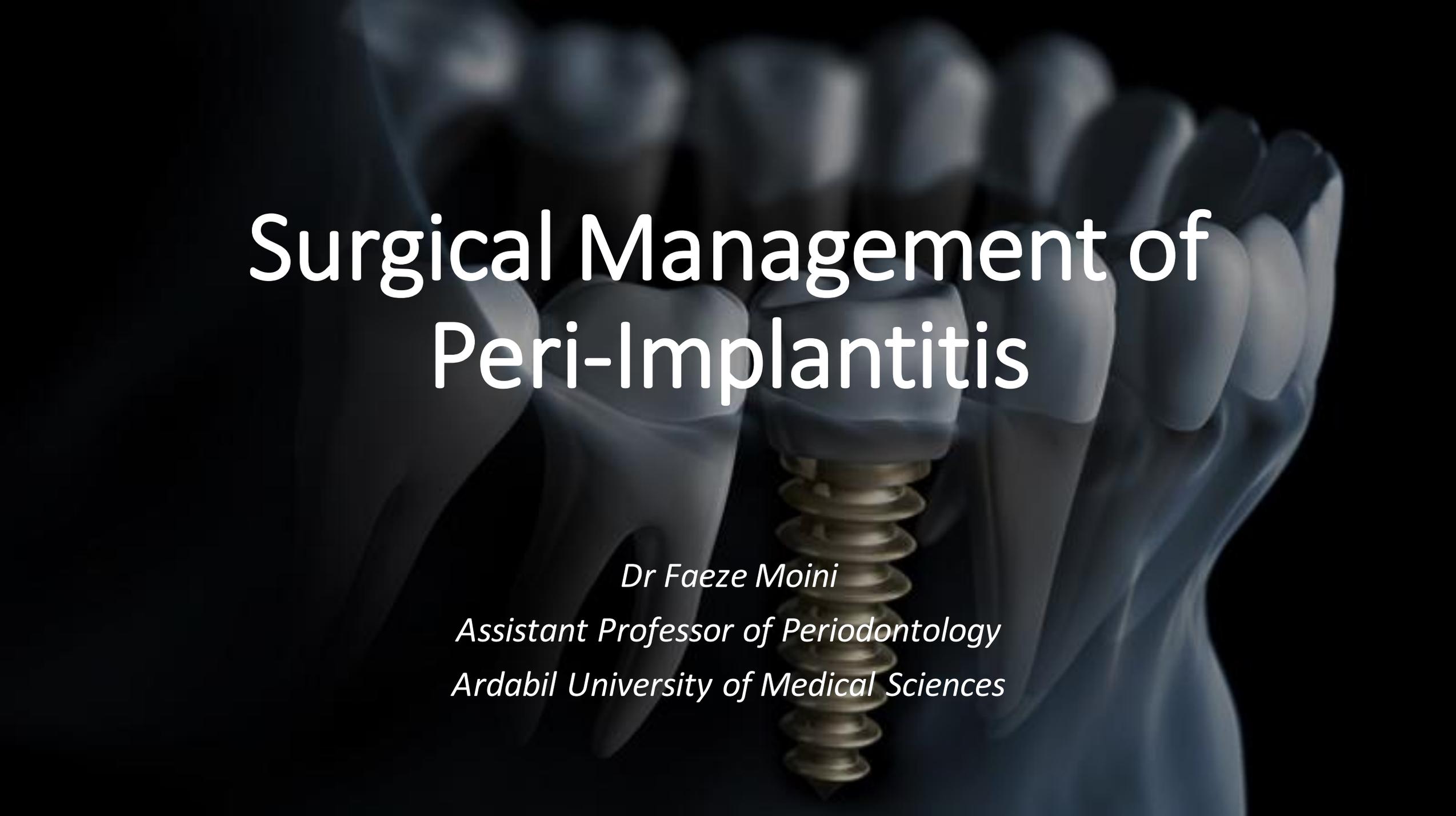


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



Surgical Management of Peri-Implantitis

Dr Faeze Moini

Assistant Professor of Periodontology

Ardabil University of Medical Sciences

BOX 18.4 Treatment of Peri-Implant Mucositis/Peri-Implantitis

Patient Self-Administered Mechanical and/or Chemical Plaque Control

Toothbrushes

Toothpastes

Antimicrobial rinses/flossing/oral irrigators

Topical application of gel

Systemic antibiotics

Probiotic *Lactobacillus reuteri*-containing tablets

Professional Nonsurgical

Mechanical plaque control

- Hand instruments
- Powered instruments

Chemical plaque control

- Local delivery of antibiotics
- Chlorhexidine
- Phosphoric acid
- Ozone, oxygen, and saline solution

Mucogingival

Prostheses

Peri-Implantitis

Nonsurgical

Different mechanical instruments

- Nonmetal instruments
- Rubber cups
- Air abrasive
- Metal instruments
- Burs

Adjunctive treatments

- Microbiologic test
- Local antimicrobials
- Systemic antimicrobials

Disinfect titanium surfaces

- Antiseptics
- Air polishing
- Laser

Mucogingival

Prostheses

Peri-Implantitis

Surgical

- Animal studies
- Open flap debridement
- Surface decontamination
- Regenerative approach
 - Biologics
 - Guided tissue regeneration
 - Guided bone regeneration

Human studies

- Systemic antibiotics
- Access surgery
- Resective surgery
- Regeneration surgery

