

## Conjunctival Autograft Versus Non-bare Sclera Mitomycin C in Surgery of Primary Pterygium

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### ABSTRACT

**OBJECTIVE:** To evaluate and compare the efficacy of using conjunctival autograft and non-bare sclera mitomycin C (MMC) techniques as two treatment options for primary pterygium.

**PATIENTS AND METHODS:** Retrospective comparative study included 55 eyes in 55 patients with primary pterygium. 30 eyes of 30 patients (group 1) underwent pterygium excision followed by conjunctival autograft. 25 eyes of 25 patients (group 2) underwent pterygium removal followed by intraoperative application of 0.02% MMC for 2 minutes with conjunctival preservation (non-bare sclera technique). Both groups were compared in terms of surgery time, pterygium size, cosmetic effect, pterygium recurrence and

complications.

**RESULTS:** Mean pterygium size was ( $3.1 \pm 0.64$  mm and  $2.6 \pm 0.94$  mm) in group 1 and 2, respectively ( $p = 0.1$ ). Mean surgery time was significantly shorter in MMC group ( $26.4 \pm 6.39$  min) as compared to conjunctival autograft group ( $47.9 \pm 11.7$  min) ( $P < 0.0001$ ). Pterygium recurrence was not seen in any of the patients. Mean follow up time was ( $14.8 \pm 6$  and  $17.2 \pm 9.6$  months) in group 1 and 2, respectively ( $p = 0.4$ ).

**CONCLUSION:** Both conjunctival graft and non-bare sclera MMC techniques are comparable as regard of pterygium recurrence. MMC technique has significantly shorter surgery time, better cosmeses and lower incidence of complications. Preserving the conjunctiva should be considered when the patient has a history of glaucoma or there is insufficient conjunctiva.

**Key words:** Conjunctival autograft; Intraoperative MMC; Primary pterygium; Non-bare sclera MMC

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### INTRODUCTION

Pterygium is a fibrovascular proliferation arising from the conjunctiva of the eye that grows in a wing like fashion over the cornea. Vision is affected when the growth obstructs the pupil or induces irregular astigmatism<sup>[1]</sup>; therefore, the proliferated tissue should be removed at that time. Cosmetic purposes and chronic eye irritation are among the indications for pterygium surgery. The currently used surgical techniques are bare sclera<sup>[2,3]</sup>, primary closure, amniotic membrane, rotational conjunctival flaps<sup>[4,5]</sup> conjunctival autografting<sup>[6,7]</sup> as well as adjuvant for aborting regrowth using different treatment modalities such as thiotepa<sup>[8]</sup>,  $\beta$  radiation<sup>[8]</sup>, or mitomycin C (MMC). Having similar success rates, simple pterygium excision with non-bare sclera MMC technique is both simpler and less time consuming when compared to other grafting techniques. Another benefit of this technique includes preserving the conjunctival tissue. Mitomycin C is

an antimetabolite, antiproliferative and alkylating compound derived from *Streptomyces caespitosus*. The blood supply to pterygium is derived mainly from the surface conjunctiva<sup>[9]</sup>, and MMC is considered an effective method to reduce pterygium recurrence<sup>[10]</sup>. Conjunctival autograft is another effective method to reduce the recurrence. The conjunctival graft will cover the defect, and abort the fibrovascular growth onto the cornea, thereby reducing pterygium recurrence<sup>[11]</sup>.

In this study, I compared two methods; pterygium removal with non-bare sclera MMC application and conjunctival autografting. The two methods were compared in terms of surgery time, cosmetic effect, recurrence rate, pterygium size, and complications.

## PATIENTS AND METHODS

This study followed the tenets of the Declaration of Helsinki, and all patients gave informed consent. Retrospective comparative study included 55 eyes of 55 patients with primary pterygia performed between April 2012 and November 2018. Thirty eyes of 30 patients (group 1) underwent pterygium excision followed by conjunctival autograft. Twenty five eyes of 25 patients (group 2) underwent pterygium excision followed by intraoperative application of 0.02% MMC for 2 minutes with conjunctival preservation (non-bare sclera technique). Demographic data of patients including pterygium size, surgery time, pterygium recurrence, surgery outcome, complications and follow up time were reported. The inclusion criteria were presence of surgically indicated primary pterygium due to vision deterioration, chronic eye irritation, cosmetic problems, and more than 1.5 mm growth on the cornea.

