

A study to determine the effectiveness of conjunctival autograft as an alternative to normal surgical procedures to reduce the recurrence of pterygium



Padala Venkateswara Prasad¹, Bhanumurthy Gangalapuram²,
Shyamprasad Bukkapatnam Ramachandra³

¹Associate Professor, Department of Ophthalmology, Rangaraya Medical College, Kakinada, ²Associate Professor, Department of Ophthalmology, Government Medical College and General Hospital, Anantapur, ³Associate Professor, Department of Biochemistry, Government Medical College, Kadapa, Andhra Pradesh, India

Submission: 24-08-2022

Revision: 23-10-2022

Publication: 01-12-2022

ABSTRACT

Background: Pterygium is a chronic degenerative condition, in which a triangular fibrovascular growth of bulbar conjunctiva encroaches on the cornea. It is a cause of concern for both the patient due to its unsightly appearance and the surgeon due to its tendency to recur.

Aims and Objectives: The present study was undertaken to determine the effectiveness of conjunctival autograft as an alternative to normal surgical procedures to reduce the recurrence of pterygium. **Materials and Methods:** A total of 30 patients with primary and recurrent pterygia who attended the ophthalmology, outpatient department were taken up for the study after obtaining informed consent. A standard surgical technique essentially similar to that described by Kenyon et al., was followed in all patients with a few minor modifications. All surgeries are performed using an operating microscope. **Results:** The majority of patients belonged to the 3rd and 4th decades. In our study of 30 cases, we had a recurrence rate of 3.0%. The results and outcome of pterygium surgery in our series stress the importance of conjunctival autograft as the procedure of choice for the surgical management of primary and recurrent pterygium in Indian eyes. The success of conjunctival autograft may be related to the significant learning curve and different surgical techniques for these procedures.

Conclusion: Conjunctival autograft proves to be a simple safe and inexpensive technique with low recurrence rates for pterygium in young people. Although conjunctival autograft is a time-consuming procedure and has a significant learning curve, it is the procedure of choice for pterygium. Further detailed studies with a higher sample size are needed in this area.

Key words: Pterygium; Degeneration; Eye

INTRODUCTION

Pterygium is a chronic degenerative condition, in which a triangular fibrovascular growth of bulbar conjunctiva encroaches on the cornea. It is a cause of concern for both the patient due to its unsightly appearance and the surgeon due to its tendency to recur. There is a directly proportional relationship between its prevalence and proximity to the equator. Prevalence and incidence rates differ with respect to age elderly have a high prevalence rate

but a much younger age group in the range of 20–40 years rarely encountered before 20 years.¹ Several theories have been proposed to explain the cause of pterygium, but none of them has proved itself to be accurate. Some feel that it is a chronic inflammation in the form of conjunctivitis or episcleritis that initiates the process.²

One school of thought is that it is a degenerative process arising from its precursor – pinguecula. It has been proved experimental that UV radiation has got the potential to

Access this article online

Website:

<http://nepjol.info/index.php/AJMS>

DOI: 10.3126/ajms.v13i12.47768

E-ISSN: 2091-0576

P-ISSN: 2467-9100

Copyright (c) 2022 Asian Journal of Medical Sciences



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Address for Correspondence:

Dr. Bhanumurthy Gangalapuram, Associate Professor, Department of Ophthalmology, Government Medical College and General Hospital, Anantapur, Andhra Pradesh, India. **Mobile:** 9440423178. **E-mail:** drgbhanumurthy@gmail.com

induce proliferative changes from hyperplasia to neoplasia in both epithelial and connective tissue. It is the UV-B (290–320) spectrum of UV radiation that is involved in the production of pterygium.³ The subepithelial cells absorb this particular wave length and this induces the proliferation. Picorole of infrared radiation is inducing thermal damage and subsequently producing pterygium. Barraquer – Tear film abnormality as a cause of pterygium formation.⁴ The deficiency of limbal stem cells leads to the formation of Conjunctivalization of the cornea. Stem cells are a small subpopulation of specialized undifferentiated, self-renewing cells which are capable of indefinite proliferation to a large number of differentiated progeny, responsible for the cellular replacement regeneration in all the self-renewing tissue.⁵ The deficiency of LSCD is a hallmark trait of conjunctivalization, neovascularization, and chronic inflammation.

Aims and objectives

The present study was undertaken to determine the effectiveness of conjunctival autograft as an alternative to normal surgical procedures to reduce the recurrence of pterygium.

MATERIALS AND METHODS

Study design

This study was observational study.

Study setting

The study was conducted at the outpatient department of ophthalmology of Rangaraya Medical College, Kakinada, in collaboration with Government Medical College and General Hospital, Anantapur. The study period was from January 2020 to December 2021.

Study population

A total of 30 patients with primary and recurrent pterygia who attended the ophthalmology, outpatient department were taken up for the study after obtaining informed consent.

