

# INPLASY PROTOCOL

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**Conflicts of interest:** None declared.

## Primary stability with the osseodensification drilling technique for dental implants in low density bone in humans: a systematic review

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**Review question / Objective:** - Does the osseodensification drilling technique increase primary stability in low-density bone? - The aim of the present investigation was to evaluate primary stability in dental implants in people with low density bone using the osseodensification technique.

**Condition being studied:** The replacement of missing teeth through dental implants is currently the most practiced in dental clinics. The main criterion for determining the success of an implant is osseointegration, which is a direct structural and functional connection between vital bone and the prosthetic load-bearing surface of an implant. In the same way, primary stability must be obtained for a good lasting clinical result of the implant and to achieve this purpose, the bone density must be evaluated where the dental implant is to be placed. Salah Huwais in 2013 introduced a new osteotomy procedure (Oseodensification) for site preparation without removal and bone preservation. The Osseodensification process produces an autograft layer around the implant with the osteotomy surface, the autologous bone comes into contact through an endosteal device that accelerates osseointegration due to the nucleation of osteoblasts in the instrumented bone adjacent to the implant and has a greater primary stability due to contact between the device and the bone.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 September 2022 and was last updated on 15 September 2022 (registration number INPLASY202290066).

## INTRODUCTION

**Review question / Objective:** - Does the osseodensification drilling technique

increase primary stability in low-density bone? - The aim of the present investigation was to evaluate primary stability in dental implants in people with

low density bone using the osseodensification technique.

**Rationale:** In a society concerned about their aesthetics and oral function, many have opted for dental implants after losing their teeth; Due to the high demand for this procedure, there are currently several techniques that try to improve the survival and success rate of dental implants. Therefore, it should be mentioned that osseodensification is a technique aimed at this objective by preserving and compacting the autogenous bone during the preparation of the implant bed, thus achieving better primary stability. This research has high scientific relevance, because the studies of osseodensification compared to other conventional techniques have been mostly in animals or in inert models, therefore this article will focus on studies in humans due to the importance of lack of scientific evidence and with this help professionals to reduce the failures of the surgical technique and patients to the loss of dental implants. Likewise, it is a viable investigation, because it has economic resources for its execution. In turn, to ensure the viability of the study, it has the support of the tutors of the University of Cuenca-Ecuador, with the research direction of the Dentistry career.

**Condition being studied:** The replacement of missing teeth through dental implants is currently the most practiced in dental clinics. The main criterion for determining the success of an implant is osseointegration, which is a direct structural and functional connection between vital bone and the prosthetic load-bearing surface of an implant. In the same way, primary stability must be obtained for a good lasting clinical result of the implant and to achieve this purpose, the bone density must be evaluated where the dental implant is to be placed. Salah Huwais in 2013 introduced a new osteotomy procedure (Oseodensification) for site preparation without removal and bone preservation. The Osseodensification process produces an autograft layer around the implant with the osteotomy surface, the autologous bone comes into

contact through an endosteal device that accelerates osseointegration due to the nucleation of osteoblasts in the instrumented bone adjacent to the implant and has a greater primary stability due to contact between the device and the bone.

## METHODS

**Search strategy:** On June 30, 2022, a systematic search was carried out in the different electronic databases such as PUBMED, Scopus, Sciencedirect, Google Scholar and Cochrane.

Pubmed

P: Dental implant / low density / Implant / dental implants / dental implantation / Endosseous Implants.

I: Osseodensification / osseodensification osteotomy / Versah drills / versah burs / versah.

C: osteotomy / implant osteotomy / drill / regular drilling / conventional drilling.

O: peri implant marginal bone loss / marginal bone loss / crestal bone loss / bone loss / crestal bone loss / bone remodeling / primary stability (((((((Dental implant) OR (low density)) OR (Implant)) OR (dental implants)) OR (dental implantation)) OR (Endosseous Implants)) AND (((((((Osseodensification) OR (osseodensification osteotomy)) OR (Versah drills)) OR (versah burs)) OR (versah))) AND (((((((osteotomy) OR (implant osteotomy)) OR (drill)) OR (regular drilling)) OR (conventional drilling))) AND (((((((peri implant marginal bone loss) OR (marginal bone loss)) OR (crestal bone loss)) OR (bone loss)) OR (crestal bone loss)) OR (bone remodeling) OR (primary stability))).

Google Scholar

P: low density bone / dental implant.

I: osseodensification / Densah burs / versah burs.

C: conventional drilling.

O: osseointegration / Peri-Implant Bone Loss / marginal bone loss / radiographic evaluation "low density bone" OR "dental implant" AND "osseodensification" OR "Densah burs" OR "versah burs" AND "conventional drilling" AND "osseointegration" OR "Peri-Implant Bone Loss" OR "marginal bone loss" OR "radiographic evaluation".

