

## **Physicochemical Properties and Bonding to Self-Adhesive Prosthetic Cement of Dentine Subjected to Microabrasive Blasting**

**Objectives:** Dental air abrasion is a simple cavity preparation technique that uses an air-abrasive jet. In recent years, tools have appeared, described as abrasive micro sandblasters. The use of micro-sandblasters in the procedure of tooth preparation, in addition to preparation with drills, for the final optimization of the surface is not a widely used method. The aim of the study was to obtain data on the effect of micro air abrasion on the properties of dentin. **Materials and methods:** The study used 90 human third molars extracted for orthodontic or surgical reasons. The material was divided into three equinumerous sets of samples A, B and C (control). Groups A and B were subjected to abrasive blasting using an abrasive micro sandblasting device, using two gradations of aluminum oxide  $Al_2O_3$  abrasive. The microgeometry, chemical composition, contact angle, surface free energy and mechanical strength of the dentine-cement connection were evaluated. **Results:** Dentine preparation using air microabrasion modifies its surface structure by increasing the roughness parameters and contributes to the development of the adhesive surface. The aluminum oxide used in the micro-sandblasting procedure caused changes in the chemical composition of the top layer of dentine, which did not adversely affect the connection of the dentin with the cementing material. Abrasive blasting in the form of air microabrasion increases the wettability and surface free energy of the dentin. The differences between the groups, in all conducted quantitative test, were statistically significant. **Conclusions:** Air microabrasion with the use of aluminum oxide with a gradation of 27  $\mu m$  and 50  $\mu m$ , through multi-factor positive reorganization of the treated surface, increases the bond strength of the dentin with self-adhesive prosthetic cement and can be recommended as a treatment optimizing the surface of the prepared dentin for the procedures of cementation of prosthetic restorations.