









"I am not paíd by any company to promote their products"

"Some manufacturers fund my research"

"I will try to be evidencebased rather than anecdotal"

Patients care more about dental materials than I suspected!

A practice-based assessment of patients' knowledge of dental materials

F. J. T. Burke*1.2 and R. J. Crisp1.2

IN BRIEF

 Suggests that dental practice should be the prime location for clinical dental research.

RESE

ARCH

- Discusses patients concerns regarding which dental materials are used.
- Demonstrates that patients care strongly that the materials are of a high quality and have been thoroughly researched.

Justifying the lecture!!!

Aims It is the aim of this study to determine, by means of a questionnaire completed by patients attending ten UK dental practices, patients' level of knowledge on dental materials and techniques. Materials and methods Members of The PREP (Product Research and Evaluation by Practitioners) Panel were asked to recruit patients to participate in a questionnaire-based assessment of their knowledge of dental materials. **Results** Two hundred and forty-nine patients took part in the questionnaire. Sixty-three percent (n = 157) of the respondents were female and 92% (n = 229) of the respondents stated they were regular attenders at the dental practice. The respondents were asked how important the quality of dental materials used in their mouth was, and on a Visual Analogue Scale (VAS) where 1 = not important and 10 = very important, the result was 9.6. The same score was recorded when they were asked how important it was that the materials used in their mouth were supported with relevant clinical research evidence and long term data of the success of the material. They were also questioned on the subjects of price, manufacturer, source or material and type of filling material. A significant amount of respondents demonstrated that they had concerns over the use of amalgam. **Conclusions** Respondents expressed strong views that the materials used on their teeth should have a robust evidence base and they care about the materials that are used in their mouths.

Refereed Paper Accepted 9 November 2015 DOI: 10.1038/sj.bdj.2015.956 "British Dental Journal 2015; 219: 577-582

BRITISH DENTAL JOURNAL VOLUME 219 NO. 12 DEC 18 20

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BRITISH DENTAL JOURNAL VOLUME 219 NO. 12 DEC 18 201

CONCLUSIONS:

Patients feel that materials should have a robust evidence base, produced by manufacturers with experience in the field
 Patients care about the materials that we use

- Almost half did not wish "own label" materials to be used in their mouths
- One third expressed anxieties regarding the use of amalgam in their teeth



What do we want from a dentine bonding agent?

First, bonding to enamel



Michael Buonocore



Buonocore MG. A simple method of increasing the adhesion of acrylic filling materials to enamel surfaces. J.Dent.Res.1955:34(6):849-853.



Bonding to dentine is therefore more difficult

It is a vital substrate

Why do dentists need adhesion?

- Cervical restorations
- Build up of fractured or worn anterior and posterior teeth
- Short clinical crown for full or partial coverage restorations
- Resin retained bridges



Seals dentinal tubules to reduce post operative sensitivity

0099-2398/86/1210-0453/\$02:00/0 JOURNAL OF ENDODONTICS Copyright © 1986 by The American Association of Endodontists

Printed in U.S.A. Vol. 12, No. 10. Octoeer 1986

The Hydrodynamic Theory of Dentinal Pain: Sensation in Preparations, Caries, and the Dentinal Crack Syndrome

Martin Brännström, DDS, Dr. Odont.

 Seals restoration margins to reduce the risk of marginal staining and recurrent caries. ...briefly, on the subject of class V restorations

Maximising class V effectiveness

The survival of Class V restorations in general dental practice: part 3, five-year survival

D. Stewardson,¹ S. Creanor,² P. Thornley,³ T. Bigg,⁴ C. Bromage,⁵ A. Browne,⁶ D. Cottam,⁷ D. Dalby,⁸ J. Gilmour,⁹ J. Horton,¹⁰ E. Roberts,¹¹ L. Westoby¹² and T. Burke¹³

IN BRIEF

- This study reminds dentists that they are the most important factor determining the survival of Class V restorations.
- Presents evidence that has been collected from a large number of restorations placed in dental practices and is therefore likely to be particularly relevant to general practitioners.
- Identifies a number of factors associated with poor restoration survival which can help dentists improve their patient care.

