OUTCOME OF AUTOLOGOUS LIMBAL CONJUNCTIVAL TRANSPLANTATION IN TERMS OF RECURRENCE RATE, AS THE MAIN OUTCOME MEASURE AND COMPLICATIONS AS THE SECONDARY OUTCOME

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Abstract:

Purpose: To find the outcome of autologous limbal conjunctival transplantation in terms of recurrence rate, as the main outcome measure and complications as the secondary outcome.

Methods: The present study retrospective study conducted from a tertiary eye care hospital. Pterygium excision with limbal conjunctival autograft from the affected eye was performed for primary pterygium. Secondary pterygia resulting from inflammation, trauma and other diseases were excluded. Patients were followed up for 18 months for recurrence and other complications.

Results: A total of 36 eyes of 36 patients with primary pterygia from November 2016 and October 2017 were included in the study. The study recruited 19 (52.7%) males and 17 (47.2%) females with mean age of 38.2 ± 10.42 years. Pterygium was diagnosed more commonly in left eye (55.5%) as compare to right eye (44.4%). Out of 36 cases 32 (88.8%) cases of nasal and 4 (11.1%) cases of temporal pterygium noted. Out of 36 cases Graft edema in 1 (2.7%) case, graft retraction in 2 (5.5%) cases and 1 (2.7%) case of granuloma were noted. Any kind of pterygium recurrence and graft necrosis was not noted in present study.

Conclusions: Pterygium excision with autologous limbal conjunctival autograft is safe and effective method to treat primary pterygium.

Introduction

Primary pterygium is a fibrovascular proliferation over the cornea, probably resulting from the limbal stem cell deficiency. The exact pathophysiology of primary pterygium remains elusive in spite of its characteristic clinical appearance and florid recurrence after simple excision. It is proposed that normally the limbal stem cells provide anatomical and physiological barrier to the growth of conjunctiva blood vessels over the cornea. Hence, local or diffuse limbal stem cell deficiency is probably the accepted hypothesis for primary pterygium

evolution. Simple excision by 'bare sclera' technique alone resulted in increased incidence rates of recurrent pterygium.¹ Metaanalytical study following bare sclera method revealed, a six fold increase in recurrence if conjunctival grafting was not performed.² Although mitomycin-C proved to be an excellent adjuvant in terms of decreasing the incidence of recurrent pterygium, unfortunately caused ocular surface problems namely dry eye, persistent photophobia and chronic irritation. Bare sclera technique without the use of adjuvant carried a high risk of pterygium recurrences and sight threatening complications, commonly surgically

induced necrotising scleritis.³ Conjunctival autografting yielded acceptable limits of recurrences with no reports of long term vision threatening complications.⁴⁻⁷

Patients and methods

In present retrospective study data collected from medical records of tertiary care eye hospital. Data collection included patient demographics of age, sex and laterality of the primary pterygium. Patients of all age groups with history of progressive primary pterygium, who attended outpatient Department of tertiary eye care hospital from November 2016 to October 2017, were included in present study. 36 eyes of 36 patients, who presented with primary pterygium were included in the study. Pterygium present in the nasal and temporal side of the limbus was categorized into nasal and temporal pterygium respectively. When the pterygium was seen on both the sides of the limbus (nasal or temporal) in the same eye, then it was classified as double headed pterygia. Secondary pterygium due to trauma, inflammation, chemical burns; thermal and autoimmune conditions were excluded. Bowman's probe test was helpful in differentiating the true pterygium from the pseudopterygium by the inability of the probe to insinuate freely underneath the body of the primary pterygium, due to its adherence to underlying episclera and the sclera throughout the extent of the growth. The morphological features of the pterygium were studied under the slit lamp microscopy with photographic documentation and by measuring the horizontal growth extension by means of a simple transparent scale graduated in millimeters from the apex of the pterygium to the corneal limbus. There was common history of constant exposure to sunlight, working in hot climate and dusty environment in most of cases. Patients were unaware of pterygium probably due to the negligence or the lack of education in the initial stages of the natural course of the condition and to the benign nature of the growth. Younger patients complained of increase in the size of the

growth and presented after 6 months to 1 year when the pterygium started invading the cornea. In older patients main complaint was the recurrent redness and pain. All the patients were operated by single surgeon. All the patients were operated under the local infiltration of 2% Lignocaine. After excision fibrovascular mass, the excised raw area of the bare sclera was covered by limbal conjunctival autograft. All limbal conjunctival autografts were taken from superotemporal aspect. Limbal conjunctival autograft was secured with 4, 10-0 nylon sutures by maintaining the limbus to limbus polarity. Post operative regimen included topical installation of Moxifloxacin 4 time/day and predforte acetate in tapering dose for 4 weeks. The sutures were removed by the 10th day of surgery. All patients followed up to 18 months for any recurrence and other complications regularly.

