Temporalis Muscle Flap Versus Abdominal Dermis- Fat Graft as Replacements after TMJ Discectomy: A Clinical Study

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Presented by

Fatma Wageeh Attya

BDS 2008 Faculty of Dentistry Ain Shams University
Msc 2015 in Oral and Maxillofacial Surgery, Faculty of Dentistry, Ain Shams University

Supervisors

Dr/ Mohamed Galal Gamal El-Deen Beheiri

Professor of Oral and Maxillofacial Surgery
Faculty of Oral and Dental Medicine, Cairo University

Dr/Tarek Mohamed El-Zayat

Professor of radiology
Faculty of Oral and Dental Medicine, Cairo University

Dr/ Mohammed Abd El-Mageed Katamesh

Professor of Oral and Maxillofacial Surgery
Faculty of dentistry, Ain Shams University

Dr/ Mostafa Mohamed El- Sayed Taha

Lecturer of Oral and Maxillofacial Surgery
Faculty of Dentistry, Ain Shams University

Dr/Ahmed Mohammed Salah

Fellow of Maxillofacial surgery
Ahmed Maher Teaching Hospital

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Dedication

This work is dedicated to

My beloved husband

My Dear Parents and My Brothers

Who love me unconditionally, even on the days where I made it impossible for them to do

My true friends and colleagues for their encouragement and cooperation

Contents

List of Abbreviations

ADDwor : Anterior disc derangement/displacement without reduction.

ADDwr : Anterior disc derangement/displacement with reduction.

ARS : Anterior repositioning splint.

CBCT : Cone beam computed tomography.

DJD : Degenerative joint disease.

EMG : Electromyography.

Max : Maximum.

mm : Millimeter.

mo : Month.

MRI : Magnetic resonance image.

NS : Statistically non-significant.

PD : Proton density.

RDC/TMD : Research diagnostic criteria of temporo-mandibular disorders.

Sig. : Significance.

SS : Statistically significant.

T1W : T1 weighted.

T2W : T2 weighted.

TMDs : Temporomandibular disorders.

TMJ : Temporomandibular joint.

VAS : Visual analog scale.

List of Figures

List of Tables

The Temporomandibular joint (TMJ) is one of the most complex as well as the most used joints in the human body. The main functions of the TMJ are mastication and speech **(Alomar, Medrano, et al., 2007).** It is a joint that connects the mandible to the skull and regulates mandibular movement, a bi-condylar joint in which the condyles located at the two ends of the mandible, function at the same time and articulates with the temporal fossae. Between the condyle and the fossa is a disc that acts as a cushion to absorb stresses and allows the condyle to move easily when the mouth opens and closes **(Ide, Kaji, et al., 1991).**

Temporomandibular disorders (TMDs) is a generic term used for any problem concerning the TMJ. Trauma to the lower jaw, TMJ, or muscles of the head and neck can cause TMDs. Other possible causes include grinding or clenching the teeth, which puts a lot of pressure on the TMJ; displacement of the disc; presence of osteoarthritis or rheumatoid arthritis involving the TMJ; stress, which can cause a person to tighten facial and jaw muscles or clench the teeth; aging. The most common TMJ disorders are pain dysfunction syndrome, internal derangement and arthritis **(Barbick, Dolwick, et al., 2008)**.

Treatments for the various TMJ disorders range from physical therapy and non-surgical treatments to numerous surgical procedures. Usually the treatment begins with conservative, non-surgical therapies first, with surgery left as the last option**(J. Okeson, 2007)**.

The majority of TMDs patients can be successfully treated by non-surgical therapies and surgical interventions may be required for only a small part of TMD population. All non-surgical treatment options must be exhausted before undertaking the invasive methods for the management of TMDs **(Ingawalé & Goswami, 2009).**

The correct course of treatment may vary, for example: pharmacologic therapy, splints, arthrocentesis, discectomy, or prosthesis. The initial treatment might not work and therefore more intense treatments such as disc replacement may be needed **(Kearns, Perrott, et al., 1995)** .

Discectomy or disc replacement is a surgical treatment, which is performed on individuals with severe anterior disc displacement without reduction **(ADDwor)**, to remove the displaced and very often damaged articular disc without going to a more extreme treatment such as a prosthetic joint **(H. Sato, Tominaga, et al., 2005).**

However, removal of the painful pathologic disc causes the reduced absorbency of the TMJ and increased loading during articulation **(H. Sato, Tominaga, et al., 2005),(Tanaka, Detamore, et al., 2008),(Tanaka, Dalla-Bona, et al., 2006) .**

Although various materials are available as disc replacements such as Teflon proplast, temporalis muscle flap, conchal cartilage, fat graft or dermis-fat graft, there are no ideal inter-positional material that can protect articular cartilage from degenerative changes following discectomy. **(H. Sato, Tominaga, et al., 2005)** Temporalis flaps **(Feinberg & Larsen, 1989),(Pogrel & Kaban, 1990),(Karasu, Okcu, et al., 2005)** auricular cartilage **(Matukas & Lachner, 1990),(Tucker & Watzke, 1991)** and dermis grafts **(Georgiade, 1962),(Meyer, 1988)** have been reported with seemingly good results.

The temporalis muscle/fascia flap is the most popular interpositional material for reasons of proximity and ease of use. However, limitation of mouth opening, post-operative muscle pain and osteoarthritis were found in many cases postoperatively**(Pogrel & Kaban, 1990)**. In 2004, Dimitroulis **(G. Dimitroulis, 2004)** first reported the use of abdominal dermis-fat grafts in TMJ surgery in eleven patients with TMJ ankylosis. It was found that dermis-fat graft prevented recurrence of ankylosis by preventing bone to bone contact.

Before too much emphasis is placed on such studies, other evidence must be considered and for that the current study was performed.

TMJ, certainly one of the most complex joints in the body. It provides for hinging movement in one plane and therefore can be considered **as** ginglymoid joint. However, at the same time it also provides for gliding movements, which classifies it as an arthrodial joint. Thus, it has been technically considered a ginglymo-arthrodial joint **(JP. Okeson, 2008).**

The TMJ is formed by the mandibular condyle and the mandibular fossa of the temporal bone, into which it fits. The articular disc separates these two bones from direct contact. The TMJ is classified as a compound joint. a compound joint requires the presence of at least three bones, yet the TMJ is made up of only two **(JP. Okeson, 2008).**

Functionally, the articular disc serves as a non-ossified bone, which permits the complex movements of the joint. Since the articular disc functions as a third bone, the cranio-mandibular articulation is considered a compound joint **(JP. Okeson, 2007).**

The adult mandibular condyle is roughly elliptical in shape with the largest diameter being medio-lateral. There is considerable individual variation in both condylar size and angulation to the various planes and there are often differences between the right and left sides in the same individual **(JP. Okeson, 2007)** .