterygium grew above or below the conjunctival graft on the side which was short. There were 2 cases of graft dehiscence due to early breakdown of sutures. No complication of MMC was observed.

DISCUSSION

In the present study, CAG was used in combination with MMC for the treatment of primary pterygia and excellent results were found as far as recurrence (< 1%) is concerned. Overgrowth of conjunctival vessels from up or down, around the graft was an indication that graft was probably short in size at that side. Adjunctive use of MMC in CAG pterygium excision remains controversial.

One study has recommended MMC in conjunctival graft for severe pterygia and observed that MMC (0.25 mg/ml for 1 minute) decreased recurrence from 18% to 9% in conjunctival autograft pterygium excision after one year and there were no complications.³ Others have observed that recurrence was 15.6% with and 15.8% without application of MMC in conjunctival graft cases and it was half as compared to amniotic membrane graft cases.¹ MMC 0.04% was applied per-operatively by soaking a sponge and placing it between sclera and overlying

conjunctiva of the pterygium for 5 min, and on the exposed sclera for 2 min. Six months follow up did not reveal any recurrence or graft displacement/loss.⁴

A systematic review and meta-analysis found single intraoperative topical application of 0.02% MMC during excision of pterygium followed by CAG to decrease the rate of pterygium recurrence significantly to 1.4% with no severe complications.⁵ The lowest recurrence rate was seen after CAG especially for larger pterygia. The higher recurrence rate after intraoperative use of MMC was probably caused by selection bias.²

Regarding timing of the recurrence, in one study, most recurrences occurred in first 3 – 6 months after pterygium excision.⁶ They recommended CAG and MMC in recurrent cases. Amniotic membrane has been combined with MMC and it resulted in recurrence in 5.8% cases.⁷ In one study, one third of recurrences occurred after one year of follow up so requiring long term follow up.¹

Use of topical Cyclosporin (Ciclosporin/cyclosporine) had equivocal results. Topical cyclosporin with conjunctival graft was most successful in preventing recurrence of the pterygium after excision.⁸ However another study found that 0.05% Cyclosporine eye drops 10 days before and 10 days after pterygium excision did not make any difference as far as recurrence was concerned.⁹ In yet another study, CAG and ciclosporin 0.05% eye drops resulted in minimum recurrence.¹⁰

Graft stability after pterygium excision is also important. We fixed the graft with sutures which achieved a very stable graft. Suturing however takes time and there is a trend to fix it by other means to shorten the operation time. The other two alternatives to attach conjunctival graft to the scleral bed are autologous blood and fibrin glue. Autologous blood has been compared to fibrin glue and sutures. In one study, after pterygium excision with CAG and

autologous blood fixation, 84% of the patients had stable postoperative graft. In this cohort, 5% of patients had significant displacement of the graft. After one year of follow-up, 16% of patients had recurrence.¹¹ In another study, conjunctival grafts were taken from the inferior bulbar conjunctiva and attached to sclera with the help of bipolar electro-cauterization. In this series, 5% recurrence was seen with a mean follow-up of 41 months (range 12 to 81 months).¹² Other researchers have shown no difference in recurrence rate. However autologous blood was found to be inferior to fibrin glue as far as duration of the operation, graft retraction and displacement are concerned. Autologous blood was superior to sutures in terms of surgical duration and inferior to sutures in terms of graft retraction. No difference was detected in terms of graft displacement.¹³ In another study, CAG with MMC and fibrin glue resulted in recurrence rate of 2.6%.¹⁴

Recent trends in the treatment of pterygium include Femtosecond assisted conjunctival graft. It has less deviation from the planned thickness.¹⁵

A Russian study compared Aflibercept after bare sclera versus CAG and found almost equal recurrence after 23 months of follow up (26% versus 24%). In the third limb, treated by peripheral lamellar keratoplasty and Aflibercept, recurrence decreased to 3%.¹⁶

