

## ORIGINAL ARTICLE

**Risk Factors Involved in Recurrence of Pterygium Excision after Surgical Excision**MUHAMMAD WASEEM<sup>1</sup>, SHAHID ANWAR BHATTI<sup>2</sup>, MUHAMMAD AYUB KHAN<sup>3</sup>, ZAHEER UDDIN BABAR<sup>4</sup>, ABDUL RAFAE<sup>5</sup>, HAROON SALEEM<sup>6</sup><sup>1</sup>District Ophthalmologist, DHQ Hospital, Batkhela<sup>2</sup>Associate Professor of Eye Sahara Medical College, Narowal<sup>3</sup>Assistant Professor Ophthalmology, Gomal Medical College, Dera Ismail Khan<sup>4</sup>Associate Professor Ophthalmology, CMH Lahore<sup>5</sup>Assistant Professor Ophthalmology, Avicenna Medical College, Lahore<sup>6</sup>Ophthalmologist, Alshifa Centre of Community Ophthalmology, Alshifa Trust Eye Hospital, RawalpindiCorresponding author: Shahid Anwar Bhatti, Email: [hamzadrshahidanwar@yahoo.com](mailto:hamzadrshahidanwar@yahoo.com)**ABSTRACT****Aim:** To determine the effect of the type and size of growth, sex and patients age, and the application of mitomycin-C intraoperatively and its application duration effect on pterygium recurrence afterwards excision.**Study Design:** A retrospective and descriptive case series.**Place and Duration:** In Alshifa Trust Eye Hospital, Rawalpindi and the department of Ophthalmology CMH, Lahore for the duration from November 2022 to April 2022.**Methods:** Data files from 80 patients (80 eyes) who underwent bare sclera technique surgery with MMC at 0.2 mg / ml (0.02%) and application time ranging from 1 to 5 mints. The study included 60 males and 20 females with 46.4 years of mean age (16 to 60 years). Cases were classified according to sex, age, pterygium type and size and MMC application time. The main outcome measures were to compare the eye affected by the pterygium for any type of recurrence after at least 1-year of follow-up.**Results:** In our case series, the rate of pterygium recurrence was 10% in the mean follow-up of 1 year. The influencing factors like younger age at admission (<50 years), secondary pterygium (p = 0.330) was suggestively related with pterygium recurrence. There was a clear tendency of less rate of recurrence with smaller pterygium size, with MMC administration times greater than 3 minutes. However, it was not possible to obtain statistical significance due to the smaller sample size.**Conclusions:** This study results propose that younger age < 50-years, a history of multiple recurrences, increased size and a duration of MMC administration < 3 mints are risk factors for postoperative recurrence of pterygium.**INTRODUCTION**

Pterygium is a common degenerative change in the surface of the eye. The pathogenesis of pterygium is not fully understood and many causative agents have been described<sup>1</sup>. The ultimate treatment for pterygium is surgical removal<sup>2</sup>. The most common and major complication of anxiety is recurrence. Risk factors for recurrence may be due to patient factors, pterygium characteristics, and / or surgical factors<sup>3</sup>. According to reports, the experience of the surgeon is one of the predictors. One study attempted to identify risk factors for pterygium recurrence in training surgeons but found no significant factors<sup>4</sup>. The technique of conjunctival autograft is one of the most operative surgical methods for pterygium. Although the conjunctival autograft is operative in evading recurrence of pterygium, this technique needs proficiency and a long surgical time due to the two-step procedure (conjunctival donor removal and conjunctival autograft fixation)<sup>5-6</sup>. In addition, this technique may not be suitable if glaucoma surgery is required in the future. In some training centres, pterygium surgery begins early in residential training<sup>7-8</sup>. The surgeons with little experience, such as new ophthalmologists should avoid cases with potential risk to reduce the risk of recurrences<sup>9</sup>. The aim of the study is to determine the effect of the type and size of growth, sex and patients age, and the application of mitomycin-C intraoperatively and its application duration effect on pterygium recurrence afterwards excision.

