# Peri-implant health of dental implants in alveolar sockets treated with ridge preservation vs. no treatment: a comparative retrospective analysis

**Vincenzo Marchio**, DDS, MsC*; **Chiara Cinquini**, DDS, MsC*; **Nino Buonocunto**, DDS*; **Giacomo Derchi**, DDS, MsC, PhD*; **Niccolò Baldi**, DDS*; **Antonio Barone** DDS, MsC, PhD*

*Department of Surgical, Medical and Molecular Pathology and Critical Care Medicine*
*University of Pisa, Pisa, Tuscany, Italy*

Academy of Osseointegration

IN SUPREMÆ DIGNITATIS 1343

UNIVERSITÀ DI PISA

# Peri-implant health of dental implants in alveolar sockets treated with ridge preservation vs. no treatment: a comparative retrospective analysis

UNIVERSITÀ DI PISA

**Vincenzo Marchio**, DDS, MsC*; **Chiara Cinquini**, DDS, MsC*; **Nino Buonocunto**, DDS*;
**Giacomo Derchi**, DDS, MsC, PhD*; **Niccolò Baldi**, DDS*; **Antonio Barone** DDS, MsC, PhD*

## Background

After tooth extraction, controlling the physiological bone dimensional changes is a key factor for a prosthetically-guided, correct implant fixture positioning.

Maintaining adequate bone dimension after extraction also guarantees adequate bone thickness around the fixture without resorting to bone or soft tissue augmentation procedures

Alveolar Ridge Preservation (ARP) procedures are able to significantly reduce vertical and horizontal bone dimensional change following tooth extraction compared to spontaneously healed sites.[1]

It is unclear, however, if Alveolar Ridge Preservation Sites (ARPs) have an influence on the peri-implant tissues of fixtures over time.

## Study Objectives

**The primary focus** of this retrospective cohort comparative study is to evaluate and compare the *peri-implant health status of implants inserted in alveolar sockets* ***treated with ARP*** *vs implants inserted in* ***spontaneously healed ridges*** *(non-ARP).*

1. MacBeth N, Trullenque-Eriksson A, Donos N, Mardas N. Hard and soft tissue changes following alveolar ridge preservation: a systematic review. Clin Oral Implants Res. 2017 Aug;28(8):982-1004. doi: 10.1111/clr.12911. Epub 2016 Jul 26. PMID: 27458031.

# Peri-implant health of dental implants in alveolar sockets treated with ridge preservation vs. no treatment: a comparative retrospective analysis

**Vincenzo Marchio**, DDS, MsC*; **Chiara Cinquini**, DDS, MsC*; **Nino Buonocunto**, DDS*;
**Giacomo Derchi**, DDS, MsC, PhD*; **Niccolò Baldi**, DDS*; **Antonio Barone** DDS, MsC, PhD*

UNIVERSITÀ DI PISA

## Inclusion Criteria

Patients were selected among those treated at the Oral Surgery Unit, School of Dental Medicine, University-Hospital of Pisa, according to the following inclusion criteria:

- At least 18 years of age
- At least one dental implant inserted in an ARP site
- At least one dental implant inserted in a spontaneously healed site
- Implants with at least 1 year of function.

**51 patients** (38 females, 13 males, mean age 57±20 years) who received a total of 102 implants (51 in ARP sites, 51 in sponeaneously healed sites) were included.

## Data collection

The following data were collected from the patients' medical records:

- History of periodontal disease
- Smoking habits
- ARP procedures specifics
- Implants specifics
- Prosthetic rehabilitation specifics

At the follow up visit, the following data was collected:

- Signs of mucositis/peri-implantitis according to the 2017 World Workshop on the classification of Periodontal and Peri-Implant Diseases and Conditions

# Peri-implant health of dental implants in alveolar sockets treated with ridge preservation vs. no treatment: a comparative retrospective analysis

**Vincenzo Marchio**, DDS, MsC*; **Chiara Cinquini**, DDS, MsC*; **Nino Buonocunto**, DDS*;
**Giacomo Derchi**, DDS, MsC, PhD*; **Niccolò Baldi**, DDS*; **Antonio Barone** DDS, MsC, PhD*

UNIVERSITÀ DI PISA

## Alveolar Ridge Preservation procedure

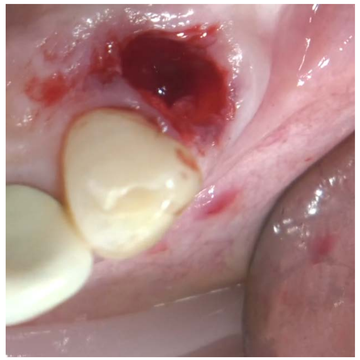
- Atraumatic extraction
- Thorough courettage and cleaning of alveolar site in order to remove inflammatory tissue
- Site washed with physiologic solution
- Insertion of bone graft materials up to the buccal and palatal/lingual bone walls
- Positioning of a resorbable collagen to stop the material from exiting the alveolar site
- Crossed mattress suture

