TUCK IN CONJUNCTIVAL AUTOGRAFTING WITH IN SITU LIMBAL STEM CELL TRANSPLANTATION IN CASE OF RECURRENT PTERYGIUM IN CENTRAL INDIA

Ophthalmology

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ABSTRACT

AIM: To report outcome and recurrence with Tuck in conjunctival autografting with in situ limbal stem cell transplantation in case of recurrent pterygium in central India where cost is a limiting factor in use of any sutures, Amniotic membrane, Fibrin glue, Mitomycin or Avastin.

METHODS: A randomized, non-comparative interventional and prospective clinical study was carried out on 50 patients of recurrent nasal and temporal pterygium at MGM Medical college and Hospital, Jamshedpur from August 2019 to September 2020. Patients with cystic atrophic and Inflamed pterygium, pseudo pterygium, other ocular disorders like Sjogren's syndrome, blood clotting disorders, glaucoma medication, stents or filtering bleb were excluded from the study.

RESULTS: Mean age was 32.2 years. Mean follow up was 12.2 months. Outcome measures were cosmetic satisfaction, recurrence rate, graft edema, graft dislocation, graft failure and loss of graft.

CONCLUSION: Pterygium being a local limbal stem cell deficiency, its surgical treatment by replenishment of limbal stem cells by tuck in conjunctival autografting with in situ limbal stem cell transplantation is a viable option. In cases of recurrent pterygium and is a cheap alternative alleviating need of any sutures, tissue adhesive, antimitotic drugs, anti VEGF, with a lesser intraoperative time, excellent cosmetic result and low recurrence rate.

KEYWORDS

Autografting, Limbal Stem Cell, Recurrent Pterygium

INTRODUCTION

One of the oldest diseases known to the history of Ophthalmology is Limbal stem cell deficiency. A very common form of partial stem cell deficiency is Pterygium. It looks like an insect wing and is a fibrovascular growth of conjunctiva on to the surface of cornea i.e. conjunctivalisation with vascularization. Prolonged ultraviolet exposure can be a cause of this partial loss of stem cells in pterygium. It presents with symptoms of irregular astigmatism, prolonged inflammation, double vision with loss of vision and impaired mortality. Increased recurrence rates after surgical treatment of pterygium is one of the important issues that needs to be catered.

Different adjuvant procedures like lamellar graft, beta irradiation, thiotepa, mitomycin-c, 5-fluorouracil have been tried to prevent recurrence, but serious complications like corneal melting, scleral necrosis, secondary glaucoma, uveitis, cataract formations and disfiguring skin pigmentation may occur. Fibrin glue is generally considered safe, but is currently manufactured from human plasma and has potential risks of carrying viral disease and can cause rare hypersensitivity and anaphylactic reaction. Fibrin glue is presently manufactured by very few companies and it is not easily available. It carries potential risk for transmission of viral and prion diseases. Autologous blood is safe and very effective for graft fixation after pterygium excision. It is a viable alternative to fibrin glue without any extra cost, extra risks and is readily available, but patients taking aspirin or other blood thinners or who suffer from a coagulation factor deficiency are not good candidates for auto blood graft fixation. Currently the most popular technique is Tuck-in conjunctival autografting with in-situ Limbal stem cell transplantation. This method is very helpful in rural and semi-rural areas where cost is a big limiting factor.

MATERIAL AND METHODS

A randomized, non-comparative, interventional and prospective clinical study was carried out at MGM Medical college and Hospital, Jamshedpur, India from August 2019 to September 2020. Informed consent was obtained from all patients. A total number of 50 patients were reviewed. 20 were males and 30 females. Patients with recurrent nasal and temporal pterygium were taken up for the study. Patients with cystic atrophic and Inflamed pterygium were excluded from the study. Other exclusion criteria were cases with associated ocular surface disorders like Sjogren's syndrome. Pregnant and lactating mothers were excluded from the study. Cases of secondary pterygium or pseudo pterygium due to inflammation, trauma and other ocular surface disorders were also excluded from the study. The indications for surgical intervention included cases with induced astigmatism and

having vision related difficulties and progressive growth of pterygium onto cornea.

With involvement of papillary area, ocular mortality restriction and discomfort and irritation despite repeated medications. Primary outcome measures included Patient satisfaction, graft clarity, graft dislocation, graft rejection and Pterygium recurrence. Graft success was defined as intact, healthy and viable graft post four weeks of operation with no need of secondary sutures. Recurrence was defined as proliferative conjunctival tissue extending across the limbus more than 1mm onto the surface of cornea within the surgical field as early as six months post-surgery. All patients in the study underwent thorough ocular and general examination. Preoperative work up included history taking, systemic examination and Ophthalmic examination. Systemic examination was done to exclude diabetes, asthma, hypertension. A complete hemogram including hemostasis, hemoglobin, red blood cell count, differential count was performed. Bleeding time and clotting time were given a special consideration. The preoperative parameters were best corrected Snellen's visual acuity and Astigmatism. Grade of pterygium was not considered as cases were of recurrent pterygium ocular examination conjunctiva was analyzed in context to pterygium and its extent and location with signs of conjunctival inflammations signs of conjunctival scarring. Cornea was evaluated for depth of corneal involvement, pupillary encroachment, signs of corneal inflammation and sub epithelial deposits. Anterior chamber was evaluated for any reaction, depth both centrally and peripherally. The pupil size, shape and pupillary reaction was checked. The position and clarity of lens reviewed. Fundus evaluated using indirect ophthalmoscopy. Tear break up time and tear film evaluated for ocular surface stability. Applanation tonometry and full cycloplegic refraction was done.

