

# THE USE OF THE ERBIUM YTTTRIUM ALUMINUM GARNET (2940nm) IN A LASER-ASSISTED LATERAL WINDOW SINUS APPROACH



AVI REYHANIAN, DDS, Netanya, Israel (private practice)

## ABSTRACT

The sinus floor elevation technique is commonly used to augment and enhance the insufficient maxillary posterior ridge for optimal implant placement<sup>1</sup>. Primary stability of the implant is a required condition for the success of any implant. Various maxillary sinus floor augmentation techniques using bone grafts and bone substitutes are frequently used to enable placement of dental implants in the posterior maxilla<sup>2</sup>. The classic lateral antrostomy (pioneered by Tatum<sup>3</sup> in 1976 and subsequently published by Boyne<sup>4</sup> in 1980) appears to be the most common sinus lift procedure. Many techniques<sup>5-8</sup> have been developed and tested to reduce the size and alter the anatomy of the sinus to augment the quantity of bone available for an adequate number of prosthetically well-placed implants of a satisfactory length. Numerous articles have been published in this field regarding grafting materials, their techniques and the comparisons between them.

The purpose of this paper is to demonstrate the ways in which Er:YAG laser energy can be used to aid in the preparation of the surgical site for sinus lift and implant placement at the augmented ridge.

## INTRODUCTION

Deciding which sinus elevation technique to use<sup>9-10</sup> depends on the residual bone height between the Alveolar crest and the sinus floor:

1. Residual bone with a height of at least 6-10 mm: closed sinus elevation (push up) is recommended.
2. Residual bone height of between 4-6 mm: lateral sinus approach is recommended.
3. Residual bone height of less than 4 mm: recommended two-stage technique:
  - Lateral window approach
  - Insertion of the implants 6-9 months later

There are many techniques today for the lateral window approach, i.e. rotator instruments with bur, Piezo (ultra-sonic instrument), etc. It is very important to keep the Schneiderian membrane completely intact without any perforation<sup>11</sup>.

The following case describes the use of an Er:YAG laser system (LiteTouch, Syneron Medical Ltd.) for a lateral sinus approach using various modalities. These include laser-assisted incision (soft tissue application<sup>12,13,14,15&16</sup>), and laser-assisted opening of the lateral window (hard tissue application<sup>14,15,17,18&19</sup>).

## CASE STUDY

This case describes the use of LiteTouch Er:YAG laser (developed by Syneron Medical Ltd.), for lateral sinus approach, using various modalities. These include a laser-assisted incision (soft-tissue application), and laser-assisted opening of the lateral window (hard-tissue application).

## PRE-TREATMENT

### **Clinical examination:**

A forty year old female patient presented for full mouth rehabilitation, her chief complaint being missing teeth in the upper-right quadrant due to periodontal disease, and requesting rehabilitation. The clinical examination showed an absence of teeth # 14,15,16,17,23,24,25,26, 27,34,36&37 (Figure 2).

### **Medical history:**

No medical abnormalities presented for treatment.

### **Radiographic examination:**

Examination revealed less than 4 mm residual bone height between the Alveolar crest and the sinus floor at the upper right quadrant (Figure 1). This is not within the normal limits for inserting implants without using guided bone regeneration (GBR)<sup>35,37,38</sup>. There was more than 10 mm height of bone at the upper left quadrant, which enables insertion of implants without an open sinus lift procedure being required.

### **Soft tissue examination:**

Soft tissue presented within normal limits. Periodontal probing showed 3-4 mm pockets, no bleeding upon probing.

## TREATMENT PLAN

Every surgical procedure is preceded by initial preparation by the hygienist that includes scaling and root planing (if necessary). The treatment plan included the insertion of four implants in the upper left quadrant, insertion of three implants in the lower left quadrant at the location of teeth # 34,36&37. A decision was made to

## **Reference:**

Reyhanian A. The use of the Erbium Yttrium Aluminum Garnet (2940nm) in a Laser-Assisted Lateral Window Sinus Approach. May 2008.