

**BDA LIBRARY MEDLINE SEARCH**

**NON-CARIOUS CERVICAL LESIONS – AETIOLOGY/EPIDEMIOLOGY 2000-2013**

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Database: Ovid MEDLINE(R) <1946 to July Week 2 2013>
Search Strategy:

1. ((noncarious or non-carious) adj cervical adj lesion$).tw. (213)
2. exp Tooth Diseases/et [Etiology] (20713)
3. exp Tooth Diseases/ep [Epidemiology] (14437)
4. exp Prevalence/ (188562)
5. exp Incidence/ (174776)
6. 1 and (2 or 3 or 4 or 5) (70)
7. limit 6 to english language (67)
8. limit 7 to yr="2000 - 2013" (56)

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**<1>**

Unique Identifier 22882712
Status MEDLINE
Authors Que K. Guo B. Jia Z. Chen Z. Yang J. Gao P.
Institution The Department of Endodontics, Stomatology College of Tian'jin Medical University, Tianjin, China.
Title A cross-sectional study: non-carious cervical lesions, cervical dentine hypersensitivity and related risk factors.
Abstract The present survey aims to study the prevalence and clinical characteristics of non-carious cervical lesions (NCCLs) and cervical dentine hypersensitivity (CDH), as well as their possible risk factors in a general population in China. A total of 1023 subjects were included in the present study. Each subject completed a structured interview, and all teeth of each subject were examined by a practitioner to determine NCCLs and CDH. Teeth with NCCLs and CDH were diagnosed according to the tooth wear index and by a blast of air from a triple syringe, respectively. Binary logistic regression was completed by analysing the association of risk factors with the occurrence of NCCLs and CDH. Loss of attachment (LOA) and gingival recession (GR) of teeth with NCCLs and/or CDH were diagnosed following a clinical assessment yielded an overall prevalence of 61.7% and 27.1%, respectively. The 60-69 age group had the greatest proportion of subjects with NCCLs or CDH. The pre-molars were the most commonly affected teeth type with NCCLs or CDH. The proportion of teeth with CDH associated with NCCLs increased significantly with age, but the proportion of teeth with CDH only associated with LOA or GR decreased slowly with age. The single variables and interactive effects of variables associated with the occurrence of NCCLs include the following: age group, occupation type, method of toothbrushing, frequency and method of toothbrushing, and method of toothbrushing and duration of a toothbrush used. Gender, age group, occupation type and frequency of toothbrushing were associated with the occurrence of CDH. The current study presented higher prevalence of NCCLs and CDH in a general Chinese population. Both diseases were closely associated with age and periodontal status.

**<2>**

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Institution Department of Surgery and Integrated Clinic, School of Dentistry, Sao Paulo State University (UNESP), Aracatuba, Brazil. brandini@foa.unesp.br
Title Clinical evaluation of the association between noncarious cervical lesions and occlusal forces.
Abstract STATEMENT OF PROBLEM: Noncarious cervical lesions (NCCLs) are a frequent challenge in clinical dental practice, given the variety of opinions regarding their etiology, diagnosis, and treatment.

PURPOSE: The purpose of this study was to assess the potential relationship between occlusal forces and the occurrence of NCCLs.
MATERIAL AND METHODS: The participant population consisted of 111 volunteers (30 male and 81 female, mean age 23.6 years). General personal information was recorded, after which participants were examined for the presence and location of NCCLs, gingival recession, fracture lines, dental and restoration fractures, presence and location of tooth wear, type of occlusal guidance scheme for lateral mandibular movements, and existence of occlusal interference or premature contacts. The participants were divided according to the presence or absence of NCCLs, and data were statistically analyzed with the Independent t test, the Chi-square test, and the Fisher exact test (=.05).

RESULTS: A significant association was found between the presence of NCCLs and age (P=.008), gingival recession (P<.001), occlusal trauma (P<.001), presence (P<.001) and location of tooth wear, and group function as occlusal guidance scheme in lateral excursive movements (P<.001).

CONCLUSIONS: A strong relationship between the presence of NCCLs and occlusal overload was found. Copyright 2012 The Editorial Council of the Journal of Prosthetic Dentistry. Published by Mosby, Inc. All rights reserved.

INTRODUCTION: The aim of this two-year prospective clinical study was to evaluate and compare the clinical performance of three different adhesive esthetic materials in noncarious cervical lesions.

MATERIAL AND METHODS: A total of 90 restorations (30 per material) were placed in 30 patients who ranged in age between 18 and 50 years and of both genders, by a single operator with no previous preparation. The restoration of noncarious cervical lesions was done with either a microfilled composite (Esthet.X/Dentsply/De Trey, Konstanz, Germany, and Prime&Bond NT/Dentsply/De Trey), a nanohybrid composite (TetricEvoCeram/Vivadent, Schaan, Liechtenstein, and AdheSE/Vivadent), or a compomer (Dyract eXtra/Dentsply/De Trey and Xeno III Dentsply/De Trey). All restorations were evaluated by independent examiners using a modified US Public Health Service criteria at baseline and after 12 and 24 months for six clinical categories. Data were analyzed statistically by Pearson's chi-square or the Fisher’s exact test at 5% significance level (p<0.05).

RESULTS: Results showed that most of the restorations were clinically satisfactory after 12 and 24 months, with no statistically significant differences among the three groups for all evaluated criteria.

CONCLUSION: Treatment of noncarious cervical lesions using composite and compomer materials, combined with the appropriate adhesive systems and properly implemented restorative procedures, gives satisfactory results after a two-year evaluation period.
BACKGROUND: Controversies rage in the literature as to the characteristics of non-caries cervical lesions (NCCLs) in terms of the location and its severity.

OBJECTIVE: The study is to investigate the characteristics of NCCLs in adult patients who had a high incidence in them and to see if there are any association with the findings.

Methods: The author examined 356 teeth with NCCLs in 34 subjects (male and female aged 22-75 years). The characteristics were based on the location of the lesion and the size (shape, extensiveness and depth).

RESULTS: In terms of the location, 61.2% were located on the posterior teeth, and 55.9% on the maxillary teeth. The first premolars (25.8%) and canines (19.4%) were affected most often, followed by the first molars (16.9%) and second premolars (13.8%). There was slight right side preponderance (50.3%) and more lesions in the male subjects (67.4%). Patients tended to be older, with 76.4% in the 40 years and older age group. In terms of the size of the lesion, 75.0% of the lesion had angular shape of < 135 (wedge), 70.2% had axial depth of 1-2 mm, and 51.7% had occlusogingival width (extensiveness) of 2-3.9mm (small). There was association between gender and the severity (extensiveness) of the lesion. The severity (shape and extensiveness) of NCCL was associated with age. There was strong association between the severity of NCCL and site of the lesion (jaws).

