

# Maxillary sinus augmentation using different osseodensification protocols: a retrospective study with 3-year follow-up

<b>Submission date</b> 24/09/2025	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 06/10/2025	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 06/10/2025	<b>Condition category</b> Oral Health	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

The rehabilitation of atrophic jaws may require sinus floor elevation procedures before or simultaneously with implant placement. Several surgical procedures have been documented for maxillary sinus elevation to overcome this bone resorption, and more recently, conservative and minimally invasive protocols using the osseodensification (OD) technique have been described. This study aims to determine the relationship between Insertion torque (IT) and resonance frequency analysis (RFA) on the day of implant placement. And how the ISQ varied over 36 months of follow-up.

### Who can participate?

Patients at least 18 years old with healed edentulous sites in the posterior maxilla with residual bone height between 2 and 8 mm to facilitate the placement of implants requiring sinus grafting procedures

### What does the study involve?

The study involves the use of a novel osseous technique in the rehabilitation of atrophic maxillae.

### What are the possible benefits and risks of participating?

The use of osseodensification technique differs from other maxillary sinus elevation techniques, which use subtractive instrumentation method to perform the implant bed to the desired diameter, increasing the risk of perforation of the maxillary sinus membrane.

### Where is the study run from?

Cooperativa de Ensino Superior Politécnico e Universitário (Portugal)

### When is the study starting and how long is it expected to run for?

February 2019 to February 2022

### Who is funding the study?

Investigator initiated and funded

Who is the main contact?

Prof. Marco Câmara, marco.camara@iucs.cespu.pt

## Contact information

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Public, Scientific

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## Additional identifiers

### EudraCT/CTIS number

Nil known

### IRAS number

### ClinicalTrials.gov number

Nil known

### Secondary identifying numbers

Nil known

## Study information

### Scientific Title

Sinus floor elevation using osseodensification protocols I, II and III: a retrospective study with 36 months follow-up

### Study objectives

To determine the relationship between insertion torque (IT) and resonance frequency analysis (RFA) on the day of implant placement, and how the implant stability quotient (ISQ) varied over 36 months of follow-up.

### Ethics approval required

Ethics approval required

### Ethics approval(s)

Approved 05/02/2019, Ethics Committee of the University Institute of Health Sciences (Rua Central de Gandra, Gandra, 4585-116, Portugal; +351 (0)224 157 100; sec.ce@cespu.pt), ref: 02 /CE-IUCS/2019

### Study design

Retrospective observational study

### Primary study design

Observational

### Secondary study design

Cohort study

### Study setting(s)

Hospital

### Study type(s)

Quality of life

### Participant information sheet

Not available in web format, please use the contact details to request a participant information sheet

### Health condition(s) or problem(s) studied

Dental implant stability

### Interventions

The participants provided their informed consent after being thoroughly enlightened about the goal and methods of the study both orally and in writing.

A meticulous clinical examination, an assessment of oral hygiene, and a detailed analysis of the patients' medical and dental histories comprised the initial evaluation of each patient.

**Intervention Type**

Procedure/Surgery

**Primary outcome measure**

Insertion torque (IT) measured using a manual torque wrench (Straumann®, Basel, Switzerland) and resonance frequency analysis (RFA) on the day of implant placement

**Secondary outcome measures**

The implant stability quotient (ISQ) value was recorded as the average of buccal, lingual, mesial, and distal measurements using Osstell® IDX (Osstell, W&H, Gothenburg, Sweden) immediately after implant placement (T1); 1 year after implant placement (T2); 2 years of follow-up (T3); 3 years of follow-up (T4)

**Overall study start date**

05/02/2019

**Completion date**

15/02/2022

**Eligibility****Key inclusion criteria**

1. At least 18 years old
2. Healed edentulous sites in the posterior maxilla with residual bone height between 2 and 8 mm to facilitate the placement of implants requiring sinus grafting procedures after prior analysis with Cone Beam computer Tomography (CBCT, New Tom® Go 3D, CEFLA S.C., Imola (BO) Italy)

**Participant type(s)**

Patient

**Age group**

Adult

**Lower age limit**

18 Years

**Upper age limit**

70 Years

**Sex**

Both

**Target number of participants**

190

**Total final enrolment**

105

**Key exclusion criteria**

1. Irradiated patients
2. Impaired immune systems
3. Smoking, drug abuse or alcoholism
4. Diabetes
5. Heart disease
6. Bleeding disorders
7. Sinus pathology
8. Previous bone augmentation
9. Past or current usage of steroids or bisphosphonates

**Date of first enrolment**

06/02/2019

**Date of final enrolment**

06/02/2022

## Locations

**Countries of recruitment**

Portugal

**Study participating centre**

University Institute of Health Sciences - IUCS

Rua Central de Gandra

Gandra

Portugal

4585-116

## Sponsor information

**Organisation**

Cooperativa de Ensino Superior Politécnico e Universitário

**Sponsor details**

Rua Central de Gandra

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**Sponsor type**

Research organisation

**Website**

<https://www.cespu.pt/en/>

**ROR**

<https://ror.org/00w7bj245>

## **Funder(s)**

**Funder type**

Not defined

**Funder Name**

Investigator initiated and funded

## **Results and Publications**

**Publication and dissemination plan**

**Intention to publish date**

01/01/2026

**Individual participant data (IPD) sharing plan**

The datasets generated during the current study are stored in a non-publicly available repository (<https://repositorio.cespu.pt/>)

**IPD sharing plan summary**

Stored in non-publicly available repository