

A Study of Limbal Conjunctival Autograft Transplantation in Primary Pterygium

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Abstract

Aim: To study limbal conjunctival autograft transplantation in primary pterygium. **Material and Methods:** The present study was conducted on 100 eyes of 100 patients with primary pterygium attending the outpatient department of Ophthalmology department of Dr. Vasant Rao Pawar Medical college, Nashik from July 2011 to June 2013 who were managed by Limbal Conjunctival Autografting(LCAT) which were performed by single surgeon. **Result:** This study shows that most of the patients belonged to age groups of 31-70. The mean pre-op astigmatism of 2.60 +2.20 Diopters (D) significantly reduced to 1.28 +1.22D postoperatively. There is significant improvement in Post operative Best Corrected Visual Acuity (BCVA) compared to preoperative BCVA with difference of 0.17 +0.02. Postoperatively out of 100 eyes, 4 recurrences occurred with recurrence rate of 4%. **Conclusion:** Limbal Conjunctival Autograft transplantation is a safe and effective technique in management of Pterygium.

Keywords: LCAT, Mitomycin C, Pterygium

1. Introduction

Pterygium word comes from the greek word 'pterygos' meaning "wing of an insect" which was described by Hippocrates, Callen and others. It is a wing shaped fibro-vascular tissue proliferation from the conjunctiva on to the cornea. Pterygium is a worldwide condition commonly seen in the Cameron belt located between 37° north and south of the equator¹.

1.1 Pathogenesis

Different theories regarding pathogenesis include U-V light exposure, chronic inflammation, and dry eye. There is abnormal expression of P53 tumour suppressor gene in the conjunctiva of patients with Pterygium which

suggests that Pterygium is a growth disorder rather than a degeneration². The mutation of P53 gene is located on chromosome 17^{2,3}.

1.2 Etiologies of Pterygium

Etiological factors include hypersensitivity which is generally Type 1 reaction due to presence of IgG and IgE, dietary deficiencies like choline and raised blood cholesterol, exposure to Ultra Violet type B radiations, infections and inflammations. Thus persons having an outdoor occupation like farming have higher chance of development of pterygium⁴. Heredity is considered as an important etiological factor for pterygium development. Autosomal dominant inheritance is associated with pterygium development. Environmental factors like

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exposure to sunlight, heat, dry climate, wind, dust are considered important etiological factors for development of pterygium. Adjunctive factors for development of pterygium are decreased secretion from lacrimal glands, tear film abnormality and some immune mechanisms.

1.3 Chen's Classification of Pterygium⁵

Grade T₁ (Atrophic) – Pterygium in which episcleral vessels are unobscured and clearly distinguished beneath the body of Pterygium (Figure 1).

Grade T₂ (Intermediate) – Pterygium in which episcleral vessels are indistinctly seen or partially obscured (Figure 2).

Grade T₃ (Fleshy) – Denotes the thick Pterygium in which episcleral vessels underlying the body of Pterygium are totally obscured (Figure 3).

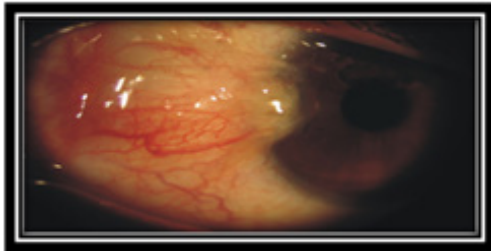


Figure 1. Grade T1 pterygium.

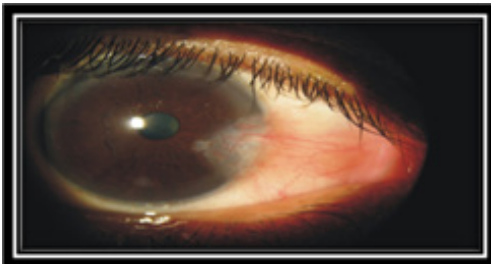


Figure 2. Grade T2 pterygium.

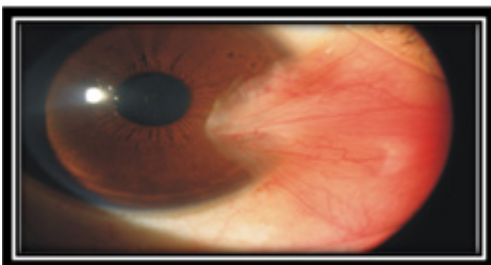


Figure 3. Grade T3 Pterygium.

1.4 Clinical Features of Pterygium

Patients with pterygium generally present with complaints of cosmetic disfigurement, diminution of vision, irritation, watering, redness, foreign body sensation and eye discomfort.

1.5 Management of Pterygium

Prevention of pterygium is important aspect in management of pterygium. Prophylaxis of pterygium includes protection of eyes by dark glasses when exposed to the sun or irritating environmental conditions and a change of smoke and dust filled environment.

