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EVALUATION OF SUBCONJUNCTIVAL MITOMYCIN- C, ONE MONTH BEFORE BARE SCLERA IN THE MANAGEMENT OF PRIMARY PROGRESSIVE PTERYGIUM

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ABSTRACT

Purpose: Evaluation of subconjunctival mitomycin- C, one month before bare sclera in the management of primary progressive pterygium. **Design**: Prospective, randomized, interventional, hospital based study. **Material & Methods:** In present study 30 patients having primary progressive pterygium were randomly selected and they were treated with subconjunctival Mitomycin 1 month before bare sclera. All patients were followed up at one week, one month, three months, six months, twelve months and eighteen months post-operatively. A clinical photograph was taken at each follow-up visit. The major outcome measures were recurrence rate and complications if any. **Results:** Mean age of the patients in the study was 38.6 ± 12.6 years with males' outnumbered females. Majority (70%) of patients were pursuing outdoor occupations. More (63%) number of patients were residing in rural area than urban area. Right eye had slight preponderance in the distribution of eyes. Maximum (90%) number of patients had pterygium on nasal side. Mean follow up period was 10.2±4.49 months. One patient (3.33%) had recurrence within study period. The surgical technique was not found to be associated with any serious vision threatening complications. **Conclusion:** Subconjunctival mitomycin C one month before bare sclera is simple, safe, economical, less time consuming, technically less demanding procedure and thus has potential to replace other methods of management of pterygium because of its simplicity, low recurrence rate and less complications.

KEYWORDS: Pterygium, Fibrin glue, Mitomycin C.

INTRODUCTION

The first recorded description of pterygium and the surgical procedure to treat it was by Susruta, the world's first surgeon-ophthalmologist who lived in India around 1000 BC.[2] It is degenerative condition of subconjunctival tissues which proliferate as vascularised granulation tissue to invade the cornea, destroying the superficial layers of the stroma and bowman's membrane, whole being covered by conjunctival epithelium.[3]

Pterygium is found more commonly in populations residing in tropical and subtropical areas.[4] The prevalence of pterygium seems to be associated with geographic latitude with moderate to high prevalence occurring within 35 degree above and below the equator, suggesting prolonged exposure to sunlight or UV light as a causal factor.[5,6,7] Other risk factors include outdoor work[8,9], exposure to dry dusty environment[10], and genetic predisposition.[11] Pterygium is common in India because of geographical location and climatic conditions.

Pterygium is best left alone unless it is symptomatic. Till date no topical medication has been developed that may stop or prevent pterygium in its early stage. Treatment of pterygium is essentially surgical. The primary surgical indication for pterygium removal is decreased visual acuity as a result of encroachment into the visual axis or irregular astigmatism, restricted ocular motility and poor cosmesis. Pterygium surgery dates back to 1855 when Desmarres first performed a transposition of pterygium head.[12] Since then various surgical techniques have been evolved because recurrence after surgery which is often more aggressive than primary lesion is a major problem.[12]

In this study, we evaluated preoperative subconjunctival mitomycin- C, one month before bare sclera and measured the outcome of this technique in terms of recurrence rate and complications.

MATERIAL AND METHODS

Source of data

30 patients with classical features of **Primary progressive pterygium** were selected from the outpatient and inpatient departments of Ophthalmology, Dr VMGMC Solapur between Dec 2010 to Dec 2011.

Selection of patient
The selection was done based on clinical examination. A careful clinical history of all those patients complaining of Pain, redness, watering and mass in eyes were considered. The patients were then subjected to a thorough, examination and after establishing the diagnosis; the patients were taken for the clinical study.

Inclusion criteria
- All patients less than 50 years of age having primary progressive pterygium, who signed the consent form, were included in this study.

Exclusion criteria
- Patient having dry eye syndrome
- Patient having collagen vascular disease
- Patient with co-existent conjunctival diseases like previous alkali burns, moorens ulcer which predispose to pseudopterygium.
- Patient having atrophic pterygium.
- Patients having uveitis, scleritis, glaucoma
- Follow up less than 6 month.

RESEARCH PROTOCOL
Approval was obtained from Institutional Ethical Committee of our institution for conducting this study.

Patients underwent full preoperative evaluation (complete history and ophthalmological examination) as per case proforma. Patients were required to sign a proforma of written consent after complete discussion of the procedure. They were given subconjunctival injection of MMC (0.1ml of 0.10mg/ml) at the outpatient clinic under aseptic condition as and when they presented to OPD and then operated with bare sclera technique after 1 month. A clinical photograph of every patient was taken pre-operatively and post operatively on each follow up visit.