Results

A total of 36 eyes of 36 patients with the primary pterygium were included in the present study. Out of 36 patients 19 (52.7%) were males and 17 (47.2%) were females. The mean age of present study was 38.2 ± 10.42 years. Out of 36 cases 16 (44.4%) cases had right eye and 20 (55.5%) had left eye pterygium. Out of 36 cases 32 (88.8%) cases of nasal and 4 (11.1%) cases of temporal pterygium noted. Post operative, Graft edema was seen in 1 (2.7%) case, graft retraction was noted in 2 (5.5%) cases and 1 (2.7%) case of granuloma noted. Any kind of pterygium recurrence and graft necrosis was not reported in present study.

Discussion

Pterygium is a fibrovascular proliferation over the cornea, probably resulting from the limbal stem cell deficiency. Although the exact aetiology of the pterygium is elusive, it is hypothesised that the ultraviolet induced stem cell disruption might be one of the factors.⁸ Several predisposing factors were implicated in its causation that included exposure to the heat, dust and prolonged outdoor activity. At one time

'bare sclera' technique was the most widely adopted procedure for the management of the pterygium despite the high recurrence rates (30–70%) and complications.⁹ With the introduction of the simple conjunctival graft and the amniotic membrane transplantation with or without intraoperative use of mitomycin-C as adjuvant the recurrence rates were decreased. The successful results with mitomycin-C encouraging for the routine adoption, unfortunately the procedure was heralded by the sight threatening complications and ocular surface disruption in the long run. In a previous comparative study, a recurrence rate of 15.9% with the mitomycin-C group and 1.9% in the limbal conjunctival group suggested that the latter procedure showed minimal recurrence rate.¹⁰ The present study investigated outcome of the autologous limbal stem cell conjunctival transplantation for the ocular surface reconstruction in primary pterygium. The age of onset observed in this study ranged from 25 to 72 years suggesting that the tendency of pterygium development seen in all the age groups. The mean age of the patients observed in the present study was 38.2 years (± 10.4) that included the more younger population compared to the previous studies on the pterygium surgery that showed higher mean age groups.⁸⁻⁹ The younger to middle age seem to be vulnerable for the development of pterygium, probably because of their increased outdoor occupations for prolonged time. The pterygium was more fleshy and reddish with more prominent vascular component than the fibrous component in the younger patients compared to thin and membrane like appearance with decreased vascular component that was more commonly observed in elderly patients. There was almost equal preponderance noticed between the males and the females in

the present study. In comparison to the other studies the left eye showed more predilections for the pterygium than the right eye. A study on pterygium excision with conjunctival graft was investigated for long term survival rate in a retrospective cohort study that invited patients for interrogation about the pterygium recurrence 10 years after the surgical procedure. There were 20 (11.4%) recurrences out of 176 patients during a mean follow up time of 34.4 years and concluded that worse prognosis could be expected for younger patients with the use of thicker sutures and probably in lesser invading pterygium.¹¹ The present study found no recurrences (Table-1) during the 18 months follow up possibly due to the use of limbal conjunctival graft and thin sutures. In the present study 10-0 nylon suture was used to minimise the post operative ocular irritation that might be more pronounced with absorbable. Harvesting of a thin conjunctiva that was free of any tenons facia, use of less-irritating suture material and minimal post operative inflammation might account for no recurrences in the present study that correlated with 0% recurrence rate reported by Mery et al.¹² Young et al. observed three conjunctival cysts, three symblephara, one granuloma and one delllen as post operative complications.¹⁰ In present study 2 cases had minimal graft retraction that managed conservatively. One patient had graft edema that resolved with hiking the dose of topical steroids. The donor site observation revealed conjunctival epithelialisation with no signs of limbal stem cell deficiency in all cases. All the patients had comfortable ocular surface reconstruction with the absence of irritation, dry eye and photophobia during eighteen months supervision with satisfactory postoperative vision.

Table 1: Comparative analysis of the previous study results with the present study

Study	No of cases	Age range (Years)	Follow up (Months)	Recurrence (%)
Young AL ¹⁰	52	39-81	16.73	1.9
G.Merry ¹²	16	31-81	19	0
Abdalla WM ⁹	40	21-52	12.5	7.5
Present study	36	25-72	18	2.7

Conclusion

Pterygium excision with limbal conjunctival autograft is safe and effective method to treat primary pterygium. Meticulous dissection of pterygium and Limbal conjunctival autograft along with use of less irritating sutures significantly reduced the risk of recurrence of pterygium.

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