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Original Research Article

Evaluating surgical outcome of pterygium excision with conjunctival autograft using autologous blood: Can it be a new norm?

Snehal Mahadik[1]*, Z S Saifee[1], Ayushi Neema[1]

[1]*Dept. of Ophthalmology, R.D. Gardi Medical College, Ujjain, Madhya Pradesh, India*

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ABSTRACT

Aim: To evaluate the surgical outcome of use of autologous blood as an adhesive agent in pterygium excision with conjunctival auto-grafting.
Purpose: To observe the effectiveness of autologous blood adherence on the scleral bed and to know whether autologous blood technique can be made as a standard procedure in pterygium surgery or not.
Materials and Methods: The present study is a retrospective observational study. The records of 94 cases of primary pterygium surgery done during August 2022- January 2023 were taken. All patients underwent comprehensive ocular examination pertinent to the disease. Pterygium was dissected and remaining subconjunctival pterygium tissue was separated and excised. The conjunctival limbal auto-graft was taken secured in place by autologous blood and dressing done. Follow-up was done on second post operative day,1st week and 1 month.
Results: The study displayed excellent surgical outcome with minimal post operative complications, which too resolved in a week. The most common complication was subconjunctival hemorrhage in 38 cases followed by graft edema in 32 cases. Though graft displacement was observed in 4 cases, they were later rearranged successfully. We did not observe even a single graft loss in our study.
Conclusion: Pterygium excision with conjunctival auto-grafting with autologous blood is very safe, less time consuming, easy to perform with less learning curve, economical with excellent postoperative outcome and most importantly more patient satisfaction, thus, making it equivalent to or rather superior to other comparable procedures.

1. Introduction

A pterygium is a wing-shaped fibro vascular overgrowth from the subconjunctival tissue. Pathologically, pterygium is a degenerative and hyper plastic condition of conjunctiva where subconjunctival tissue undergoes elastotic degeneration and proliferates as vascularized granulation tissue under epithelium, which encroach the cornea. It invades corneal epithelium, Bowman's layer and sometimes even superficial stroma in case of fleshy pterygium.[1]

Prevalence of pterygium ranges widely from 0.7% to 31% in various populations around the world.[2] More outdoor activities increases the risk by 1.5-fold, suggesting chronic environmental irritations such as dust, dryness, wind, heat, and ultraviolet rays as a causative factor. Ultraviolet light is the most common contributing factor for pterygium formation.[3–5] Pterygium can cause eye irritation, foreign body sensation, dryness and restrict eye movements, visual impairment due to astigmatism and blockade of visual axis.

Early in the disease process, often a conservative approach is taken, limiting to medical therapy. As the disease progresses, surgical treatment is the only option

* *Corresponding author*.
E-mail address: drsnehal9@yahoo.co.in (S. Mahadik).

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available. Pterygium excision techniques have improved over the years. Earlier the standard treatment was simple excision of the pterygium tissue. But it was associated highest recurrence rate of 30 percent to 100 percent.[6,7] Thus, a newer technique of pterygium excision with conjuctival auto-grafting has came up as most promising method.[8–14]

After pterygium surgery, the conjunctival auto-graft adherence to the excisional site is done by either absorbable or non-absorbable sutures or fibrin glue. The presence of sutures is associated with various complications like papillary hyperplasia causing foreign body sensation, lid edema, increased lacrimation and some time in severe cases may lead to suture-related granuloma formation.[15] Also, the procedure is quite tedious too. Comparative to sutures, fibrin glue is relatively easy and comfortable as far as patients perspective is concerned. But it may produce possible hypersensitivity reactions and since fibrin glue is a blood-derived product, it has risk of transmission of blood-related diseases.[16] Further it is expensive too. In attempt to address all these issues the concept of Autologous Blood came up. The only exceptions are the patients who are on aspirin or other blood thinners and those who are suffering from a coagulation factor deficiency, rest all patients can be benefited from this technique. With this background, we would like to present our study on surgical outcome of pterygium excision with conjunctival auto grafting using autologous blood in series of cases.

2. Materials and Methods

The present study is a retrospective observational study. Total of 94 cases of primary pterygium surgery done in Ophthalmology department of R. D. Gardi Medical College, Ujjain, Madhya Pradesh during August 2022- January 2023 were studied to determine the surgical outcome of pterygium excision with conjunctival auto grafting using autologous blood.

2.1. Data collection

Patient records with all grades of primary pterygium were included in the study.

Pterygium grading system by Johnston and colleagues:[17]

Grade 1 – An indistinguishable translucent tissue with dilated vessels compared to normal conjunctival vessels. Episcleral vessels are easily visible.

Grade 2- A pink translucent tissue with increased density of vessels. Still allows episcleral vessels to be seen.

