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Title: Pilot In Vitro Study to Assess Cleaning Ability and Effects of Different Decontamination Methods on Implant Surfaces

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Author Questionnaire

1. We have marked your project as author-provided footage, meaning you film the video yourself and provide JoVE with the footage to edit. JoVE will not send the videographer. Please confirm that this is correct.

✓ Correct

2. Interview statements: Which interview statement filming option is the most appropriate for your group? **Please select one.**



Interview Statements are provided by authors.

3. Proposed interview filming date: Please indicate the proposed date that your group will self-film interviews: **12/11/2025**

Current Protocol Length

Number of Steps: 03

Number of Shots: 08

Introduction

NOTE: Please use the interview videos newly provided by the authors

INTRODUCTION:

- 1.1. **Gizem Kuka:** The scope of this study is to compare the cleaning efficacy and the surface effects of three commonly used mechanical decontamination methods for implant surfaces in-vitro.
 - 1.1.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

CONCLUSION:

- 1.2. **Gizem Kuka:** This study shows that titanium brushes clean implants most effectively with minimal damage, while titanium curettes and chitosan brushes cause more alteration and leave contamination.
 - 1.2.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera
- 1.3. **Gizem Kuka:** These findings highlight the limitations of existing methods and the need for combined or improved decontamination strategies.
 - 1.3.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera
- 1.4. **Gizem Kuka:** Future research will focus on understanding methods to fully decontaminate implant surfaces without causing damage by combining mechanical tools with chemical or electrolytic techniques.
 - 1.4.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

Protocol

2. Cleaning the Implants and Photographing

Demonstrators: Gizem Kuka, Selin Gungormek

2.1. To begin, prepare a custom-made acrylic splint to [1] position the camera with angulations of 30 degrees for the upper view and 60 degrees for the lower view relative to the implant long axis to assess the coronal and apical threads in a standardized manner [2].

2.1.1. LAB MEDIA: Acrylic preparation 00:00–00:45

2.1.2. LAB MEDIA: Preparation of stent 00:00-00:20

2.2. Position the implant and apply three different decontamination methods separately [1] to the exposed buccal and oral surfaces per implant, commonly used in the treatment of peri-implantitis [2]. Perform each method for 2 minutes by a single operator to eliminate bias [3] and control the instrumentation time with a stopwatch [4].

2.2.1. LAB MEDIA: Application of ChB

2.2.2. LAB MEDIA: Application of TiC 00:00–00:10

2.2.3. LAB MEDIA: Application of ChB2 00:00–00:15

2.2.4. LAB MEDIA: TiB application.mov 00:00–00:11

2.3. Place the camera 15 centimeters away from the implant surface [1]. Take standardized photographs at a frontal view of 0 degrees from the longitudinal implant axis at the buccal and oral surfaces of each implant before and after decontamination [2-TXT].

2.3.1. LAB MEDIA: Photographing 0:00-00:05

2.3.2. LAB MEDIA: Photographing.mov 00:05–00:12 **TXT: Verify the alignment of the camera using a calibration ruler**

Results

3. Results

3.1. None of the treated surfaces showed complete removal of ink stain following decontamination [1]. Residual ink percentages varied depending on the device used and the angulation of the photographs [2].

3.1.1. LAB MEDIA: Figure 3. *Video editor: Highlight the images on the right in A, B and C.*

3.1.2. LAB MEDIA: Figure 4.

3.2. At the buccal and oral frontal views, TiB (T-I-B) resulted in the lowest residual stain percentage at 75.98 percent [1], followed by TiC (T-I-C) at 80.31 percent [2] and ChB (C-H-B) at 90.34 percent [3].

3.2.1. LAB MEDIA: Table 1. *Video editor: Highlight the row for "TiB" under "Buccal + Oral Frontal" view showing 75.98%.*

3.2.2. LAB MEDIA: Table 1. *Video editor: Highlight the row for "TiC" under "Buccal + Oral Frontal" view showing 80.31%.*

3.2.3. LAB MEDIA: Table 1. *Video editor: Highlight the row for "ChB" under "Buccal + Oral Frontal" view showing 90.34%.*

3.3. At 60-degree views, all groups showed high levels of residual staining, indicating reduced cleaning efficacy in deeper implant regions [1].

3.3.1. LAB MEDIA: Table 1. *Video editor: Highlight the row "Buccal and oral 60°" row*

3.4. Scanning electron microscopy examination showed that all treatment techniques modified the implant surface [1], in contrast to the negative control which retained the original uniformly rough topography [2].

