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Comparison between conjunctival autograft and post-op mitomycin c in patients of pterygium

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Introduction: Pterygium is one of the most common conjunctival diseases among ophthalmicpathologies, it is a fibro vascular encroachment of the conjunctival tissue on to the cornea, causing variable degree of ocular morbidity.The purpose of this study was to evaluate and compare recurrence rate in treating primary pterygium by two different techniques i.e. conjunctival autografting and intra-operative Mitomycin –C (0.02%) with reference to recurrence and complication rate. **Material and Methods:** Present study was the prospective, comparative case study involving 80 eyes of 40 patients came in Index Medical College in OPD and Camp conducted in different rural areas. Patient were assigned to two groups (A and B) randomly. Group A underwent limbalconjuctivalautograft. Group B underwent pterygium excision augmented with postoperative topical mitomycin C application. **Result:** Out of the 80 patients maximum numbers of patients were in the age group from 41 to 50 years. there was a male preponderance in this study with 47 males (58.75%) as compared to 33 females (41.25%). It was found that recurrence of pterygium occurred in 2 (5%) out of 40 eyes treated with limbalconjuctivalautograft and 3 (7.5%) out of 40 eyes in whom pterygium excision was followed by postoperative mitomycin C. In Group B, 2 patients showed the sclera thinning while no complication found in Group A. There were no statistically significant differencebetween two groups. **Conclusions:** Conjunctivallimbalautograft and postoperative MMC (0.02%) are both safe and effective adjuncts to primary pterygium surgery. The main prejudices against auto- grafting are the expertise and time required for the procedure. The recent use of biologic adhesives to fixate the autograft in place may simplify the procedure. Age of the patients was strongly associated with recurrence regardless of which procedure was used.

Keywords: Pterygium, conjunctival autograft, intra-operative Mitomycin – C

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Introduction

Pterygium is an excessive proliferation of fibro vascular tissue over the exposed ocular surface and frequently leads to almost irreversible visual loss. terygium is a common disorder in many parts of the world, with reported prevalence rate ranging from 0.3 to 29%. Epidemiological studies suggest an association with chronic exposure to sunlight; with an increased geographical prevalence within a peri-equatorial 'pterygium belt' of latitudes of 37 degrees north and south of the equator [1].

Clinically pterygium is a fibro vascular wing-shaped encroachment of conjunctiva onto the cornea [2]. Ultraviolet B light in solar radiation has been found to be the most significant environmental factoring pterygium pathogenesis[1]. A recent study has suggested that P-53 and human papilloma virus may also be implicated in pterygium pathogenesis. Ultraviolet radiation can cause mutation in genes such as the P-53 tumor suppressor gene, resulting in its abnormal expression in pterygial epithelium. These findings suggest that pterygium is not just a degenerative lesion, but could be a result of uncontrolled cell proliferation [3]. Indications for surgery include visual impairment, cosmetic disfigurement, motility restriction, recurrent inflammation and interference with contact lens wear [4]. Surgical management includes simple excision with bare sclera technique, excision with adjunctive measures like intra-operative and postoperative beta radiation, thiotepa drops, intra-operative mitomycin C and various techniques of conjunctival auto grafting. The reported recurrence rates of these techniques vary widely, from 5% for pterygium excision with conjunctival auto grafting, to89% for simple excision [1,4]. Ablation with erbium or YAG laser, and smoothening the corneal surface with excimer [5]. Laser has been tried but the results are not encouraging.Mitomycin C is an anti neo plastic antibiotic alkylating agent isolated from fermentation filtrate of Streptomyces caespitosus. It selectively inhibits DNA replication by forming covalent linkages with guanosine residues in DNA, inhibits cellular RNA and protein synthesis. Therefore, it prevents mitosis leading to cell death and interferes with collagen synthesis, thus preventing recurrence after pterygiumsurgery [6]. Although generally proven simple and effective, toxicity remains a concern. Complications reported with intra-operative or

Postoperative use of mitomycin C are pain, iritis, secondary glaucoma, and cataract, punctuate keratitis, chemosis, delayed conjunctival healing, conjunctival granuloma and scleral and corneal melting [7]. Many of these reported serious complications involved use of high concentrations (0.04 – 0.1%), prolonged postoperative topical use and/or larger cumulative dosages resulting from poor drug compliance [7,8].