Recurrent pterygia are more difficult to treat and so recurrence in these cases is a bigger problem. In one series comparing limbal CAG, intraoperative MMC 0.02% for 5 minutes and combined CAG with MMC 0.02% for 5 min, all had favorable outcomes for recurrent pterygium.¹⁷ CAG results in less recurrences than AMG in recurrent pterygium. The use of intraoperative MMC may result in statistically insignificant decrease in the recurrence rate (recurrence CAU+MMC 0%, CAU18%, AMG+MMC 46%, AMG 80%) and may be associated with complications.¹⁸ In another study, management of recurrent pterygium with severe Symblepharon using MMC, double AMT, cryo-preserved limbal allograft (CLA) transplantation, and a conjunctival flap were effective treatment options.¹⁹ Recurrence rate of 3.2% was achieved in recurrent pterygia surgery with CAG, AMG and MMC.²⁰

We did not encounter any MMC related complications. Main reasons probably included deep site of application (avoiding anterior 4-5 mm of sclera), short application time (2 minutes) and low concentration (0.02%). Limitations of our study

included short follow up period. As recurrence can be expected after 6-12 months period, one month follow up failed to detect many recurrent cases. Lack of comparison using randomized control trial is another limitation. Strength of our study is relatively large number of cases.

CONCLUSION

Recurrence after pterygium excision can be reduced to minimum by application of MMC with CAG and it is a safe procedure. Recurrence mostly encroaches on the cornea from above or below the conjunctival graft. A large conjunctival graft is thus necessary to cover the pterygium area and prevent recurrence. MMC is safe. Suturing the conjunctival graft provides minimum chances of graft loss.

Conflict of Interest: Authors declared no conflict of interest.

Ethical Approval: The study was approved by the Institutional review board/Ethical review board (MEHT-0009).

REFERENCES

1. **Alsarhani W, Alshahrani S, Showail M, Alhabdan N, Alsumari O, Almalki A, et al.** Characteristics and recurrence of pterygium in Saudi Arabia: a single center study with a long follow-up. *BMC Ophthalmol.* 2021;**21(1)**:207. Doi: 10.1186/s12886-021-01960-0.
2. **Eisenmann K, Zeman F, Helbig H, Gamulescu MA, Barth T.** Ergebnisse der Pterygiumchirurgie nach verschiedenen Operationstechniken – Ist die Exzision mit einfachem Bindehautverschluss noch lege artis? [Outcome of pterygium excision after various surgical techniques-is excision with simple conjunctival closure still lege artis?]. *Ophthalmologie.* 2020;**117(4)**:359-365. German. Doi: 10.1007/s00347-019-00968-8.
3. **Wong VA, Law FC.** Use of mitomycin C with conjunctival autograft in pterygium surgery in Asian-Canadians. *Ophthalmology.* 1999;**106(8)**:1512-1515. Doi: 10.1016/S0161-6420(99)90445-1
4. **Ghoz N, Elalfy M, Said D, Dua H.** Healing of autologous conjunctival grafts in pterygium surgery. *Acta Ophthalmol.* 2018;**96(8)**:e979-e988. Doi: 10.1111/aos.13794.
5. **Taher NO, Alnabihi AN, Hersi RM, Alrajhi RK, Alzahrani RA, Batais WT, et al.** Amniotic membrane transplantation and conjunctival autograft combined with mitomycin C for the management of primary pterygium: A systematic review and meta-analysis. *Front Med (Lausanne).* 2022;**9**:981663. Doi: 10.3389/fmed.2022.981663.