Inclusion criteria

Willing children, aged more than 20 years, having primary pterygium and recurrent pterygium, symptomatic pterygium with reported episodes of redness and pain, and those with defective vision were included in the study.

Exclusion criteria

Unwilling participants, patients with pseudopterygium, and patients with a co-existent conjunctival disease such as previous alkali burns and moorhens ulcer were excluded from the study. Those predisposed to the formation of pseudopterygium were excluded from the study.

Methods

A standard surgical technique essentially similar to that described by Kenyon et al., was followed in all patients with a few minor modifications. All surgeries are performed using an operating microscope. Conjunctival auto grafting for pterygium involves two main steps. All the cases are done under two-point peribulbar anesthesia. 4 ml of 2% lignocaine with 1 in 1500 units of hyaline and 1 in 100,000 adrenaline is mixed with 4 ml of 0.5% bupivacaine. The block is first given at the lower lid at the junction of medial two-third lateral one-third. The upper lid it is given at the supratrochlear notch to block the supratrochlear vessels. This is followed by the stabilization of the globe, and excision of pterygium tissue. The size of the graft required to resurface the exposed sclera surface was determined using calipers 1 mm excess of the conjunctiva that is taken in all dimensions to allow for later shrinkage of the conjunctiva. Further, harvesting of the conjunctival autograft and orientation of conjunctival autograft was performed. The graft was smoothened out in its bed taking care to avoid folding of the conjunctiva. The four corners of the grafts are first secured with interrupted 10/0 nylon sutures to maintain position. The conjunctiva side of the graft was sutured first and the graft is later secured to the limbus with 4–5 10/ nylon interrupted sutures 0.5 CC of gentamicin and 0.5 CC of dexamethasone which were injected sub-conjunctively in the inferior fornix at the conclusion of the procedure. The superior rectus suture is removed pad and bandage applied. Postoperatively, topical betamethasone eye drops were used every 2 h- for the 1st operative weeks and then tapered over the next 5–6 weeks antibiotic ointment was used 3 times daily for the 1st 2 weeks.

Ethical considerations

The study protocol was approved by the Institutional Human Ethics Committee.

Statistical analysis

Data were analyzed using SPSS 20.0. As the data were qualitative data, it was presented as frequency and percentage.

RESULTS

In the present study, we have operated on about 30 cases. The youngest patient was 23 years old and the oldest patient was 58 years of age. The majority of patients belonged to the 3rd and 4th decades. In our study of 30 cases, we had a recurrence rate of 3.0%. The present study results suggest that the importance of conjunctival autograft as the procedure of choice for the surgical management of primary and recurrent pterygium in Indian eyes. The

success of conjunctival autograft may be related to the significant learning curve and different surgical techniques for these procedures. This procedure can be accepted as a successful technique for recurrent pterygium and pterygium in younger patients. The incidence was higher in the age group of 41–50 years (Table 1). Incidence was more in females (Table 2). Incidence was more in the right eye than left and bilateral (Table 3). Major intraoperative complications were not encountered in this study. The major intraoperative complication observed was buttonholing of the conjunctiva in two cases (6.6%) and the fleshy and vascular excessive hemorrhage from the sclera bed occurred in one case.

DISCUSSION

The wide range of recurrence rates reported has been attributed to various, study differences, surgical technique, and surgical experience of all these the surgical technique that is probably the single most important factor influencing recurrence.^{6,7} The meticulousness with which the limbal tissue is included in the autograft determines the success of the procedure. Major intraoperative complications were not encountered in this study. The major intraoperative complication observed was buttonholing of conjunctiva in two cases (6.6%) and the was fleshy and vascular excessive hemorrhage from the sclera bed occurred in 1 case. In the present study, we have operated on about 30 cases. The

youngest patient was 23 years old and the oldest patient was 58 years of age. The majority of patients belonged to the 3rd and 4th decades. In our study of 30 cases, we had a recurrence rate of 3.0%. The present study results highlights the importance of conjunctival autograft as the procedure of choice for the surgical management of the primary and recurrent pterygium in Indian eyes. The success of conjunctival autograft may be related to the significant learning curve and different surgical techniques for these procedures. This procedure can be accepted as a successful technique for recurrent pterygium and pterygium in younger patients. The study results highlights the importance of conjunctival autograft as the procedure of choice for the surgical management of the primary and recurrent pterygium in Indian eyes. Conjunctival autograft proves to be a simple safe and inexpensive technique with low recurrence rates for pterygium in young people. Although conjunctival autograft is a time-consuming procedure and has a significant learning curve, it is the procedure of choice for pterygium. Conjunctival autograft for pterygium meets three main goals safety, good optical outcome, and low rate of recurrence. The success of conjunctival autograft may be related to the significant learning curve and different surgical techniques for these procedures. This procedure can be accepted as a successful technique for recurrent pterygium and pterygium in younger patients. The low recurrence rate in our series may be due to the inclusion of limbal tissue in the graft. The study results are in accordance with earlier studies.⁸⁻¹²

