CHAPTER 15

Engineering an Ear

N-A. O'Sullivan

Summary

Total reconstruction of the external auricle remains one of the greatest challenges for plastic surgeons. A unique aesthetic unit, its reconstruction requires the marriage of surgical skill and artistic ability. A suitable substitute for elastic auricular cartilage remains elusive. Autologous costal grafting is the current gold standard, but results are variable and highly dependent on the surgeon. The use of alloplasts remains controversial, and indications for prostheses are limited. One alternative may be to tissue engineer an ear-shaped cartilaginous framework for implantation. Over the last decade, since the iconic image of 'the ear on the back of the mouse', significant advances have been made in this exciting field. Reviews of recent developments, the current state of the art and the science and possibilities for the future of the tissue-engineered auricle are presented. In particular, it shall explore potential cell sources and scaffolds for engineering an auricle and provide a perspective on the biomechanical and morphological requirements for the engineered ear.

KEYWORDS: cartilage, tissue engineering, tissue engineered ear, auricular reconstruction

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