Treatment modalities for pterygium include medical and surgical line of management. The medical treatment includes use of hyaluronidase injection, corticosteroids, lubricants, tear replacement and vasoconstrictors. Surgical management is the treatment of choice for pterygium and is indicated when there is visual impairment, recurrent inflammation, motility restriction, irritation, cosmetic disfigurement and interference with contact lens wear. Different surgical techniques could be used ranging from simple avulsion of pterygium to excision. Bare Sclera Method is one of the most popular methods in which pterygium is excised in total and bare sclera is exposed which allows the cornea and conjunctiva to heal separately. Conjunctival Flap Rotation or Z Plasty Technique involves interposition of flap of normal conjunctiva between the body of pterygium and corneal limbus. This flap is supposed to act as a barrier and prevent pterygium regrowth. Mucous Membrane Graft is used in those with extensive loss of conjunctiva. A piece of mucous membrane of lower lip and also from buccal mucosa can be used. Amniotic Membrane transplant is also used to cover the conjunctival defect. The most common complication described is recurrence in the surgeries of Pterygium. Recently limbal conjunctival autografting has been advocated as an effective method to reduce recurrence rate significantly for primary as well as recurrent Pterygium.

Majoros (1950) was the first to describe free conjunctival autografts for Pterygium⁶. Kenyon et al. in 1985 described the use of conjunctival autografting from same eye following Pterygium excision⁷. Limbal Conjunctival Autograft Transplantation is becoming popular these days. In this method conjunctival graft from superotemporal region of conjunctiva is excised along with some area of limbus margin and is transplanted in the area of defect created by excising pterygium. The limbal area contain stem cells and it supposedly helps in preventing recurrences. Corneal Grafts and Lamellar

Keratoplasty are also used in advanced pterygium involving corneal stroma, Studies done by Friedenwald and Buscke (1944)⁸, Ebato et al. (1987)⁹, Tseng (1989)¹⁰ support this hypothesis. Recurrence of pterygium is main complication of pterygium surgery. To avoid recurrence different techniques are used like Mitomycin C is applied to the bare sclera intraoperatively or given as eye drops post operatively for one week twice a day. It is an antibiotic antineoplastic agent and acts by selectively inhibiting the synthesis of DND RNA and proteins in rapidly growing cells. Lasers, β Radiation and ThioTepa are other options available¹¹.

2. Methodology

The present study was conducted on 100 patients with primary pterygium attending the outpatient department of Ophthalmology department of Dr. Vasant Rao Pawar Medical College and tertiary health care centre, from July 2011 to June 2013. All patients were managed by Limbal Conjunctival Autografting (Figure 4). All operations were performed by single surgeon, so that the surgeon's factor did not influence the surgical outcome in terms of complication and recurrence.

2.1 Eligibility Criteria

a) Inclusion Criteria included patients with primary pterygium only. Patients who were willing to undergo the surgery after understanding the nature of treatment, its complications and prognosis and patients with reasonable commitment for the follow up schedule. Patients of all ages and genders were included in this study.

b) Exclusion Criteria excluded the patients with other ocular surface pathology like corneal ulcer, keratoconus, keratitis, corneal dystrophies, squamous cell carcinoma, conjunctival growth, scarred conjunctiva, dry eye (keratoconjunctivitis sicca), Sjogren's syndrome, traumatic pterygium, acid burns. Patients who were not willing to participate in the study.

Before the surgical procedure, each patient was subjected to a thorough clinical assessment, recording of keratometric readings using POTEK PRK-5000 autorefractometer and relevant laboratory investigations.

All the cases received identical postoperative regimen of topical antibiotic steroid eye drops 1½ hourly for 1 week, 2 hourly for 1 week, 3 times a day for 1 week, 2 times daily for a week then once daily for 1 week and lubricating eye drops four times in a day. Antibiotic steroid eye ointment was prescribed for night time application for 2 weeks. All selected cases were advised follow up on 1st, 7th, 15th, 30th, 60th, 90th, 180th and 365th postoperative days.

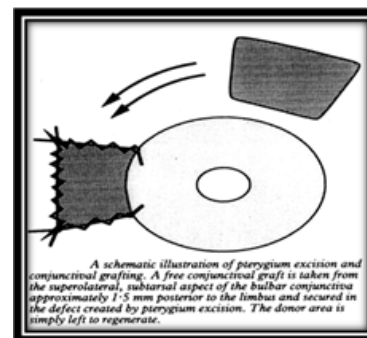


Figure 4. Limbal Conjunctival Autografting.

Postoperative Evaluation included change in astigmatism, change in visual acuity, acceptance of the graft and clarity of the corneal tissue and follow up slit lamp examination for the donor area recovery.

3. Results

Table 1. Age and gender distribution

Sr. No.	Age(in yrs)	No. of patients(%)
1	21-30	03 (3%)
2	31-40	12 (12%)
3	41-50	22 (22%)
4	51-60	25 (25%)
5	61-70	35 (35%)
6	71-80	03 (3%)
Total		100 (100%)
Sr. No.	Gender	
1	Male	48 (48%)
2	Female	52 (52%)
Total		100

Table 1 shows the ot of total number of patients treated 48% were male and 52% were female.