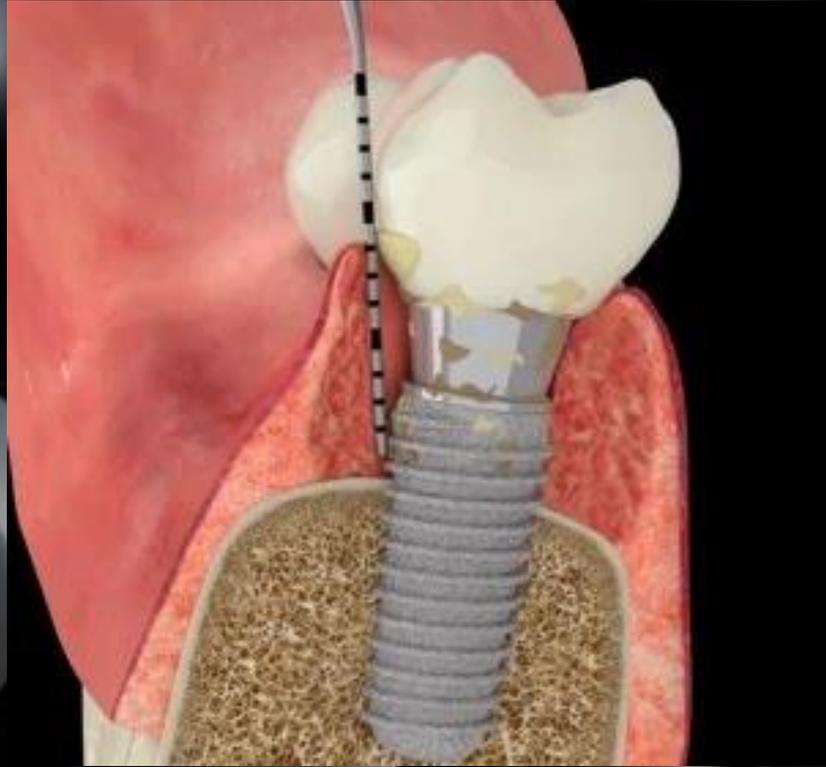
Retrograde Peri-Implantitis

Maintenance and Prevention

Patient self-administered preventive regimens

Supportive periodontal therapy/maintenance (professionally)

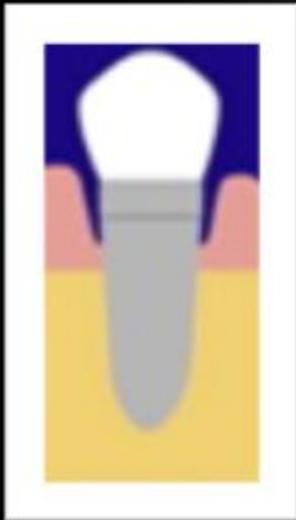
- Mechanical nonsurgical therapy
- Mucogingival
- Prostheses



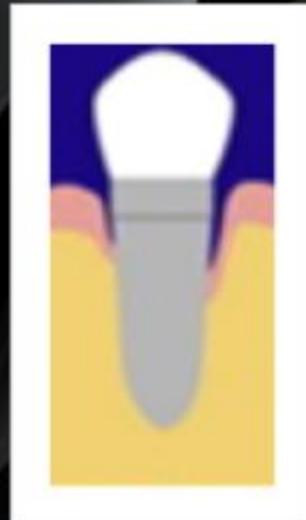
- ✓ Though nonsurgical treatment of peri-implantitis may be effective in some cases, the **majority of cases** require a **more invasive approach** to ensure an effective treatment outcome.

Surgical Management of Peri-Implantitis

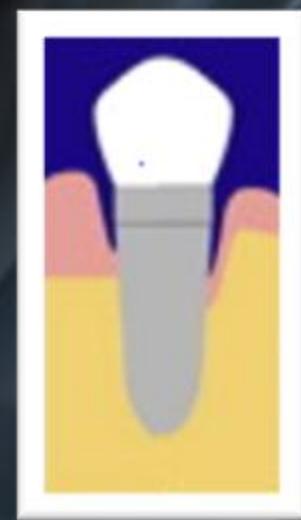
horizontal bone loss



intrabony defects



intrabony defects + horizontal bone loss



Combined Therapy

- Access to the defect & Removal of inflamed tissues
- Decontamination of the implant surface
- Implantoplasty performed at buccally and supracrestally exposed implant parts
- Grafting of the intrabony defect (bone substitute + barrier membrane) with or without a connective tissue graft
- Adequate flap adaptation



Indeed, numerous peri-implantitis surgical treatment protocols have been proposed, which basically can be categorized into two main modalities:

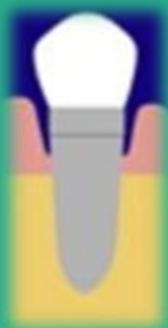


Surgical Management of Peri-Implantitis

non-augmentative

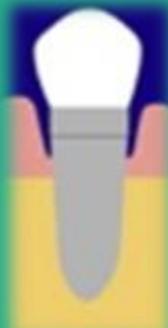
Open flap
debridement

Horizontal
bone loss



Resective

Horizontal
bone loss



Combined

(Reconstructive
+Resective)