**Cochrane**

**P:** dental implant / low density / Endosseous Implants / dental implantation / dental implants

**I:** Osseodensification / osseodensification osteotomy / Versah drills / versah burs / Densah

**C:** osteotomy / implant osteotomy / drill / conventional drilling / regular drilling

**O:** peri marginal implant bone loss / marginal bone loss / crestal bone loss / radiographic evaluation / osseointegration. (dental implant) OR (low density) OR (Endosseous Implants) OR (dental implantation) OR (dental implants) in Title Abstract Keyword AND (Osseodensification) OR (osseodensification osteotomy) OR (Versah drills) OR (versah burs) OR (Densah) in Title Abstract Keyword AND (osteotomy) OR (implant osteotomy) OR (drill) OR (conventional drilling) OR (regular drilling) in Title Summary Keyword AND (peri marginal implant bone loss) OR (marginal bone loss) OR (crestal bone loss) OR (radiographic evaluation) OR (osseointegration).

**Scopus**

**P:** dental implant / low density / dental implants / dental implantation / endosseous implants

**I:** osseodensification / osseodensification osteotomy / versah drills / versah burs / densah

**C:** osteotomy / implant osteotomy / drill / regular drilling / conventional drilling

**O:** periimplante marginal bone loss / marginal bone loss /crestal bone loss / bone remodeling / osseointegration / radiographic evaluation

(( TITLE-ABS-KEY ( dental AND implant ) OR TITLE-ABS-KEY ( low AND density ) OR TITLE-ABS-KEY ( dental AND implants ) OR TITLE-ABS-KEY ( dental AND implantation ) OR TITLE-ABS-KEY ( endosseous AND implants ) ) ) AND ( ( TITLE-ABS-KEY ( osseodensification ) OR TITLE-ABS-KEY ( osseodensification AND osteotomy ) OR TITLE-ABS-KEY ( versah AND drills ) OR TITLE-ABS-KEY ( versah AND burs ) OR TITLE-ABS-KEY ( densah ) ) ) AND ( ( TITLE-ABS-KEY ( osteotomy ) OR TITLE-ABS-KEY ( implant AND osteotomy ) OR TITLE-ABS-KEY ( drill ) OR TITLE-ABS-KEY ( regular

AND drilling ) OR TITLE-ABS-KEY ( conventional AND drilling ) ) ) AND ( ( TITLE-ABS-KEY ( periimplant AND marginal AND bone AND loss ) OR TITLE-ABS-KEY ( marginal AND bone AND loss ) OR TITLE-ABS-KEY ( crestal AND bone AND loss ) OR TITLE-ABS-KEY ( bone AND remodeling ) OR TITLE-ABS-KEY ( osseointegration ) OR TITLE-ABS-KEY ( radiographic AND evaluation ) ) ) ).

**Sciencedirect**

**P:** low density bone / dental implant

**I:** osseodensification / versah burs

**C:** conventional drilling

**O:** osseointegration / Peri-Implant Bone Loss / marginal bone loss / radiographic evaluation ("low density bone" OR "dental implant") AND ("osseodensification" OR "versah burs") AND ("conventional drilling") AND ("osseointegration" OR "Peri-Implant Bone Loss" OR "marginal bone loss" OR "radiographic evaluation").

**Participant or population:** Dental implant / low density / Implant / dental implants / dental implantation / Endosseous Implants

**Intervention:** Osseodensification / osseodensification osteotomy / Versah drills / versah burs.

**Comparator:** Osteotomy / implant osteotomy / drill / regular drilling / conventional drilling.

**Study designs to be included:** In vivo studies with randomized controlled trials, non-randomized controlled trials, prospective and retrospective clinical cohort studies, case-control studies.

**Eligibility criteria:** 1. Articles comparing OD and conventional technique 2. Human studies 3. Articles with studies on low bone density bone 4. Articles that value ISQ. 5. In vivo studies with randomized controlled trials, prospective and retrospective clinical cohort studies. 6. Case and control studies . exclusion criteria: studies that are in animals. Insufficient information about the surgical protocol

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**Information sources:** Electronic databases such as PUBMED, Scopus, Sciencedirect, Google Scholar and Cochrane.

**Main outcome(s):** Not apply.

**Quality assessment / Risk of bias analysis:** The articles will be evaluated with the bias tools: RoB 2, Newcastle-Ottawa scale.

**Strategy of data synthesis:** Not apply.

**Subgroup analysis:** Not apply.

**Sensitivity analysis:** Not apply.

**Language restriction:** No language limit.

**Country(ies) involved:** Ecuador.

**Keywords:** Dental implant, primary stability, Osseodensification, low density, drill.

**Contributions of each author:**

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