

107 The Role of Tissue Engineering in Auricular Reconstruction: A Critical Review

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Aim: Despite several decades of research in tissue engineering, reconstructing a 3D human-sized ear that can stand the test of time has remained a challenge. Autologous cartilage reconstruction remains the main treatment choice despite the associated morbidity. Progress in the field has been made and several studies have used tissue-engineered implants in immunocompetent animals with promising results.

Method: This study critically reviews and assesses the characteristics that make auricular reconstruction so challenging and how far research has come in addressing the following: mechanical properties; vascularisation; immune response; cell sourcing; surgical attachments; allografts; and cost.

Results: The question is whether tissue engineering will realistically replace autologous cartilage reconstruction in the short-term, or will advances in other areas, outlined in this article, manage to provide suitable and aesthetically accurate scaffolds.

Conclusions: Advances in tissue engineering are slowly progressing and utilise advances in both biomaterial design and 3D bioprinting to try and address the challenges of auricular reconstruction. Tissue engineering is still a promising solution to auricular reconstruction but still requires further research before becoming a reality.