SURGICAL TECHNIQUE
Anaesthesia
All patients were operated under peribulbar block using 5cc of 2% xylocaine + 1:2,00,000 adrenaline.

SUBCONJUNCTIVAL MITOMYCIN C 1 MONTH BEFORE BARE SCLERA
Initially, two drops of proparacaine 0.5% topical anaesthetic instilled in the involved eye. Mitomycin C was prepared from the commercially available 2 mg vial by mixing it with 10 ml sterile distilled water, which is again double diluted with distilled water to achieve a concentration of 0.10mg/ml. Then 0.1 ml of Mitomycin C was injected subconjunctivally into the body of pterygium with a 30-0 gauge needle on a tuberculine syringe. Cotton bud is kept for few seconds on injection site to prevent egress of MMC. After injection, the conjunctival sac was irrigated with saline to wash out excess Mitomycin C and the patient received one drop of ofloxacin 0.3%, which was continued four times daily for 4 days. Patients were seen 1 day, 1 week and 1 month after the subconjunctival injection of mitomycin C. A complete slit lamp examination including fluorescein staining was done to evaluate epithelial defect.

One month after mitomycin C injection, the patients underwent bare sclera excision of the pterygium. Eye was prepared and draped in usual sterile fashion. Eye speculum was applied. The neck of pterygium was grasped with Saint Martin's forceps and its head was dissected off cornea by conjunctival scissor and blunt dissection using cotton bud. Scleral portion of pterygium was then excised using section enlarging scissors. A thorough removal of sub conjunctival fibrous tissue was then performed. The scleral bed and the cornea were then polished with no.15 surgical blade. Antibiotic steroid ointment (Polymyxin B sulphate 10,000 Units + chloramphenicol 10 mg + dexamethasone sodium phosphate 1 mg per gram of ointment) was instilled and sterile eye pad was applied. Duration of surgery was noted from insertion of speculum to its removal at the end of surgery.

Follow up
All patients were followed up at one week, one month, three months, six months, twelve months and eighteen months post-operatively. A clinical photograph was taken at each follow-up visit. The major outcome measures were recurrence rate and complications if any.

RESULTS
Out of 30 patients 5(16.66%) patients were in age group of 21-30 years, 11(36.66%) patients were in the age group of 31-40 years, 14(46.66%) patients were in age group of 41-50 years. Average age of the patients in the study was 38.6 ± 12.8 years. Out of 30 patients in the study, 18 (60%) were male and 12 (40%) were female. More no of male patients may be because males are indulged in outdoor activity more than female. However, if the study was carried out in larger sample size could be conclusive. Out of 30 patients 9 (30%) patients were doing indoor occupation while 21 (70%) patients were doing outdoor activities. The reason of increased incidence in outdoor occupant is exposure to heat, dust, smoke, fumes. Out of 60 patients taken for the study, 40% were vegetarians and 60% were of mixed diet variety. Since study sample is small, relation with diet cannot be drawn. 63% patients were from rural areas and 37% were from urban area. This shows that pterygium are more prevalent in rural area than the urban because of malnourishment, low socio-economic status, ignorance to health. Out of 30 patients 13(43.33%) patients had pterygium only in their right eye, 12(40%) had pterygium in only left eye, and 5(16.66%) patients had bilateral pterygia i.e. pterygium in both right and left eyes. Out of 30 eyes of 30 patients 27 (90%) were nasal pterygia, 2 (6.66%) were temporal pterygia and 1 (3.33%) were double pterygia i.e. pterygium with both nasal and temporal heads.

Mean follow up period for patients with bare sclera with pre-op MMC one month before sclera was 10.2 ± 4.49 months. There was 1 (3.3%) recurrence over mean follow up period of 10.2 ± 4.49 months. All 30 eyes had conjunctival congestion post- operatively. Subconjunctival hemorrhage was seen in 4 eyes and in 2 eyes of another patients had Conjunctival granuloma seen.

DISCUSSION

The primary concern in pterygium surgery is recurrence, defined by re- encroachment of fibro vascular growth across the limbus and onto the cornea.[11] The simplest technique; the bare sclera technique is associated with unacceptably high recurrence rate of 37-91%.[13,14] So various treatment modalities including conjunctival autograft, amniotic membrane grafting, adjunctive mitomycin C are used to reduce recurrence rates. It is believed that surgical trauma and subsequent post-operative inflammation activates subconjunctival fibroblast and the proliferation of fibroblast with deposition of extracellular matrix protein in turn contributes to pterygium recurrence.

