

Limbal Stem Cell Transplantation (LSCT): Current perspectives

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Limbal stem cell transplantation is one of the most promising techniques in the field of regenerative medicine. This paper reviews the etiopathogenesis and clinical features of *limbal stem cell deficiency (LSCD)* and role of *LSCT* as a treatment modality. LSCD is a group of disorders comprising of vascularized conjunctivalization, keratinization, corneal scarring, & corneal Opacification. Thus, LSCD can develop in traumatic, immunologic, or genetic diseases affecting ocular surface. The clinical signs of LSCD include loss of limbal anatomy, stippled fluorescein staining of the area covered by abnormal epithelium, vascularization, persistent epithelial defects leading to ulceration etc. LSCD can be primary or secondary. LSCT is a surgical treatment to address LSCD and restore a corneal epithelial phenotype. Based on source of cells, limbal transplant can be autologous or allogenic. Currently, main clinical procedures that are performed include a conjunctival limbal autograft (CLAU) using tissue from the fellow eye; a living related conjunctival limbal allograft (lr-CLAL), where a living relative donates conjunctiva and limbal tissue; and keratolimbal allograft (KLAL), utilizing a cadaveric donor where the peripheral cornea is used to transfer the limbal stem cells. These procedures are classified on the basis of Holland and Schwartz's Nomenclature. Most recently, *ex vivo* expanded limbal stem cells or oral mucosa cells have also been used successfully to reconstruct the ocular surface so that the risk of iatrogenic LSCD to the donor eye is minimized. Still some of the issues that have to be tackled are difficulty in identifying stem cells due to the lack of specific markers, immunological rejection, difficult culturing techniques and lack of adequate treatment for the tear film dysfunction.

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