CONCLUSION: The authors found that NCCLs were significantly related to age. The posterior maxillary teeth especially the first premolars followed by the canines were the teeth commonly involved. No great difference in incidence was found between the right and left sides as a result of right or left hand dexterity. Awareness of a multifactorial etiology in non-carious cervical lesions may help the clinician to formulate an appropriate treatment plan for the patient. In addition, these characteristics help identify which teeth and patients that are more susceptible.
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Title

Comments
Comment on: J Esthet Restor Dent. 2012 Feb;24(1):10-23; PMID: 22296690

Source

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Title
Abfraction, abrasion, biocorrosion, and the enigma of noncarious cervical lesions: a 20-year perspective. [Review]

Comments
Comment in: J Esthet Restor Dent. 2012 Feb;24(1):24-5; PMID: 22296691

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Abstract
Hitherto, noncarious cervical lesions (NCCLs) of teeth have been generally ascribed to either toothbrush-dentifrice abrasion or acid "erosion." The last two decades have provided a plethora of new studies concerning such lesions. The most significant studies are reviewed and integrated into a practical approach to the understanding and designation of these lesions. A paradigm shift is suggested regarding use of the term "biocorrosion" to supplant "erosion" as it continues to be misused in the United States and many other countries of the world. Biocorrosion embraces the chemical, biochemical, and electrochemical degradation of tooth substance caused by endogenous and exogenous acids, proteolytic agents, as well as the piezoelectric effects only on dentin. Abfraction, representing the microstructural loss of tooth substance in areas of stress concentration, should not be used to designate all NCCLs because these lesions are commonly multifactorial in origin. Appropriate designation of a particular NCCL depends upon the interplay of the specific combination of three major mechanisms: stress, friction, and biocorrosion, unique to that individual case. Modifying factors, such as saliva, tongue action, and tooth form, composition, microstructure, mobility, and positional prominence are elucidated. CLINICAL SIGNIFICANCE: By performing a comprehensive medical and dental history, using precise terms and concepts, and utilizing the Revised Schema of Pathodynamic Mechanisms, the dentist may successfully identify and treat the etiology of root surface lesions. Preventive measures may be instituted if the causative factors are detected and their modifying factors are considered. 2011 Wiley Periodicals, Inc.

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Title

Source

Local Messages
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Abstract
This 13-year randomized clinical trial compared the clinical effectiveness of two three-step etch-and-rinse adhesives in combination with a hybrid, stiffer composite versus a micro-filled, more flexible composite. The influence of composite stiffness on the clinical performance of
one of the adhesives was assessed as well. One hundred and forty-two non-carious cervical lesions were restored with composites with contrasting stiffness. Seventy-one patients randomly received two cervical restorations placed following two out of three adhesive procedures: (1) the three-step etch-and-rinse adhesive Permaquick applied with the stiff micro-hybrid composite Amelogen Hybrid (PMQ-H, Ultradent), (2) Permaquick applied with the more flexible micro-filled Amelogen Microfill (PMQ-M, Ultradent), or (3) the “gold-standard” three-step etch-and-rinse adhesive Optibond FL applied with the micro-hybrid composite Prodigy (OFL-P, Kerr). The restorations were evaluated after 6 months, 1, 2, 3, 5, 7, and 13 years of clinical service regarding their retention, marginal integrity and discoloration, caries occurrence, preservation of tooth vitality, and post-operative sensitivity. Retention loss, severe marginal defects, and/or discoloration that needed intervention (repair or replacement) and the occurrence of caries were considered as clinical failures. The recall rate at 13 years was 77%. Bond degradation after 13 years was mainly characterized by a further increase in the presence of small but clinically acceptable marginal defects and superficial marginal discoloration. Twelve percent of the OFL-P restorations were clinically unacceptable. In the PMQ group, 22% of the PMQ-M restorations and 26% of the PMQ-H restorations needed repair or replacement. Regarding the clinical failure rate, Optibond FL scored significantly better than Permaquick (McNemar; p = 0.015). No statistically significant differences were found between the micro-filled and the hybrid composite for each of the parameters evaluated (McNemar, p > 0.05). After 13 years of clinical functioning, the clinical effectiveness of the three adhesive/composite combinations remained highly acceptable.

CONCLUSION: Within the limitations of this pilot study, the use of medium and hard toothbrushes and greater force applied during toothbrushing might contribute to the development and/or aggravation of NCCLs.
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**Title**
Noncarious cervical lesions: why on the facial? A theory.

**Source**

**Abstract**
BACKGROUND: Researchers conducting laboratory investigations have reported that bonding to dry demineralized dentin can be feasible technically as long as the adhesives are rubbed vigorously onto the dentin surface. The authors aimed to evaluate the 24-month clinical performance of resin-based composites in noncarious cervical lesions (NCCLs) in teeth restored with two etch-and-rinse adhesives that had been applied with a vigorous rubbing action to both dry and rewet dentin.

**METHODS:** The authors enrolled 40 patients in this study. They inserted 160 restorations and evaluated them at baseline and at six, 12 and 24 months of service. They divided the restorations into four groups: One-Step (OS) Universal Dental Adhesive System (Bisco, Schaumburg, Ill.) (acetone-based adhesive) with rewet dentin; OS with dry dentin; Adper Single Bond (SB) Plus Adhesive (3M ESPE, St. Paul, Minn.) (ethanol/water-based adhesive) with rewet dentin; and SB with dry dentin. The authors used the same resin-based composite for all restorations. They evaluated the restorations according to modified U.S. Public Health Service criteria.

RESULTS: The 24-month retention rates for the rewet and dry conditions, respectively, were 95.0 percent and 97.5 percent for SB and 97.5 percent and 91.9 percent for OS. The authors detected no significant difference between rewet and dry groups for either adhesive (P > .05). In terms of marginal discoloration, OS performed significantly worse than did SB, irrespective of dentin moisture (P < .05).

CONCLUSIONS AND CLINICAL IMPLICATIONS: Dentin moisture seems not to be important for the retention of etch-and-rinse adhesives as long as the adhesives have been rubbed vigorously onto the dentin surface. The ethanol/water-based adhesive showed a better overall performance than did the acetone-based system.
DESIGN: A sample of 2,160 adults, aged 35-44 years and 65-74 years and balanced by age, gender, and urbanization, participated in the cross sectional epidemiological survey. Non-carious cervical lesions were examined using a modified Tooth Wear Index. Data were collected based on structured questionnaires that assessed general information as well as oral health.

RESULTS: The prevalence of non-carious cervical lesions was 38.8% for 35-44-year-olds and 56.6% for 65-74-year-olds. The first premolars, canines, and second premolars showed the highest prevalence of lesions, while the second molars demonstrated the least. Several risk factors such as age (OR = 2.45, p < 0.001), location (OR = 1.68, p = 0.001), frequency of toothbrushing (OR = 1.33, p = 0.016), bruxism (OR = 1.37, p < 0.001), and family income (OR = 1.44, p < 0.001) were found to be associated with lesion occurrence.

CONCLUSIONS: The prevalence of non-carious cervical lesions was relatively high in the middle-aged and elderly persons in China and was also associated with socio-behavioural risk factors.
METHODS: 33 patients, with at least two similar sized non-carious cervical lesions participated in this study. A total of 66 restorations were placed, half using the 2-step All Bond 3 (AB3-2) and the other half using 3-step All Bond 3 (AB3-3). The restorations were placed incrementally using the composite resin Aelite. The restorations were evaluated at baseline and after 6, 12 and 24 months following the modified USPHS criteria. Statistical differences between the adhesive were tested using McNemar's test and clinical performance over time for each material with the Fisher's exact test (alpha = 0.05).

