

## Ligament reconstruction using tissue engineering

*Hritanjali Upadhyay*

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Ligaments are dense fibrous tissues that connect bones together and help maintain stability in the body. They sustain mechanical loads that are applied to the skeletal system. However, due to their lower requirements for oxygen and nutrients along with low cell density, their regenerative capacity is slow and inadequate. In case of damage, ligaments are repaired by weaker tissues that are prone to reinjury. Although autografts can be used for ligament reconstruction, they have some drawbacks such as donor site morbidity which causes pain and scarring. Hence, to eliminate these problems, other techniques have been developed for ligament reconstruction using biomaterials, cell therapies and tissue engineering strategies to enhance the healing process. In the case of ligament tissue engineering, biodegradable biomaterials, such as hydrogels or membranes can be used as scaffolds to replicate the organisation of native tissue along with cells that are isolated from the healthy region of the patient's ligament. The scaffolds provide growth factors and mechanical strength to the cells for regeneration of the tissue. After creating the artificial ligament substitute in the laboratory, it is transplanted into the patient following in vitro maturation. Hence, tissue engineering holds promise for the future because it reduces the risks associated with ligament graftings, such as tissue mismatch and rejection, as the reconstruction of the ligament could be achieved using the patient's cells.

*Keywords: Autografts, Ligament reconstruction, Tissue engineering, Biomaterials, Biodegradable materials*

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