Grade 3- The pterygium is red in color, the vessels are engorged and tortuous, and the underlying episcleral vessels are indistinguishable.

Grade 4 - A deep and diffusely red tissue that completely obscures the underlying scleral tissue.

Patient records with history of recurrent pterygium, temporal pterygium, bleeding disorders and other associated ocular pathology were excluded.

The patient's details retrieved from their records for the study were the demographic details such as name, age, sex, socioeconomic status, education status; medical history, ocular history, and chief complaints. Details on eye involvement in terms of unilateral or bilateral, right sided or left sided were also retrieved from the records. Thorough study of the patient's records was done which showed that all the patients underwent comprehensive ocular examination pertinent to the disease.

2.2. Ophthalmic examination

Included recording of visual acuity and intraocular pressure. Slit lamp examination was done for clinical signs, defective vision and any limitation of ocular movements was noted.

2.3. General examination

Pulse, blood pressure, respiratory rate, auscultation were recorded.

2.4. Laboratory investigation

Routine pre-operative investigation like complete blood count, random blood sugar, complete urine analysis, serological investigations like HIV and HbsAg done were noted.

2.5. Surgical procedure

All surgeries were performed by same surgeon under peribulbar block. Superior rectus bridle suture was applied. Pterygium was dissected from neck using vannas scissors and head was separated from cornea with the help of crescent blade (Figures 1 and 2). Remaining subconjunctival pterygium tissue was separated and excised. Cauterization was not done instead bleeding was controlled by applying pressure using cotton buds. The conjunctival limbal auto graft was taken from the superior quadrant (Figures 3 and 4) of slightly greater size of that of the defect, measured using caliper. The auto graft was then placed over the bare sclera formed by excision of the pterygium and was secured in place with the help of forceps using autologous blood (Figure 5). A thin film of blood clot was formed over the bare area, and any active bleeding was stopped by direct tamponade. On completion of the surgery speculum was removed carefully without disturbing the auto graft. Post op follow-ups were done three times - first on the second day, second after seven days and then after one month.

2.6. Data management

The study variables like age, gender, grades of pterygium, symptoms of patients, surgical time duration, post operative