RESULTS: After 24 months, six AB3-2 and four AB3-3 were rated as bravo for marginal discoloration but did not differ from each other significantly (P > 0.05). The retention rates at 24 months of AB3-2 and AB3-3 were 90.9% and 97.0%, respectively (P > 0.05).

CONCLUSION: Over the 3-year study period, both curing units, QTH and LED, produced acceptable clinical results in noncarious cervical lesions.
OBJECTIVE: To evaluate the performance of All Bond SE used in a one- or two-step protocol in a 24-month randomized clinical study.

METHODS: Thirty-three patients with two similarly sized non-carious cervical lesions participated in this study. A total of 66 restorations were placed, half using the one-step All Bond SE protocol (SE-1) and the other half using the two-step All Bond SE protocol (SE-2). The restorations were evaluated at baseline and after 6, 12 and 24 months following the modified USPHS criteria and analyzed by the McNemar's test and Fisher's exact test (alpha = 0.05).

RESULTS: After 24 months, six SE-1 and four SE-2 restorations were rated as Bravo in marginal discoloration. The retention rates for SE-1 and SE-2 were 84.8% and 90.9%, respectively, after 24 months. Compared to baseline, the retention rate for SE-1 was statistically lower.

CONCLUSIONS: All Bond SE used in the one- or two-step protocol resulted in high retention rates after 24 months.

Restoration of non-carious cervical lesions (NCCLs) represents a major challenge for resin materials due to the different adhesive properties of the tooth structure, the biomechanical aspects of the cervical area, and the difficulties in the access and isolation of the operative field. Furthermore, NCCLs should be approached with a complete understanding of the role played by the marginal periodontal tissue. Whenever a cervical lesion is associated with a gingival recession, the interplay between restorative dentistry and periodontology is decisive for full esthetic and long-term success. A case report is presented dealing with the treatment of NCCLs associated with multiple gingival recessions using a combined restorative and periodontal treatment with a 12-month follow-up.

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Comparative Study. Journal Article. Randomized Controlled Trial. Research Support, Non-U.S. Gov't.

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Title

Source

Abstract
PURPOSE: To evaluate the clinical effectiveness of two different one-step self-etching adhesives.

METHODS: Two single-step self-etching adhesive systems, Clearfil Tri-S Bond and G-Bond, were evaluated. As a control, a two-step self-etching adhesive system, Clearfil SE Bond, was used. The teeth to be restored were randomly assigned. The resin composite used to restore the teeth was Clearfil AP-X. The three adhesive systems were evaluated by Modified USPHS at baseline, 3 months, 6 months, and 12 months. The evaluation consisted of retention rate, color match, marginal discoloration (interfacial staining), marginal adaptation (integrity), wear, post-operative sensitivity, caries recurrence, and other failures.
over time and across groups were evaluated statistically using generalized estimating equations.

RESULTS: During the 12-month study period, no statistical differences were observed among the three groups (P > 0.05) in retention rate, color match, marginal discoloration (interfacial staining), marginal adaptation (integrity). No wear, post-operative sensitivity, caries recurrence, or other failures were detected in any groups. The two one-step self-etching adhesives tested showed good clinical performance at the end of 12 months.

CONCLUSION: First premolars in all the quadrants were the most frequently involved teeth in NCCLs. More males had NCCLs. Middle aged patients were more involved. A weak positive correlation was found between age and NCCLs. No association was observed between hand used and site of NCCLs, between wear facets and NCCL, Excursive guidance and NCCL, Angles classification and NCCL.
vulnerable cervical region of teeth. Such stress is then believed to directly or indirectly contribute to the loss of cervical tooth substance. This article critically reviews the literature for and against the concept of abfraction. Although there is theoretical evidence in support of abfraction, predominantly from finite element analysis studies, caution is advised when interpreting results of these studies because of their limitations. In fact, there is only a small amount of experimental evidence for abfraction. Clinical studies have shown associations between abfraction lesions, bruxism and occlusal factors, such as premature contacts and wear facets, but these investigations do not confirm causal relationships. Importantly, abfraction lesions have not been reported in pre-contemporary populations. It is important that oral health professionals understand that abfraction is still a theoretical concept, as it is not backed up by appropriate clinical evidence. It is recommended that destructive, irreversible treatments aimed at treating so-called abfraction lesions, such as occlusal adjustment, be avoided. [References: 52]

UNLABELLED: Hitherto, noncarious cervical lesions (NCCLs) of teeth have been generally ascribed to either toothbrush-dentifrice abrasion or acid "erosion." The last two decades have provided a plethora of new studies concerning such lesions. The most significant studies are reviewed and integrated into a practical approach to the understanding and designation of these lesions. A paradigm shift is suggested regarding use of the term "biocorrosion" to supplant "erosion" as it continues to be misused in the United States and many other countries of the world. Biocorrosion embraces the chemical, biochemical, and electrochemical degradation of tooth substance caused by endogenous and exogenous acids, proteolytic agents, as well as the piezoelectric effects only on dentin. Abfraction, representing the microstructural loss of tooth substance in areas of stress concentration, should not be used to designate all NCCLs because these lesions are commonly multifactorial in origin. Appropriate designation of a particular NCCL depends upon the interplay of the specific combination of three major mechanisms: stress, friction, and biocorrosion, unique to that individual case. Modifying factors, such as saliva, tongue action, and tooth form, composition, microstructure, mobility, and positional prominence are elucidated.

CLINICAL SIGNIFICANCE: By performing a comprehensive medical and dental history, using precise terms and concepts, and utilizing the Revised Schema of Pathodynamic Mechanisms, the dentist may successfully identify and treat the etiology of root surface lesions. Preventive measures may be instituted if the causative factors are detected and their modifying factors are considered. 2011 Wiley Periodicals, Inc.
UNLABELLED: When restoring anterior and posterior teeth affected by noncarious cervical lesions, many clinicians overlook the etiologic factors responsible for the lesions' development, resulting in frequent restorative failures. The treatment approach for noncarious cervical lesions must not be based only on restorative procedures since a variety of causative and aggravating factors are related to their formation. This article discusses a treatment protocol and techniques for the restoration of noncarious Class V lesions and presents a clinical case in which esthetic restorations are achieved.

CLINICAL SIGNIFICANCE: Treatment options for noncarious Class V lesions can range from simply eliminating the causative factors of the lesions and regularly monitoring their progression to specific restorative procedures. Resin composites are the best materials for restoring cervical defects owing to their bonding ability, physical properties, and esthetic potential. A straightforward technique for the successful restoration of noncarious Class V lesions is presented.

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Case Reports. Journal Article.
Date Created 20051017
Year of Publication 2005

PURPOSE: To compare the morphology of experimentally induced cervical toothbrush abrasion lesions to teeth demonstrating non-carious cervical lesions in vivo.

