

# Anatomic zirconia dental implants compared with non-zirconia implants

<b>Submission date</b> 31/03/2021	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 08/04/2021	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 09/08/2022	<b>Condition category</b> Oral Health	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

The use of dental implants to replace lost teeth is an acceptable and common treatment with success rates of 90-100%. Titanium has been widely used in the manufacture of dental implants and the fact that cosmetic expectations in dentistry increased and research in the field of using whole ceramic materials to compensate for the natural tooth was widely used. Zirconia was used for the manufacture of anatomical ceramic implants due to its excellent biological acceptance, good biomechanical properties, and being anatomical, as it takes the shape of the natural tooth root in addition to the color match.

The aim of this study is to evaluate the clinical performance of anatomical zirconia implant and to compare it with non-anatomical zirconia implant, in addition, to evaluate the effect of different types of crowns (composite resin and porcelain fused to metal) on the success of anatomically modified zirconia implants.

### Who can participate?

Adults over 18 years, who require a tooth replacement

### What does the study involve?

Half of the participants will receive anatomical zirconia implant and the other half will receive non-anatomical zirconia implant. Patients will be followed up for 12 months.

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

None

### Where is the study run from?

Damascus University (Syria)

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

November 2018 to September 2021

### Who is funding the study?

Damascus University (Syria)

Who is the main contact?

Dr Alaa Aldebes, dr.alaa-aldebes@outlook.com

## Contact information

### Type(s)

Scientific

### Contact name

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## Additional identifiers

## Study information

### Scientific Title

Evaluation of clinical performance for different types of modified anatomic zirconia implants restoration

### Study objectives

1. Composite resin crowns may be better than porcelain fused to metal crowns over zirconia implants in terms of bone absorption around them
2. Anatomical zirconia implant might be better than non-anatomical zirconia implant

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Approved 29/04/2019, Council for Scientific Research and Upper Graduate Studies (Damascus University, Faculty of Dentistry, Mazzeh Highway, Damascus, Syria ; +963113341864; manager@hcsr.gov.sy), ref:2552

### Study design

Interventional randomized controlled trial

### Primary study design

Interventional

## **Study type(s)**

Treatment

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

Replacement of hopeless teeth with zirconia implant

## **Interventions**

Group1: 20 anatomical zirconia implants divided into 10 implants will receive 10 composite resin crowns and 10 implants will receive 10 porcelain fused to metal crowns.

Group 2: 20 non-anatomical zircon implants divided into 10 implants will receive 10 composite resin crowns and 10 implants will receive 10 porcelain fused to metal crowns.

Randomisation is by sealed envelope.

The patient will be examined, the clinical and medical story will be taken, the oral healthcare will be evaluated, the work plan is explained to him and the written consent is taken to enter the research sample and after the clinical examination of the patient is conducted, Anterior, lateral, occlusal, photographs and cone beam computerized radiograph (CBCT) will taken, which are used for the radiographic evaluation of the tooth to be extracted, to make measurements of the level alveolar bone, and to measure the bone density around the root.

The extracted tooth is taken to the dental laboratory and a scan is performed using a scanner and by computer aided design -computer aided manufacturing device (CAD-CAM) , we can add an abutment in the coronal section of the root, thus obtaining the final implant shape then we will got the anatomical zirconia implant the same as the extracted tooth. Similarly the non anatomical zirconia implant is manufactured to replace lost teeth in the old extraction area using the final drill that will be used by scanning it to manufacture the implant as the same of it. The retention of the implants is measured immediately after the implantation and after one and three months, using the perio test device, additionally the Bone absorption measured using periapical radiographs immediately after implantation , 3,12 months later. Three months after implantation the implants divided randomizelly to receive final composite resin crowns or porcelain fused to metal crowns, discoloration of the crown will measured using crown discoloration index, and crown fracture will measured using crown fracture index 6,12 months later.

## **Intervention Type**

Procedure/Surgery

## **Primary outcome(s)**

Retention of the implants is measured using perio test device immediately after implantation and at 1 and 3 months

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

1. Bone absorption measured using periapical radiographs immediately after implantation and 3 and 12 months
2. Discoloration of the crown measured using crown discolouration index at 6 and 12 months
3. Crown fracture measured using crown fracture index at 6 and 12 months

## **Completion date**

15/09/2021

## **Eligibility**

**Key inclusion criteria**

1. Good oral health
2. The absence of general systemic diseases that prevent the extraction procedure or impede healing and the occurrence of osseointegration such as uncontrolled diabetes and other metabolic diseases that are not controlled
3. Not to be subjected to any radiotherapy or chemical treatment during the past five years
4. There is a clear indication for extraction:
  - 4.1. A hopeless tooth that cannot be restored
  - 4.2. Vertical or horizontal fracture
5. The normal position of the tooth that will be extracted within the dental arch
6. The presence of the teeth adjacent to the tooth that will be extracted
7. The absence of acute inflammation in the extraction area
8. Upper or lower premolar
9. The length of the root that will be extracted at least 10 mm
10. Type D2 and D3 of the bone around the tooth that will be extracted
11. The absence of periodontal diseases
12. The absence of bad oral habits

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Sex**

All

**Total final enrolment**

40

**Key exclusion criteria**

1. The patient's age is less than 18 years or older than 60 years
2. Patients with uncontrolled diabetes
3. Poor oral healthcare
4. The presence of diseases in the periodontal tissues
5. Pregnant females
6. Smoking
7. The root that will be extracted is absorbed, leaving half or less of its length
8. A periapical lesion around the tip of the tooth, with a size greater than 2 mm

**Date of first enrolment**

28/11/2018

**Date of final enrolment**

15/09/2020

## Locations

### Countries of recruitment

Syria

### Study participating centre

**Damascus University**

Mazzeah highway

Damascus

Syria

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## Sponsor information

### Organisation

Damascus University

### ROR

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

## Funder(s)

### Funder type

University/education

### Funder Name

Damascus University

## Results and Publications

### Individual participant data (IPD) sharing plan

All data generated or analysed during this study will be included in the subsequent results publication.

### IPD sharing plan summary

Other

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>		01/08/2022	09/08/2022	Yes	No

