CONJUNCTIVAL AUTOGRAFT WITH AUTOLOGOUS BLOOD COAGULUM IN PRIMARY AND RECURRENT PTERYGIUM- AN OBSERVATIONAL STUDY

Sharmila Devi Mohandoss¹, Kalpana Suresh Rao², Mary Thomas Santhosh³

¹Consultant, Department of Ophthalmology, Rajan Eye Care, Sri Ramachandra Medical College and Research Institute.

²Consultant, Department of Ophthalmology, Kalpana Eye Care, Sri Ramachandra Medical College and Research Institute.

³Professor, Department of Ophthalmology, SRMC and RI.

ABSTRACT

BACKGROUND

Pterygium is a triangular wing-shaped encroachment of bulbar conjunctival tissue extending to cornea. It is a degenerative and hyperplastic process, in which conjunctiva actively invades the cornea. The aim of this study is to investigate the efficacy of limbal conjunctival autograft in primary and recurrent Pterygium and to report the incidence of recurrence after surgery using conjunctival autograft with autologous blood coagulum.

MATERIALS AND METHODS

A hospital-based observational study of one-year duration was conducted in 45 patients with pterygia for whom conjunctival autografting was done. Both males and females of age group 20 - 60 years were included in the study. Pterygium excision was done and autograft placed on the blood coagulum over bare sclera and patients were followed postoperatively on Day 1, 7, 30 and then every 2 months until six months and was assessed for visual outcome and symptomatic improvement.

RESULTS

In this study 16% cases were in age group 20 to 30 years, 33% in 31 to 40 years, 24% in 41 to 50 years and 27% in 51 to 60 years. High incidence was seen in patients working outdoor than indoors (64% versus 36%). Higher incidence was noted in females (64%). Fewer complications noted like granuloma formation in 1 patient and 4 patients developed recurrence.

CONCLUSION

Autologous conjunctival grafting is a safe, economical and effective procedure with narrow learning curve. It prevents recurrence of pterygium and reduces the surgical time with fewer postoperative complications.

KEYWORDS

Pterygium Surgery, Autologous Blood, Autograft, Fibrin Glue.

HOW TO CITE THIS ARTICLE: Mohandoss SD, Rao KS, Santhosh MT. Conjunctival autograft with autologous blood coagulum in primary and recurrent pterygium- an observational study. J. Evolution Med. Dent. Sci. 2017;6(81):5729-5732, DOI: 10.14260/jemds/2017/1242

BACKGROUND

Pterygium is a triangular wing-shaped encroachment of bulbar conjunctival tissue extending to cornea.^[1] It is a degenerative and hyperplastic process, in which conjunctiva actively invades the cornea. It can be small atrophic to large progressive fibrovascular tissue that causes visual disturbances as well as cosmetic problems. Risk factors for pterygium include conjunctivalisation of cornea by hot-dry-dusty environments and outdoor occupation.^[2] Pterygial fibroblasts are responsible for corneal invasion.^[3] The strong epidemiological correlation between occurrence of pterygium and exposure to sunshine has led to the assumption that some parts of the solar radiation may have a direct pathogenic role, where the scattered light might follow alternative (transcameral) optical paths when entering the eye, thus hitting limbal stem cells from their inner surface.^[4]

The effects of UVR-A and UVR-B (290 - 400 nm) are considered particularly detrimental.^[5] Hereditary factor is also believed to play a role in growth of pterygium.

The common indications for surgery include reduced vision, symptomatic irritation and inflammation, ocular motility limitations, irregular astigmatism and cosmesis. Various surgical techniques like bare sclera excision with or without mitomycin C, thiotepa drops, beta irradiation, amniotic membrane grafting and conjunctival autograft have been described.^[6-7] Recently, the importance of limbal stem cells in the pathogenesis of pterygia has been reported and authors have suggested that a healthy limbus acts as a barrier to conjunctival overgrowth.^[8]

Despite different treatment modalities, recurrence continues to be a major complication. Recurrence is more common in bare sclera technique than excision with autograft.

