

Analysis of etiologic factors and periodontal conditions involved with 309 abfractions.

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OBJECTIVES: : Non-carious cervical lesions (NCCL), also termed abfractions, have long been thought to be produced by excessive brushing. Nearly 20 years ago an occlusal etiology was proffered (Lee & Eagle 1984). Controversy still exists concerning these two concepts. The present work was carried out to verify the occurrence of signs of excessive brushing or occlusal disturbances associated with abfractions. **MATERIAL AND METHODS:** : All first consultants were screened for the presence of abfractions during one trimester. NCCL were found in 61 patients who consequently received a thorough examination searching for clinical evidence of excessive brushing or occlusal disturbances. The presence of plaque, calculus, periodontitis, or mobility was also noted. Simple frequency and percentage were used to describe the occurrence of different clinical signs in association with the presence of abfractions. **RESULTS:** : Abfractions often exist in mouths presenting plaque (40.1%), calculus (41.7%), or periodontitis (20.4%). Ulceration of the gingiva is a rare finding (1.6%). However, subgingival apical limits were frequent (32.5%). NCCL coexist almost systematically with occlusal wear facets (94.5%). Lack of canine disclusion (77.2%) was also closely associated with the presence of abfractions. Conversely, mobility was seldom found (1.9%). **CONCLUSIONS:** : Clinical signs of excessive brushing were lacking, whereas signs of occlusal disturbance were very consistent with the presence of abfractions.

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Finite element analysis of the possible mechanism of cervical lesion formation by occlusal force.

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Recently, various authors have proposed the interesting idea that occlusal force may be a principal factor in cervical lesions of the tooth. It is speculated that the lateral force in non-ideal mastication causes the tooth to bend and that the resulting tensile stress damages the enamel surface. In this study, we carried out stress analysis on the upper central incisor and the lower first molar using the plastic-elastic deformation theory with two-dimensional finite element method (FEM). The essential feature that the tensile yield strength is much smaller than the compressive one was taken into account. Our results suggested that oblique loading on the tooth stretches the enamel surface near the cemento-enamel junction and causes plastic deformation which eventually leads to the cervical lesion.

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A review of the biomechanics of abfraction.

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Loss of tooth substance in the cervical region is usually attributed to abrasion or erosion. However, the role of occlusal loading is becoming increasingly prominent. It is suggested that high occlusal loads result in large stress concentrations in the cervical region of the teeth. These stresses may be high enough to cause disruption of the bonds between the hydroxyapatite crystals, eventually resulting in the loss of cervical enamel. This article reviews the available evidence to support the thesis that occlusal loading can contribute to the process of non-carious cervical tooth loss or abfraction. It also reviews the potential interactions between occlusal loading and erosion that may contribute to non-carious cervical tooth loss.

Publication Types:

- Review
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J Prosthet Dent. 1996 May;75(5):487-94.

Stress-induced cervical lesions: review of advances in the past 10 years.

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The accumulation of experimental and clinical evidence during the past decade has significantly contributed to the understanding of the role of occlusally generated tensile stress in the etiology of certain noncarious cervical lesions of teeth. More important, this knowledge has led to the understanding of the reasons why traditional restorative treatments of these stress-induced cervical lesions fail. The case of failure can be attributed to the occlusally generated stresses that are concentrated at the cervical region and result in debonding, leakage, retention failure, and, ultimately, restorative failure. With the new understanding, restorative approaches that combine chemical adhesion and restorative materials of appropriate elastic properties show promise of long-term success.

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- Review
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Abfractions: a new classification of hard tissue lesions of teeth.

Grippio JO.

Due to the stresses resulting from biomechanical loading forces exerted on the teeth (static, as in swallowing and clenching or cyclic, as in chewing), both enamel and dentin can chip or break away. This loss of tooth substance, which shall be termed Abfraction, is dependent on the magnitude, duration, direction, frequency, and location of the forces. These abfraction lesions are caused by flexure and ultimate material fatigue of susceptible teeth at locations away from the point of loading. Clinical observation of a variety of enamel and dentin lesions due to the shapes, sizes, loci, and frequency warrants a new and distinct classification.

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J Oral Implantol. 1983;11(2):248-67.

On the longevity of teeth.

McCoy G.

PMID: 6584638 [PubMed - indexed for MEDLINE]