

# Comparison of piezoelectric surgery with conventional technique in preparing dental implant beds

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<b>Registration date</b> 19/05/2025	<b>Overall study status</b> Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 19/05/2025	<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

Dental implant treatment involves many invasive procedures, therefore, many studies aim to make it a less traumatic treatment. This study evaluates the effectiveness of piezoelectric surgery, which uses ultrasonic vibrations to perform bone surgery, in reducing postoperative pain and oedema, and improving the dental implant success rate.

### Who can participate?

Adult patients who are systemically stable and have bilateral edentulous areas and sufficient alveolar bone volume.

### What does the study involve?

The experimental group will receive dental implants using piezoelectric surgery, while the control group will receive the traditional dental implant procedure. The participants will be followed up for 90 days.

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

The potential benefits of using piezoelectric surgery include reducing postoperative pain and oedema. However, the potential risks involve a dental implant failure rate of up to 5%.

### Where is the study run from?

Oral and Maxillofacial Surgery Hospital, Faculty of Dentistry, Damascus University (Syria).

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

November 2022 to November 2026

### Who is funding the study?

Investigator initiated and funded

Who is the main contact?

Dr Mohamad Haroun, mohamad.haroun@damascusuniversity.edu.sy, doctor.

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## Contact information

### Type(s)

Public, Scientific, Principal investigator

### Contact name

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## Additional identifiers

### Clinical Trials Information System (CTIS)

Nil known

### Protocol serial number

Nil known

## Study information

### Scientific Title

Comparing of piezoelectric surgery with conventional drilling in preparing of dental implant beds: randomized, controlled clinical trial

### Study objectives

The null hypothesis posited that there is no a significant difference between piezoelectric surgery and conventional drilling in dental implant stability

### Ethics approval required

Ethics approval required

### Ethics approval(s)

approved 18/10/2022, Vice President for Scientific Research and Study in Damascus University (Damascus University (Oral and Maxillofacial Surgery Department - Faculty of Dental Medicine) (Mezzeh Highway), Damascus, -, Syria; +963; dean.dent@damascusuniversity.edu.sy), ref: DN-180225-416

## **Study design**

Randomized controlled trial

## **Primary study design**

Interventional

## **Study type(s)**

Quality of life, Treatment

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

Dental implant insertion in edentulous areas of the mouth

## **Interventions**

This study is a randomized controlled trial, involving piezoelectric surgery tips and conventional drills in dental implant bed preparation. The experimental group received piezoelectric surgery while the control group received the conventional drilling for dental implant bed preparations. Implant stability is measured using a resonance frequency analysis device during the surgery intervention time, after 30, 60 and 90 days. Each group was randomly selected using <http://www.randomizer.org/>

## **Intervention Type**

Procedure/Surgery

## **Primary outcome(s)**

Dental implant stability was measured using a resonance frequency analysis device at the surgery intervention time, and at 30, 60 and 90 days

## **Key secondary outcome(s)**

Pain severity postoperatively in each group was measured using a Visual Analogue Scale (VAS) over 7 days

## **Completion date**

30/11/2026

# **Eligibility**

## **Key inclusion criteria**

1. Stable medical condition and able to withstand the stress of surgery
2. At least 6 months of teeth extraction healing without any grafting
3. Minimum alveolar bone dimensions required of 6mm in width and 12mm in height in both implantation sites

## **Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

20 years

**Upper age limit**

60 years

**Sex**

All

**Key exclusion criteria**

1. Unstable systemic conditions
2. Harmful oral habits (such as smoking, high load occlusions)
3. A history of radiation, chemical, or bisphosphonate therapy

**Date of first enrolment**

10/11/2025

**Date of final enrolment**

13/11/2026

**Locations****Countries of recruitment**

Syria

**Study participating centre**

Oral and Maxillofacial Surgery Hospital, Faculty of Dentistry, Damascus University

Mezzeh Highway

Damascus

Syria

4671

**Sponsor information****Organisation**

Damascus University

**ROR**

<https://ror.org/03m098d13>

## **Funder(s)**

### **Funder type**

Other

### **Funder Name**

Investigator initiated and funded

## **Results and Publications**

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

The data sharing plans for the current study are unknown and will be made available at a later date.

### **IPD sharing plan summary**

Data sharing statement to be made available at a later date