ABSTRACT

Background: Stem cells of the corneal epithelium are located at the limbus. They are ultimately responsible for renewal and regeneration of the corneal epithelium under normal circumstances and during wound healing. Diseases causing either complete loss of limbal stem cells or severe destruction of the limbal stroma result in the pathologic state of limbal stem cell deficiency. A new technique termed cultivated oral mucosal epithelial transplantation (COMET) has been developed to treat patients with limbal stem cell deficiency.

Methods: Oral biopsies were obtained from three potential COMET candidates after their informed consent and were cultured as explants on denuded freeze-dried amniotic membrane for 24 days. Cultures were examined by light microscopy and immunohistochemistry.

Results: Sheets of healthy, stratified oral epithelial cells were obtained at day 24. Cultured oral epithelial cells expressed marker of epithelial differentiation keratin 3. The cells also expressed p63 (a marker of poorly differentiated epithelial cells). The cells did not express cornea-specific keratin 12.

Conclusion: Oral epithelial cells can be cultured as explants on denuded freeze dried amniotic membrane without using feeder cells. Characterization showed that these cells maintain the phenotypic characteristics of oral epithelial cells and that the culture is a heterogeneous population of differentiated and poorly differentiated cells.

Key Words

- Oral mucosal epithelium
- Limbal stem cell deficiency
- Ocular surface reconstruction
- Cultivated oral mucosal epithelial transplantation