COMPARISON OF CONJUNCTIVAL AUTOGRAFT AND CONJUNCTIVAL ROTATION FLAP TECHNIQUES IN PRIMARY PTERYGIUM SURGERY

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ABSTRACT

BACKGROUND

A large section of the society is pursuing occupations in the outdoors which exposes the eyes to the ultraviolet radiations. The UV exposure leads to primary pterygium which in turn may lead to loss of vision. Persons with sedentary occupations in the indoors also have reported with primary pterygium although they are less in number. Prognosis of surgical treatment is encouraging. Therefore, the authors are motivated to incorporate two safer methods of surgeries. They are Conjunctival autograft and Conjunctival rotation flap techniques in primary pterygium surgery.

The objectives of this study were to evaluate the complications and recurrence rate after primary pterygium excision with conjunctival autograft and conjunctival rotation flap techniques over a span of 18 months and to compare the two aforesaid methods as they are safer techniques in the treatment of primary pterygium.

MATERIALS AND METHODS

It is a prospective study conducted at P. G. Department of Ophthalmology, MKCG Medical College and Hospital, Berhampur from April 2016 to Sep 2017 (18 months). 40 patients were operated upon. Following primary pterygium excision, autoconjunctival graft was employed in 21 cases and conjunctival rotation flap was utilised in 19 cases. 36 patients were in the age group 32 to 60 years and 4 patients were more than 60 years old.

RESULTS

High prevalence of pterygium was seen in age group of 40 to 49 years (18 eyes - 45%). There is high incidence (80%) of pterygium in patients who have their occupation in outdoors which exposes persons to ultraviolet radiations. Patients of pterygium were less in number (20%) who have indoor occupations. All the pterygium were nasally located with mean corneal encroachment of 3mm X 3mm. 55% of surgeries were carried out on the right eyes and 45% of surgeries were carried out on left eyes. During the follow up period of this study, progressive pterygium recurred in 2 patients. The average duration of recurrence was 5.5 months. The mean age of patients with recurrence was 46 years. Mean surgical time spans in conjunctival rotation flap and conjunctival autograft group were 18 minutes and 25 minutes respectively. The recurrence in conjunctival autograft and conjunctival rotation flap groups were 4.76% and 5.26% respectively.

CONCLUSION

Both conjunctival rotation flap and conjunctival autograft techniques have almost same results in terms of pterygium recurrence and surgical complications in the treatment of primary pterygium, surgical time span in conjunctival rotation flap technique is significantly shorter. So, the conjunctival rotation flap technique may be a good alternative method for primary pterygium surgery.

KEYWORDS

Pterygium, Conjunctival Rotation Flap, Conjunctival Autograft.

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BACKGROUND

Pterygium is a triangular fibrovascular, subepithelial wing shaped encroachment of the conjunctiva onto the cornea typically inducing astigmatism and leading to loss of vision if it occludes the pupil.[1] It is common worldwide (5.2%)[2] but is particularly prevalent in tropical and subtropical areas. The main indicators for the pterygium excision are redness with ocular irritation and decreased vision secondary to induced astigmatism or occlusion of the papillary axis.[3,4]

In this study, we compared two techniques i.e. conjunctival, rotation flap and conjunctival auto grafting as

they are safer methods in the treatment of primary pterygium. Both the methods have almost same success rates and low recurrence rates. Conjunctival rotation flap technique is not only simple but also less time consuming as compared to conjunctival autograft technique.

MATERIALS AND METHODS

Study was carried out on 40 eyes from April 2016 to Sep 2017 (18 months). Following excision of primary pterygium, the conjunctival autograft was employed in 21 cases and conjunctival rotation flap was utilised in 19 cases. After surgery, patients were followed up once in a month for a period of 6 months to look for recurrence. Patients of age between 30 to 60 years presenting with pterygium to the out-patient department, P.G. Department of Ophthalmology of M.K.C.G. MCH, Berhampur were taken into our study.

- Grade 1 Extension of < 2 mm into the cornea
- Grade 2 Extension of upto 4 mm into the cornea
- Grade 3 Extension of > 4 mm into the cornea

Health of the conjunctiva at harvest site and any associated corneal diseases were noted. All petients were evaluated to rule out Diabetes mellitus, hypertension. All patients underwent[5] visual acuity assessment, slit lamp examination, keratometry, IOP measurement and lacrimal passage syringing prior to surgery. A written informed consent explaining the complications and possibility of recurrence was obtained from all the patients. Prerequisite blood tests were carried out. Patients were started on Moxifloxacin e/d 6 hourly in the eye to be operated 3 days prior to surgery.