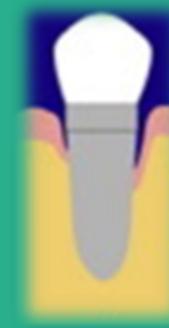
intrabony +
horizontal



augmentative

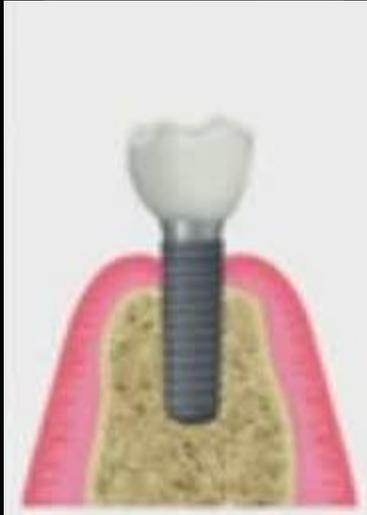
Reconstru
ctive

Intrabony
defects

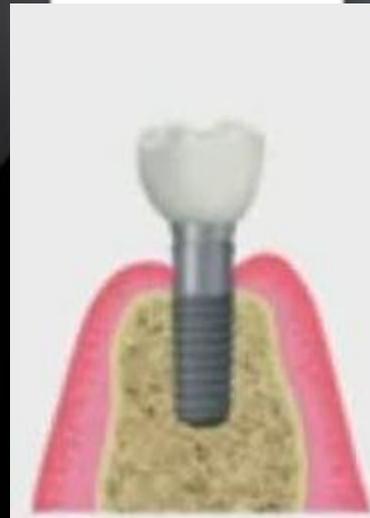


Surgical Management of Peri-Implantitis

Open flap
debridement



Resective



Reconstructive



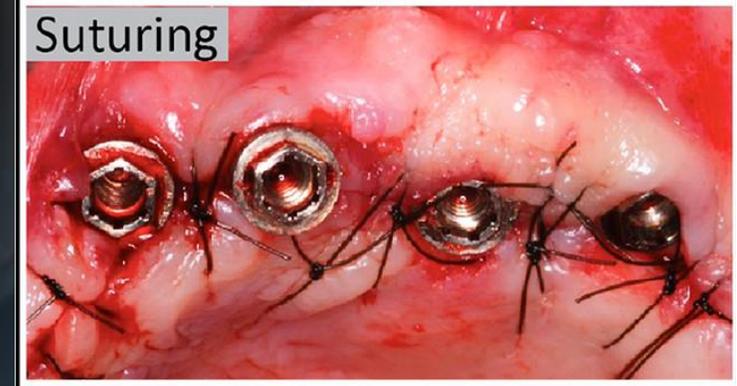
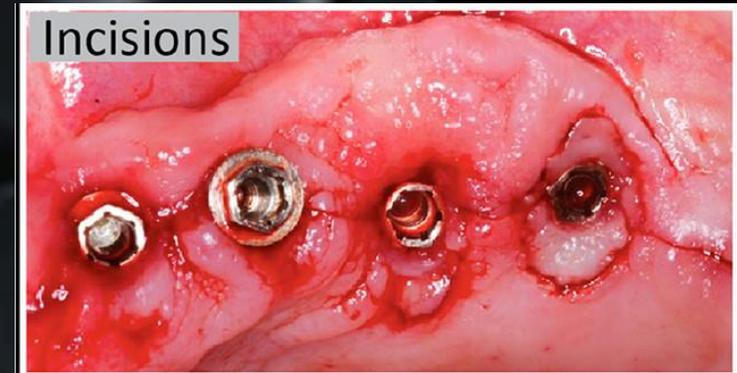
Combined



Access Flap/Open Flap Debridement with or without apical flap positioning

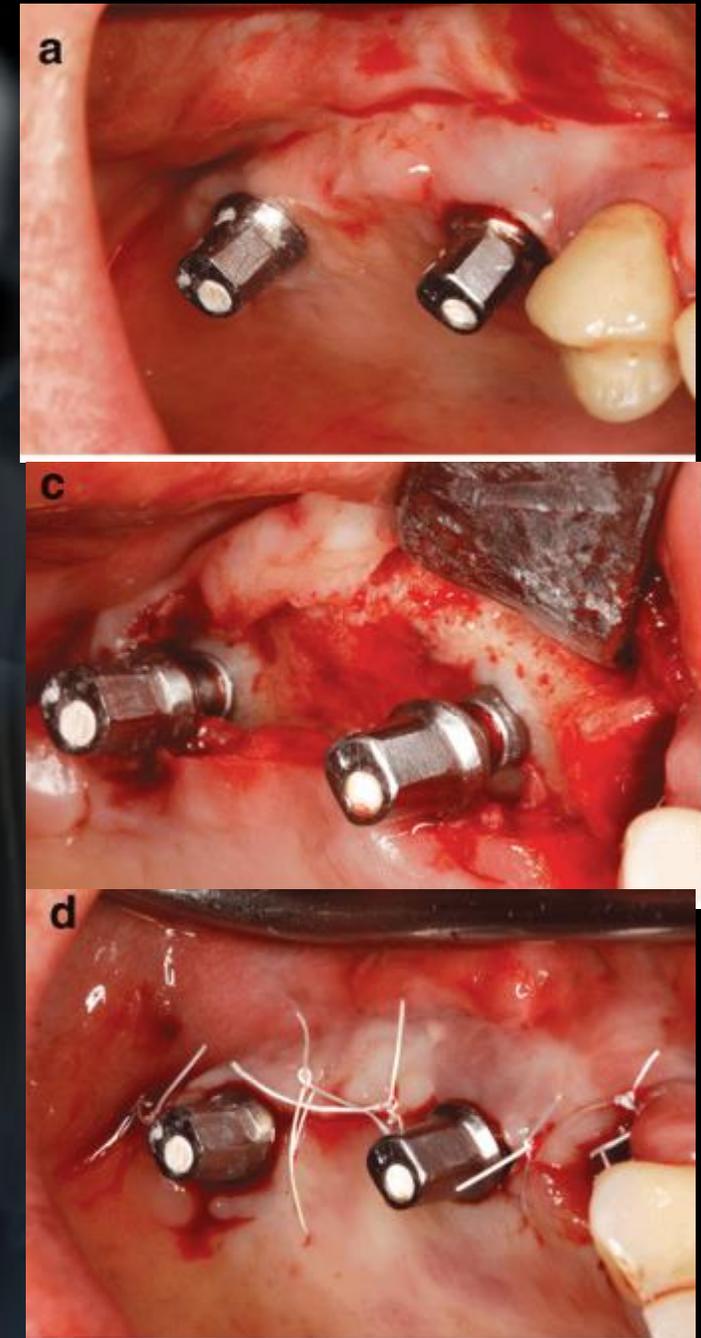
The surgery consists of the following steps:

