COMMENTARY

Effects of Cyclic Fatigue Stress-Biocorrosion on Noncarious Cervical Lesions[1]

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There is still a great deal of debate about the existence of abfraction lesions among clinicians with many suggesting that these are erosion/abrasion lesions. Much of the evidence about the pathoetiology of these lesions is based on laboratory models and computer modeling using finite element stress analysis. Work carried out over 10 years ago[2,3] showed that the stress fields present in cervical enamel induced particularly by lateral, excursive loading exceeded the known failure stress for enamel by a factor of four or five times.[3] More recent work also has shown that the Hunter-Schreger bands present in cervical enamel, which contribute much to the structural integrity of enamel, are less well developed in cervical enamel compared with occlusal enamel.[4]

One anomaly highlighted by the finite element studies was that the cervical stress fields were found to be similar in both the buccal and the palatal areas, yet clinically one only tends to find abfraction lesions predominantly on buccal surfaces. In a review article published in this *Journal* in 2003, it was hypothesized that one explanation for this anomaly was that abfraction could well be a stress-corrosion phenomena caused by a combination of high cervical stresses and dietary acid.[5] The salivary clearance rates of dietary acids bucally is around eight times slower than lingually/palatally which may well explain the preponderance of these lesions bucally.

This fascinating in vitro study by Grippo and colleagues investigated a possible stress-corrosion etiology for abfraction lesions and provides the first solid evidence that a combination of repeated occlusal loading in the presence of acid can lead to abfraction type lesions.[1] It is fortunate indeed that the majority of our patients only tend to consume orange juice on a regular basis rather than hydrochloric acid. This study was exclusively carried out on premolars, although clinically they also commonly are found on upper incisors, so it would be interesting to see a further study carried out using upper incisors and canines.[2]

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