

***Quantitative Assessment of Mutans
Streptococci Adhesion to Coated and
Uncoated Orthodontic Archwires***
(Comparative and in Vitro study)

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Abstract

The brackets, archwires, and various orthodontic elements (e.g. bands, elastics, and springs) make oral hygiene more difficult and facilitate plaque accumulation. As a result, enamel decalcification and white spot lesions around orthodontic appliances can occur. Mutans streptococcus is closely associated with enamel decalcification, and many studies have shown increased mutans streptococcus after the placement of fixed orthodontic appliances.

This in-vitro study aimed to quantitatively investigate the bacterial adhesion of mutans streptococcus to various type of orthodontic archwire with respect to saliva coating and incubation time.

Six types of archwires stainless steel and nickel titanium with two type of coating (Epoxy, Teflon) were used. Twelve specimens of each archwire were incubated with sterilized unstimulated whole saliva or phosphate-buffered saline for 2 hours, then incubated with suspension of mutans streptococci allowed to adhere for (5,90,180 minutes). Adhesion was quantitated by a microbial culture technique by treating the archwires with adhering bacteria with trypsin and enumerating the total viable counts of bacteria recovered after cultivation by using Dentocult kit.

The result showed the mutans streptococci adhered to the nickel titanium and Epoxy coated archwires significantly more than to the stainless steel and Teflon coated archwires. The extended incubation time significantly increased bacterial adhesion. The presence of saliva coated reduced the number of adhering bacteria to all six types of archwires.

We can conclude that the adhesion of bacteria to orthodontic archwires depend on several factors like the surface of archwire plays an important role in adhesion and the presence of a salivary pellicle seems to have a significant effect on the adhesion of mutans streptococci, reducing their numbers