According to several studies so far, conjunctival autograft results in lower pterygium recurrence rates when compared with bare sclera excision and it is also associated with fewer complications.[11] However conjunctival autografting has its limitations in that it may adversely affect outcome of future glaucoma filtration surgeries if needed and it is of limited use in cases with large double headed pterygia and scarred conjunctiva as enough donor conjunctival tissue might not be available. Also, it is technically demanding and time-consuming procedure; suturing of the autograft is rather difficult and necessitates surgical experience and technical skill. Furthermore, sutures may cause patient discomfort, dellen formation, symblepharon.[11]

Recently adjunctive mitomycin C has become a more commonly used technique in preventing pterygium recurrence. Several modalities of usage have been described including preoperative injection and intraoperative application. Mitomycin C is an effective intraoperative treatment for preventing recurrence of pterygium. The newer technique, subconjunctival injection of mitomycin C allows exact dose delivery directly to the activated fibroblast in the subconjunctival space, where it can work directly on the cells responsible for pterygium recurrence without damaging surface epithelial stem cells, which play no role in pterygium formation or recurrence. In the present study, mitomycin C was injected subconjunctivally to minimize exposure to the ocular surface and reduce the epithelial stem cell toxicity associated with intraoperative application. Also, the subconjunctival route allows exact dose delivery (0.1 ml of 0.10mg/ml of MMC) rather than the inexact and substantially higher dosing with sponge delivery during intraoperative application. We chose to wait 1 month after the injection of Mitomycin C before performing bare sclera pterygium surgery based on previous studies of subconjunctival mitomycinC for ocular cicatricial pemphigoid and pterygium done by Donnenfeld et al. Eyes became less inflamed and quiescent at1 month and there was less bleeding than is normally associated with pterygium excision.

The aim of this study was to find out 1) Whether pre-operative MMC reduces recurrence rate after bare sclera excision to acceptable levels without causing significant complications and 2) Whether it can be considered as a good alternative to standard techniques of pterygium management.

In our study, recurrence rate was (3.3%) in the subconjunctival Mitomycin C one month before bare sclera group at the end of mean follow up of 10.2 ± 4.49 months All patients had conjunctival congestion post – operatively due to surgical trauma which decreased with topical antibiotic-steroid eye drops, 4 patients had subconjunctival hemorrhage after the injection of mitomycin C which cleared in a week. No patients had any sign of conjunctival or corneal staining on any visit after subconjunctival injection of mitomycin C. Two patients had conjunctival granuloma at one week and one month post operatively after bare sclera technique which resolved completely with topical steroid eye drops till next follow up. None of the patients had any serious vision threatening complications such as glaucoma, corneal edema, corneal perforation, scleral melting, cataract which are associated with intra operative application of Mitomycin C.

SUMMARY AND CONCLUSION

Conjunctival autograft with suture is standard surgical option for pterygium, but its major drawbacks are post-operative patient discomfort, sacrificing conjunctiva of donor site and is more time consuming.

Simple bare sclera excision has got unacceptably high recurrence rate of 37 to 91%. By giving mitomycin C one month before bare sclera, recurrence rate reduced to 3.33% without causing significant complications.

Subconjunctival mitomycin C (0.1ml of 0.10mg/ml) one month before bare sclera is not associated with any serious vision threatening complications (corneal perforation, scleral melting, glaucoma) that are associated with intraoperative mitomycin C (0.2 to 0.4 mg /ml) use.

In our study recurrence rate with subconjunctival mitomycin C before bare sclera excision of pterygium was (3.33%) and it is comparable to recurrence rate by other standard technique like conjunctival autograft using suture or fibrin glue (6.67%).

Subconjunctival mitomycin C one month before bare sclera is simple, safe, economical, less time consuming,

technically less demanding and as effective as conjunctival autografting. It has definite role in patients with recurrent pterygium, large double headed pterygia, patients with glaucoma who may require filtration surgery in future and combined pterygium with cataract patients.

In conclusion, subconjunctival mitomycin C one month before bare sclera has a potential to replace other methods of management of pterygium because of its simplicity, low recurrence rate and less complications.

Recommendations for further study
It is recommended to carry the study on larger sample size.

Comparative study with conjunctival autografting using suture/Fibrin glue.

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Conflicts of interest
There are no conflicts of interest.

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