A recurrent pterygium is usually aggressive and is termed as "malignant recurrence," where the growth is seen over cornea within one month of postoperative period. Hence using conjunctiva, cut flushed with limbus containing stem cells for grafting is reported to be effective method in view of low recurrence and other complications.^[9-10]

India being a tropical country pterygium is very common, where the main occupation of the people is agriculture and other outdoor works. Hence, we decided to analyse the

*'Financial or Other Competing Interest': None.
Submission 05-05-2017, Peer Review 26-09-2017,
Acceptance 04-10-2017, Published 09-10-2017.*

Corresponding Author:

*Dr. Mary Thomas Santhosh,
Department of Ophthalmology,
Sri Ramachandra University, Porur.
Chennai-600116, Tamilnadu, India.
E-mail: marysanthoshj@yahoo.co.in
DOI: 10.14260/jemds/2017/1242*

outcome of conjunctival autograft in primary and recurrent pterygium. Aim of the article is to study the efficacy of limbal conjunctival autograft in primary and recurrent Pterygium and to report the incidence of recurrence after primary pterygium excision followed by conjunctival autograft with autologous blood coagulum.

MATERIALS AND METHODS

This observational study included patients with pterygium attended the OPD of a tertiary care centre attached to a medical college in Chennai from March 2013 to February 2014. Conjunctival autografting was done for 45 patients, of which 5 were recurrent pterygia and the remaining were progressive fleshy types. Both males and females of age group 20 - 60 were included. Patients with ocular surface diseases, pseudopterygium and any previous intraocular surgery, trauma or bleeding disorders were excluded from the study.

Institutional Ethics Committee approval obtained for the study and informed written consents were obtained from patients. Detailed anterior segment examination was done under slit lamp and grade, type and site of pterygia were recorded in all patients. The grading of pterygium was done according to the classification as-[11]

Grade 1 (Atrophic)

The episcleral vessels under the body of pterygium is not obscured and is clearly distinguishable.

Grade 2 (Intermediate)

Episcleral vessels are obscured partly and indistinguishable. [Figure 1a]

Grade 3 (Fleshy)

The episcleral vessels are totally obscured [Figure 1b].

Based on the Location, Pterygium was labelled as Nasal or Temporal

Visual acuity, refraction, ocular motility, intraocular pressure, patency of lacrimal passages and fundus examination findings were noted. Routine investigations including blood pressure, random sugars, BT/CT was done to all the patients.

Preoperative and Postoperative Photographs were taken

The surgical procedure was standardised and performed by the same ophthalmologist using an operating microscope under peribulbar anaesthesia. No. 11 BP blade was used to excise the Pterygium head from the cornea. Natural haemostasis was achieved without cautery. The area of conjunctival defect was measured with caliper and free conjunctival-limbal autograft was taken from the supero-temporal quadrant and was transferred over to the area of bare sclera maintaining the limbus to limbus orientation and the conjunctival graft was immediately spread over the defect using blood coagulum as the bed for attachment and then smoothened out with a non-toothed forceps and edges were opposed [Figure 2].

Postoperatively, topical prednisolone eye drops along with antibiotic Ofloxacin was used every 2 hours for the first operative week and then tapered over the next 5 - 6 weeks.

Followup visits were scheduled for post-operative days 1, 7, 30 and then every 2 months until six months and was assessed for symptomatic improvement and complications.

Statistical Analysis

The data was coded and compiled on Microsoft Excel spreadsheet. Descriptive statistical analysis of the data was done. We expected a success of 88% with precision of 10. Confidence level was 95% for a sample size of 41.

RESULTS

Of the 45 patients included in the study common age distribution was between 30 - 40 years, although there is not much difference between 40 - 50 and 50 - 60 years of age group. In this study, most of the patients (73%) had grade 2 pterygium and 24% had grade 3 pterygium.

In our study, 96% patients presented with fleshy mass. Vision diminution was noted in 16% of patients and redness in 29% and ocular irritation was present in 22%. However, no patient complained of pain.

On first postoperative day, 98% of patients had congestion followed by 93% after 1st week and 22% over 3 months. Graft oedema was seen in 78% of patients on Day 1, mild oedema in 31% of patients during 1st month and only 4% at the end of 3 months. Haemorrhage was found in 42% of patients on the first day followed by 33% on Day 7 and 22% at the end of one month. All patients were totally relieved of congestion, graft oedema and haemorrhage by 6 months after surgery.