RESEARCH

Objective To evaluate the survival over five years of Class V restorations placed by UK general practitioners, and to identify factors associated with increased longevity. **Design** Prospective longitudinal cohort multi-centre study. **Setting** UK general dental practices. **Materials and method** Ten general dental practitioners each placed 100 Class V restorations of varying sizes, using a range of materials and recorded selected clinical information at placement and recall visits. After five years the data were analysed using the Kaplan-Meier method, log-rank tests and Cox regressions models to identify significant associations between the time to restoration failure and different clinical factors. **Results** After five years 275/989 restorations had failed (27.8%), with 116 (11.7%) lost to follow-up. Cox regression analysis identified that, in combination, the practitioner, patient age, cavity size, moisture contamination and cavity preparation were found to influence the survival of the restorations. **Conclusions** At least 60.5% of the restorations survived for five years. The time to failure of Class V restorations placed by this group of dentists was reduced in association with the individual practitioner, smaller cavities, glass ionomer restorations, cavities which had not been prepared with a bur, moisture contamination, increasing patient age, cavities confined to dentine and non-carious cavities.

Maximising class V effectiveness: what is associated with failure at 5 years? Restorations involving dentine only:

hazard of failure increased by 39%

Large restorations compared with small: hazard of failure increased by 85%

Major or minor moisture contamination: hazard of failure increased by 29%

Preparation method/rotary instrument used: hazard of failure decreased by 40% Maximising class V effectiveness: what material is best at 5 years?

Five year survival

RMGI 78.6%

Amalgam 75%

Compomer 71.2%

Flowable composite 69%

Composite 68.3%

Glass ionomer 50.6%

Class V meta analysis: conclusions "The dentist shall roughen the dentine and enamel surfaces" "Additional bevelling of enamel can be omitted" "Isolation with rubber dam is recommended"



Gwinnett AJ, Kanca J. Interfacial morphology of resin composite and shiny erosion lesions. Am.J.Dent.1992:5:315-317. Zimmerli B, De Munck J, Lussi A, Lambrechts P, van Meerbeck B. Long-term bonding to eroded dentin requires superficial bur preparation. Clin.Oral Invest.2012:16:1451-1461.

How to bond to sclerotic dentine

RestorativeDentistry



Dental Materials: What Goes Where? Class V Restorations

Abstract: A large number of Class V restorations are placed per annum to restore cervical lesions. This paper evaluates the pathogenesis of these lesions, with particular reference to the role of occlusal factors, and reviews the literature in order to provide advice on the material(s) which are most likely to produce optimal longevity of a Class V restoration.

CPD/Clinical Relevance: Resin-modified glass ionomer materials appear to provide optimal survival for a Class V restoration, but a (flowable) composite might produce a better aesthetic result. Dental Update 2015; 42: 829–839

Conclusions

Which material and clinical

technique performs best? From this review, it may be concluded that:

- RMGI performs optimally and is therefore recommended in clinical situations in which aesthetics is not an overriding factor;
- The surface of a NCCL should be roughened prior to placement of the restoration, be it GI-based or resin-based;
- There is no need to bevel the coronal aspect of the cavity margin; and
- 2-step self-etch bonding agents, Clearfil SE being an example, appear to perform optimally, 3-step etch and rinse bonding agents also being well ranked in a number of studies, but with the bond reducing with time.

Bonding to dentine: How Nature Does It

As a rule of thumb – with 20 MPa of bond strength you are usually on the safe side.

E. Swift, ADA 2002, New Orleans

Smear Layer

- Thickness:
 - 0.5 5.0 microns
- Will not wash off
- Weak bond to tooth -2 3 MPa
- Very soluble in weak acid

Previous strategies to treat the smear layer



Etch & Rinse/ Total etch, 4 steps



Self etch/ No Rinse, 1 step The quality of the hybridised dentine is more important than the bond strength

N.Nakabayashi, 2003

How wet is wet?







Wet

Noosa Beach, Queensland, Australia

Dry

The classification, *until recently*, of dentine bonding systems

1.Etch and rinse
(etch & bond, total etch)
2.Self etch One bottle
Two bottles

...a landmark paper

Clearfil SE used as bonding agent, pH 2.3

100 class V restorations followed for 5 years

Five-year Clinical Effectiveness of a Two-step Self-etching Adhesive

Marleen Peumans^a/Jan De Munck^b/Kirsten Van Landuyt^c/Paul Lambrechts^a/ Bart Van Meerbeek^a

Purpose: The purpose of this prospective randomized controlled clinical study was to evaluate the clinical performance of a "mild" two-step self-etching adhesive, Clearfil SE, in Class V restorations after 5 years of clinical functioning.

Materials and Methods: Twenty-nine patients received two or four restorations following two randomly assigned experimental protocols: (1) a mild self-etching adhesive (Clearfil SE, Kuraray) was applied following manufacturer's instructions on both enamer and dentin (C-SE non-etch); (2) similar application of Clearfil SE, but including prior selective acid-etching of the enamel cavity margins with 40% phosphoric acid (C-SE etch). Clearfil AP-X (Kuraray) was used as the restorative composite for all 100 restorations. The clinical effectiveness was recorded in terms of retention, marginal integrity, marginal discoloration, caries recurrence, postoperative sensitivity, and preservation of tooth vitality after 5 years of clinical service. The hypothesis tested was that selective acid etching of enamel with phosphoric acid improved retention, marginal integrity, and clinical microleakage of Class V restorations.

