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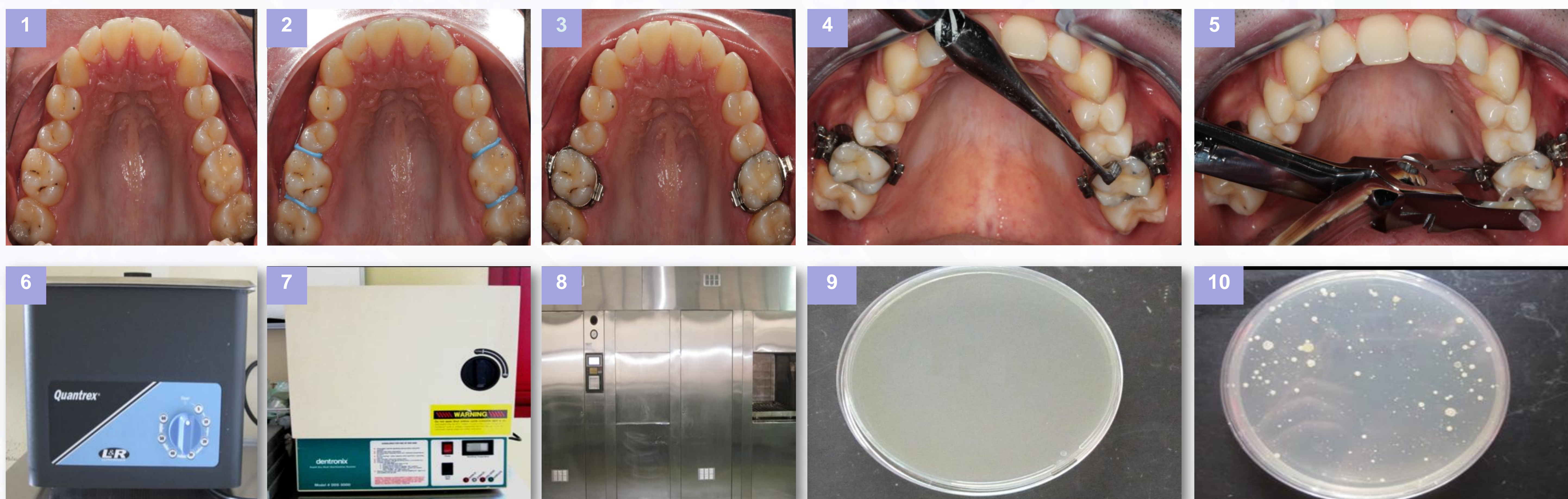
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Objectives

Given the scarcity of studies in the area of cross-infection in Portugal, we carried out a research study aimed at evaluating the effectiveness of two methods of sterilization and disinfection of orthodontic bands, after being tested in the mouth. Simultaneously, we tested the protocol of the Department of Orthodontics of the Dental Faculty of Oporto University (DO-DFOU).

Materials and Methods

In this experiment 40 sterilized orthodontic bands were used. 5 of them weren't used on individuals, being used for the negative control. After putting spacers on the sides of the first superior molars of 10 individuals a week before (figures 1 and 2), the other 35 bands were put on the same teeth (figure 3 and 4). Then, they were removed from the mouth (figure 5) and 5 were separated for the positive control. The remaining 30 bands were immersed in an ultrasonic bath with disinfectant Elusept® for 15 minutes (figure 6). Afterwards the 30 bands were divided into 3 groups. The first served as disinfection control, the second and the third were subjected to an additional sterilization with dry heat (210° C, 30 min) (figure 7) and steam (121° C, 33 min) (figure 8) respectively. The third group simulated the protocol of the DO-DFOU. Finally, each band was placed in a phosphate buffer saline solution to remove adherent microorganisms and the resulting suspension was inoculated in a nutrient agar. The number of colony-forming units (CFU) was observed in each plate after 4 days of incubation at 37°C. In order to relate the results and meet the international reality, we performed a literature search in the Pubmed database using the keywords: "cross infection control", "orthodontics", "orthodontic bands", "decontamination", "sterilization", "disinfection". We selected 7 articles.



Figures (1) Initial occlusal photo of a sample patient's maxillary arch. (2) Initial occlusal photo of a maxillary arch with spacers. (3) Initial occlusal photo of a maxillary with orthodontic bands placed. (4) Orthodontic bands adaptation. (5) Orthodontic bands removal. (6) Ultrasonic bath container. (7) Rapid dry heat orthodontic sterilizer. (8) Saturated water vapor horizontal sterilizer. (9) Petri plate with disinfectant decontamination, 4 days after inoculation. (10) Petri plate with a positive control, 4 days after inoculation.

Results

As expected, the samples used as positive controls presented a high number of CFUs (figure 9). The samples submitted to the different treatments and the negative controls did not present any CFU (figure 10), pointing out their efficacy.

Conclusions

Considering the methodology used, based on the study of bacterial life forms and on the fact that all guidelines for decontamination have been strictly applied, all decontamination methods have proved to be effective and the DO-DFOU protocol is safe. Therefore the reuse of orthodontic bands can be applied taking into account the guidelines for decontamination.

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