Table 2 shows that out of 100 eyes, 93% of the eyes had nasal pterygium, 5% had temporal pterygium and 2% had double (temporal and nasal both) pterygium. It also shows that out of 100 patients, 17% had T₁ grade Pterygium, 49% had T₂ grade Pterygium and 34% had T₃ grade Pterygium.

The mean pre-op astigmatism is 2.60 ±2.22 Diopters (D) and mean post-op astigmatism is 1.28±1.22D. There is significant reduction in astigmatism post operatively.

In this study mean difference in Pre and Post operative BCVA is 0.17 with SD of 0.02. There is significant improvement in Post operative BCVA compared to preoperative BCVA.

The recurrence rate in this study came to be 4% with 95% confidence interval of 1-10%.

Table 2. Clinical picture of pterygium

Clinical picture	No. of patients (%)
A) Site-	
Nasal	93 (93%)
Temporal	05 (5%)
Double	02 (2%)
TOTAL	100
B) Eye Involved-	
Right Eye	65 (65%)
Left Eye	34 (34%)
Bilateral	01 (1%)
TOTAL	100
C) Grades-	
T1	17 (17%)
T2	49 (49%)
T3	34 (34%)
TOTAL	100

4. Conclusion

The following results were obtained in present study:

- Mean age of patients treated was 55.61 yrs with standard deviation 11.33yrs.
- Most of the patients had right eye involvement.
- 93% of patients had nasal Pterygium.
- 49% of patients presented with T2 grade of Pterygium.
- Grade T3 pterygia were common among patients with age <40 yrs and Grade T2 pterygia were common among patients with age >40 yrs.
- 91% of patients had corneal involvement 2.4 mm.
- Majority of patients had preoperative best corrected visual acuity of 6/6-6/9.
- Postoperative visual acuity was improved in 64% patients and was stable in 36% patients and there was no deterioration in those treated with Free Limbal Conjunctival Autograft Transplantation.
- None of the eyes developed sight threatening complications.
- In our series recurrence rate is only 4.00% which is low as compared to other methods of Pterygium surgery.

It can be concluded that Limbal Conjunctival Autograft transplantation is a safe and effective technique in management of Pterygium as compared to other methods like Bare sclera method, Mitomycin-C application and Amniotic Membrane Grafting etc.

5. Discussion

Pterygium remains an important clinical entity for

ophthalmologists because of its visual threatening implications, cosmetic disfigurement and constant source of irritation. It is a wing shaped fibrovascular growth encroaching upon the cornea. Due to increased recurrence rate and visual complications some new modifications in pterygium surgery as well as adjunctive treatment is mandatory. Limbal Conjunctival Autografting as compared to bare sclera excision is new simple and fast emerging technique and better option in prevention of recurrence of pterygium.

The present study “ A Study of Limbal Conjunctival Autograft Transplantation in Primary Pterygium” was conducted at Dr. Vasantrao Pawar Medical College and Tertiary Care Centre during the period, July 2011 to June 2013. This study included 100 eyes with primary pterygium.

Table 1 shows age of patients ranging from 21-80 yrs, with a mean age of 55.61 and a standard deviation of 11.33 yrs. This is supported by the study of Varssnao D (2002) who recorded mean age of 53.73 ± 14.82 yrs and Young A L (2002) who recorded mean age of 59.50 ± 12.93. Shrinivas et al (1998) observed that the mean age of his study population was 42.7 ± 14.5 yrs. In the present study the youngest patients were of 28 yrs and the oldest was of 75 yrs of age.

Table 1 also shows that the condition is observed more in females (52%) as compared to males (48%) which are opposite to the prevalent theory of male dominance. This is probably because cosmetic disfigurement could be the main reason for females presenting more than males. Young A L (2002) also observed in his study group that 70 (60.86%) females and 45 (39.13%) males had pterygium.

As seen in table 2 most of the cases 93% had nasal pterygium while 5% had temporal pterygium. Only 2% of eyes had both nasal and temporal pterygium. Srinivas et al (1998) reported 86.8% of the eyes with nasal and 7.5% of eyes with temporal pterygium. In their study 5.7% of the patients had both nasal and temporal pterygium.

Table 2 shows 65% of patients had right eye involved while 34% had left eye involved and 1% had bilateral involvement. Young A L in his study recorded that 59.13% had right eye involved and 40.86% had left eye involved. Srinivas et al recorded 32 (60.4%) right eyes and 21 (39.6%) left eyes while 2 patients had bilateral pterygia.

It is also evident from the table that 17% of the patients had grade T1 pterygium, 49% had grade T2 and 34% of the patients had grade T3 pterygium. Chen P P et al (1995) in their study observed 68.8% of the eyes had type 3 (inflamed), 26.6% were type 2 (non-inflamed) and 4.7% of the eyes had type 1 (atrophic) pterygium.

6. References

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