**METHODS**

This retrospective case series study was conducted at Alshifa Trust Eye Hospital, Rawalpindi and the department of Ophthalmology CMH, Lahore for the duration from November 2020 to April 2022. The patients meeting the inclusion criteria, with informed consent, people of all ages with a definitive diagnosis of unilaterally progressive pterygium or bilateral pterygium of various sizes, under supervision of surgical excision of pterygium with bare sclera technique and application of MMC with at least 12 months of follow-up. The patients with corneal scars, had suspected growth or were non-compliant with the follow-up were omitted from the study. A comprehensive medical history was obtained from all

patients with a full eye assessment, counting BCVA, slit lamp examination, fundus examination and IOP evaluation with Goldman applanation tonometry. Pterygium was classified as primary or secondary by first episode or recurrence, respectively. The size of the pterygium was classified according to the degree of corneal involvement: Grade-I: pterygium encroaching the cornea 2 mm. Grade-II: the pterygium head covering the cornea >2mm but not involving the visual axis and grade-III: visual axis involvement. 80 total subjects (80 eyes) with minimum 12 months of follow-up were enrolled in the study; 60 were males and 20 women (M:F ratio of 2: 1) aged 16-60 years (46.4 years of mean age) were enrolled. Primary pterygium was diagnosed in 65 cases, and secondary pterygium in 15 subjects. Grade 1 pterygium was found in 55 eyes (68.8%), grade 2 pterygium in 18 eyes (22.5%), and grade 3 pterygium in 7 eyes (8.7%). A pterygium was found in 62 eyes (77.5%) on nasal side, temporal side in 16 eyes (20%) and bilateral side in 2 eyes (2.5%). Of the 80 eyes with a pterygium, 30 were left and 50 were right.

The bare sclera technique for pterygium excision under local anesthesia (Proparacaine - Alcon) was used and 5x5 mm of sterile sponge soaked with 0.2 mg / ml MMC (8-10 drops) (0.02% concentration) applied on the sclera and cornea from where the pterygium was removed with varying times from 1 to 5 mints. After that irrigation with 20 ml of 0.9% normal saline was done. Then Tobramycin 0.3%+ Dexamethasone 0.1% and hydroxypropyl methylcellulose (Tear Natural II) were prescribed topically in QID for one-month. The MMC dose was calculated according to international recommendations. Patients were evaluated after surgery for every three months. Any physical symptoms or complications were recorded at every follow-up for for one year. The pterygium recurrence was definite as fibrovascular connective tissue encroachment onto the cornea along the limbus and at any distance from the previous lesion. Cases were classified according to age, sex, time of MMC application, grading and type of pterygium. The patients were alienated into 2 age groups (1) > 50 years (2) ≤ 50 years. The topical MMC time of application was divided into 5 groups varies from 1-5 mints. Potential factors were also ranked consequently (Table 2). The main outcome measures were to compare the eye affected by the pterygium for any type of

recurrence for minimum follow-up of 12 months. The data was entered into SPSS 22.0 and analyzed by means of ratios, frequencies, standard deviation, group means, Pearson chi-square test and Fisher's exact test. The CI of 95%, 0.05 of alpha level and 0.8 power were designated for the analysis.

**RESULTS**

Pterygium recurrence was observed in 8 eyes (10%) of 8 patients and the median time to recurrence was 6.80 months. Six of the patients with recurrence were < 50 years of age-group (p = 0.03, Pearson Chi-square test). Likewise, although statistically insignificant (p = 0.550), males were more likely have recurrence than females.

Table-1: shows the patients demographic Features

Patients Characteristics	No of Patients	Frequency
<b>Gender</b>		
Males	60	75
Females	20	25
<b>Affected Eye</b>		
Left	30	37.5
Right	50	62.5
<b>Pterygium Grading</b>		
Grade-I	55	68.8
Grade-II	18	22.5
Grade-I	7	8.7
<b>Pterygium Site</b>		
Nasal	62	77.5
Temporal	16	20
Bilateral	2	2.5
<b>Recurrence</b>		
Yes	8	10
No	72	90

The percentage of recurrence was high in patients already have recurrent pterygiums in comparison to the patients with primary pterygiums (7.5%). A clear recurrence trend was also observed in the further stratification of patients based on corneal involvement, with patients with a higher degree of corneal involvement had high recurrence rate (p = 0.06).

