

Method and Apparatus for Electroforming Tissue

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BACKGROUND

The functional and esthetic defects in the head and neck that result from surgery, trauma, or congenital malformations have led to the development of surgical techniques to reshape cartilage. Conventional reconstructive techniques (e.g., otoplasty, rhinoplasty, tracheoplasty) involve the grafting or shape modification of cartilage (harvested from the ear, nasal septum, or rib). The disadvantages of these approaches include donor site morbidity from graft harvest, waste of excess graft tissue, shape memory effects, and lack of control over warping, particularly in costal cartilage tissue. Alternative approaches include enzymatic digestion in situ, radiofrequency (RF) reshaping, and laser cartilage reshaping. However, a drawback associated with thermal reshaping such as laser is that the high temperature rise at the treatment site may result in damage to the cartilage and surrounding tissues.

TECHNOLOGY DESCRIPTION

Researchers at the University of California have developed a technique that can be used to reshape cartilage tissue by combining mechanical deformation with the application of direct current (DC) electric fields. This concept of tissue electromechanical reshaping ("electroforming") is novel. The method also comprises the step of monitoring the stresses in the tissue and controlling the current flowing in the tissue according to the stresses therein. During the process, deformed tissue can acquire new shapes that are permanently retained after treatment. Tissue modification can be achieved using minimally invasive techniques, with less morbidity than traditional procedures. In addition, the invention uses inexpensive and readily available technology.

APPLICATIONS

This procedure can be useful for otorhinolaryngology, orthopedics, and cosmetic and plastic surgery procedures in the head, neck, etc.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,416,550	08/26/2008	2002-281

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OTHER INFORMATION

CATEGORIZED AS

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