ORIGINAL RESEARCH PAPER

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OUTCOME OF LSCT WITH AND WITHOUT AMT IN PARTIAL LSCD

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ABSTRACT

Purpose – To compare the outcomes of LSCT with and with out AMT in patients of partial LSCD following chemical burns. **Method –** 32 eyes with unilateral LSCD were randomized into two groups. Group A included 16 eyes who underwent LSCT with AMT while group B included 16 eyes who underwent LSCT alone at a tertiary hospital. Outcome were measured in terms of improvement of visual acuity , corneal clarity, vascularization and symblepharon reduction. Patients were followed up at end of 1st week,1 month and 3rd month,6th month and 1 year. **Results –** There was improvement of visual acuity in both groups. Also both group shows reduction in symblepharon score and corneal vascularization. Both group shows improvement in corneal clarity. **Conclusions-** Both surgical technique are useful treatment modalities in patients with partial LSCD following ocular chemical injury.

INTRODUCTION-

Limbal stem cell deficiency (LSCD) is characterized by deficiency or loss of stem cells at limbus that are required to renew corneal epithelium and to act as barrier at limbus[1,2]. Due to LSCD, cornea losses its capacity to repair itself. Hence various sequelae occurs like persistent epithelial defect, vascularization, conjunctivalization and chronic inflammation[2,3]. As a result cornea becomes opaque and patient suffers from ocular comorbidities.

Treatment of LSCD includes medical and surgical management. When limbal stem cell deficiency is transient medical management is done by aggressive lubrication with preservative-free artificial tears, short-term pulse topical corticosteroids loteprednol etabonate 0.5% or 0.2%, or prednisolone acetate 1%, and cyclosporine 0.05%[4,5]. However surgical management is often required when damage is permanent. Unilateral LSCD can be treated with autologous limbal stem cell transplantation from unaffected eye[6]. This option carries the risk of LSCD in the donor eye. Bilateral LSCD can be managed with allogenic transplantation[7]. Newer modalities like ex vivo cultivation has also been tried[8,9,10]. Our study aimed at comparing outcomes in two surgical techniques of Limbal stem cell transplantation (LSCT) with and without Amniotic membrane transplantation (AMT).

METHODOLOGY-

The study included 32 cases of unilateral LSCD who underwent LSCT after ocular chemical burns at a tertiary care hospital. Detailed history of patient was recorded. Through torch light examination and slit lamp examination was done and findings were recorded. Visual acuity, fundus examination and IOP assessment was done periodically. LSCD was classified as per modified Roper Hall classification. 32 patients were randomized into two groups. Group A included 16 cases with LSCT with AMT and Group B included 16 cases with LSCT alone. Outcome were analyzed by following factors

1) Improvement in visual acuity
2) Symblepharon score - forniceal obliteration due to scar tissue formation. It was graded from 0 to 4. Score of 1 was given to every 3 o'clock hour involvement.
3) Corneal clarity- It was graded from 1 to 4 based on assessment of iris and pupil on slit lamp examination with 1 being opaque cornea and 4 being clear cornea.
4) Vascularization- it was graded from 0 to 12 clock hours.

Scores from above mentioned parameters were collected and Quantitative variables were analyzed using paired and unpaired independent *t*-tests. A *P*-value of <0.05 was considered statistically significant.

RESULT –

During the study period, 16 patients (Group A) underwent LSCT with AMT and 16 patients (Group B) underwent LSCT alone from fellow eye. The age and sex distribution was comparable among the two groups. The average time from injury to surgical intervention was 6 months, which was comparable among both groups. There was no significant difference in the demographic profile and mean age of the patients in both groups.

Visual Outcome

The preoperative LogMAR BCVA in group A was 2.7±0.20 which improved to 1.60±0.20 at the end of 3 month. The preoperative LogMAR BCVA in group B was 2.15±0.70 which improved to 1.25±0.50 at the end of 3 month. The improvement within both groups is statistically significant.

	Pre operative BCVA	Post operative BCVA (end of 1 year)
Group A	2.7±0.20	1.60±0.20
Group B	2.15±0.70	1.25±0.50

Structural Outcome

There was statistically significant difference with in both groups on following parameters.

1) Symblepharon score –

	Pre operative score	Post operative score (1 year)
Group A	2.75±0.34	0.18±0.06
Group B	2.5±0.25	0.13±0.01

2) Corneal clarity

	Pre operative score	Post operative score (1 year)
Group A	1.25±0.22	1.95±0.05
Group B	1.95±0.70	2.45±0.70

3) Vascularization

	Pre operative score	Post operative score (end of 1 year)
Group A	11.15±0.75	8.5±0.09
Group B	10.25±0.90	4.15±0.50

DISCUSSION –

Chen and Tseng conducted a study and concluded that a deficiency of limbal stem cells contributes to the triad of conjunctival epithelial ingrowth, corneal vascularization, and delayed healing with recurrent erosion. In partial limbal deficiency, corneal epithelium is still compromised, particularly when a large epithelial cell mass is removed[11]. Other study conducted by Anderson et al shows AMT to be a effective method to restore corneal epithelium in a case of

partial LSCD[12].However another study showed Amniotic membrane transplantation using fibrin glue to be a safe and effective method for cases with partial LSCD. This approach avoids the need of transplanting limbal epithelial stem cells [13]. Another study conducted by Telma P Barreiro, shows results of both group were similar. Hence both technique were found to be useful for ocular surface reconstruction following chemical burns[14].Namrata sharma et al , they found that AMT alone is a useful therapeutic modality in cases with partial LSCD due to ocular chemical injury. Stem cell transplantation may not be required in such cases[15].

CONCLUSION –

we conducted this study with the aim to study the outcome of two different techniques in cases of partial LSCD and we observed both techniques to be effective treatment option in patient of partial LSCD.

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