


Cartilage Tissue Engineering for Reconstructive Head and Neck Surgery

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Summary

Cartilage Tissue Engineering holds considerable promise for reconstructive head and neck surgery. With an increasingly ageing population, the number of patients affected by cartilage defects in the head and neck region is constantly growing, along with the associated socioeconomic costs. The reconstruction of such defects usually requires complex multistage surgical procedures. In the case of a complete nasal defect, a combination of different types of tissues is required for reconstruction: skin, subcutaneous tissue, vasculature, cartilage, bone, and respiratory epithelium. Thus several transplants or flaps are required, adding to the complication of the reconstruction procedure. Using local or free flaps for reconstruction creates additional surgical defects in the donor areas, which by themselves require additional tissue from a different anatomical site to be reconstructed. However, harvesting of suitable donor tissue might only be possible to a very limited extent as in the case of severely burned or polytraumatized patients. A possible alternative source to obtain tissue for reconstructive head and neck surgery is offered by the methods of tissue engineering using a combination of in vitro engineered cells and one or several biomaterials. Recent advances in stem cell biology and genetic engineering methods compliment traditional approaches based on the use of differentiated cells. However in the head and neck the clinical application of tissue engineered cartilage is still limited to case reports. This chapter will discuss the requirements for engineered cartilage, recent advances and remaining questions which need to be addressed.

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