Figure 1a. Grade 2 Pterygium, 1b. Grade 3 Pterygium

Figure 2. Intraoperative Steps

Figure 3a. 1st Week Postop, 3b. 3 Months Postop

Figure 4a. Graft Oedema, 4b. Graft Haemorrhage, 4c. Graft Retraction, 4d. Recurrence with Granuloma

Legends for Chart

In the present study congestion was found in 98% of patients on Day 1 followed by 93% during 1st week, 22% over 3 months and absent at the end of 6 months and graft oedema was seen in 78% of patients on Day 1, 58% in 1st week, mild oedema in 31% of patients during 1st month, only 4% at the end of 3 months and totally absent by 6 months. Haemorrhage was found in 42% of patients on the first day, followed by 33% on Day 7 and 22% at the end of one month. It was only 4% by 3 months and totally absent after 6 months.

DISCUSSION

In the present study, increased incidence of pterygium was noted in patients of the age group 30 - 40 (33%). Though the literature documents male preponderance our study showed female preponderance (64%), which may be due to the fact that majority of patients were concerned about the cosmetic disfigurement.

A study from New Delhi reported higher prevalence rate between the age group of 31 to 50 years,^[12] which were comparable to our study. Most of the patients (64%) were farmers or outdoor labourers in our study suggesting the demographic characteristics of occurrence of pterygium like other studies.^[13]

In our study, 82% of patients had unilateral pterygium. 96% patients presented with fleshy mass and most of them (73%) had grade 2 pterygium and 24% patients had grade 3 pterygium. In a study from Malaysia done on 137 eyes of 113 patients reported 68% with grade-2 pterygium.^[14] Majority of the patients 89% of them have progressive type of pterygium. The commonest being nasal side (91%). An epidemiological study reported that 92.68% (38/41) of pterygium were located on the nasal side in the monocular patients.^[15] The appearance of congestion was 98% patients on day one, which reduced to 22% in 3 months [Figure 3a and 3b]. All the patients had quiet eye at 6 months. Kim et al reported that patient's symptoms disappeared in 23 out of 36 eyes (64%) in one week and all the symptoms gone within two weeks after surgery in all patients.^[16]

Graft oedema was noticed in 78% of patients at day one, which gradually reduced to 4% at the end of 3 months and with short course of topical steroids oedema fully resolved at the end of 6 months in all patients [Figure 4a]. A study from Philippines reported that postoperatively some amount of graft oedema was present in all eyes and it gradually subsided overtime.^[17] In our study graft haemorrhage was observed in 42% patients on postoperative day one, which resolved spontaneously at the end of 6 months without compromising the results [Figure 4b].

No major intraoperative complications were encountered in this study, except two patients who had graft retraction of 1.0 mm at the nasal site of the graft [Figure 4c]. The patients were closely followed and re-epithelialisation of the conjunctival defect occurred within 1 month. One patient had graft displacement in the immediate postoperative day, which required sutures to place the graft intact and granuloma was noted in 1 case by the end of 2 weeks which was persistent that required excision with re-graft placement. In the present study two cases (4%) were observed to have recurrence at 3 months postoperative [Figure 4d]. In Dr. Ashok K Sharma's study, out of 150 cases who underwent graft fixation with autologous blood during followup recurrence was seen in 4 patients - 2.6%, 2 patients had graft retraction and 1 patient had Tenon's granuloma.^[18] Other studies show a recurrence of 3% - 6% (Kenyan) in 1985, 6% with Vastin, Dr. Amitav Das et al and AIOC proceedings in 1999 shows no recurrence where conjunctival graft was done in 42 patients of Pterygium.

We have noted recurrence was significantly higher in males with primary pterygium and it was also higher in patients below 40 years age. The lipid degeneration in the peripheral cornea in elderly individuals may be an inhibiting factor to Pterygium progression.

CONCLUSION

Conjunctival autograft with autologous blood coagulum is a safe, simple, quick and economical procedure and is very effective in preventing recurrences and a good alternative in the management of pterygium excision.^[19-21] Also, it significantly reduces the surgical time with fewer postoperative complications and lesser learning curve and can be performed in any medical care centre level. It is a very useful technique that not only supplements other treatment modalities, but also supplants them. Expenses on glue/sutures were also avoided.