METHODS: Eighteen premolars extracted for orthodontic reasons were each subjected to 80 hours (1.4 million strokes) of horizontal brushing in a custom fabricated toothbrushing machine. Toothpaste slurry was applied continuously and specimens were subjected to 300 gms of toothbrushing force. Denture base resin was used to simulate gingival recession of 1 mm and a sulcus width of 0.1 mm. Cervical abrasions were analyzed by optical and scanning electron microscopy and classified as either V-shape/wedged vs. U-shape/rounded lesions. When lesions exhibited both shapes, they were classified as mixed. Shapes of experimentally induced lesions then were compared to naturally occurring ones found on extracted premolars. RESULTS: Experimentally induced toothbrush abrasion duplicated the classical clinical shapes. Half (9/18) of the experimentally induced toothbrush abrasions exhibited wedge lesions, 28% (5/18) showed a mixed wedge/rounded lesion, and 22% (4/18) showed rounded lesions. Serial photography showed progression of the morphology of the lesions. Toothbrush abrasion apparently begins apical to the cemento-enamel junction, progresses to dentin, and then undermines enamel with loss of the original cemento-enamel junction. Wedged lesions may appear with the apex oriented coronal or apical, or may be symmetrical.

Publication Type
Comparative Study. Journal Article.
Date Created 20041013
Year of Publication 2004

Tooth grinding during sleep is thought to be one of the important factors causing oral diseases. However, no evidence is available regarding the relationship between the dental status and tooth contact during sleep bruxism. The purpose of this clinical study was to investigate the relationship between oral diseases and tooth grinding patterns during sleep bruxism. Fifty subjects (21 men and 29 women) were selected. The clinical attachment level,
Tooth mobility, noncarious cervical lesion (NCL) and hypersensitivity were examined in each tooth. Subjects wore a bruxism-recording device to visualize the grinding pattern during sleep bruxism. The grinding pattern was categorized into laterotrusive grinding (LG) and mediotrusive side grinding (MG). Furthermore, LG was divided into three types: incisor-canine (IC), incisor-canine-premolar (ICP), and incisor-canine-premolar-molar (ICPM) types. The average attachment level and tooth mobility of the ICPM and ICP+MG types were much more aggravating than those of the IC or ICP types. The NCL encountered in the ICPM type was more aggravating than the other types. The average NCL of the ICPM type was significantly larger than that of the IC type (p = 0.01), the ICP (p = 0.05), the ICP+MG (p = 0.05) and the ICP+MG (p = 0.05) types and MG (p = 0.01). The average hypersensitivity of the ICP type was significantly greater than that of the IC type (p = 0.05). There was a moderate correlation between the attachment level and mobility. It was concluded that grinding patterns during sleep bruxism should be considered as a probable causative factor in the development of dental problems related to clinical attachment level, tooth mobility, NCL, and hypersensitivity, especially the ICPM type and mediotrusive grinding that seems to be the pattern that could more easily deteriorate the dental condition.

**METHODS:**
A total of 159 male self-defense force officials with a mean age of 36.2 years participated in this study. All present teeth were examined for the presence and type of NCL using the Tooth Wear Index (TWI). The subjects were then interviewed about bruxing and toothbrushing habit. Finally, occlusal force, occlusal contact area and average pressure were measured using a pressure-detecting sheet. Subject-level logistic regression was carried out to assess the associations of factors with presence of v-shaped NCLL teeth. Subjects without v-shaped NCLL were designated as control subjects.

**RESULTS:**
Totally, 4518 teeth were examined. Seventy-eight subjects (49.1%) had one or more teeth with typical v-shaped NCLL (259 teeth). The number of teeth with v-shaped NCLL of grade 2 (defect less than 1mm in depth) was 195 (4.3%), and the number of teeth with v-shaped NCLL of grade 3 (defect 1-2mm in depth) was 54 (1.2%). The prevalence of teeth with v-shaped NCLL was significantly higher in the maxilla than in the mandible. Most of the NCLL teeth were premolars. There was no significant difference between teeth with NCLL on the right side and those on the left side. Subject-level logistic regression analysis revealed that age (OR=1.11), toothbrushing pressure (400g, OR=2.43) and occlusal contact area (>23.0mm(2), OR=4.15) were associated with the presence of NCLL teeth.

**CONCLUSIONS:**
It is concluded that aging, toothbrushing pressure and occlusal contact area are associated with the presence of NCLLs.
Abstract

This randomized clinical trial compared the performance of an all-in-one adhesive (iBond) applied in sclerotic and non-sclerotic non-carious cervical lesions with that of a three-step etch-prime-bond adhesive (Gluma Solid Bond, SB). One-hundred and five lesions were randomly assigned to four groups according to adhesive, sclerosis scale and technique: 1) SB applied to lesions with sclerosis scale 1 and 2 (n=26); 2) iBond applied to lesions with sclerosis scale 1 and 2 (n=28); 3) iBond applied to lesions with sclerosis scale 3 and 4 (n=25) and 4) iBond applied with prior acid-etching to lesions with sclerosis scale 3 and 4 (n=26). A microfilled composite (Durafill VS) was used as the restorative material. The restorations were evaluated for retention, color match, marginal adaptation, anatomic form, cavosurface margin discoloration, secondary caries, pre- and post-operative sensitivity, surface texture and fracture at insertion (baseline), 6, 18 months and at 3 years using modified USPHS evaluation criteria (Alfa=excellent; Bravo=clinically acceptable; Charlie=clinically unacceptable). There was a high percentage of Bravo scores for marginal adaptation (4%-32%) and marginal discoloration (18%-60%) in Groups 2, 3 and 4, but all groups had <5% Charlie scores at 6 months and <10% Charlie scores at 18 months for retention and marginal discoloration, respectively. However, it should be noted that 13% of the restorations in Group 4 were not retained at three years.

STATEMENT OF PROBLEM: A review of the dental literature indicates that noncarious cervical lesions (NCCLs) are formed by erosion, abrasion, and/or abfraction of tooth structure, but their etiology remains scientifically unsubstantiated.

PURPOSE: The purpose of this study was to reproduce noncarious cervical lesions in vitro. This study was not designed to statistically quantify the amount of lost tooth structure via abrasion, but rather to attempt to create NCCLs in the various shapes and sizes that are clinically observed.

MATERIAL AND METHODS: Three pairs of toothbrush types (generic and name-brand) with soft, medium, or firm bristles were tested with 3 different toothpastes of varying abrasive potentials (low, medium, and high) or with water only, on mounted human teeth with and without simulated gingival tissues (6 toothbrushes x 4 brushing solutions (L, M, H, dentifrices, or water only) x 2 gingival mask conditions = 48 test/control groups of 4 teeth each = 192).

RESULTS: The control sets, brushed in water only, demonstrated no visible loss of tooth structure. Each set brushed with toothpaste, regardless of the degree of abrasiveness or toothbrush bristle firmness, demonstrated visible wear at the level of the CEJ.

CONCLUSIONS: Significant noncarious cervical lesions were created via horizontal brushing with common commercial toothpaste, while brushing with water only did not create these cervical lesions.
PURPOSE: To compare the clinical performance of a resin composite and a polyacid-modified resin composite (compomer) in non-carious cervical lesions using a one-step self-etch adhesive.