Injection of xylocaine 2% test dose was administered subcutaneously to look for any signs of sensitivity.

Inclusion Criteria

All cases of operable pterygium were taken up for surgery and studied. Only patients with primary pterygium were included in the study.

Exclusion Criteria

Patients with recurrent pterygium, any previous ocular surgery, previous ocular trauma, dry eye, ectropion, entropion pseudopterygium, chronic conjunctivitis, any existing ocular diseases, age below 30 years were excluded. All patients included in the study were examined to assess the following aspects prior to the surgery.

1. Location of pterygium
2. Progressive or non-progressive pterygium
3. Extent of encroachment of pterygium into the cornea.

Surgical Procedure

- Peribulbar anaesthesia was given with 2% xylocaine with or without adrenalin and 0.5% bupivacaine (total 5 to 7ml).
- The surgical field was painted with Betadine and draped with sterile drapes.
- Universal eye speculum was used to separate the lids and expose the surgical field.
- The head of the pterygium was grasped with fine-toothed forceps and the head was dissected off from the cornea with a crescent blade up to the limbus.
- The body of the pterygium was dissected and excised using Westcott's scissors.
- The excised area included a 1mm border beyond the edges of the excised head at the limbus.
- The globe was turned inferiorly and lignocaine 2% was injected subconjunctivally in the superotemporal quadrant to from a bleb and separate conjunctiva from the Tenon's Capsule.
- Westcott's scissors was used to cut a conjunctival flap of the exact size of the receiving sclera bed measured using Castroviejo calipers.
- The exact limbal orientation of the conjunctival graft was maintained and shifted to the receiving bed.
- The donor site was covered by pulling the superior forniceal conjunctiva and anchoring it to the limbal episcleral tissue with one 10-0. Nylon suture.
- The graft was sutured using 10/0 nylon interrupted sutures.
- The dissected area of the cornea was smoothened out by \scraping with no. 15 BP blade and visco was put over it.

For conjunctival rotation flap procedure, the flap was created from the superior bulbar conjunctiva rotated to the site of the scleral bed aligning the limbal end of the flap with the limbal end of the bared scleral bed and secured with 10-0 monofilament nylon suture to the surrounding conjunctiva and the Tenon's capsule.

Injection Dexamethasone+ gentamycin (0.5ml) was given to the inferior fornix at the end of the procedure and the eye was closed and padded. Post operatively the patients were evaluated for visual acuity, condition of the cornea (amount of opacity-nebular, macular, leucoma), condition of the graft (retraction, chemosis, haemorrhage, congestion), condition of the donor site, post operatively the patients were started on topical antibiotic and steroid combination eye drops 8 times a day and tear substitutes 4 times a day. The antibiotic drops were stopped after a period of 2 weeks and tapering doses of steroids, tear substitutes were continued for 1 month, any retained sutures were removed after 1 month. Patients were then evaluated with respect to visual acuity and presence or absence of recurrence and complications at 1 week, 1 month, and then at monthly interval up to 6 months. Recurrence was considered as encroachment of the cornea by vascularization more than 1.5 mm along with presence of conjunctival drag, vascularization without conjunctival drag was not considered as recurrence.[5]

RESULTS

Highest prevalence of pterygium was seen in age group of 40 to 49 years. 18 eyes (45%). (Table 1) There is high incidence in outdoor patients i.e. 80% & indoor 20%. (Table-2) All the pterygium were nasally located with mean corneal encroachment of 3mmX3mm. 60% of cases are grade 2

pterygium (Table-2) Right eye 55% and left eye 45%. (Table 2). All the cases are progressive type (Table 2) Out of 40 patients 26 (65%) were male, 14 (35%) were female. (Table 5) During the follow up period of this study progressive pterygium recurred in 2 patients. The average duration of recurrence was 5.5 months. (Table 5) The mean age of patients with recurrence was 46 years. Mean surgery times in conjunctival rotation flap and conjunctival autograft group was 18 minutes and 25 minutes respectively. (Table 3) The recurrence in conjunctival autograft (4.76%) and conjunctival rotation flap groups (5.26%). (Table-5)

AGE (in Years)	Total Number	Percentage (%)
30-39	8	20%
40-49	18	45%
50-59	10	25%
> 60	4	10%
Total	**40**	

Table 1. Age Distribution in Present Study

Characteristics	Number of Patients		Percentage (%)
Occupation	Outdoor	32	80%
	Indoor	8	20%
Grade of Pterygium	Grade - 1	10	25%
	Grade - 2	24	60%
	Grade – 3	6	15%
Pterygium Type	Progressive	40	100%
	Non-Progressive	0	0%
Chief Complaints	Fleshy Mass	38	95%
	Redness	2	5%
Operated Eye	Right	22	55%
	Left	18	45%