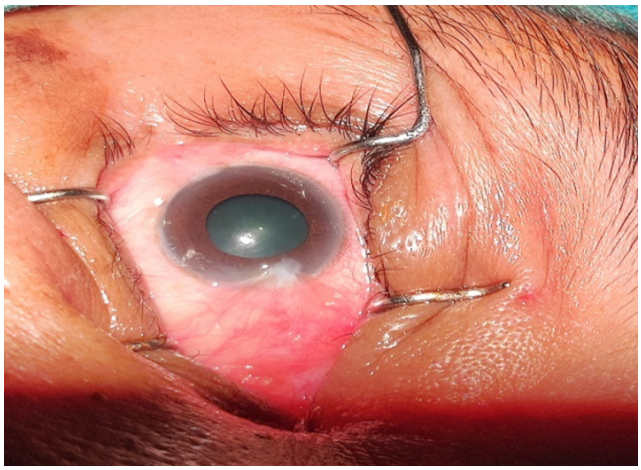

Figure 1: Grade II pterygium

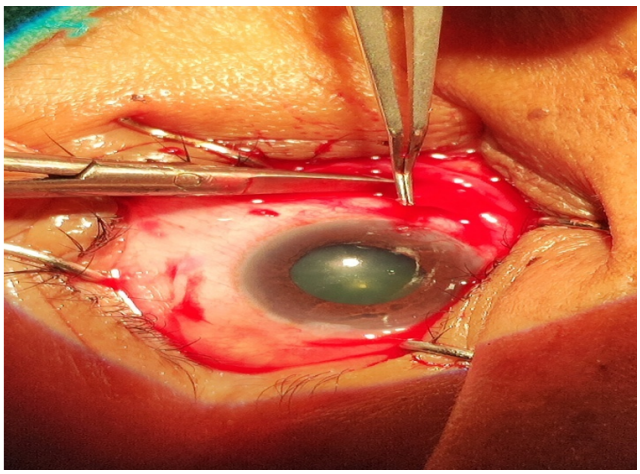

Figure 2: Pterygium excision

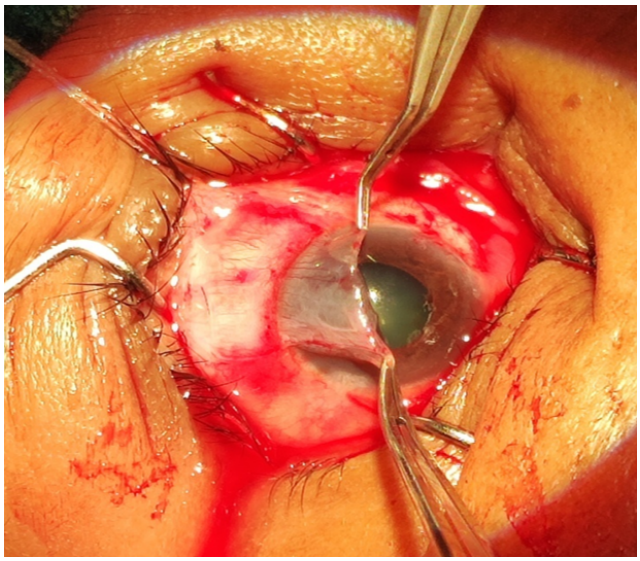

Figure 3: Separating graft from superior quadrant

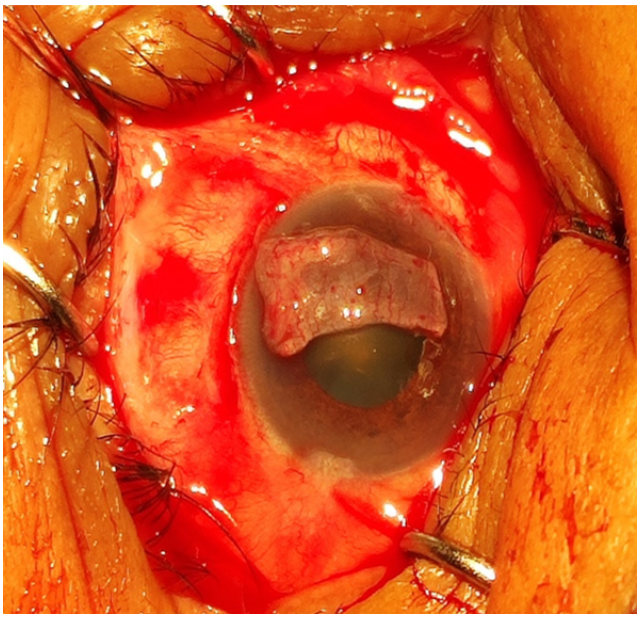

Figure 4: Graft separated

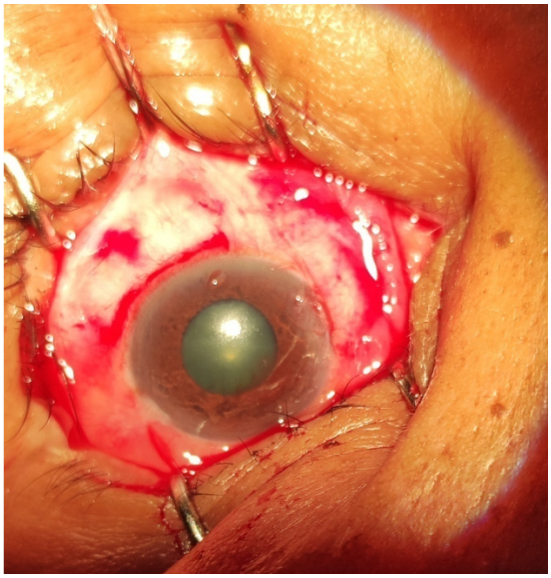

Figure 5: Graft attached over bare sclera using autologous blood

findings were checked and data was entered in Excel files.

2.7. Statistical analysis

Data was analyzed using the version 23 of Statistical Package of Social Science (SPSS) software. Frequency and percentage were presented for categorical data.

2.8. Ethical consideration

The study was approved by the Institutional Ethical Committee of RDGMC, Ujjain (approval no. IEC-

RDGMC_13/2023). A verbal and written informed consent was obtained from the study participants in their own language. It was made clear that their participation was voluntary. The data was anatomized and confidentiality was maintained. The study complies with the declaration of Helsinski.

3. Results

A total of 94 patients with the diagnosis of primary pterygium underwent the surgery named pterygium excision with conjunctival auto-graft using autologous blood. The study participants were aged between 20-70 years with maximum being in the age group of 30-50 years accounting for 62.76% (Table 1). There were 38 females and 56 males included in the study (Table 2). Most of the study population was farmer by occupation (67%). Maximum patients had Grade II-III Pterygia (Table 2). The most common chief complaints were foreign body sensation in 22 patients, redness of eye 15 patients, visual impairment in 4 patients, 14 patients had come with a complaint of cosmetic disfigurement, and most of them were females. Remaining 39 patients had combination of above symptoms and others like watering, irritation and grittiness, itching, photophobia, burning sensation in eyes (Table 3). Though the surgery is very safe, few minimal complications were still observed (Table 4). Most of these symptoms resolved in a week. Subconjunctival hemorrhage was the most common finding observed, in around 38 (40.42%) cases, followed by graft edema seen in 32 (34%). Graft retraction was seen in 7 case (7.4%) owning to inadequate size of graft, 3(3%) patients had graft displacement and 14(14.89%) patients had no complaints at all. Most of the patients with grade II pterygium observed Improvement in visual acuity of at least one line on snellen's chart. All patients were satisfied with good cosmesis.