METHODS: Thirty patients, each with two non-carious cervical lesions (60 restorations), received one composite (Pertac-II) restoration and one compomer (Hytac) restoration, both used in conjunction with a self-etch adhesive (Prompt L-Pop) and placed following the manufacturer’s instructions. Evaluations were at baseline, 6, 12 and 36 months after placement for retention, margin adaptation, marginal discoloration, anatomic form, secondary caries and postoperative sensitivity. Statistical analysis with the Pearson Chi-square test was undertaken.

RESULTS: Retention rates were 86.6% for composite and 86.7% for compomer at 36 months. 3.3% of composite and 6.7% of compomer restorations showed a deficiency in marginal adaptation. Both materials showed a slight marginal discoloration of 7.7%. More deterioration in anatomic form occurred with the compomer (11.5%) than the composite (3.8%). None of the restorations exhibited secondary caries or postoperative sensitivity problems. There was no significant difference in performance between the materials in any of the categories evaluated.

Publication Type
Clinical Trial. Comparative Study. Journal Article.

Abstract
Noncarious cervical lesions (NCCLs) are considered to be of multifactorial origin, normally associated with inadequate brushing. This study assessed the influence in vitro of simulated brushing on NCCL formation. Fifteen human premolars were submitted to brushing in the cementoenamel junction region, using hard-, medium- and soft-bristled brushes associated with a toothpaste of medium abrasiveness under a 200 g load, at a speed of 356 rpm for 100 minutes. The surface topography of the region was analyzed before and after brushing, by means of a laser interferometer, using "cut-off" values of 0.25 and considering roughness values in mm. The initial roughness (mm) results for dentin (D / bristle consistency: 1--soft, 2--medium and 3--hard) were as follows: (D1) 1.25 +/- 0.45; (D2) 1.12 +/- 0.44; (D3) 1.05 +/- 0.41. For enamel (E / bristle consistency: 1--soft, 2--medium and 3--hard), the initial results were: (E1) 1.18 +/- 0.35; (E2) 1.32 +/- 0.25; (E3) 1.50 +/- 0.38. After brushing, the following were the values for dentin: (D1) 2.32 +/- 1.99; (D2) 3.30 +/- 0.96; (D3) Over 500. For enamel, the values after brushing were: (E1) 1.37 +/- 0.31; (E2) 2.15 +/- 0.90; (E3) 1.22 +/- 0.47. Based on the results of the ANOVA and Tukey statistical analyses (a = .05) it was concluded that soft, medium and hard brushes are not capable of abrading enamel, whereas dentin showed changes in surface roughness by the action of medium- and hard-bristled brushes.

Publication Type
Journal Article. Research Support, Non-U.S. Gov't.

Abstract
The prevalence and severity of non-carious cervical lesions in a group of patients attending a university hospital in Trinidad.

Source

Abstract
Noncavious cervical lesions (NCCLS) are considered to be of multifactorial origin, normally associated with inadequate brushing. This study assessed the influence in vitro of simulated brushing on NCCL formation. Fifteen human premolars were submitted to brushing in the cementoenamel junction region, using hard-, medium- and soft-bristled brushes associated with a toothpaste of medium abrasiveness under a 200 g load, at a speed of 356 rpm for 100 minutes. The surface topography of the region was analyzed before and after brushing, by means of a laser interferometer, using "cut-off" values of 0.25 and considering roughness values in mm. The initial roughness (mm) results for dentin (D / bristle consistency: 1--soft, 2--medium and 3--hard) were as follows: (D1) 1.25 +/- 0.45; (D2) 1.12 +/- 0.44; (D3) 1.05 +/- 0.41. For enamel (E / bristle consistency: 1--soft, 2--medium and 3--hard), the initial results were: (E1) 1.18 +/- 0.35; (E2) 1.32 +/- 0.25; (E3) 1.50 +/- 0.38. After brushing, the following were the values for dentin: (D1) 2.32 +/- 1.99; (D2) 3.30 +/- 0.96; (D3) Over 500. For enamel, the values after brushing were: (E1) 1.37 +/- 0.31; (E2) 2.15 +/- 0.90; (E3) 1.22 +/- 0.47. Based on the results of the ANOVA and Tukey statistical analyses (a = .05) it was concluded that soft, medium and hard brushes are not capable of abrading enamel, whereas dentin showed changes in surface roughness by the action of medium- and hard-bristled brushes.
Non-carious cervical lesions (NCCLs) are often encountered in clinical practice and their aetiology attributed to toothbrush abrasion, erosion and tooth flexure. This paper aims to determine the prevalence and severity of NCCLs in a sample of patients attending a university clinic in Trinidad and to investigate the relationship with medical and dental histories, oral hygiene practices, dietary habits and occlusion. Data were collected via a questionnaire and clinical examination. Odds ratios were used to determine the association of the presence of lesions and the factors examined. One hundred and fifty-six patients with a mean age of 40.6 years were examined of whom 62.2% had one or more NCCLs. Forty five per cent of the lesions were sensitive to compressed air. Younger age groups had a significantly lower correlation with the presence of NCCLs than older age groups. Other significant factors included patients who reported heartburn, gastric reflux, headaches, bruxism, sensitive teeth and swimming or had a history of broken restorations in the last year. There was also significant correlation of NCCLs in patients who brushed more than once a day or used a medium or hard toothbrush. Patients with vegetarian diets and those who reported consuming citrus fruits, soft drinks, alcohol, yoghurt and vitamin C drinks were associated with the presence of lesions. Significant associations were also found in patients with group function, faceting, clicking joints or those who wore occlusal splints.

STATEMENT OF PROBLEM: Occlusal load has frequently been suggested to be involved in the development of a noncarious cervical lesion (NCL). However, there is a lack of clinical studies evaluating NCLs and occlusal parameters in sleep bruxism (SB) subjects.

PURPOSE: The purpose of this clinical study was to assess the frequency of NCLs and determine potential occlusal differences between SB subjects and healthy control subjects.

MATERIAL AND METHODS: A total of 91 volunteers, 58 women and 33 men, with a mean (SD) age of 28.37 (4.89) years (range of 20 to 39 years), participated in this investigation. The clinical assessment of SB was based on the criteria of the American Academy of Sleep Medicine. The participants were divided into 2 groups; 58 subjects were assigned to the SB group and 33 subjects to the control group, following a thorough dental examination that was performed by a single trained dentist. Additionally, the following parameters were recorded: mean number of teeth present, existence/absence of NCLs, frequency of NCLs relating to the type of tooth, type of occlusal guidance scheme, existence of a slide from centric occlusion (CO) to maximum intercuspation (MI), length of the slide, and report of tooth hypersensitivity. Group differences were statistically analyzed using chi-square tests for the qualitative variables and Mann-Whitney U tests for the quantitative variables (alpha=.05).

RESULTS: NCLs were significantly more prevalent in SB subjects (39.7%) than in the control subjects (12.1%) (P=.006). In SB subjects, the first premolars were the teeth most affected, and in control subjects, the first molars were most affected. Tooth hypersensitivity was reported in 62.1% of the SB subjects and in 36.4% of the control subjects (P=.018). The evaluation of occlusal guidance schemes revealed no significant difference between the groups. In SB subjects (70.7%), a slide from CO to MI was significantly more prevalent than in control subjects (42.4%) (P=.008). Moreover, SB subjects demonstrated a significantly longer mean (SD) slide of 0.77 (0.69) mm compared to that of control subjects of 0.4 (0.57) mm (P=.008).