Table 1: Age-wise distribution of the incidence of patients

Age	Number of patients	Incidence
20–30	2	8%
31–40	10	40%
41–50	15	66%
51–60	2	8%
61–70	1	4%

Data were presented as frequency and percentage

Table 2: Gender-wise distribution of the incidence of patients

Sex	Number of patients	Incidence
Female	25	80%
Male	5	20%

Data were presented as frequency and percentage

Table 3: Laterality-wise distribution of the incidence of patients

Laterality	Number of patients	Incidence
Right	20	80%
Left	5	20%
Bilateral	3	1%

Data were presented as frequency and percentage

Limitations of the study

The major limitation of the present study was less sample size.

CONCLUSION

Conjunctival autograft proves to be a simple safe and inexpensive technique with low recurrence rates for pterygium in young people. Although conjunctival autograft is a time-consuming procedure and has a significant learning curve, it is the procedure of choice for pterygium. Further detailed studies with a higher sample size are needed in this area.

ACKNOWLEDGEMNT

The authors would like to acknowledge with thanks to all the participants of the study for their active participation.

REFERENCES

1. Hiwt L. In: Taylor HR. Distribution, Risk Factors and Epidemiology. Pterygium. Vol 2. The Hague, Netherlands: Kugler Publications;

2000. p. 15-28.
- Hirst LW. The treatment of pterygium. *Surv Ophthalmol.* 2003;48(2):145-80.
[https://doi.org/10.1016/s0039-6257\(02\)00463-0](https://doi.org/10.1016/s0039-6257(02)00463-0)
 - Chen PP, Ariyasu RG, Kaza V, LaBree LD and McConnell PJ. Randomized trial comparing mitomycin C and conjunctival autograft after excision of primary pterygium. *Am J Ophthalmol.* 1995;120(2):151-160.
[https://doi.org/10.1016/s0002-9394\(14\)72602-9](https://doi.org/10.1016/s0002-9394(14)72602-9)
 - Rao SK, Lekha T, Mukesh BN, Sitalakshmi G and Padmanabhan P. Conjunctival limbal autografts for primary and recurrent pterygia: Technique and results. *Indian J. Ophthalmology.* 1998;46(4):203-209.
 - Dowlut MS and Laflamme MY. Les pterygions recidivants: Frequence et correction par autogreffe conjonctivale. *Can J Ophthalmol.* 1981;16:119-120.
 - Simona F, Tabatabay CA and Leunberger PM. Preliminary results of pterygium excision with conjunctival autografting. *Klink Monatsbl Augenheilkd.* 1990;196:295-297.
 - Koch M, Mellin JB and Waubke TN. Initial experience with autologous conjunctival transplantation in pterygium. *Klin Monatsbl Augenheilkd.* 1990;197:106-109.
 - Mrzygiot S and Zewsca ST. Surgery for pterygium with transplantation of an epithelial conjunctival flap. *Klin Ozn.* 1990;92(5-6):99-100.
 - Farid M and Pirnazar JR. Pterygium recurrence after excision with conjunctival autograft: A comparison of fibrin tissue adhesive to absorbable sutures. *Cornea.* 2009;28(1):43-45.
<https://doi.org/10.1097/ICO.0b013e318183a362>
 - Yuksel B, Unsal SK and Onat S. Comparison of fibrin glue and suture technique in pterygium surgery performed with limbal autograft. *Int J Ophthalmol.* 2010;3(4):316-320.
<https://doi.org/10.3980/j.issn.2222-3959.2010.04.09>
 - Mahar PS and Manzar N. Pterygium recurrence related to its size and corneal involvement. *J Coll Physicians Surg Pak.* 2013;23(2):120-123.
 - Dushku N and Reid TW. Immunohistochemical evidence that human pterygia originate from an invasion of vimentin expressing altered limbal epithelial basal cells. *Curr Eye Res.* 1994;13(7):473-481.
<https://doi.org/10.3109/02713689408999878>

Authors Contribution:

PVP- Concept, and design of the study results interpretation, review of the literature and preparing the first draft of the manuscript. **SBR, BG-** Concept, and design of the study, results interpretation, review of the literature, and preparing the first draft of the manuscript.

Work attributed to:

Government Medical College and General Hospital, Anantapur and Rangaraya Medical College, Kakinada, Andhra Pradesh, India

Orcid ID:

Dr. Bhanumurthy Gangalapuram - <https://orcid.org/0000-0003-1710-3121>
Dr. Padala Venkateswara Prasad - <https://orcid.org/0000-0001-6170-9513>
Dr. Shyamprasad Bukkapatnam Ramachandra - <https://orcid.org/0000-0002-4143-7247>

Source of Funding: Nil, **Conflicting Interest:** None declared.