Plaque Biofilm

_in vitro study_

In vitro study measuring the removal of plaque biofilm by Philips Sonicare AirFloss Pro


Objective

This study investigates the removal of in-vitro oral biofilm(s) using the new Philips AirFloss Pro with water and two mouthrinses.

Methodology

Forty-eight oral biofilms were grown from the saliva of three different volunteers on human enamel disks for 4 days, according to an established academic model. Sucrose was present during growth, to obtain strongly adhering biofilms. The biofilms were treated with the Philips Sonicare AirFloss Pro, either filled with water, or with mouthrinse 1 or 2 (Philips Sonicare BreathRx or Listerine Cool Mint, respectively). The Philips Sonicare AirFloss Pro was sprayed at the biofilm at a 90 degree angle. Before treatment the biofilm volume was measured and, from untreated biofilms, the bacterial cell density was counted using confocal laser scanning microscopy (CLSM). After treatment the number of remaining bacteria were counted using CLSM. Scanning electron microscope (SEM) images were also recorded.

Results

While before the treatment oral biofilms of 0.1 to 0.3mm thick were present, after treatment only single bacteria and some scattered small groups of bacteria remained. Quantitative analysis showed that 99.99, 99.98 and 99.99% of the adhering biofilm bacteria were removed with water, Philips Sonicare BreathRx and Listerine, respectively. There was no significant difference between the different fluids used.
Conclusion

The AirFloss Pro removes 99.9% of the adherent oral biofilm bacteria in this established laboratory model of dental plaque.

SEM images showing bacteria

CLSM images showing bacteria in red