CONCLUSIONS: Within the limitations of this study, SB subjects demonstrated significantly more NCLs than the control group; whereas, the type of occlusal guidance scheme seems to be of minor importance in the development of NCLs.
Clinical trial of G-Bond all-in-one adhesive and Gradia Direct resin composite in non-carious cervical lesions-results at 1 year.

Periodontal surgery and glass ionomer restoration in the treatment of gingival recession associated with a non-carious cervical lesion: report of three cases.

Noncarious cervical lesions among a non-toothbrushing population with Hansen's disease (leprosy): initial findings.

BACKGROUND: Buccal gingival recession is a prevalent problem in populations with a high standard of oral hygiene and is very often associated with a non-carious cervical lesion, complicating treatment. The purpose of this report is to show three cases treated by an integrated periodontal and restorative dentistry approach.

METHODS: Three patients with Miller Class I gingival recessions associated with non-carious cervical lesions were enrolled for treatment. One patient received a coronally positioned flap and a resin-modified glass ionomer restoration, and two patients were treated with a coronally positioned flap, resin-modified glass ionomer restoration, and connective tissue graft. Probing depth (PD), relative gingival recession (RGR), and clinical attachment level (CAL) were measured at baseline and at 6 and 8 months after surgery.

RESULTS: After the healing period, all patients showed CAL gain and reduction in RGR. No difference was observed on PDs compared to baseline. No signs of gingival inflammation or bleeding on probing were seen. The patients were satisfied with the final esthetics and had no more dentin hypersensitivity.

CONCLUSION: This report indicates that teeth with Miller Class I gingival recessions associated with non-carious cervical lesions can be successfully treated by an integrated periodontal and restorative dentistry approach; however, longitudinal randomized controlled clinical trials must be performed to support this approach.

OBJECTIVE: The purpose of this preliminary investigation was to examine the presence of noncarious cervical lesions (NCCls) among a convenience sample of non-toothbrushing subjects with Hansen's disease (leprosy).
METHOD AND MATERIALS: A cross-sectional sample of 102 non-toothbrushing subjects (20 to 77 years of age) was examined. The clinical parameter of interest for this study was the presence or absence of NCCLs and their probable etiology as it relates to the subjects' diet, occlusion, and use of medication. Subjects were examined clinically and interviewed according to study protocol.

RESULTS: NCCLs were found in 48 subjects (47% of the studied sample). Widespread consumption of acidic foods and beverages acting as corrodents, signs of parafunction, and use of medication that causes xerostomia were also noted. Thus, all may be contributing factors in the etiology of NCCLs in this population.

CONCLUSION: This preliminary report suggests that toothbrush/dentifrice abrasion was not a factor in the etiology of NCCLs in the population studied. The authors intend to expand their study among these non-toothbrushing
METHODS: 44 patients with at least mild sensitivity affecting cervical dentin were enrolled in a longitudinal randomized clinical trial. A resin-based desensitizer or an experimental glass-ionomer was assigned to treat at most two teeth from each side of the mouth. Sensitivity was assessed by tactile and cold tests, measured with a Visual Analogue Scale at baseline, after treatment, and at 1 week, 1, 3, 6, and 12 months after treatment. Other noteworthy clinical observations were recorded.

RESULTS: Both treatments effectively reduced dentin sensitivity (mixed linear model analysis). Sensitivity score for the glass-ionomer was significantly lower than for the resin-based desensitizer after treatment and at all follow-up periods (P < 0.0001). Some overhanging margins were observed in the glass-ionomer group, which could accumulate plaque and cause gingivitis. Despite material loss from some teeth treated with the glass-ionomer, the follow-up sensitivity scores were still lower than baseline scores.

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Title
Non carious cervical lesions. A review. [Review] [76 refs]
Source

Abstract
Non-carious cervical lesions (NCCL) are characterized by a loss of hard dental tissue near the cement-enamel-junction. Commonly, their shape is like a wedge with the apex pointing inwards. Other times, they appear as regular depressions, like a dome or a cup. Their main characteristic is the presence of hard-mineralized tissue. According to the literature, the prevalence of cervical lesions is 85%, while their incidence is about 18% among permanent teeth. NCCL are currently classified as erosion, abrasion, or abfraction. Their etiology seems to be related to different factors: hexogen and endogen acids, mechanical abrasive action, tooth flexion under axial and non-axial loads. Moreover, it seems that a fundamental role is ascribable to tooth bending phenomena due to the strength components parallel or oblique to the occlusal level, which occur during the normal function as well as during parafunctions. The frequent therapeutic failures are probably due to the same factors causing the onset of the original lesion. Several materials have been proposed to restore NCCL: amalgam (abandoned), glass-ionomer cements, compomers, and composite resins. Early failures of these restorations have often been reported in the literature, probably due to the same factors which originally caused the lesions. Further investigations are required to determine more reliable restorative therapies. [References: 76]
METHODS: The authors examined 70 people (35 men and 35 women) aged 25 to 45 years to determine the presence and type of noncarious cervical lesions, wear facets, tooth contacts in maximal intercuspal position, and lateral and protrusive movements. The assessment involved a questionnaire and clinical examination.

RESULTS: Among the teeth the authors evaluated, 17.23 percent had cervical lesions, 80.28 percent of which had wear facets (P < .01). The authors found a significant difference between the prevalence of noncarious lesions and the presence of wear facets (P = .0484).

CONCLUSIONS: The authors found that cervical lesions were related significantly to wear facets. These findings strengthen evidence for the role of occlusal forces as an etiologic factor for noncarious lesions.

CLINICAL IMPLICATIONS: The presence of wear facets should be considered in the treatment of noncarious cervical lesions.
are the best materials for restoring cervical defects owing to their bonding ability, physical properties, and esthetic potential. A straightforward technique for the successful restoration of noncarious Class V lesions is presented.

Results: At 6 months after initial placement, 120 restorations (a 100% recall rate) were evaluated. At 18 months, 87 restorations (a 72.5% recall rate) were available for evaluation. A survival rate of 100% was measured for all groups at both 6 and 18 months. Sensitivity to air decreased significantly only for Group 3 (no bevel-acid etch) from baseline to 18 months without statistical changes from 6 months to 18 months. None of the other parameters resulted in significant differences for any of the four groups. However, when data were pooled, both the overall marginal discoloration and the overall marginal adaptation were significantly worse at 18 months than at baseline, while sensitivity to air decreased significantly from baseline to 18 months. The 18-month survival rate of the self-etching adhesive Clearfil SE Bond was not improved by enamel bevel or by enamel etching. Both overall marginal adaptation and overall marginal discoloration were worse at 18 months than at baseline.

BACKGROUND: The authors conducted an in vivo investigation to compare the clinical performance of two commercial one-bottle adhesives and a two-bottle adhesive for restoration of noncarious cervical lesions (NCCLs).

