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A study comparing two dental implant preparation techniques and their effect on bone levels over three years

Submission date 17/02/2026	**Recruitment status** No longer recruiting	[_] Prospectively registered [_] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 18/02/2026	**Overall study status** Completed	
Last Edited 18/02/2026	**Condition category** Oral Health	

Plain English summary of protocol
Plain English summary of protocol not provided at time of registration

Contact information

Type(s)
Principal investigator, Public, Scientific

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Study information

Scientific Title
Hybrid funnel technique vs Conventional drill osteotomy: a novel approach for implant site preparation.

Study objectives

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 22/06/2022, Lazio 1 Ethics Committee (Comitato Etico Lazio 1) (San Camillo Hospital Circonvallazione Gianicolense 87, Rome, 00152, Italy; 06 58701; comitatoetico.lazio1@hsanf.it), ref: 904

Primary study design
Interventional

Allocation
Non-randomized controlled trial

Masking
Open (masking not used)

Control
Active

Assignment
Parallel

Purpose
Treatment

Study type(s)

Health condition(s) or problem(s) studied
Dental implant rehabilitation in adults requiring implants, comparing two implant site preparation techniques and their effects on marginal bone levels and peri-implant clinical parameters

Interventions
Participants are adults requiring implant rehabilitation in the maxilla and/or mandible who meet predefined eligibility criteria and provide written informed consent. All participants receive bioactive-surface dental implants (NINA MultiNeO NH, Alpha-Bio Tec) placed under local anaesthesia using a computer-guided surgical template. Participants are allocated pre-operatively to one of two group using a non-randomised allocation protocol aimed at maintaining clinical comparability for age, sex, implant site and bone characteristics.

In the control group, implant osteotomies are prepared with a conventional subtractive drilling sequence according to the manufacturer’s instructions (pilot drill followed by step and final drills to full planned length), and implants are inserted. In the test group, osteotomies are prepared using the Hybrid Funnel Technique, combining subtractive drilling to length with selective crestal cortical preparation using a wider drill and medullary osteocompaction using a

dedicated osteotome prior to implant insertion, creating a funnel-shaped osteotomy. Insertion torque is recorded at placement and implant stability is assessed by resonance frequency analysis; a baseline periapical radiograph is taken at surgery.

Participants enter a structured clinical and radiographic follow-up and supportive periodontal care programme with periodic visits (typically every 3–6 months). The primary outcome is radiographic marginal bone loss from baseline to 3 years assessed on standardized periapical radiographs. Secondary outcomes include bleeding on probing and plaque index assessed during follow-up.

Intervention Type
Procedure/Surgery

Primary outcome(s)
1. Radiographic marginal bone loss (MBL) measured using standardized periapical radiographs (mm) at 3 years follow up

Key secondary outcome(s)
1. Plaque Index (PI) measured using the Plaque Index score (Silness and Löe scale, 0–3) at 3 years follow-up

2. Bleeding on Probe (BOP) measured using the bleeding score (Modified Mombelli index, 0–3) at 3 years follow-up

Completion date
22/01/2026

Eligibility

Key inclusion criteria
1. Patients requiring implant rehabilitation in the maxillary and/or mandibular bone
2. ASA physical status I–II
3. Age between 30 and 85 years
4. Healthy or treated periodontal conditions (treated periodontitis, PI <25%, BoP <25%)
5. Willingness to sign the informed consent and to participate in the clinical study

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
30 Years

Upper age limit
85 Years

Sex
All

Total final enrolment
43

Key exclusion criteria
1. Absence of type 1–2 post-extraction sites
2. ASA physical status III–IV
3. Untreated periodontitis
4. Sites with a history of previous implant failure
5. Known allergy to one or more medications used during treatment
6. Pregnancy (confirmed by verbal inquiry)

Date of first enrolment
29/07/2022

Date of final enrolment
14/11/2023

Locations

Countries of recruitment
Italy

Sponsor information

Organisation
Alpha Bio Tec

Funder(s)

Funder type

Funder Name
Alpha Bio Tec

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 Prof Luigi Canullo, luigicanullo@yahoo.com.

IPD sharing plan summary
Available on request