Results: Only one restoration of the C-SE non-etch group was lost at the 5-year recall. All other restorations were clinically acceptable. Marginal integrity deteriorated with time in both groups. The number of restorations with defect-free margins was significantly lower in the C-SE non-etch group (p = 0.0043). This latter group presented significantly more small incisal marginal defects on the enamel side (p = 0.0169). Superficial marginal discoloration increased in both groups, but was more pronounced in the C-SE non-etch group and was related to the higher frequency of small incisal marginal defects.

Conclusion: The clinical effectiveness of the two-step self-etching adhesive Clearfil SE remained excellent after 5 years of clinical service. Additional etching of the enamel cavity margins resulted in an improved marginal adaptation on the enamel side; however, this was not critical for the overall clinical performance of the restorations.

Keywords: adhesives, clinical trial, cervical lesions, composite restoration.

J Adhes Dent 2007; 9: 7-10.

... the new approach is therefore.... selective enamel etching

Selective enamel etching



Kuraray etchant



a new group of dentine bonding agents

Universal bonding agents

Treatment of the smear layer

 REMOVE (Etch & Rinse/Total etch) LEAVE/PENETRATE (Self etch) UNIVERSAL MATERIALS (Etch & Rinse, Selective enamel etch, Self etch) (use for direct and indirect)

Scotchbond Universal Adhesive

- Works with both Total- and Self-Etch technique, therefore high flexibility in clinical procedures
- Provides procedural simplicity
- Total-etch or Selective-enamel etch for highest enamel bond strength, e.g. incisal edges
- Self-etch for low post-op sensitivity
- Fast technique where isolation is difficult, or with non-co-operating patients
- flip cap for opening and closing
- new nozzle design for improved dispensing and cleanliness

Scotchbond Universal Adhesive: Composition

- •BisGMA
- •MDP
- Vitrebond Copolymer
- •HEMA
- Ethanol
- •Water
- •Filler
- •Silane
- Initiators



Product Research and Evaluation by Practitioners

2013: A handling evaluation by the PREP Panel



Handling evaluation of 3M ESPE Scotchbond Universal by the PREP Panel

- 12 evaluators
- Variety of bonding agents used pre-study
- 875 restorations placed (Class 1:172, Class II:189, Class III:134, Class IV:178, Class V:182, Other:20)
 Also used for dentinal hypersensitivity, repair of fractured porcelain, bonding of posts.
- A Rated material on visual analogue scales
- 75% of evaluators would be prepared to pay extra for the convenience of single-unit doses
- All stated that the resin liquid easily wet the tooth surface, that the bond was easily visible. Some commented that it was "too yellow"

Handling evaluation of 3M ESPE Scotchbond Universal by the PREP Panel

Ease of use of previous bonding agent



Handling evaluation of Scotchbond Universal by the PREP Panel: Comments

"Disconcertingly yellow – but OK when thinned or light cured" "Spreads well when air applied" "Supposedly the lid can be opened one-handed but it is sometimes a problem" "First material that compares with G-Bond"

Conclusions re SBU colour

Our Control Co

G Higher camphorquinone content gives high degree of conversion

Better visibility on tooth in uncured state for safe application
 Lower solvent content for increased working time and uniform film thickness

Yellow colour is barely visible after air drying step and bleaches upon light curing

> Any remaining yellow colour after the light curing step indicates incomplete cure and can be bleached by repeating the light cure or extending the curing time
Handling evaluation of Scotchbond Universal by the PREP Panel: Comments

All the evaluators stated that they would purchase if available at average price.

"Extremely useful to have a material that bonds both to indirect restorations as well as the tooth structure. No need for multiple kits of materials. So far has worked well." ... I often treat tooth wear patients

Patient Information Leaflet

Information sheet for patients receiving resin composite restorations for treatment of tooth wear

Your anterior teeth will receive adhesive resin composite restorations to cover the exposed dentine and prevent it from wearing further: this is the principal reason for treatment

An improvement in appearance of your teeth will be effected if possible

You will not be able to chew on your back teeth for a period of 3 to 6 months, and you should therefore cut your food into small pieces to avoid intestinal symptoms

Your back teeth will eventually erupt so that you will be able to chew on them again after 3 to 6 months

The change in shape of your upper anterior teeth might cause lisping for a few days

Your front teeth may be a little tender to bite upon for a few days

Your "bite" will feel very unusual for several days and you may find difficulty in chewing for this period, as you will be unsure exactly where to place your jaw to get tooth to tooth contact: however, you should become accustomed to your new "bite" after a few days

The procedure will normally be carried out without the need for local anaesthesia as there will be no, or minimal, need for tooth reduction.

