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AUTOLOGOUS CULTIVATED ORAL MUCOSAL EPITHELIAL CELLS TRANSPLANTATION (COMET) WITH AMNIOTIC MEMBRANE BASED SHEETS FOR SEVERE OCULAR CHEMICAL INJURY

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Background: A normal ocular surface is covered with highly specialised corneal, limbal, and conjunctival epithelial cells that maintain surface integrity. Severe ocular surface damage caused by thermal and chemical burns represents a serious clinical challenge. Many attempts have been made to establish a surgical treatment for such diseases, including exploring the surgical treatment of epithelial transplantation with amniotic membrane (AM) as a base sheet to improve the outcome of ocular surface reconstruction. The aim of this study was to determine the feasibility of treating ocular burns with oral mucosal epithelial cells cultured onto AM.

Methods: Two patients with Grade 4 chemical burn in one of their eyes were recruited. Both patients have total limbal stem cells deficiency. Oral biopsies were obtained with informed consent and were cultured on deepithelialized AM before implanting the cells back to both patients' damaged eye. Superficial keratectomy was performed followed by transplantation of oral mucosal epithelial cell sheet. These were followed by corneal transplantation several months later.

Results: Both patients achieved good visual outcome following COMET and subsequent corneal graft. No rejection was noted.

Conclusions: COMET with AM-based sheets is effective in promoting reepithelialisation and reducing corneal vascularisation. It improves the ocular surface to enable corneal transplantation to be performed at a lower risk of rejection. It also prevents superficial vascularisation and corneal scarring.