Table-2: shows the potential risk factors for recurrence of pterygium

Pterygium Type	Recurrence		P value
	Yes	No	
Primary	6(8.5%)	65(91.5%)	0.06
Secondary	2(22.2%)	7(77.8%)	0.330
<b>Gender</b>			
Male	5(8.3%)	55(91.7%)	0.07
Female	3(15%)	17(85%)	
<b>Pterygium Grading</b>			
Grade-I	4(7.3%)	51(92.7%)	0.550
Grade-II	3(16.7%)	15(83.3%)	
Grade-I	1(14.3%)	6(85.7%)	
<b>Age in years</b>			
<50 years	6(10.9%)	49(89.1%)	0.03
>50 years	2(8%)	23(92%)	
<b>MMC application time</b>			
1-mint	1(25%)	3(75%)	0.19
2-mints	5(7.7%)	60(92.3%)	
3-mints	1(14.3%)	6(85.7%)	
4-mints	1(25%)	3(75%)	
5-mints			
<b>Associated with cataract</b>			
Yes	2(25%)	6(75%)	0.68
<b>Pterygium site</b>			
Nasal	6(9.7%)	56(90.3%)	1.02
Temporal	2(12.5%)	14(87.5%)	
Bilateral	0	2(100%)	
<b>Surgery Duration</b>			
>1 hour	6	75%	0.08
< 1hour	2	25%	

Correspondingly, when patients with the primary pterygium were graded by size, significant recurrence rate was observed with a higher pterygium grade (P = 0.006). Though, the similar condition was not observed in cases with a secondary pterygium (p = 0.330). The importance of pterygium grading in terms of recurrences is presented in Table-II. The timing of MMC administration was also noted due to its importance for recurrence, with a 50% reduction in the frequency of recurrences in the 1-minute group and no recurrence in the 5-minute group (P = 0.19). The most common postoperative symptom in most patients was corneal nebula opacity, and one subject developed a conjunctival cyst at the excision site. No major complications such as ulceration, thinning or necrosis of sclera were observed in our patients.

**DISCUSSION**

The pterygium is a wing-shaped lesion on the surface of the eye attributed to exposure to ultraviolet B rays. Although the pathogenesis of pterygium is not yet fully understood, histological features propose that inflammation have a vital role in recurrence and initial pathogenesis<sup>9-10</sup>. The most common complication after pterygium surgery is recurrence. Many techniques have been proposed with variable recurrence rates<sup>11</sup>. A recent review of the literature and a meta-analysis found that the recurrence rate for conjunctival autografts ranges from 2% to 39%<sup>12</sup>. There are 2 studies comparing the incidence of recurrences between consultant surgeons and trainees. Farrah et al. stated that the recurrence rate of 6.8% in the primary operated patients<sup>13</sup>. Chalioulias K et al. did not find a significant change between primary and secondary pterygium recurrence rate (26.3% vs 24.5%)<sup>14</sup>. According to Ti et al; the rate of recurrence varied substantially between surgeons, ranging from 5% to 82%, and was inversely proportional to previous experience, while another Thai study found that 9.7% of recurrences performed by ophthalmologists during training were within acceptable limits<sup>15-16</sup>. The explanation was the number of cases. In one study, the recurrence rate was 4.8-10% if the surgeon was experienced in 5-10 cases<sup>17</sup>. In another study of surgeons experienced in 5 or more cases, the recurrence rate (9.7%) was consistent with the first study<sup>18</sup>. From the previous evidence, it is relatively clear that surgical experience has an influence on pterygium recurrence. In the present study, "the goal was to identify risk factors that may influence pterygium recurrence. According to previous reports, recurrence was acceptable. Although not all factors had a statistically significant effect on pterygium recurrence, long operative time (≥ 1 hour) was associated with a relatively high relative risk (4.28)<sup>19</sup>. This means that the risk of recurrence in the long-term surgery group was approximately 4.28 times higher than in the short-term surgery group<sup>20</sup>. Various factors were observed in this study: younger age < 50-years, a history of multiple recurrences, increased size and a duration of MMC administration < 3 mints are risk factors for postoperative recurrence of pterygium. A possible explanation for this finding is that the long duration of the study may increase the risk of inflammation<sup>21</sup>. The use of fibrin glue instead of suture in pterygium surgery significantly shortened the time of the operation and resulted in a lower frequency of recurrences compared to the suture<sup>22</sup>. The eye surgical trauma starts an inflammatory response, and so persistent conjunctivitis around the operating field is a probable risk factor for recurrence of pterygium<sup>23</sup>. Swelling of the conjunctiva can be caused by prolonged surgery and sutures. On the other hand, conjunctival autograft with fibrin glue has been found to be associated with more complications such as graft retraction, retraction, and granuloma<sup>24</sup>.

**CONCLUSION**

This study results propose that younger age < 50-years, a history of multiple recurrences, increased size and a duration of MMC

administration < 3 mints are risk factors for postoperative recurrence of pterygium.

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