## Spontaneous Healing Procedure

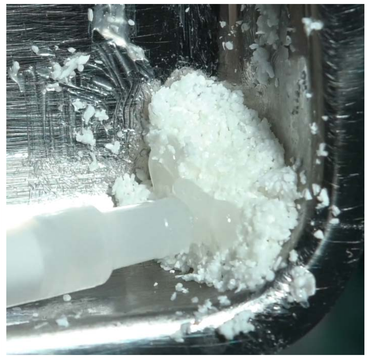
- Atraumatic extraction
- Thorough courettage and cleaning of alveolar site in order to remove inflammatory tissue
- Site washed with physiologic solution
- Crossed mattress suture

Initial situation: fractured tooth n. 12 (2.4 FDI numbering system)

Atraumatic extraction



Socket has been curetted and rinsed with saline

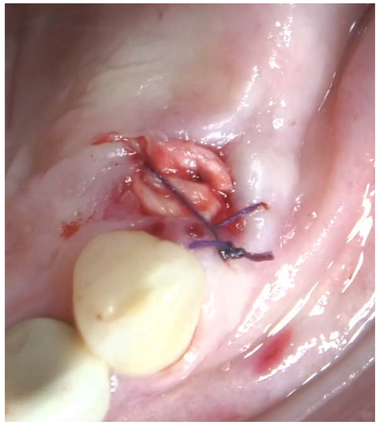


Grafting material preparation

Grafting material positioning

Alveolar socket filled with graft material

Collagen membrane positioning



Collagen membrane sutured and stabilized

# Peri-implant health of dental implants in alveolar sockets treated with ridge preservation vs. no treatment: a comparative retrospective analysis

UNIVERSITÀ DI PISA

**Vincenzo Marchio**, DDS, MsC*; **Chiara Cinquini**, DDS, MsC*; **Nino Buonocunto**, DDS*;
**Giacomo Derchi**, DDS, MsC, PhD*; **Niccolò Baldi**, DDS*; **Antonio Barone** DDS, MsC, PhD*

## Results

Mean follow up 10±5 Years

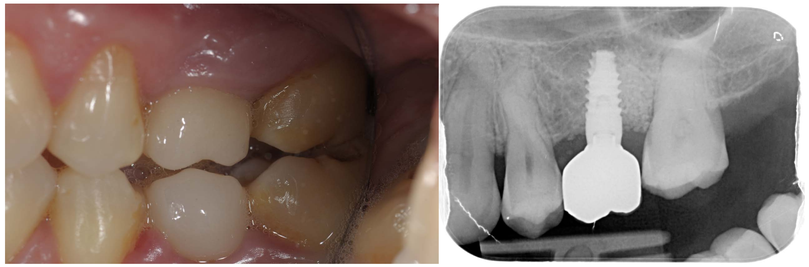
11 smokers (21.5%)
19 with history of periodontitis (37.2%)

23 patients (44%) had no systemic pathologies
28 patients suffered from hypertension, previous ischemic heart disease, diabetes.

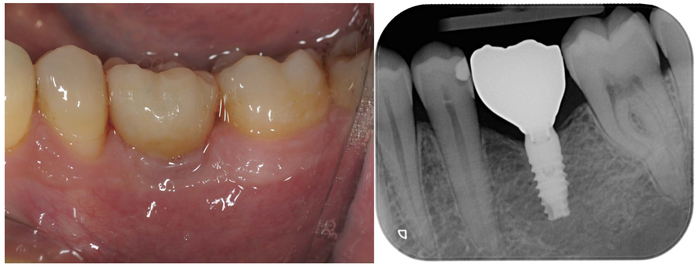
**ARP Group**: 54.1% healthy implants, 37.7% implants with signs of mucositis, 8.2% implants with signs of peri-implantitis. No failures.
Mean Marginal Bone Loss: 0.87±1.34

**Spontaneous Healing Group**: 51% healthy implants, 39.2% implants with signs of mucositis, 9.8% implants with signs of peri-implantitis. No failures.
Mean marginal bone loss: 0.694±1.34

*No statistically significant differences regarding peri-implant status and Marginal Bone Loss* (P=0.698 and P=0.585 respectively)



2 years follow up of an implant inserted in a site where ARP techniques were used.



2 years follow up of an implant inserted in a spontaneously healed site.

## Conclusion

Implants placed in augmented sockets showed **similar marginal bone loss and percentages of periimplantitis** when compared to implants inserted in spontaneously healed sites. **The differences between the 2 groups were not significant.**

Therefore, Alveolar Ridge Preservation procedures seem to be predictable with favorable long-term prognosis for peri-implant health.