METHOD: The patient pool consisted of 57 patients and 171 teeth (three teeth per patient). Each patient received three resin-based composite restorations, each with a different adhesive: one tooth with a two-bottle, water-based adhesive as the control; another tooth with a one-bottle, ethanol-based adhesive; and a third tooth with a one-bottle, solvent-free adhesive. The authors assessed restorations in terms of retention, marginal integrity, margin discoloration and air sensitivity at baseline, six months, one year, two years and three years after initial placement.
RESULTS: The retention rates at 36 months were 88 percent for the first adhesive, 81 percent for the second adhesive and 90 percent for the third adhesive. No statistically significant differences in retention rates could be shown, with 86 percent of restorations retained overall. Measures of marginal integrity, marginal discoloration and sensitivity also had no statistically significant differences between the three adhesives (P > .05).

CONCLUSIONS: All three adhesives performed with acceptable outcomes after a 36-month period, with small differences between the one- and two-bottle systems and between the various solvents. Retention rate was moderately high and air sensitivity was markedly reduced; however, superficial marginal discoloration and marginal degradation was notable. Certain lesion, tooth and patient characteristics may predispose restorations to retention failure.

CLINICAL IMPLICATIONS: The type of solvent may not be a major factor in retention of Class V restorations in NCCLs. Both single-bottle adhesives and conventional two-bottle adhesives performed acceptably.

**Abstract**

**PURPOSE:** To compare the morphology of experimentally induced cervical toothbrush abrasion lesions to teeth demonstrating non-carious cervical lesions in vivo. **METHODS:** Eighteen premolars extracted for orthodontic reasons were each subjected to 80 hours (1.4 million strokes) of horizontal brushing in a custom fabricated toothbrushing machine. Toothpaste slurry was applied continuously and specimens were subjected to 300 gms of toothbrushing force. Denture base resin was used to simulate gingival recession of 1 mm and a sulcus width of 0.1 mm. Cervical abrasions were analyzed by optical and scanning electron microscopy and classified as either V-shape/wedged vs. U-shape/rounded lesions. When lesions exhibited both shapes, they were classified as mixed. Shapes of experimentally induced lesions then were compared to naturally occurring ones found on extracted premolars. **RESULTS:** Experimentally induced toothbrush abrasion duplicated the classical clinical shapes. Half (9/18) of the experimentally induced toothbrush abrasions exhibited wedged lesions, 28% (5/18) showed a mixed wedged/rounded lesion, and 22% (4/18) showed rounded lesions. Serial photography showed progression of the morphology of the lesions. Toothbrush abrasion apparently begins apical to the cemento-enamel junction, progresses to dentin, and then undermines enamel with loss of the original cemento-enamel junction. Wedged lesions may appear with the apex oriented coronal or apical, or may be symmetrical.

**Title**

The prevalence of non-carious cervical lesions in permanent dentition.

**Source**


**Abstract**

A non-carious cervical lesion (NCCL) is the loss of hard dental tissue on the neck of the tooth, most frequently located on the vestibular plane. Causal agents are diverse and mutually interrelated. In the present study all vestibular NCCL were observed and recorded by the tooth wear index (TWI). The aim of the study was to determine the prevalence and severity of NCCL. For this purpose, 18555 teeth from the permanent dentition were examined in a population from the city of Rijeka, Croatia. Subjects were divided into six age groups. The teeth with most NCCL were the lower premolars, which also had the largest percentage of higher index levels, indicating the greater severity of the lesions. The most frequent index level was 1, and the prevalence and severity of the lesions increased with age.

**Title**

Non-carious cervical lesions: an evidenced-based approach to their diagnosis. [Review] [57 refs]

**Source**

Non-carious cervical lesions in a Nigerian population: abrasion or abfraction?

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Title
Non-carious cervical lesions in a Nigerian population: abrasion or abfraction?

Source

Abstract
OBJECTIVES: To determine the proportion of non-carious cervical lesions (NCCL) that were either abrasion or abfraction like and to test the validity of the assumption that right-handed patients cause more abrasion on the cervical surfaces of teeth on the left side of the mouth.

SETTING: Ile-Ife, Southwestern Nigeria.

PARTICIPANTS: 106 first time patients diagnosed as having any form of NCCL.

DESIGN: Patients were subjected to intra-oral examination followed by the administration of a questionnaire. The cervical lesions were examined and scored using the tooth wear index designed by Smith & Knight 1984. NCCL was diagnosed as abrasion or abfraction like based on established clinical features plus positive history of possible associated aetiological factors.

OUTCOME MEASURES: Abrasion and abfraction like lesions.

RESULTS: Abrasion was the diagnosis in 630 (62.3%) of the 1,012 tooth sites with NCCL that had no associated occlusal surface wear facet. This constituted about two-thirds of the NCCL. Three hundred and eighty two (37.7%) of the NCCL occurred in association with an occlusal surface wear facet and presented the typical wedge shaped defects with sharp margins characteristic of abfraction. These abfraction like lesions constituted about one-third of the NCCL. 50.8% of abrasive NCCL in right-handed brushers were located on the left side of the mouth.

CONCLUSIONS: About one-third of NCCL in the present study presents an abfraction component, and two-thirds abrasion. Although, right-handed brushers had more severe lesions on the opposite side of the mouth, the difference was not statistically significant.
CONCLUSION: Force applications, except for intrusive force, can produce increases in the von Mises stress and tooth deflections that can answer the question of the etiology of noncarious cervical lesions. The highest amounts of deflection and von Mises stress were produced by the 45-degree force application.

METHOD AND MATERIALS: A 3D finite element model of a maxillary central incisor was designed. A distributed force of 1.5 N was applied on the palatal side of the crown in five stages, with varying directions progressing from tipping to intrusion. Two separate approaches (displacement and stress) were considered to evaluate tooth behavior when forces were applied from different directions.

RESULTS: The displacement approach resulted in a curved path when compared to a straight line connecting the apical and incisal areas. The maximum deflections were in the cementoenamel junction area. The same area was shown to undergo the maximum of von Mises stress and stress intensity. Patterns of the von Mises stress when evaluated in a mesiodistal direction were in complete agreement with the shape of the cervical lesions (except for the application of the intrusive force, which rules out its effect in producing such lesions).

CONCLUSION: Force applications, except for intrusive force, can produce increases in the von Mises stress and tooth deflections that can answer the question of the etiology of noncarious cervical lesions. The highest amounts of deflection and von Mises stress were produced by the 45-degree force application.

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Few controlled studies exist that demonstrate the relationship between occlusal loading and abfraction lesions. The role of occlusal loading in noncarious cervical lesions (as shown by clinical data) appears to be part of a multifactorial event that may not necessarily follow the proposed classic abfraction mechanism, and other mechanisms or factors may explain cervical restoration failure just as well.

CLINICAL IMPLICATIONS: There is little direct evidence supporting the theory of abfraction as the primary factor in the formation of noncarious cervical lesions. Controlled clinical trials are necessary to elucidate more fully the etiology of those lesions. [References: 100]

PURPOSE: To clinically evaluate the 3-year performance of a one-bottle dentin adhesive in the restoration of non-carious cervical lesions (NCCLs) with resin composite.