3.4.1. LAB MEDIA: Figure 5. *Video editor: Highlight panels for A, B, and C .*

3.4.2. LAB MEDIA: Figure 5. *Video editor: Highlight panel D .*

3.5. Among the treatments, TiB caused minimal surface alterations [1], while TiC and ChB induced extensive surface changes and irregularities [2].

3.5.1. LAB MEDIA: Figure 6. *Video editor: Highlight panel C .*

3.5.2. LAB MEDIA: Figure 6. *Video editor: Highlight panels A and B.*

3.6. Horizontal scratches were particularly prominent on implants treated with TiC [1].

3.6.1. LAB MEDIA: Figure 6. *Video editor: Zoom in on panel A and point to visible horizontal scratch lines.*

- **Decontamination**

Pronunciation link: <https://www.merriam-webster.com/dictionary/decontamination> [merriam-webster.com+1](https://www.merriam-webster.com/)

IPA: /,di:kən,tæm.ə'nei.fən/

Phonetic spelling: dee-kuhn-ta-muh-NAY-shuhn

- **In-vitro**

Pronunciation link: <https://www.merriam-webster.com/dictionary/in%20vitro> [merriam-webster.com+1](https://www.merriam-webster.com/)

IPA: /ɪn 'vɪtroʊ/

Phonetic spelling: in VEE-troh

- **Implant**

Pronunciation link: <https://www.merriam-webster.com/dictionary/implant> [merriam-webster.com](https://www.merriam-webster.com/)

IPA: /ɪm'plænt/

Phonetic spelling: im-PLANT

- **Acrylic** (as in custom-made acrylic splint)

Pronunciation link: <https://www.merriam-webster.com/dictionary/acrylic> [merriam-webster.com](https://www.merriam-webster.com/)

IPA: /ə'krɪlɪk/

Phonetic spelling: uh-KRIL-ik

- **Buccal**

Pronunciation link: <https://www.merriam-webster.com/dictionary/buccal> [merriam-webster.com](https://www.merriam-webster.com/)

IPA: /'bʌkəl/

Phonetic spelling: BUCK-uhl

- **Peri-implantitis**

Pronunciation link: <https://www.howtopronounce.com/peri-implantitis> [howtopronounce.com+1](https://www.howtopronounce.com/)

IPA: /,peri,ɪm,plæn'taɪtɪs/

Phonetic spelling: pair-ee-im-PLAN-tye-tis

- **Scanning** (as in scanning electron microscopy)

Pronunciation link: <https://www.merriam-webster.com/dictionary/scanning> [merriam-webster.com](https://www.merriam-webster.com/)

IPA: /'skæniŋ/

Phonetic spelling: SKAN-ing

- **Microscopy**

Pronunciation link: <https://www.merriam-webster.com/dictionary/microscopy> [merriam-webster.com](https://www.merriam-webster.com)

IPA: /mɪ'krɒskəpi/ (American: /mɪ'krɑːskəpi/)

Phonetic spelling: mi-KRAH-skuh-pee

- **Topography** (as in surface topography)

Pronunciation link: <https://www.merriam-webster.com/dictionary/topography> [merriam-webster.com](https://www.merriam-webster.com)

IPA: /tə'pɑːgrəfi/

Phonetic spelling: tuh-PAH-gruh-fee

- **Calibration** (as in calibration ruler)

Pronunciation link: <https://www.merriam-webster.com/dictionary/calibration> [merriam-webster.com](https://www.merriam-webster.com)

IPA: /'kælɪ'breɪʃən/

Phonetic spelling: kal-ih-BRAY-shuhn

- **Residual** (as in residual stain)

Pronunciation link: <https://www.merriam-webster.com/dictionary/residual> [merriam-webster.com](https://www.merriam-webster.com)

IPA: /rɪ'zɪdʒ.u.əl/ (or /rɪ'zɪdʒuəl/)

Phonetic spelling: ri-ZID-joo-uhl

- **Irregularities**

Pronunciation link: <https://www.merriam-webster.com/dictionary/irregularities> [merriam-webster.com](https://www.merriam-webster.com)

IPA: /ɪ'reg.jə'lærɪtɪz/

Phonetic spelling: ih-REG-yuh-LAIR-ih-teez

- **Stopwatch**

Pronunciation link: <https://www.merriam-webster.com/dictionary/stopwatch> [merriam-webster.com](https://www.merriam-webster.com)

IPA: /'stɒp.wɒtʃ/

Phonetic spelling: STOP-watch

- **Calibration** (included above, but relevant again)

(already given)