Young AL et al have recommended intraoperative use [9]. The concentrations of intra-operative mitomycin C application used in most of the studies range from 0.01% to 0.04% with 0.02% applied form three months being the commonest dosage used [10]. Applying mitomycin C at the time of surgery providesclear advantage, such that the surgeon has controlover the medication delivery and, moreover, single,direct scleral bed application does not expose the entire ocular, nasal, nasolacrimal or oropharyngeal surfaces to the drug [11]. Our study was conductedto compare results of recurrence by excision with limbal conjunctival auto grafts or postoperative topical Mitomycin C drops.

Material and Methods

Present study was the randomized, prospective, comparative case study involving 80 eyes of 40 patients came in Index Medical College in OPD and Camp conducted in different rural areas. The duration of the study was 2 years. The study was reviewed by the institutional review board. Each eligible patient provided informed consent prior to the enrolment in the study.

Inclusion Criteria

01. All cases of pterygium attending the OPD including recurrent pterygium.
02. Patients came through Camp conducted in nearby rural areas.

Exclusion Criteria

Patients coming from faraway places who were not able to come for regular follow up were excluded from
this study. Patient with followings were excluded from the study.

- Recurrent Pterygium
- Previous Limbal surgery
- Ocular surface pathology
- Collagen vascular disorder

- Autoimmune diseases
- Infections

Collection of Data: Detail ocular examination including visual acuity, refraction, IOP, extra- ocular movement, slit lamp bio microscopy and fundoscopy was done before operative procedure. All 40 patients were randomly assigned to two groups. Group A: Primary Pterygium excision with LCAG (limbal conjuctival autograft) Group-B: Primary Pterygium excision with MMC 0.02%

Operative Procedure

Group-A (limbalconjuctivalautograft)

- Detachment of Pterygium head & dissection of body from overlying conjunctiva
- Excision of sub conjunctival Pterygium tissue
- Bare sclera gently cauterized
- Graft taken from supero-temporal aspect of limbus, 1mm larger than the recipient bed
- Secured with 10.0 vicryl (episcleraly)

In patients belonging to Group A excision of perygium was done followed by limbal conjunctival auto graft taken from upper temporal quadrant and sutured on the bare sclera using 6.0 vicrylsutures Patients were given gatifloxacin or moxifloxacin with dexamethasone eye drop 4 times a day for 2 weeks, then 3 times a day for 2 weeks, and then 2 times a day for 2 weeks. Gatifloxacin or moxifloxacin with dexamethasone ointment was applied at night for 6 weeks. The patient were followed after one week and then monthly for a year. Patients belonging to group B were treated with mitomycin C in a strength of 0.01 mg/ml in carboxy methyl cellulose. On first and second postoperative day patient were told to use either gatifloxacin or moxiflox- acin eye drops 6 times a day. From third to twenty first postoperative day patients were given mitomycin C drops 4 times a day and gatifloxacin (3 mg) with dexamethasone (1 mg) eye drops 4 times a day. Patients were followed weekly for three weeks and then monthly for a period of one year. Best corrected visual acuity were noted on every visit. Patients were asked for any pain, photophobia, redness, and lacrimation.

Group-B (MMC-0.02%)

- Intraoperative (MMC 0.02%) applied overbore sclera for 5 minutes
- Site of application was thoroughly irrigated with BSS solution. All patients were followed up for period of 18months (3, 6, 9, 12 and 18). Any recurrences or complications were recorded (Recurrence defined as fibro vascular tissue invading the cornea >1.5mm).

Statistical Analysis: Statistical analysis was done by calculation of range, median, mean, standard deviation, percentage, student t test.