Table 2. Patient Characteristics

	CONJUNCTIVAL AUTOGRAFT GROUP	CONJUNCTIVAL ROTATION FLAP GROUP
Surgical time in minutes	25 Min	18 Min
Recurrence		
a) Male	1	1
b) Female	0	0
Pre-operative size of pterygium in case of recurrence		
a) Large	1	1
b) Small	0	0
Postoperative Complications		
a) Sub conjunctival haemorrhage	4	4
b) Loose suture	1	1
c) Corneal thinning	1	1
d) Oedema	2	1
e) Granuloma	0	0
f) Inclusion cyst	0	0
g) Scleral Necrosis	0	0

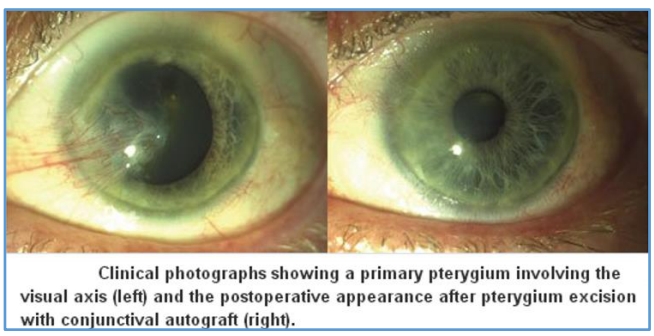
Table 3. Surgical time, Recurrence and Postoperative Complications seen after Pterygium Surgery

	Conjunctival Autograft Technique	Conjunctival Rotation Flap Technique
Torsional effect on tissue	More Prominent	Less Prominent
Surgical Time Span	Longer	Shorter
Aesthetic Morphological Appearance (postoperative)	Average	Encouraging
Traction Suture	Required	May not be required
Risk of graft loss & inversion	Present	Absent
Healing Process	Average	Encouraging
For huge pterygium	Suitable (as large size of grafting material required)	Not Suitable
Surgical Skill	Greater	Lesser

Table 4. Comparison between Conjunctival Autograft and Conjunctival Rotation Flap Technique

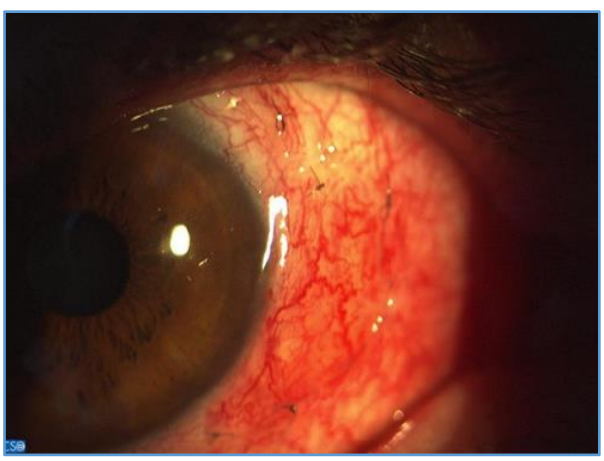
	No. of Cases	Recurrence Percentage	Mean age (in years) of Recurrence	Mean Time (in Months) of Recurrence
Conjunctival Autograft	21 (male – 13 Female- 8)	1 (male)- 4.76%	45 years	5.5 months
Conjunctival Rotation Flap	19 (male - 13 Female- 6)	1 (male)- 5.26%	45 years	5.5 months

Table 5. Comparison of Recurrence in the Two Types of Surgery



Clinical photographs showing a primary pterygium involving the visual axis (left) and the postoperative appearance after pterygium excision with conjunctival autograft (right).

Postoperative 1 Month



Photograph Showing Conjunctival Rotation Flap after Excision of Primary Pterygium (Postoperative 2nd Day)

DISCUSSION

Pterygium management is purely surgical. Simple surgical excision and leaving bare sclera i.e. bare sclera technique is a common procedure but it gives highest recurrence rate upto 80%.[6]

Application of mitomycin-c, Beta-radiation, amniotic membrane and conjunctival transposition have been adopted with surgical excision to reduce recurrence with or without mitomycin.[7,8]

Conjunctival autograft transplantation in the form of free or rotational flap is also an effective surgical procedure that reduces the recurrence of pterygium and no statistical significant between two procedures.[9,10] Recurrence of pterygia usually occurs during the first 6 months.[11] Aslan with 45 eyes observes rate of recurrence of pterygium following rotational flap surgery and auto conjunctival graft procedure (P=0.46) was comparable.[9] Kim observed statistically similar recurrence rate for auto and rotational flap 8% and 8.6% respectively.[10] By keeping view for future filtration surgery the harvesting site of transplant tissue might be inferior bulbar conjunctiva.[12] But preferred site for all patients who underwent free conjunctival auto-graft procedure for harvesting graft tissue was the superior bulbar conjunctiva.