MATERIALS AND METHODS: 105 NCCLs were restored with either AElite Flow, Bisco Glaze (both flowable resin-based composites) or Silux (a microfilled resin-based composite), using One-Step dentin adhesive. The cavities were cleaned with pumice and water slurry, the dentin lightly roughened with a fine diamond bur, and the restorations placed according to the manufacturer's instructions. Patients were recalled at 6 months, 1 year, 2 years and 3 years, and restoration integrity and marginal discoloration assessed.

RESULTS: The overall retention rates were: 6 months, 100%; 1 year, 95%; 2 years, 87%; 3 years, 75%. Marginal discoloration was negligible, and there was no significant difference among the materials, although there was a trend for it to be greater around the Bisco Glaze restorations.

BACKGROUND: Abfraction is believed to be caused by biomechanical loading forces. It may be due to flexure and ultimate fatigue of tooth tissues that occur away from the point of occlusal loading. Other possible causes of cervical lesions include toothbrush abrasion and erosion. The purpose of this study was to investigate the characteristics and prevalence of abfraction-like lesions in a population of U.S. veterans.

METHODS: The authors evaluated 103 teeth with noncarious cervical lesions in 32 subjects and characterized them based on the surface on which the lesion was located, history of toothbrush abrasion, size of the lesion, presence of plaque, surface texture, and presence and size of occlusal wear facets.

RESULTS: Clinical examination revealed that adjacent control teeth had a significantly lower percentage of surfaces with plaque than did teeth with cervical lesions. Control teeth also had significantly less gingival recession than did affected teeth. Seventy-five percent of subjects reported a history of using a firm toothbrush, and 78.1 percent reported using a
brushing technique that is known to cause toothbrush abrasion in the affected area. Affected teeth had neither significantly different occlusal wear facets nor occlusal contacts than control teeth. No significant correlations were found between cervical lesion dimensions and facet area.

CONCLUSIONS: Toothbrush abrasion is strongly suspected as contributing to the formation of the majority of wedge-shaped lesions in this group of subjects. A small subset of lesions is thought to have resulted from some other phenomenon. Although the presence or contribution of occlusal stresses in the direct formation of these lesions could not be measured directly, the possibility of abfraction could not be eliminated.

CLINICAL IMPLICATIONS: Because the existence of abfraction could not be ruled out in about 15 percent of the cases, teeth with noncarious, wedge-shaped lesions warrant careful occlusal evaluation, with the possible need for occlusal adjustment or bite splint therapy to treat bruxism.

METHODS: Thirty-three patients with non-carcinomatous cervical lesions were enrolled in the study. A total of 101 lesions were restored using one of the adhesives and a hybrid composite resin. Enamel was not beveled, nor was any mechanical retention placed. The restorations were evaluated at baseline, and at 6 and 18 months after placement using modified USPHS criteria.

RESULTS: Cumulative 18-month retention rates were 93.6% for OptiBond Solo and 98.0% for Prime & Bond 2.1. The difference in retention rates was not statistically significant. For OptiBond Solo, the only notable problems were interfacial staining and marginal adaptation, both of which were less than ideal in 9% of restorations. Marginal problems were slightly less frequent for Prime & Bond 2.1 restorations, but the difference was not significant.

CONCLUSIONS: Both adhesives provided Class V retention rates exceeding the 18-month, full acceptance guidelines set by the American Dental Association. Any additional benefit provided by the use of a filled adhesive was not detected in this 18-month clinical trial.

OBJECTIVE: The purpose of this study was to evaluate the performance of a filled (OptiBond Solo) and an unfilled (Prime & Bond 2.1) "one-bottle" adhesive in Class V restorations after 18 months of clinical service.
MATERIALS AND METHODS: Forty-eight dental students (28 males; 20 females) between the ages of 16 and 24 years, were investigated to verify the presence of noncarious cervical lesions and their relation to some occlusal aspects. The assessment involved a questionnaire, clinical examinations, and model analysis.

RESULTS: The results indicated that the lower first molars (21.3%), the upper first molars (16.0%), the upper first premolars (12.8%), the lower first premolars (11.7%), and the lower second premolars (11.7%) were the teeth most affected by the lesions. Age was a significant factor with respect to the presence of lesions; the students with noncarious cervical lesions were older than the students who showed no lesions. Among the 79 teeth exhibiting lesions, 62 (78.5%) showed wear facets. In the group with lesions, the mean, per subject, was 15.0 teeth with wear facets, whereas in the group without lesions the mean was 10.8 teeth with wear facets per subject, suggesting that occlusal stress has some effect on lesion development.

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Title
An alternative hypothesis from veterinary science for the pathogenesis of noncarious cervical lesions.
Source
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY
Abstract
An alternative hypothesis to abrasion and erosion for the pathogenesis of noncarious cervical lesions was put forward in 1984; the so-called occlusal theory suggested that tensile stresses from occlusal overload could be involved in the pathogenesis of noncarious cervical lesions and that bending stresses applied to teeth could cause disruption of the surface enamel, resulting in increased susceptibility to dissolution and abrasion at the affected sites and in the development of wedge-shaped lesions. This theory has gained increased acceptance in recent years, although absolute scientific evidence has been scant. These lesions also occur in animals, in particular, the domestic cat, in which they are called feline odontoclastic resorptive lesions. A variety of theories about pathogenesis of these lesions have been put forward, but there is some evidence that occlusal overload may be a contributory factor in the development of an inflammatory response in the periodontal membrane and the presence of enzymes associated with resorption in the gingival crevice. Further investigation may help define a common etiology between the pathogenesis of feline odontoclastic resorptive lesions and noncarious cervical lesions.

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Title
Correlation of noncarious cervical lesion size and occlusal wear in a single adult over a 14-year time span.
Source
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY
Abstract
STATEMENT OF PROBLEM: Noncarious cervical lesions are described as having a multifactorial cause, with occlusal trauma and toothbrush abrasion frequently mentioned as major factors. Finite element modeling studies have demonstrated a relocalization of occlusal stresses to the cervical area due to flexure of the crown. This may cause microcracking, especially under tensile stresses, that will lead to a loss of enamel and dentin in the cervical region. Clinical confirmation of an occlusal cause for noncarious cervical lesions has been difficult to obtain.

PURPOSE: This study investigated whether occlusal wear was correlated with an increase in the size of noncarious cervical lesions.
MATERIAL AND METHODS: Loss of contour at occlusal and cervical sites on 3 teeth of a single individual was measured using digital and visualization techniques at 3 time intervals over a 14-year time span. The 1983 baseline casts and 1991, 1994, and 1997 clinical impressions of a single adult patient with existing noncarious cervical lesions were replicated in epoxy. Surfaces of all replicas were digitized with a contact digitizing system. Sequential digitized surfaces were fit together and analyzed using AnSur-NT surface analysis software. Clinical losses of surface contour by volume and depth of the left mandibular first molar and first and second premolars were recorded.

RESULTS: Nine measurements of cervical volume loss (range 0.9 to 11.5 mm$^3$) and 9 corresponding measurements of occlusal volume loss (range 0.39 to 7.79 mm$^3$) were made. The correlation between occlusal and cervical volume loss was strong ($r(2)=0.98$) and significant ($P<.0001$).

CONCLUSION: For the single adult patient in this study, there was a direct correlation between occlusal wear and the growth of noncarious cervical lesions.

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