Statistical software: The statistical software SPSS 10.0 was used for the analysis of the data and Microsoft word and excel have been used to generate graphs, tables etc.

Result

The present study was conducted at the Index Medical College and Hospital & Research Centre, Indore, Madhya Pradesh over a period of 23 months (October 2011to September 2013). 80 eyes of 40 patients were enrolled in this study.

Patients were assigned to two groups (A and B) randomly. Group A underwent limbal conjunctival auto graft, 40 patients.

Group B underwent pterygium excision augmented with postoperative topical mitomycin C application included 40 patients. Out of the 80 patients maximum numbers of patients were in the age group from 41 to 50 years in which the youngest patient was 23 years of age and the oldest patient was 70 years of age, there was a male preponderance in this study with 47 males (58.75%) as compared to 33 females (41.25%).65 patients belong to rural areas and 15 from urban areas. There is no significant association between group A and B.

Table 1: Demographic data of study participants

	Group A	Group B
Mean age(yrs.)	50	50
Age	40-70	40-70
SexMaleFemale	2512	2211
Rural	33	32
Urban	07	08

Table 2: Recurrence rates

	Pterygium Auto graft	Pterygium Excision with Mitomycin C
No. Of Eyes treated	40	40
Recurrence No. %	2(5%)	3(7.5%)

Table 3: Age of patients with recurrence

Age of the patient	Group A(Conjunctival Auto graft)	Group B(Pterygium Excision with Mitomycin C)
Less Than or Equal to 50 years	2(5%)	2(5%)
Greater than 50 years	0	1(2.5%)

In the present study it was found that recurrence of pterygium occurred in 2 (5%) out of 40 eyes treated with limbalconjuctivalautograft and 3 (7.5%) out of 40 eyes in whom pterygium excision was followed by postoperative mitomycin C.

The present study shows that there were two recurrences in eyes with pterygium excision followed by conjunctival auto graft with age less than 50 years of age whereas in eyes with pterygium excision followed by mitomycin C there was one recurrence in patients less than 50 years and two recurrences in patients greater than 50 years of age.

Table 4: Shows postoperative complications

Type Of Complication	Type A(Conjunctival Auto graft)	Type B (Pterygium Excision followed with Mitomycin C)
Scleral Thinning	0	2(5%)

Above table shows that 2 cases (5%) of scleral thinning in eyes with pterygium excision followed by Mitomycin C while no complications had been seen in Conjunctival Auto graft.

Discussion

Pterygium is an excessive proliferation of fibro vascular tissue over the exposed ocular surface and frequently leads to almost irreversible visual loss. It is a worldwide disease which is particularly common in tropical and sub-tropical regions.

In the study conducted by Alemwork Meseretetal[12], prevalence of pterygium was more in middle and old age group. Our study shows that maximum number of patients were in the age group from 41 to 50 years in which the youngest patient was 23 years of age and the oldest was 70 years of age. So the present study agrees with the previous studies.

McCarty etal [13] found that the independent risk factors for pterygium were found to be age (OR=1.23, 95% CL=1.06, 1.44), male sex (OR=2.02, 95% CL=1.35, 3.03), rural residence (OR=5.28, 95% CL=3. 56, 7.84), and lifetime ocular sun exposure (OR=1.63, 95% CL=1.18, 2. 25). The attributable risk of sunlight and pterygium was 43.6% (95% CL=42.7, 44.6). The result was the same when ocular UV-B exposure was substituted in the model for broad band sun exposure. Above studies observed that pterygium is more likely to occur in outdoor workers, and hence it is more common in men than in women. The present study shows a male preponderance with 47 males (58.75%) as compared to 33 females (41.25%). So the present study agrees with the previous studies. Jeanie et al[14] studies have indicated that pterygium occurs as a result of localized limbal dysfunction the success of conjunctival auto grafting technique that include limbal tissue in the graft in treating primary & recurrent pterygia to provide for the Limbal Stem Cell deficiency has been highlighted. This study showed a higher prevalence in males. Previous studies showed similar results. In 1998 Lewallen et al [15] published report of a randomized trial of the conjunctival auto grafting technique for pterygium removal. She documented a lower recurrence rate (21 %) in grafted cases compared with bare sclera technique (37 %). A recurrent pterygium can be associated with decreased visual acuity due to involvement of visual axis and/or irregular astigmatism, extraocular motility restriction and symblepharon formation [16]. Because of high recurrence rate the bare sclera excision alone proved unsatisfactory. Adjunctive treatment after bare sclera excision with beta irradiation reduced recurrence rate to as low as 0.5%-10% [17], but was associated with significant complications such as scleral necrosis.

