Preservation of root cementum: A comparative evaluation of power-driven versus hand instruments

By Bozbay E, Dominoi F, Golubkov AF, Laporta S, Guida L, Aydin MS, Mariotti A, Pilloni A, Italy

Background
Grenisk et al suggested that cementum plays an important regulatory role in periodontal regeneration. One of the major goals of periodontal treatment is the removal of pathogenic micro-organisms by scaling and root planing. In the past, the misconception was to obtain a root surface with smooth and hard surface characteristics that was free of endotoxins which resulted in the removal of the subgingival plaque and calculus deposits, and the removal of all or most of the cementum. Recent studies have reported that endotoxins were not located within cementum and removal of ‘dead’ cementum was not necessary for a successful periodontal treatment. Saygin et al concluded that preservation of cementum on the root surface was necessary for new attachment and as a source of growth factor. Hence, non-aggressive removal of cementum is essential for optimal periodontal health and regeneration.

Ultrasonics with new shaped tips and subgingival air polishing devices has been developed for removal of root accretions with minimal root damage. Air polishing has been suggested as a treatment modality for root debridement resulting in probing depth reduction and removal of subgingival biofilm. No scientific evidence exists today showing the loss of root substance or surface roughness produced by either ultrasonics or Air polishing.

Aim
To assess the amount of cementum remaining following hand root instrumentation as well as the surface characteristics of the retained cementum.

Material and Methods
- 48 caries free single rooted teeth in 27 patients diagnosed with severe chronic periodontitis with periodontal probing depth (PPD) ≥5 mm in at least two sites per tooth with radiographic bone loss of more than two thirds of root length and scheduled for extraction were included in this study.
- Teeth were randomly divided into four treatment groups: Instrumentation - Teeth were randomly divided into four treatment groups: Instrumentation was 84% for U, 80% for U + AP, 94% for AP and 65% for HC.
- The amount of retained cementum with AP was significantly greater than with HC.
- Smoothest root surfaces were produced by the HC followed by the AP - Cephalometric and apical sections showed that AP produced the least amount of cementum loss and therefore the greatest retention of residual cementum.
- Root surfaces instrumented by U or U + AP presented grooves and scratches.
- Time taken to complete root instrumentation.
- Shortest time taken was using AP and the longest time was with U + AP.
- AP required 31% less time for root preparation in comparison to HC, whereas U + AP needed 90% more time.

Conclusions
- Air polishing was significantly more effective and superior in preserving cementum.
- Hand instrumentation using chisels was more effective in removing cementum in comparison to ultrasonic or hand instruments.

www.ifea2018korea.com