بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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لم ترد بالأصـــل

Evaluation Of Osteosynthesis Using Titanium Lag Screw With Biconcave Washer In Oblique Mandibular Fracture (Experimental Study)

Thesis

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To

My Dearest

Family

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INTRODUCTION

Introduction

The therapeutic goal of fracture management is to restore original form and function as soon as possible without any morbidity. It is well established that bone healing is optimized by precise anatomic reduction and rigid immobilization.[1,2]

In the effort to optimize bone repair and minimize the necessity of intermaxillary fixation, many different systems and methods of internal fixation have been devised.[3,4]

Conventional therapy with intermaxillary fixation alone or supplemented by interosseous wiring results in semirigid fixation and healing by secondary intention. Moreover, intermaxillary fixation has a potential for associated morbidity, such as malnutrition, weight loss, loss of function, and poor hygiene.[4]

Interosseous wiring has not been successful without concomitant maxillomandibular fixation for fracture reduction and immobilization.[2,5,6]

Although interfragmentary compression can be established with wires, the compression is not maintained.[5,6,7]

Rigid internal fixation, on the other hand, achieves an excellent reduction of the fracture and a primary bone healing by causing interfragmentary compression and rigid immobilization.[1]

In this respect, the lag screw technique was first introduced to maxillofacial surgery by Brons and Boering in 1970[8], who cautioned that at least two screws are necessary to prevent rotational movement of the fragments in oblique fractures of the mandible.

However, beside rigid fixation, lag screws have distinct advantages when compared with plates in appropriate indications in mandibular fractures. Forces are applied inside the cross section of the fractured bone. Thus in the mandible there is no tendency to develop lingual or alveolar gaps which are often encountered with plates. Owing to compression of the fragments the gaps in the fracture line vanish almost completely. Lag screw fixation requires minimal equipment and is quicker than plating. Finally, lag screws require minimal surgical approaches for insertion and removal.[8,9]

Displacement of the bone segments almost never occurs while applying lag screw fixation; which also permits the rapid application of fixation without a decrease in the rigidity of the fracture reduction.[8]

However, the use of lag screws previously presented problems because the spherical screw head acted as a wedge and caused the screw to slip away from the bone when positioned obliquely. Subsequently, this could result in bone cracking.[8]

In order to overcome this problem in vitro and in vivo, Terheyden and Muhlendyck[9] suggested the use of a biconcave washer[*] between the screw head and the cortical bone to achieve better distribution of forces. This discovery has opened the door for many new possibilities for lag screw osteosynthesis, as screws with biconcave washers can now be placed at angles of 0° to 45° in relation to the cortical bone.[9]

It has been further demonstrated that the biconcave washer enables the underneath surface to countersink into the bone and the screw head to remain secure in the outer concavity.[9]

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[*] *Leibinger- Salzburg- Titanium lag screw system with biconcave washers*