Cementum is a component of the periodontium, and its major role is to serve as the site of attachment for principal collagen fibers. Periodontal disease is the local inflammation of the supporting tissues of teeth, it causes destruction of gingival tissues, bone loss and loss of connective tissue attachment to cementum. It is generally accepted that removal of the pathogenic microorganisms that form plaque and calculus is the major goal of the periodontal treatment. The teeth treated by hand curettes (HC) and ultrasonic scaler (US) can present a surface without cementum and the open dentinal tubules. US with new shaped tips and airpolishing (AP) devices as alternative to HC designed for subgingival access have been developed for minimal root damage. The aim of the this study is to compare the effect of in vivo root instrumentation using a new piezoelectric US instrument, HC and air polishing by glycine powder, under routine clinical conditions, on the thickness and surface characteristics of cementum.

Twenty-seven patients with teeth clinically and radiographically diagnosed by chronic advanced periodontitis and scheduled for extraction treated in four different methods. The teeth were instrumented subgingivally at one approximal site either with manual instruments, air-polishing, piezoelectric ultrasonic scaler, piezoelectric ultrasonic scaler following air-polishing. After instrumentation the teeth were immediately extracted and cut horizontally into two sections. The teeth were sectioned perpendicularly to the root axis with a microtome and stained with hematoxylin & eosin. Six parts of cementum of all sections, including mesial and distal areas of each tooth, were analysed and each measure was reported as a mean value of five quantifications. The root surface characteristics of teeth were analyzed by scanning electron microscopy.

The results showed that all periodontal treatment methods used in this study remove cementum although using AP alone removed less cementum than HC and US. AP device was more effective at the apical part of the treated area. However, in using of US device following AP the cementum loss was lower on the apical sites than coronal sites. This study showed that US devices and subgingival AP preserve more tooth structure compared to HC, while AP is producing a smooth root surface.

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