

## University of British Columbia

### EFFECT OF NTP ON SBS OF ORTHODONTIC BRACKETS -IN VITRO STUDY

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**Objectives:** Non-thermal plasma (NTP) has been used to modify dentin surfaces and improve the interfacial bonding of dental composite restorations. We sought to determine if NTP application after enamel acid etching could improve bracket to enamel bonding and also if NTP application by itself has a potential to bond brackets.

**Methods:** 84 extracted pre-molars, washed and disinfected were divided into 2 broad groups: No-treatment and Treatment group. No-treatment group consisted of 12 premolars on whom orthodontic bracket bonding was performed without any surface treatment. Treatment group consisted of 72 premolars which were divided randomly into 3 main groups of 24 premolars each. These groups were Group 1: Etch, Group 2: Etch + NTP and Group 3: NTP. As the shear bond strength (sbs) testing was conducted at 2 time points -24 hours and 30 days, each group was subdivided into 2 subgroups of 12 premolars each according to the time point. The teeth were stored in distilled water for 24 hours and 30 days prior to testing.

Fracture mode and amount of adhesive left on the enamel was studied by using the Adhesive remnant index score. SEM pictures were taken of enamel surfaces at different magnifications.

**Results:** During the first 24 hours of testing, sbs was maximum with Etch +NTP treated group followed by the Etch group and then by NTP group. After 30 days of aging the sbs was maximum with the Etch group followed by Etch+ NTP group and then the NTP group. ARI scoring was higher with Etch and Etch + plasma group. SEM pictures showed acid etch pattern with Etch and Etch+ NTP group whereas NTP treated group showed no surface changes.

**Conclusions:** NTP (plasma) application by itself has a potential to bond orthodontic brackets however longer ageing time is required to determine feasibility.