

**Assessment of the efficacy of sinus balloon technique
in transcrestal maxillary sinus floor elevation
surgery**

(Clinical study)

A thesis

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Abstract

Background: There are various factors that made dental implants rehabilitation in the posterior maxilla more difficult and it necessitate the need to perform sinus floor elevation surgery. Various surgical advances have been introduced to overcome the invasiveness of modified Caldwell-Luc (lateral) approach and the drawbacks of the osteotome technique (*Summers' technique*) in sinus floor elevation surgery. Among these surgical techniques and devices a minimally invasive antral membrane balloon elevation (MIAMBE) introduced.

Aims of the study: The purpose of this study was to evaluate the efficacy of balloon technique in the maxillary sinus floor elevation surgery and to assess the outcome, complications and the implant survival rate (during the first 6 months after placement) in the augmented maxillary sinus.

Materials and methods: Between December 2013 and December 2014 a total of (13) patients with insufficient subantral bone height for dental implants placement underwent maxillary sinus floor elevation surgery via crestal approach using sinus balloon technique. A panoramic radiograph and cone beam computed tomography (CBCT) or medical CT scan were obtained before and after surgery to exclude any maxillary sinus pathology and to assess the integrity of sinus membrane, the amount of elevation and the osseointegration of dental implants. Genoss sinus lift balloon (Genoss Company, Korea) utilized for sinus floor elevation surgery in the all cases of this study. The dental implant systems were (Dentium, korea) & (Nucleoss, Turkey) and the standard utilized bone substitute was (RTR) β tricalcium phosphate bone substitute (Zizine laboratoire, France). Postoperative patient complications including pain, discharge, nasal bleeding, and ecchymosis were recorded. The whole follow up period was 6 months following sinus floor elevation surgery.

Results: A total of (13) adult Iraqi patients aged (28-55) years old, (4) males & (9) females were participated in this study. Nine patients underwent unilateral sinus floor elevation surgery and four patients underwent bilateral procedures. The total performed sinus floor elevation cases were (17) with a total of (27) sinus floor elevation sites. Fifteen cases were performed in a single-stage surgery (simultaneous sinus floor elevation and dental implant placement) and two cases were performed in a two-stage surgery. The mean bone gain was 6.70 mm and the mean utilized non-autogenous bone graft material was 0.74 cc. The maximum bone gain with sinus balloon technique was 10.6 mm and the minimum bone gain was 4.9 mm. Twenty three dental implants placed in the augmented maxillary sinus, two implants failed early (8.70%) and the survival rate of the dental implants was (91.30%). *Schneiderian membrane* perforation didn't occur in any case of this study (0%).

Conclusions: Sinus floor elevation via crestal approach using the balloon technique solve the limitations of osteotome technique original (*Summers' technique*) for cases even when the subantral bone height is less than 3 mm. It produces the same elevation achieved by lateral approach (modified Caldwell-Luc approach) with less invasive technique. The antral membrane balloon elevation (AMBE) is a safe and conservative procedure. It decreases the risk of sinus membrane perforation, it also reduces the postoperative pain, infection, and other symptoms often associated with sinus lift procedures.