REFERENCES

- [1] Pal VK, Bhatia K, Agrawal A, et al. Primary radical excision of pterygium with minimal incidence of recurrence. *Delhi J Ophthalmol* 2012;23(1):37-9.
- [2] Hiwt L. Distribution, risk factors and epidemiology. In: Taylor HR. edr. *Pterygium*. Vol 2. The Hague, Netherlands: Kugler Publications 2000:15-28.
- [3] Li DQ, Lee SB, Gurja-Smith Z, et al. Over expression of collagenase (MMP-1) and stromelysin (MMP-3) by pterygium head fibroblasts. *Arch Ophthalmol* 2001;119(1):71-80.
- [4] Detorakis ET, Spandidos DA. Pathogenetic mechanisms and treatment options for ophthalmic pterygium: trends and perspectives (Review). *International J Molecular Med* 2009;23(4):439-47.
- [5] Khan SB, Jan A, Saleem M, et al. Surgical management of pterygium. *PJO* 2005;21:54-7.
- [6] Hirst LW. The treatment of Pterygium. *Surv Ophthalmology* 2003;48(2):145-80.
- [7] Kaufman SC, Jacobs DS, Lee WB, et al. Options and adjuvants in surgery for pterygium: a report by the American Academy of Ophthalmology. *Ophthalmology* 2013;120(1):201-8.
- [8] Coroneo MT, Di Girolamo N, Wakefield D. The pathogenesis of pterygia. *Curr Opin Ophthalmol* 1999;10(4):282-8.
- [9] Luanratanakorn P, Ratanapakorn T, Suwan-Apichon O, et al. Randomised controlled study of conjunctival autograft versus amniotic membrane graft in pterygium excision. *Br J Ophthalmol* 2006;90(12):1476-80.
- [10] Fernandes M, Sangwan VS, Bansal AK, et al. Outcome of pterygium surgery: analysis over 14 years. *Eye (Lond)* 2005;19(11):1182-90.
- [11] Tan DT, Chee SP, Dear KB, et al. Effect of pterygium morphology on pterygium recurrence in a controlled trial comparing conjunctival autografting with bare sclera excision. *Arch Ophthalmol* 1997;115(10):1235-40.
- [12] Bisen RK, Desai RJ, Mehta F, et al. Comparison of cut and paste (No Suture) with cut and suture technique of pterygium surgery. New Delhi: AICO 2009 Proceedings, 2009.
- [13] Nemesure B, Wu SY, Hennis A, et al. Nine-year incidence and risk factors for pterygium in the Barbados eye studies. *Ophthalmology* 2008;115(12):2153-8.
- [14] Ratnalingam V, Eu AL, Ng GL, et al. Fibrin adhesive is better than sutures in pterygium surgery. *Cornea* 2010;29(5):485-9.
- [15] Lin SF, Tsai RK, Tung IC, et al. An epidemiologic study of pterygium in middle-aged and elderly aboriginal populations of the Tao Tribe of Orchid Island in Taiwan. *Tzu Chi Med J* 2006;18(4):283-6.
- [16] Kim HH, Mun HJ, Park YJ, et al. Conjunctivolimbic autograft using a fibrin adhesive in pterygium surgery. *Korean J Ophthalmol* 2008;22(3):147-54.
- [17] Uy HS, Reyes JM, Flores JD, et al. Comparison of fibrin glue and sutures for attaching conjunctival autografts after pterygium excision. *Ophthalmology* 2005;112(4):667-71.
- [18] Marticorena J, Rodriguez-Ares MT, Tourino R, et al. Pterygium surgery: conjunctival autograft using a fibrin adhesive. *Cornea* 2006;25(1):34-6.
- [19] Elwan SAM. Comparison between sutureless and glue free versus sutured limbal conjunctival autograft in primary pterygium surgery. *Saudi J Ophthalmol* 2014;28(4):292-8.
- [20] Singh PK, Singh S, Vyas C, et al. Conjunctival autografting without fibrin glue or sutures for pterygium surgery. *Cornea* 2013;32(1):104-7.
- [21] Majumder CS. A prospective study on? Pterygium excision and conjunctival autograft-without suture, without glue? *J Clin Exp Ophthalmol* 2014;5(3):146.