1. Access to the lesion
 - Sulcular incision
 - extend at least one tooth mesial and one tooth distal
 - Full thickness flap reflection
 - complete past the mucogingival junction
2. Removal of granulation tissues
3. detoxified with Decontamination of the implant surface
 - citric acid, cleaned with currettes and titanium brush if needed
4. Suturing with or without apical flap positioning
 - Horizontal mattress sutures or interrupted sutures



Resective Therapy

- Access to the defect
- Removal of inflamed tissues
- Decontamination of the implant surface
 - Implants are detoxified with citric acid, cleaned with curettes and titanium brush if needed.
- Performance of resective therapy by means of
 - osseous recontouring (positive architecture)
 - with or without implantoplasty.
- Apical positioning of the mucosal flap.



Augmentative Therapy

- Access to the defect
- Removal of inflamed tissues



Augmentative Therapy

- Decontamination of the implant surface
Detoxification:
 - a. **Citric acid** is applied to exposed surface for 30 to 60 seconds.
 - b. Rinse with sterile **saline** for 30 seconds.
- Placement of the graft material (with or without a barrier membrane)

A **resorbable membrane** (extended resorbable collagen membrane: 4–6 months) is then draped over bone graft being careful to **cover 3 mm past all edges** of bone graft

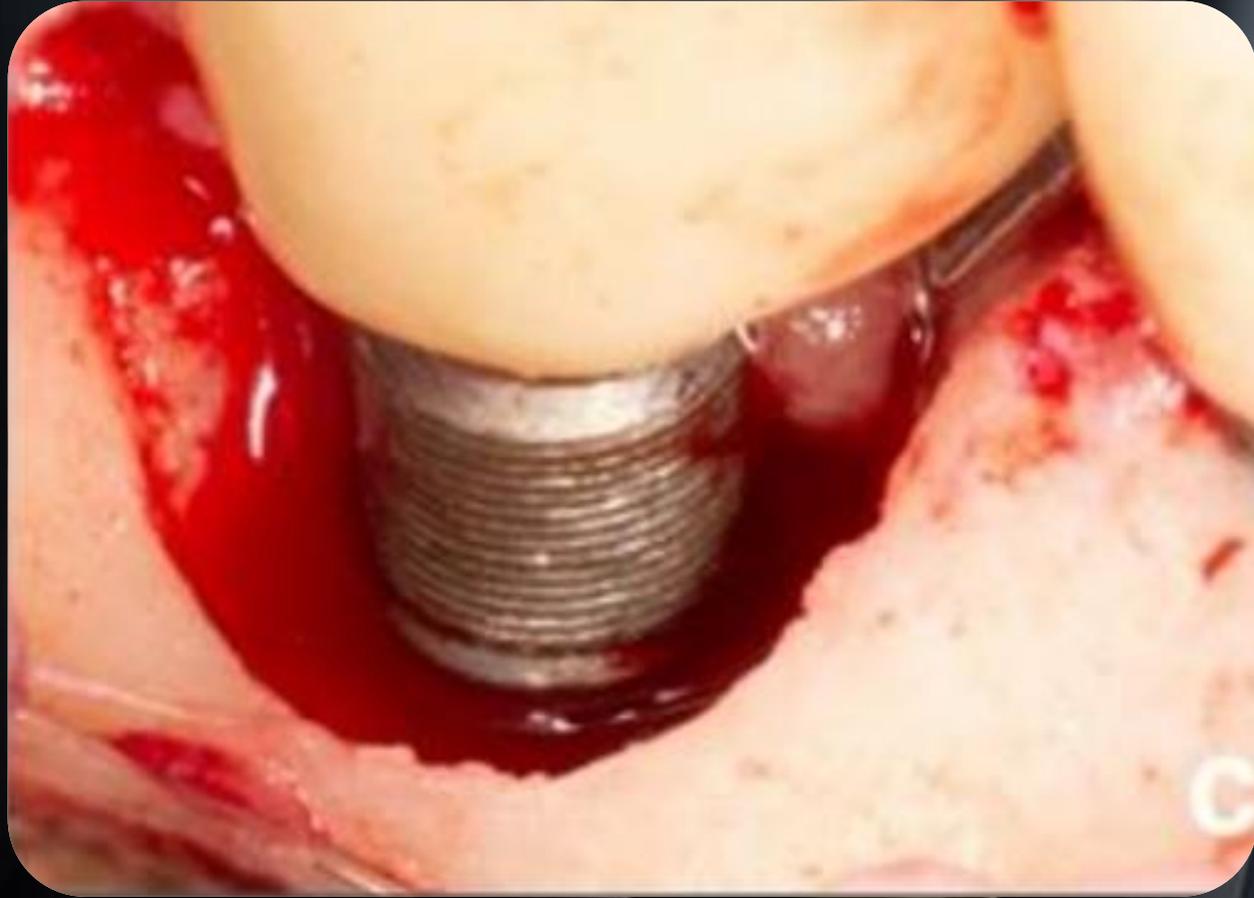


Augmentative Therapy

- Adequate flap adaptation

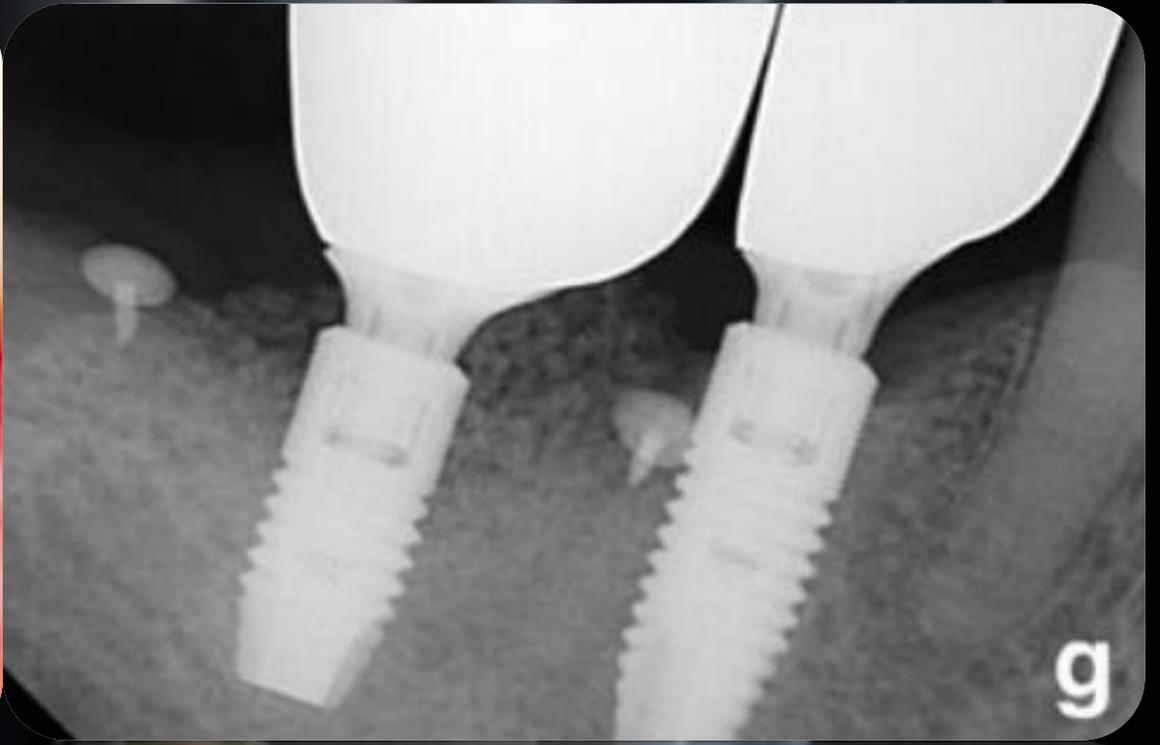


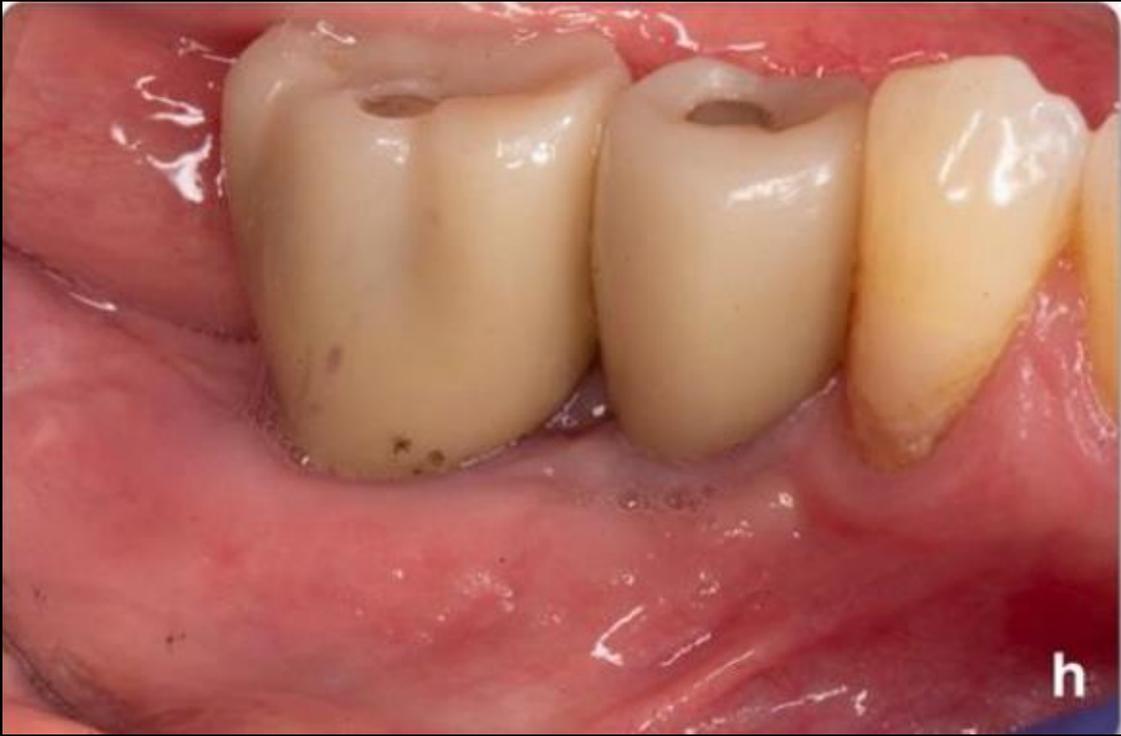






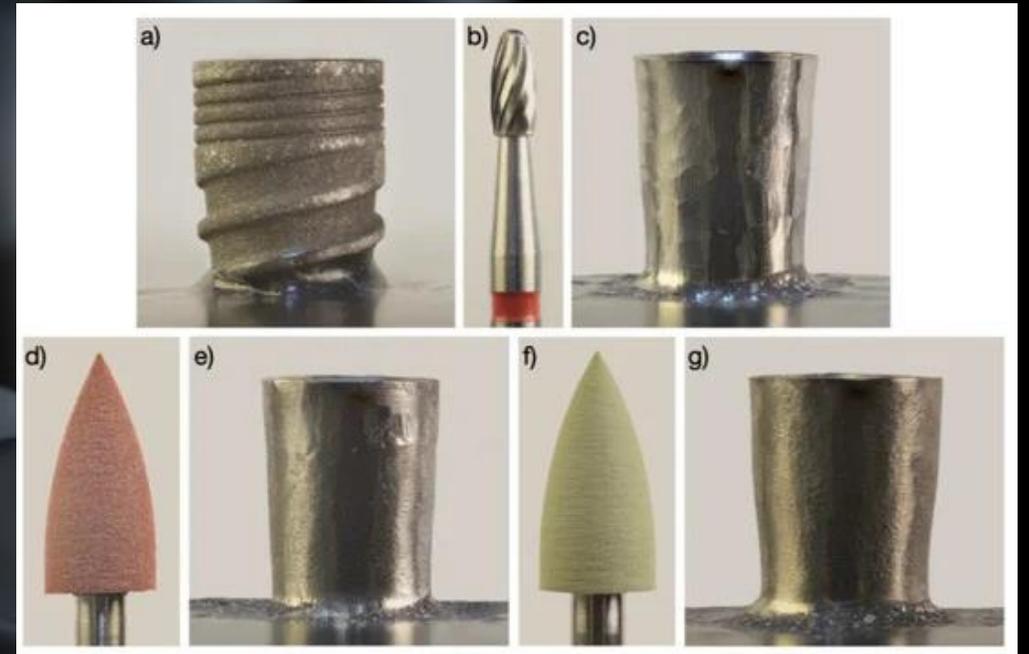






Implantoplasty

- Implantoplasty as a part of periimplantitis surgical therapy may be less prone to plaque accumulation and, ultimately, the recurrence of infection, so improve soft tissue inflammatory status; however, it can lead to **more extensive mucosal recession**
- **Soft tissue volume grafting** as an adjunct to surgical peri-implant therapy may be effective to overcome mucosa **recession in the aesthetic zone.**



Simplified three-bur protocol IP procedure. (a) Macroscopic appearance of the implant; (b) Tungsten carbide bur; (c) Macroscopic appearance of the implant after applying the tungsten carbide bur; (d) Brown silicon carbide polisher; (e) Macroscopic appearance of the implant after applying the brown silicon carbide polisher; (f) Green silicon carbide polisher; (g) Macroscopic appearance of the implant after applying the green silicon carbide polisher.

Decontamination

- the use of **titanium brushes** led to significantly better PD reduction and bone defect fill compared with the controls.



Decontamination

- There are several types of antiseptics ready for dental use:
 - several qualities are needed for antiseptics to be effective:
 - biofilm penetration
 - long substantivity
 - tissue biocompatibility
 - low resistance