Sharma et al, 2003[18] found that Mitomycin-C is an alkylating antineoplastic agent which inhibits cellular division and replication by inhibiting DNA synthesis. Intra operative MMC is preferred and current regimen of 0.02% MMC for 5minutes has been found to be equally effective, simple, and has comparable recurrence rates. In conclusion, simple excision of pterygium followed by MMC or limbal conjunctival auto graft both yielded acceptable results. Young et al (2004)[19] in their study found recurrence rate higher in group II than group I while in the present study it was approximately equal in both the groups.

In contrast AL et al[20] found thatTwelve of 47 patients (25.5%) in the original MMC group and

2 of 29 patients (6.9%) in the LCAU group had recurrent pterygium (P = 0.021). The mean ECD was 2,39 2 ± 342 cells/mm(2) in the MMC group and 2,390 ± 388 cells/mm(2) in the LCAU group (P = 0.978). There was no significant difference in the ECD between the operated eyes and the fellow eyes in both groups (P = 0.926 MMC, P = 0.468 LCAU). No other significant ocular complications were observed in either group at the 10- year postoperative follow-up.

Nitin Vichare et al [21] found that, the average surgical time taken was 50.93 ± 4.96 min with suture group and 34.43 ± 4.94 min with fibrin glue group. Pain and foreign body sensation was markedly less with fibrin glue group. At the end of final follow up at 6 months, 3 cases (10%) from suture group and 1 case (3.33%) from fibrin group had recurrence.

Chen et al.[22] reported the mean time of recurrence varied from 3.7 to 4.8 months with only 6% of recurrences occurring after the sixth postoperative month. In the present study, cases where limbal conjunctival auto grafting was done there was recurrence occurring in the first and third month whereas in cases where pterygium excision followed by mitomycin was done recurrence occurred in third, fourth and sixth month of follow up so the present study agrees with previous studies. Lam et al. [23] reported 2 cases (5.57%) of scleral thinning in the group in which they applied MMC. The present study shows, 2 cases (5%) of scleral thinning in eyes with pterygium excision followed by MMC which agrees with previous studies.

In the study conducted by igueiredoet al. [24] patients with age less than 50 years had significantly more recur- rences. It has been suggested that lipoid degeneration in the cornea is an inhibiting factor to pterygium growth, based on observations that pterygium does not cross an arcussenilis to any great extent. The presence of increasing amounts of lipoid degeneration with age might explain in part, the strong association between age and recurrence. The present study shows that there were two recurrences in eyes with pterygium excision followed by conjunctival autog raft with age less than 50 years of age whereas in eyes with pterygium excision followed by mitomycin C there was one recurrence in patients less than 50 years and two recurrences in patients greater than 50 years of age which agrees with previous studies.

Conclusion

Simple excision of Pterygium followed by Limbal conjunctival auto grafting (LCAG) and Mitomycin -C (MMC) 0.02%. Both yielded acceptable and comparable results &both are safe and effective adjuvant of Pterygium surgery LCAG appeared to be technically difficult, time consuming and required skillful dissection and placement of graft, which is main limiting factor for successful grafting. Single intra operative MMC (0.02%) appear to be simple and equally effective and useful adjunctive therapy without serious complication.

The choice of adjuvant should be carefully made by assessing the individual recurrence risk factors, and most importantly surgeon's expertise. More research needs to be done to delve into this seemingly innocuous pathology of conjunctiva to effectively manage the disease condition.

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