One surgeon (AA) performed all the surgical procedures. Each patient gave written informed consent before the surgery. The surgical procedure was performed under subconjunctival anesthesia with lidocaine HCl 20 mg/ml. The pterygium was dissected at the limbus using Westcott's scissors, the head of the pterygium was peeled off the surface of the cornea and subconjunctival fibrous tissue was completely excised. The surface of the cornea was then smoothed by the Diamond burr. Minimal cauterization was applied to the bed of pterygium. For the graft technique, flap was taken from the superotemporal limbus. The conjunctival flap was gently dissected avoiding the Tenon's capsule, transferred to the defect area and was secured in place to the episclera and surrounding conjunctiva with interrupted 8.0 Vicryl sutures. For non-bare sclera MMC technique, after pterygium removal and dissection of subconjunctival fibrovascular tissue, piece of sponge soaked in 0.02% MMC were then applied to the scleral bed for 2 minutes. The areas were then thoroughly irrigated with balanced salt solution after removing the sponge material and then the preserved conjunctiva was sutured to the adjacent conjunctiva at the limbus using 8.0 Vicryl sutures. A subconjunctival injection of dexamethasone gentamicin was given at the inferior fornix. After the surgery all the patients were prescribed dexamethasone and tobramycin eye drops 4 times a day for 4 weeks. All Vicryl sutures were removed by the end of the third week postoperatively and patients were examined at days 1, weeks 1 and then monthly till the end of the follow up period.

## RESULTS

Demographic and clinical data of the study groups are listed in table 1. Mean patient age (years) was  $55.8 \pm 12.5$  (range 30-77) in the conjunctival autograft group,  $58.7 \pm 14$  (range 35-78) in the MMC group. Mean pterygium size was ( $3.1 \pm 0.64$  mm and  $2.6 \pm 0.94$  mm) in conjunctival autograft and MMC groups, respectively ( $p = 0.1$ ).

**Table 1** A comparison between some of the most important indexes studied in the patients of both groups by means  $\pm$  standard deviation (SD).

Variables	Conjunctival autograft group (n = 30)	MMC group (n = 25)	p - value
Age [mean (SD) years]	$55.8 \pm 12.5$	$58.7 \pm 14$	0.5
Male/Female ratio	21/9	20/5	
OD/OS	20/10	11/14	
Follow-up [mean (SD) months]	$14.8 \pm 6$	$17.2 \pm 9.6$	0.4
Surgery time [mean (SD) minutes]	$47.9 \pm 11.7$	$26.4 \pm 6.39$	< 0.0001
Pterygium size [mean (SD) mm]	$3.1 \pm 0.64$	$2.6 \pm 0.94$	0.1
Recurrence	-	-	
Injection at surgery site	3 patients	-	
Corneal infection	-	-	
Dellen	-	-	

Mean age was comparable in all study groups ( $p = 0.5$ ). The surgical procedure was successful in all cases. Mean follow up time was  $14.8 \pm 6$  (range 6- 24 months) in conjunctival autograft group and  $17.2 \pm 9.6$  (range 8-36 months) in MMC group ( $p = 0.4$ ). The corneal defect was completely epithelialised within three days after surgery in all patients. Complications such as corneal dellen, corneal infection, scleral necrosis, pyogenic granuloma were not seen in any of the patients. Regrowth of pterygium was not seen in any of the patients throughout the follow up period. Three patients of the conjunctival graft group (10%) were unsatisfied after surgery because of conjunctival injection at surgery site. In non-bare sclera MMC group, mean surgery time ( $26.4 \pm 6.39$  min) was found to be significantly shorter as compared to conjunctival autograft group ( $47.9 \pm 11.7$  min) ( $p < 0.0001$ ).

## DISCUSSION

Many surgical techniques have been employed to treat pterygium; however, recurrence has been observed in many of these methods<sup>[12]</sup>. Highest rate of recurrence was reported in bare sclera technique<sup>[13]</sup>. In conjunctival graft technique, the recurrence rate was reported to vary between 3.5 and 39 percent<sup>[14]</sup>. Some studies showed that conjunctival autograft method were similar to those achieved when intraoperative mitomycin C was used<sup>[15]</sup>. In the current study, conjunctival autografting technique and non-bare sclera MMC were evaluated in terms of efficacy, complications, recurrences and surgery time. The current study showed that, non-bare sclera MMC technique was free from complications, provided satisfactory cosmeses and saved extra surgery time when compared with grafting technique. Mean surgery time was significantly shorter in non-bare sclera MMC groups ( $26.4 \pm 6.39$  min) than in the graft group ( $47.9 \pm 11.7$  min) ( $p < 0.0001$ ). One study<sup>[16]</sup> showed that conjunctival graft required longer surgery time (18-32) min, than MMC technique (6-22) min. Three patients of the conjunctival graft group (10%) were unsatisfied because of conjunctival injection at surgery site. In this study, no grafts were lost. On the other hand, MMC with conjunctival preservation was analyzed in this study in which the sclera was not left bare. Pterygium removal augmented with intraoperative MMC can reduce the regrowth of pterygium because MMC inhibits the proliferation of fibroblasts at the site of resection. Complications as corneal infection, persistent corneal ulcer and scleral thinning were not observed in MMC group throughout the follow up period.

In conclusion, both conjunctival autograft and non-bare sclera MMC methods have comparable results regarding pterygium

recurrence. Non-bare sclera MMC technique has significantly shorter surgery time, better cosmeses and lower incidence of complications. Preserving the conjunctiva should be considered when the patient has a history of glaucoma or when there is insufficient conjunctiva.

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