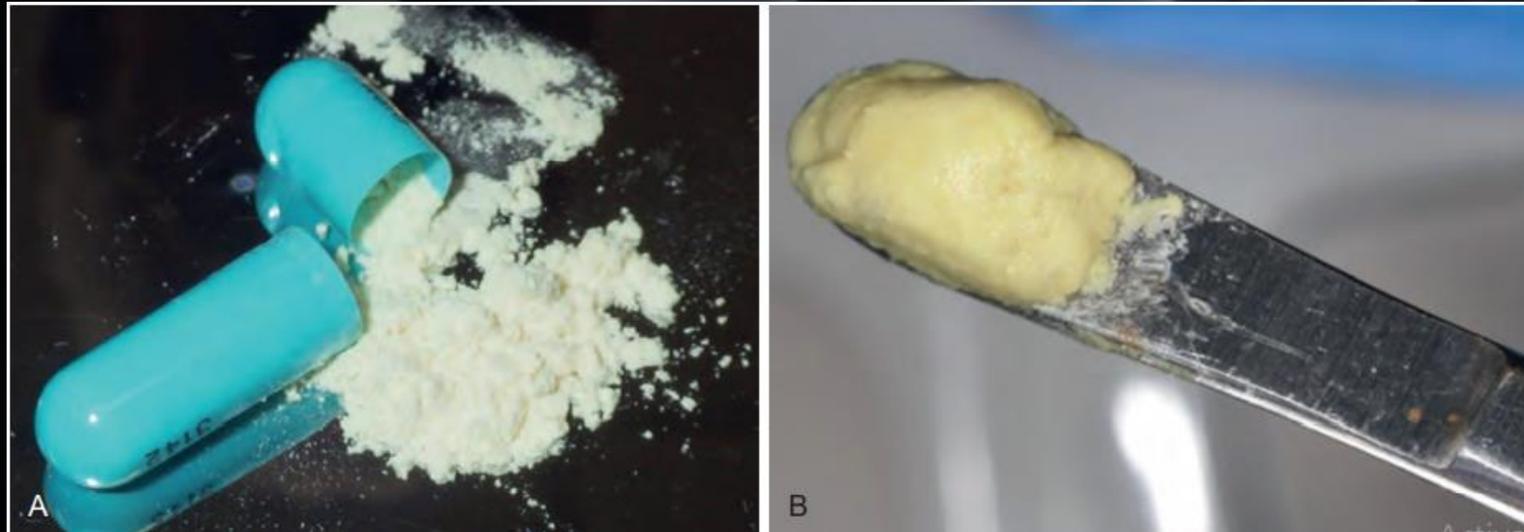
sodium hypochlorite 1.0%
hydrogen peroxide 3.0%
chlorhexidine gluconate
0.12% (USA) or 0.2% (Europe,
Asia, Canada)
citric acid 40.0%
EDTA 24%
povidone iodine 10%
phenols and essential oils.

For these reasons, we recommend the use of citric acid.

Removal of macro deposits should be performed with scalers first. A cotton pellet is soaked with 40% citric acid. It is gently dabbed to remove excess fluid then burnished onto exposed implant surfaces for 30 to 60 seconds.

Locally delivered antibiotics

- locally delivered antibiotic (LDA) is tetracycline at 50 mg/ml solution. Tetracycline capsules can be opened and mixed with small amounts of saline solution to create a paste.



Systemic antibiotics

- Therefore, the systemic administration of antibiotics, in the case of peri-implantitis, should be rethought in light of the present results, contributing to address the problem of increasing antibiotic resistance.

(A Systematic Review and Meta-Analysis)

Review

A Systematic Review and Meta-Analysis of Systemic Antibiotic Therapy in the Treatment of Peri-Implantitis

Manuel Toledano-Osorio^{1,*}, Cristina Vallecillo^{1,*}, Raquel Toledano², Fátima S. Aguilera¹, María T. Osorio², Esther Muñoz-Soto¹, Franklin García-Godoy² and Marta Vallecillo-Rivas¹

¹ Department of Stomatology, Faculty of Dentistry, University of Granada, Colegio Máximo de Cartuja s/n, 18071 Granada, Spain; mtoledano@ugr.es (M.T.-O.); fatimas@ugr.es (F.S.A.); emsoto@ugr.es (E.M.-S.); mvallecillo@correo.ugr.es (M.V.-R.)

² Independent Researcher, 18071 Granada, Spain; rtoledanos@icmail.com (R.T.); mtoleosorio@gmail.com (M.T.O.)

³ Health Science Center, College of Dentistry, University of Tennessee, 875 Union Avenue, Memphis, TN 38103, USA; fgarcia@godoy@gmail.com

* Correspondence: cvallecillo@icmail.com; Tel: +34-958-243-789



Citation: Toledano-Osorio, M.; Vallecillo, C.; Toledano, R.; Aguilera, F.S.; Osorio, M.T.; Muñoz-Soto, E.; García-Godoy, F.; Vallecillo-Rivas, M. A Systematic Review and Meta-Analysis of Systemic Antibiotic Therapy in the Treatment of Peri-Implantitis. *Int. J. Environ. Res. Public Health* **2022**, *19*, 6002. <https://doi.org/10.3390/ijerph19116002>

Academic Editor: Paul B. Tchounwou

Received: 4 May 2022

Accepted: 24 May 2022

Published: 26 May 2022

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Abstract: Research has been conducted into the advantages of the systemic administration of antibiotics. The aim of this systematic review and meta-analysis was to assess the efficacy of systemic antibiotic administration in the treatment of peri-implantitis in terms of bleeding on probing (BoP) and probing pocket depth (PPD). Literature searches were performed across PubMed, EMBASE, and Cochrane Central Register of Controlled Trials (CENTRAL) to identify randomized controlled trials and observational clinical studies. After peri-implantitis treatment, PPD was reduced by 0.1 mm ($p = 0.58$; IC 95% [-0.24, 0.47]), indicating a non-significant effect of antibiotic administration on PPD. The BoP odds ratio value was 1.15 ($p = 0.5$; IC 95% [0.75, 1.75]), indicating that the likelihood of bleeding is almost similar between the test and control groups. Secondary outcomes were found, such as reduced clinical attachment level, lower suppuration and recession, less bone loss, and a reduction in total bacterial counts. In the treatment of peri-implantitis, the systemic antibiotic application reduces neither PPD nor BoP. Therefore, the systemic administration of antibiotics, in the case of peri-implantitis, should be rethought in light of the present results, contributing to address the problems of increasing antibiotic resistance.

