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A comparative study of techniques for alveolar ridge preservation after tooth extraction

Submission date 17/09/2025	**Recruitment status** Recruiting	[_] Prospectively registered [X] Protocol
Registration date 19/09/2025	**Overall study status** Ongoing	[_] Statistical analysis plan [_] Results
Last Edited 19/09/2025	**Condition category** Oral Health	[_] Individual participant data [X] Record updated in last year

Plain English summary of protocol
Background and study aims
Tooth extraction often leads to bone loss in the alveolar ridge, which can affect future implant placement. This study compares two techniques for preserving the ridge using different bone graft materials.

Who can participate?
Adults aged 20–50 with two similar teeth requiring extraction.

What Does the Study Involve?
Participants will receive two different treatments on each side of the mouth. One side will be treated with Sticky Bone, and the other with a calcium sulfate/tricalcium phosphate mixture.

What are the possible benefits and risks of participating?
No benefits and risks provided at registration

Where is the study run from?
Faculty of Dentistry, Idlib University, Syria

When is the study starting and how long is it expected to run for?
December 2024 to May 2027

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Dr Hussamdin Ismail, hussamdin_ismail@idlib.edu.sy

Contact information

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Scientific, Principal investigator

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
Nil known

Study information

Scientific Title
Effect of a mixture of calcium sulfate and tricalcium phosphate versus sticky bone technique on alveolar ridge preservation: a clinical, radiographic, and histological split-mouth study

Acronym

ARP reserve

Study objectives
Evaluation of the efficacy of sticky bone graft and calcium sulfate in:
Alveolar edge dimensions change
Bone Density
Osteogenesis (histological study)

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 15/05/2025, Ethics Committee of Idlib University (University Street, Idlib, -, Syria; +963936179302; fouad_aldaoud@idlib.edu.sy), ref: -

Study design
Interventional randomized split-mouth single-centre non-blinded clinical trial

Primary study design
Interventional

Study type(s)
Prevention, Treatment

Health condition(s) or problem(s) studied
Alveolar ridge resorption following tooth extraction

Interventions
The method of randomization used in this study is allocation by the draw-a-card method.

Group A (Sticky Bone):
Atraumatic extraction followed by application of tricalcium phosphate mixed with PRF using the Sticky Bone technique.

- Group B ($CaSO_4$ + TCP):
Atraumatic extraction followed by application of a 40:60 mixture of calcium sulfate and tricalcium phosphate.

- Follow-up Duration:
6 months

- Measurements:
Clinically: Measuring the dimensional changes of soft tissues and the thickness of the soft tissue covering the alveolar ridge crest.
Radiographically: Evaluating the radiographic bone density of the newly formed bone and assessing the dimensional changes in the buccal and lingual walls of the socket.
After standardizing the imaging parameters for cone-beam computed tomography (CBCT), radiographic scans will be taken using a Vatech X-ray device with the following settings:
• 120 kVp, 5 mA
• Voxel Size: 0.2 mm
Two CBCT images will be taken:

• First scan: Immediately after tooth extraction.
• Second scan: Six months post-extraction.
Both images will be loaded into the OnDemand3D software, where they will be aligned along the sagittal, coronal, and axial planes. The most relevant section of the image corresponding to the surgical intervention site will be selected.
Histologically: Determining the quality of the newly formed bone six months after the surgical procedure.

1. Pain score using VAS at 1 and 7 days post-operative.
2. Healing index using the Landry scale at 1 week.
3. Soft tissue height at 6 months • Local anesthesia (2% lidocaine 1:100,000) administered to the alveolar ridge crest. A periodontal probe (UNC-15) will be inserted at the center of the soft tissue covering the alveolar ridge crest. A small drop of flowable composite will be placed on the soft tissue surface around the probe and then light-cured. The distance from the tip of the probe to the composite marker will be measured using a digital calliper.

Intervention Type
Procedure/Surgery

Primary outcome(s)
1. Dimensional changes of soft tissues and the thickness of the soft tissue covering the alveolar ridge crest measured clinically after tooth extraction and six months post-extraction
2. Bone density of the newly formed bone and assessing the dimensional changes in the buccal and lingual walls of the socket, measured using cone-beam computed tomography (CBCT) with a Vatech X-ray device immediately after tooth extraction and six months post-extraction
3. Quality of the newly formed bone measured using histology six months after the surgical procedure

Key secondary outcome(s))
1. Pain measured using a Visual Analog Score (VAS) at 1 and 7 days post-operative
2. Healing measured using the Healing Index Landry scale at 7 days post-operative
3. Soft tissue height measured using the periodontal probe (UNC-15) method at 6 months

Completion date
20/05/2027

Eligibility

Key inclusion criteria
1. Age 20–50 years
2. Good oral hygiene
3. Presence of two similar teeth requiring extraction in the same jaw (both upper and lower jaw)
4. The patient has two symmetrical teeth indicated for extraction
5. Type 1 socket classification (Elian) (indicating that the buccal bone plate is intact and undamaged following tooth extraction)

Participant type(s)
Patient, Service user

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
20 years

Upper age limit
50 years

Sex
All

Total final enrolment
14

Key exclusion criteria
1. Smokers or alcohol users
2. Systemic diseases or medications affecting bone healing
3. Pregnant or lactating women
4. Presence of infection or fistula at the extraction site

Date of first enrolment
16/06/2025

Date of final enrolment
21/12/2026

Locations

Countries of recruitment
Syria

Study participating centre
Faculty of Dentistry – Idlib University
University Street
Idlib
Syria
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Sponsor information

Organisation
Idlib University

ROR
https://ror.org/038n03236

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Dr Hussamdin Ismail, hussamdin_ismail@idlib.edu.sy. The shared dataset will include anonymized variables such as pain scores, healing indices, soft tissue measurements, radiographic bone density, and histological findings.

Data will be made available via an open-access repository such as Zenodo or Dryad, or upon reasonable request to the principal investigator. Access will be granted to qualified researchers who provide a clear research purpose, obtain ethical approval, and sign a data use agreement ensuring responsible and confidential use.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet			19/09/2025	No	Yes
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes
Protocol file			19/09/2025	No	No