Table 1: Age distribution

Age (years)	No. of patients (n=94)
20-30	9
31-40	28
41-50	31
51-60	19
61-70	7

Table 2: Gender wise grading of pterygium

	Grade I	Grade II	Grade III	Grade IV	Total
Males	3	33	19	1	56
Females	4	26	8	0	38

Table 3: Chief complaints

Chief complaints	Number of cases (n=94)
Foreign body sensation	22
Redness of eye	15
Cosmetic disfigurement	14
Visual impairment	4
Mixed complaints	39

Table 4: Complications observed during the study

Complications Observed	Number of cases (n=94)
Subconjunctival hemorrhage	38
Graft edema	32
Graft retraction	7
Graft displacement	3
No complications	14

4. Discussion

Pterygium is one of the most common ocular disease encounters in our day to day out patient department. It is the most rewarding surgery for patient as well as surgeon, in terms of convenient procedure and fast recovery post-operatively. But the major concern in modern times is prevention of recurrences and complications. To prevent recurrence, conjunctival auto-grafting has come up. This technique utilizes sutures or either fibrin glue which have their own drawbacks. Thus, sutureless and glue free limbal conjunctival auto-grafting using autologus blood seems to be the most affordable and convenient technique.

In present study, the mean surgical time taken was 10-12 minutes, which is in accordance with study done by Choudhary S et al[18] who observed the mean duration of surgery was 15 ± 2 min.

In our study from rural central India, the most prevalent age group was between 30–50 years accounting for 62.76% of total study population. Singh SK et al. also found prevalence of pterygium almost in same age group from 30-39 years (67±0.8%).[19] According to The Tanjong Pagar survey population aged 40 and older have a higher prevalence of pterygium.[20] Supanji et al[21] from Indonesia also found the mean age being 53.84 ± 10.91 (range: 29 – 81). The Riau study, also shows similar findings like ours with the number of cases peaked in the fourth decade.[22]

Tanjong Pagar survey also found that the majority of subjects were farmers (74.9%)[20] Which is in accordance with our study, where most of the population was farmer by occupation (67%).

Prevalence of males was more than females in our study. Tan CSH et al, Liu L et al, McCarty CA et al. also observed the same.[22–24]

In our study, maximum patients had Grade II-III Pterygium which was similar to Wong TY et al. findings with maximum grade 2 cases in there survey.[20] The most common chief complaints in our study were foreign body

sensation in 22 patients, redness of eye 15 patients, visual impairment in 4 patients, cosmetic disfigurement in 14 patients and remaining 39 patients had combination of above symptoms like watering, irritation and grittiness, itching, photophobia, burning sensation in eyes while Konidaris V.[25] found in their study that the predominant symptoms associated with the pterygium were foreign body in 31 patients, redness in 23, lacrimation in 17, aesthetic reasons in 12, visual disturbance in 4 cases. Subconjunctival hemorrhage (38 (40.42%) cases) was the most common finding observed in our study followed by graft edema seen in 32 (34%). Most of these symptoms resolved in a week. Graft retraction was seen in 7 case (7.4%) owning to inadequate size of graft, 3(3%) patients had graft displacement and 14 (14.89%) patients had no complaints at all. Ratnam et al[26] observed graft edema in 30%, graft displacement in 6.7%, subconjunctival hemorrhage in 10%. There was no graft loss in our study as well as in Ratnam et al[26] study while Abraham Kurian et al[27] observed graft loss 3 eyes out of 100 eyes (3.1%) in their study.

Our study is supported by other studies like Kultheetal[28] and Sharma et al,[29] Mitra et al[30] studies and many more, who observed the similar findings like ours. A Systematic Review and Meta-analysis done by Hossam Zein et al[31] also concluded that patient satisfaction and postoperative symptoms are relatively better in the blood coagulum group than the other techniques. Weijuan Zeng too observed that autologous blood is an appropriate method for graft fixation in pterygium surgery.[32] We too agree that pterygium excision with conjunctival autografting using autologus blood is a safe and easy procedure comparable to other techniques.

5. Conclusions

From the observed results of our study, we come to the conclusion that, pterygium excision with conjunctival autografting using autologous blood is the most effective and useful alternative method as the procedure is very safe, less time-consuming, easy to perform with less learning curve, economical with excellent postoperative outcome, thus, making it equivalent to or rather superior to other comparable procedures.

6. Source of Funding

None.

7. Conflict of Interest

None.

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Author biography

Snehal Mahadik, Associate Professor

Z S Saifee, Assistant Professor

Ayushi Neema, 2nd Year Resident

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