Keywords: antibiotics; bleeding on probing; peri-implantitis; probing pocket depth; antibiotic resistance; antibacterial agents

1. Introduction

Dental implant therapy is one of the most common treatments for replacing missing teeth [1]. Peri-implantitis is a common biological complication in patients with implant-supported prosthesis [2]. According to the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions (2017 WWP), the definition of peri-implantitis includes (1) bleeding and/or suppuration on gentle probing, (2) increased probing pocket depth compared to previous examinations and (3) bone loss. This definition requires the existence of a previous examination of the patient, which is not always available. If no previous registers are available, alternative diagnostic criteria have been proposed: (1) bleeding and/or suppuration on gentle probing, (2) probing pocket depths of ≥ 6 mm and (3) bone levels ≥ 3 mm apical of the most coronal portion of the intra-osseous part of the implant [3].

In the pathogenesis of peri-implantitis, microbial colonization of the implant surface is the main causative factor [4]. Peri-implant biofilm contains a complex array of bacterial species that trigger the infection and cause the beginning of the disease [5]. The microbiota in peri-implantitis seems to be mainly composed of anaerobic Gram-negative

Systemic antibiotics

- Prescription of 2 or 3 g of amoxicillin one hour before surgery is recommended to reduce the early failure rate of one-stage implants and to decrease the bacterial load of grafted bone particles in bone augmentation procedures with one or two-stage implants.

- Amoxicillin 500 mg tid, metronidazole 250 mg, 21 tabs tid

(Misch's Avoiding Complications in Oral Implantology)



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Review

Preventive antibiotic therapy in bone augmentation procedures in oral implantology: A systematic review

Angel-Orión Salgado-Peralvo^{a,b,c,*}, María-Victoria Mateos-Moreno^d, Eugenio Velasco-Ortega^{e,f}, Juan-Francisco Peña-Cardelles^g, Naresh Kewalramani^h

^aMaster in Implant Dentistry, University of Seville, Seville, Spain
^bMaster's Degree in Family and Community Dentistry, University of Seville, Seville, Spain
^cCollaborating Professor of the Master's Degree in Family and Community Dentistry, University of Seville, Seville, Spain
^dDepartment of Clinical Dental Specialties, Faculty of Dentistry, Complutense University of Madrid, Madrid, Spain
^eProfessor of Comprehensive Dentistry for Adults and Gerodontology, University of Seville, Seville, Spain
^fDirector of the Master in Implant Dentistry, University of Seville, Seville, Spain
^gPostgraduate Program in Oral Surgery and Implantology, Rey Juan Carlos University, Madrid, Spain
^hPostgraduate Program in Oral Surgery, Periodontology and Implantology, Rey Juan Carlos University, Madrid, Spain

ARTICLE INFO

Article history:
Received 7 December 2020
Accepted 11 January 2021

Keywords:
Antibiotic prophylaxis
Antibiotics
Guided bone regeneration
Bone augmentation

ABSTRACT

Introduction: Since the beginning of Oral Implantology, preventive antibiotic therapy has been routinely prescribed. However, at present, due to the growing appearance of antimicrobial resistance, its use has been questioned, generating a great debate and an emerging controversy. The present systematic review aims to analyze the scientific literature to determine whether the preventive prescription of antibiotics in augmentation procedures with the insertion of implants in one or two phases decreases the incidence of postoperative infections and/or the survival rate of the implants.

Material and methods: The MEDLINE database was searched (via PubMed) with the following keywords: (bone grafting OR alveolar ridge augmentation OR bone graft augmentation OR guided bone regeneration OR bone block) AND (dental implants OR dental implant OR oral implantology) AND (antibiotic prophylaxis OR antibiotics). The criteria used were those described by the PRISMA[®] Statement. The search was limited to randomised clinical trials, systematic reviews and meta-analyses published in the last 15 years (2005–2020).

Results: After reading the titles and abstracts of the resulting articles, only one systematic review meeting the described criteria and 4 randomised clinical trials were included.

Conclusions: Prescription of 2 or 3 g of amoxicillin one hour before surgery is recommended to reduce the early failure rate of one-stage implants and to decrease the bacterial load of grafted bone particles in bone augmentation procedures with one or two-stage implants.

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1. Introduction

Preventive antibiotic therapy in Oral Implantology or, commonly referred to as "antibiotic prophylaxis", was originally born through its implementation in the first implant therapy protocol described by Branemark et al. [1] These authors routinely prescribed phenoxymethylpenicillin one hour before surgery and for 10 days after to improve the early survival of dental implants. This trend was established due to the presence of more than 300 bacterial species at the oral level in addition to other non-cultivable microorganisms discovered by molecular biological techniques [2] that may contribute to the occurrence of postoperative infections. These practices have now been challenged and oral surgeons are faced with the dilemma of whether or not to prescribe antibiotics preventively in bone augmentation and implant insertion procedures, a controversial issue. The prescription has been accepted to avoid systemic bacteremias [3] but also to reach an adequate antibiotic concentration in the blood to prevent bacterial contamination during the surgical act of the implants or grafted material [4], even though in Oral Implantology

* Corresponding author at: Calle San Salvador 5, bajo (Robles Dental), Vigo, 36204, Pontevedra, Spain.
E-mail addresses: orsalp@seu.us.es (A.-O. Salgado-Peralvo), mateosm@seu.us.es (M.-V. Mateos-Moreno), evelasco@us.es (E. Velasco-Ortega), jfpenacardelles@gmail.com (J.-F. Peña-Cardelles), nkewalramani@gmail.com (N. Kewalramani).

<https://doi.org/10.1016/j.jormas.2021.01.011>
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Thanks