Accurate graft transplantation also leads to lower recurrence of pterygium. Graft tissue that is relatively larger (1mm) than the host implant site has been shown to reduce recurrence.[13] Large pterygium size also has a greater incidence of recurrence, published in some literature.[14]

In our study the highest incidence of pterygium is seen in the age group of 40 to 49 years i.e in 18 eyes (45%). (Table-1) There are high incidence in patients with outdoor activities (80%).(Table-2) Most of the pterygium are located nasally and corneal encroachment is 3mm from the limbus. Right eye (55%) and left eye (45%) affected. (Table-2) During follow up period there were recurrence of two eyes at 5.5 months. (Table-5) The mean surgery time in conjunctival rotation flap and auto conjunctival graft techniques were 18 minutes and 25 minutes respectively. (Table-3) The recurrence in conjunctival auto graft (4.76%) and conjunctival rotation flap (5.26%) (Table-5) were statistically not significant. Male gender has been shown to be associated with development of pterygium[15] and recurrence of pterygium after surgery.[16] These findings are consistent with those of the published literatures.

CONCLUSION

Based on comparable recurrence and complication rates, both the procedures have same outcome. Rotational conjunctival flap procedure is preferable in comparison to free conjunctival auto graft because it takes a shorter duration of time.

REFERENCES

[1] Kanski JJ, Bowbing B. Chnical opthmology a systematic approach. 7th edn. Chap- 5. Elsevier Publisher 2011: p. 163.
[2] Mackenzie FD, Hirst LW, Battistutta D, et al. Risk analysis in the development of pterygia. Ophthalmology 1992;99(7):1056-1061.
[3] Asokan R, Venkatasubbu RS, Velumuri L, et al. Prevalence and associated factors for pterygium and pinguecula in a south Indian population. Ophthalmic Physiol Opt 2012;32(1):39-44.
[4] Wu K, He M, Xu J, et al. Pterygium in aged population in Doumen County, China. Yan Ke Xue Bao 2002;18(3):181-184.
[5] Akhter W, Tayyab A, Kausar A, et al. Reducing postoperative pterygium recurrence: comparison of

free conjunctival auto-graft and conjunctival rotation flap techniques. J Coll Physicians Surg Pak 2014;24(10):740-744.
[6] Riordan-Eva P, Kielhorn I, Ficker LA, et al. Conjunctival autografting in the surgical management of pterygium. Eye (Lond) 1993;7(Pt 5):634-638.
[7] Alpay A, Ugurbas SH, Erdogan B. Comparing techniques for pterygium surgery. Clin Ophthalmol 2009;3:69-74.
[8] Narsani AK, Nagdev PR, Memon MN. Outcome of recurrent pterygium with intraoperative 0.02% mitomycin C and free flap limbal conjunctival auto-graft. J Coll Physicians Surg Pak 2013;23(3):199-202.
[9] Aslan L, Aslankurt M, Aksoy A, et al. Comparison of wide conjunctival flap and conjunctival auto-grafting techniques in pterygium surgery. J Ophthalmol 2013;2013:1-5.
[10] Kim SH, Oh JH, Do JR, et al. A comparison of anchored conjunctival rotation flap and conjunctival auto-graft techniques in pterygium surgery. Cornea 2013;32(12):1578-1581.
[11] Adamis AP, Starck T, Kenyon KR. The management of pterygium. Ophthalmol Clin North Am 1990;3:611-623.
[12] Broadway DC, Grierson I, Hitchings RA. Local effects of previous conjunctival incisional surgery and subsequent outcome of filtration surgery. Am J Ophthalmol 1998;125(6):805-818.
[13] Allan BD, Short P, Crawford GJ, et al. Pterygium excision with conjunctival auto-grafting: an effective and safe technique. Br J Ophthalmol 1993;77(11):698-701.
[14] Mahar PS, Manzar NJ. Pterygium recurrence related to its size and corneal involvement. J Coll Physicians Surg Pak 2013;23(2):120-123.
[15] Ma K, Xu L, Jie Y, et al. Prevalence of and factors associated with pterygium in adult Chinese: the Beijing eye study. Cornea 2007;26(10):1184-1186.
[16] Fernandes M, Sangwan V, Bansal A, et al. Outcome of pterygium surgery: analysis over 14 years. Eye (Lond) 2005;19(11):1182-1190.