6. **Ghiasian L, Samavat B, Hadi Y, Arbab M, Abolfathzadeh N.** Recurrent Pterygium: A Review. *J Curr Ophthalmol.* 2022;**33(4)**:367-378. Doi: 10.4103/joco.joco_153_20
7. **Rosen R.** Amniotic Membrane Grafts to Reduce Pterygium Recurrence. *Cornea,* 2018;**37(2)**:189-193. Doi: 10.1097/ICO.0000000000001407.
8. **Chu WK, Choi HL, Bhat AK, Jhanji V.** Pterygium: new insights. *Eye (Lond).* 2020;**34(6)**:1047-1050. Doi: 10.1038/s41433-020-0786-3.
9. **Meneghim RLFS, Satto LH, Natsuaki KL, Oliveira AC, Padovani CR, Viveiros MMH, et al.** Topical cyclosporine A 0.05% before and after surgery to prevent pterygium recurrence. *Arq Bras Oftalmol.* 2019;**82(5)**:372-376. Doi: 10.5935/0004-2749.20190075.
10. **Fonseca EC, Rocha EM, Arruda GV.** Comparison among adjuvant treatments for primary pterygium: a network meta-analysis. *Br J Ophthalmol.* 2018;**102(6)**:748-756. Doi: 10.1136/bjophthalmol-2017-310288.
11. **Nganga Ngabou CGF, Makita C, Ndalla SS, Nkokolo F, Messe Ambia Koulimaya R, Diatwa B.** Chirurgie du ptérygion avec greffe de conjonctive fixée par du sang autologue [Pterygium surgery by conjunctiva autograft with autologous blood fixation]. *J Fr Ophtalmol.* 2018;**41(5)**:425-432. French. Doi: 10.1016/j.jfo.2017.10.007.
12. **Costa FQ, Costa RQ, Barbosa JB, Gomes JÁP.** Pterygium Surgery with Conjunctival Autograft Fixation Using Bipolar Electrocauterization. *Eur J Ophthalmol.* 2021;**31(3)**:1458-1462. Doi: 10.1177/1120672120965488.
13. **Zeng W, Dai H, Luo H.** Evaluation of Autologous Blood in Pterygium Surgery with Conjunctival Autograft. *Cornea,* 2019;**38(2)**:210-216. Doi: 10.1097/ICO.0000000000001798.
14. **Hwang HS, Cho KJ, Rand G, Chuck RS, Kwon JW.** Optimal size of pterygium excision for limbal conjunctival autograft using fibrin glue in primary pterygia. *BMC Ophthalmol.* 2018;**18(1)**:135. Doi: 10.1186/s12886-018-0790-6
15. **Liu YC, Ji AJS, Tan TE, Fuest M, Mehta JS.** Femtosecond Laser-assisted Preparation of Conjunctival Autograft for Pterygium Surgery. *Sci Rep.* 2020 Feb 14;**10(1)**:2674. Doi: 10.1038/s41598-020-59586-z.
16. **Malozhen SA, Trufanov SV, Krakhmaleva DA.** Antiangiogenaya terapiya v khirurgicheskom lechenii pterigiuma [Antiangiogenic therapy in the surgical treatment of pterygium]. *Vestn Oftalmol.* 2020;**136(5.Vyp.2)**:177-183. Russian. Doi: 10.17116/oftalma2020136052177.
17. **Kam KW, Young AL.** Fifteen-year results of a randomized controlled trial comparing 0.02% mitomycin C, limbal conjunctival autograft, and combined mitomycin C with limbal conjunctival autograft in recurrent pterygium surgery. *Graefes Arch Clin Exp Ophthalmol.* 2019;**257(12)**:2683-2690. Doi: 10.1007/s00417-019-04499-5.
18. **Kim YJ, Rao R, Lee HJ.** Comparison of surgical techniques for recurrent pterygium. *Can J Ophthalmol.* 2022;**S0008-4182(22)**:00175-2. Doi: 10.1016/j.jcjo.2022.05.011.
19. **Monden Y, Nagashima C, Yokote N, Hotokezaka F, Maeda S, Sasaki K, et al.** Management of Recurrent Pterygium with Severe Symblepharon Using Mitomycin C, Double Amniotic Membrane Transplantation, Cryopreserved Limbal Allograft, and a Conjunctival Flap. *Int Med Case Rep J.* 2020;**13**:201-209. Doi: 10.2147/IMCRJ.S245256.
20. **Monden Y, Hotokezaka F, Yamakawa R.** Recurrent pterygium treatment using mitomycin C, double amniotic membrane transplantation, and a large conjunctival flap. *Int Med Case Rep J.* 2018;**11**:47-52. Doi: 10.2147/IMCRJ.S150969.

Authors' Designation and Contribution

Khawaja Khalid Shoab: Professor: *Concepts, Design, Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