All surgeries done by a single surgeon to avoid errors. After peribulbar block and full aseptic and antiseptic draping, the thickened and firmly attached part of pterygium was wrapped off using crescent blade. Once the plane was formed, the head of pterygium is avulsed. Any damage to the medial rectus was avoided. The graft was harvested from superotemporal bulbar conjunctiva. A superior circumferential incision into the cornea 0.5 mm from limbus of length equal to resected limbus is made. Limbal dissection was carried forward from conjunctiva to include 0.5 mm of peripheral cornea with conjunctival graft. Graft placement was done taking care to maintain limbal to limbal and epithelial to epithelial up orientation. Here, care was taken to keep the graft size more than the size of incised pterygium so that tucking of excess conjunctival graft was possible. Slightly oversized (about 0.5 mm) Tenon-free graft that is as thin as possible was made.

This prevents the risk of graft retraction and rejection. Meticulous dissection was done to remove the Tenon's layer and subgraft blood was wiped. This avoided graft displacement. Ironing of graft with help of two repositors was done to aid graft attachment to the surface bed at an accelerated rate. 0.5cc of dexona with gentamicin was injected subconjunctival. Patching of eye with antibiotic coverage done. In post-operative care topical steroids used at two hourly intervals and tapered over next six weeks. On first post-operative patients' pain and discomfort was graded on a scale 0 to 3 using questionnaire. Grade 0 was no symptoms. Grade 1 patients had tolerable and occasional symptoms; Grade 2 had tolerable symptoms present throughout the day. Grade 3 had intolerable symptoms throughout the day. Graft success was defined by intact graft by 4th week after surgery. Graft failure was defined as detachment of graft 4week post-surgery. Graft failure was defined as detachment of graft by 4-week post-surgery. Recurrence was defined as proliferative conjunctival tissue extending across the limbus more than 1mm into the cornea within the surgical field. Graft status was properly placed or displayed or lost. Graft edema and any ocular movement restriction evaluated. On subsequent visits, any sign of rejection like graft edema, graft dislocation or lost graft was assessed. Any sign of recurrence seen and recurrence rate evaluated. Cosmetic satisfaction in form of graft clarity was seen. Patient comfort was analyzed.

RESULT

The study included 50 patients, out of which 35 (70%) were females and 15 (30%) were males. Majority patients (60%) were in age group of 30 to 40 years. 40 (80 %) patients had recurrent nasal pterygium and 10(20 %) patients had temporal pterygium. Mean age was 32.2 years. Mean follow up was 12.2 years. In post-operative complications, Subconjunctival haze was present in 5 (10 %) patients. Transient graft edema was seen in 10 (20 %) patients. Detached graft was present in 1 (2%). Recurrence was seen in none of the patients. Graft failure was nil in our study. 40 (80 %) patients experienced no post-operative discomfort. 5(10 %) patients had mild discomfort and rest 10 % had moderate discomfort which was catered properly with medications. No recurrence was seen at one year follow up.

DISCUSSION

Tuck in conjunctival autografting with in situ limbal stem cell transplantation is a recent modification in surgical treatment of pterygium. Limbal stem cell replenishment via this method helps in reducing the local limbal stem cell deficiency and thereby, minimizing the recurrence rate. It helps in preventing the ongoing process of overriding of conjunctival cells into the surface of cornea and vascularization. Limbal stem cells implanted prevents this migration. At the same time, this is a relatively low-cost surgery alleviating any need for sutures or fibrin glue. Tucking in of graft helps in preventing graft displacement, dislocation or failure. Sutures are constant source of irritation and fibrin glue also has various limitations like cost and risk of transmission of infection and hypersensitivity reactions. A similar study done by Paulte et al observed 2 recurrence in a group of 50 patients of pterygium (62 primary and 8 recurrent) who underwent conjunctival limbal autografting. Rao et al. reported 2 recurrences (3.8%) in a group of 53 patients (36 primary and 17 recurrent cases) after a mean follow up of 18.9 months after limbal conjunctival autografting. Grisly et al did limbal conjunctival autografting for recurrent cases and none of 7 patients showed any signs of recurrence after minimal follow up of 14 months. Graft failure was nil (0%). Patients comfort level with only mild symptoms was 90 % due to absence of suture related complications like foreign body sensation. There was no risk of transmission as no fibrin glue or autologous serum was used. There is nothing to promote inflammation, and patients achieve a good appearance very quickly, within six weeks. Theoretically, the rate should be lower with fibrin glue, given its ability to reduce inflammation. Nonetheless, the rate appears to be between 10 and 15 percent. a graft that was too thick and did not cover the limbus, resulting in a small recurrence within the first two months following surgery. To get an accurate sense of recurrence and specially to identify the earliest stages of recurrence a follow up of patients for at least one year is required. Tuck in conjunctival autografting with on situ limbal stem cell transplantation in case of recurrent pterygium is a cheap alternative alleviating need of any tissue adhesive, antimetabolic drugs and anti VEGFs. It is a viable option with lesser intraoperative time, excellent cosmetic result and low recurrence rate.

CONCLUSION

As per the recent perception of pterygium being a local limbal stem cell

deficiency, its surgical treatment by replenishment of limbal stem cells by tuck in conjunctival autografting with in situ limbal stem cell transplantation is a viable option especially in areas where cost is a big limiting factor. There are lesser rates of post-operative complications with minimal recurrence rate and a better patient satisfaction and comfort.

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