Temporo-mandibular Joint Meniscus

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Technology description

Background

Temporomandibular joint (TMJ) disorders cause pain and dysfunction in the jaw joint and muscles that control jaw movement. A variety of procedures including minimally invasive techniques and arthrotomy have been used to treat this condition. However, meniscectomy is indicated in the majority of cases where the TMJ meniscus is irreparably damaged or if the meniscal disc is anatomically amenable to repair but prohibits the fluid, smooth movement of the condyle. Alloplastic materials such as Silastic, silicone and Proplast-Teflon have been previously used to replace the TMJ meniscus with limited success, with joint pathology often worsening following the placement of such devices. Autograft tissues have also been used both as disc replacement materials following meniscectomy and as interpositional materials in the treatment of joint fusion. The obvious disadvantage associated with autografts is the morbidity associated with the graft donor site. The ideal graft material for the treatment of TMJ pathology resulting in meniscus abnormality would be a material that provides a scaffold for tissue ingrowth, prevents degenerative changes of the TMJ, and is readily implanted without the associated morbidity of autogenous tissue harvest.

Technology Description

A novel extracellular matrix (ECM) device has been developed for TMJ reconstruction. This device, consisting of a particulate or gel ECM pillow encased in sheets of ECM, mimics the shape and size of the native TMJ meniscus. These biodegradable scaffolds are capable of repairing and replacing cartilaginous meniscuses. This ECM device therefore represents an effective tissue scaffold for the reconstruction of the TMJ meniscus following meniscectomy.

* Reconstruction of the temporo-mandibular joint

1) Scaffolds are biodegradable, elastomeric, porous and biocompatible
2) Device mimics the shape and size of the native TMJ meniscus
3) Device undergoes rapid and constructive remodeling into cartilage-like tissue that highly resembles native TMJ in terms of ECM components, organization, and cellular populations
4) Functionality of the device is not degraded over time; remodeling allows device to confirm to unique anatomy of each implanted individual

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