If you have crowns, bridges or a denture in the posterior part of your mouth, it is likely that these will require replacement.

Regarding the longevity of the restorations:

The reliability of the restorations should be good, but that there was a small potential for restorations to de-bond, since bonding, albeit better than 15 years ago, was still not as good as dentists might wish.

The margins of the restorations may require occasional polishing

Occasionally, chipping of the restorations may occur

I switched to Scotchbond Universal Adhesive in September 2011

Much better adhesive performance in wear cases than previously!

Bond strength MPa

This is not exact science, but it is similar to what dentists do in their surgeries, and suggests that ease of use might contribute to an improved bond strength



In one round of experiments, 3 out of 4 "own label" specimens didn't even make it to the Instron machine!!

Ne too: Are own label brands a threat to the development of new materials?

Comment

Authors' Information

Dental Update invites submission of articles pertinent to general dental practice. Articles should be wellwritten, authoritative and fully ilkustrated. Manuscripts should be prepared following the Guidelines for Authors published in the April 2005 issue (additional copies are available from the Editor on request). Authors are advised to submit a synopsis before writing an article. The opinions expressed in this publication are those of the authors and are not necessarily those of the editorial staff or the members of the Editorial Board. The journal is listed in Index to Dental Literature, Current Opinion in Dentistry, MEDLINE & other databases Subscription Information Full UK £97 • Europe £105 • Airmail £130 Surface mail £115 • Retired GDP/Vocational Trainee/ PCD £57 • Student £33 10 issues per year Single copies £10 (Overseas £12) Subscriptions cannot be refunded. For all changes of address and subscription enquiries please contact: Dental Update Subscriptions George Warman Publications, Unit 2 Riverview Business Park, Walnut Tree Close, Guildford GU1 4UX T: 01483 304944 F: 01483 303191 E: dusubscriptions@georgewarman.co.uk All subscriptions should be made payable to George Warman Publications (UK) Ltd. Publishing Director: Stuart Thompson Assistant Production Managor: Debbie Graig

Design/Layout: Lisa Dunbar Illustrator: Richard Taylor Onaiman: John Siebert Derkal Updata Is published by: George Warman Publickbrs: (Wk) Ltd, Unk 2, Rhenriew Butiness Park, Walnut Tree Oces, Guildford, Surray GUI 4UX Teb O1483 304044, Fax 01463 303101 email: Astroudiegeorgewarman.co.uk webble: http://www.dmailupdate.co.uk e GEORGE WARMAN PUBLICKTIONS (UK) LTD Primidelin the United Brigdom by Williams Frees (Barks) Ltd Reare by Williams Press (Barks) Ltd



Member of the Periodical Publishers Association

Trevor Burke

Me too

Forty years ago, restorative dentistry had at its disposal only a handful of materials, namely amalgam, an early (macrofilled) composite, an elementary metal-ceramic, silicate cement, zinc oxyphosphate for kitting and acrylic for dentures. Bonding systems had not materialized. Readers who were not around then (the vast majority I suspect) will be amazed at the very limited variety, given the wide array of materials available today. Indeed, although amalgam may not have moved on much, there are many different types of composite (microhybrid, microfilled, nanofilled, flowable) and many manufacturers of each. Presently, although metalceramic remains the most used material for crowns and bridges, three are many other types of ceramic and the dominant position of metal-ceramic is being threatened by the exponential rise in Tetragoral-Zirconia-Polycrystal (TZP) famed crowns and bridges. Silicate cement has long since passed its sell by date – it was never a great material anyway, and while zinc oxyphosphate is still used for kiting by a dwindling number of clinicians, the majority now recognize the superior properties of resin luting materials and resin modified glass inormer cements, the latter being a material which had not been introduced 40 years ago.

This explosion of materials and manufactures has not come without a cost indeed, they come at a substantial cost. This includes the cost of research, development and testing, often over a period of many years. New materials often start as an idea, or a wish list testing, often over a period of many years. New materials often start as an idea, or a wish list and start depth of cure. A team of scientists, often specialized in chemistry, looks at the possibilities and, if and when the idea becomes a prototype material, extensive testing in the developing company's laboratory begins. If that indicates potential, further testing ensues and eventually the material undergoes toxicology testing and regulatory approval begins. There are often setbacks along the way Readers will now begin to understand why dental materials cost as much as they do since the company developing the material will eventually be hoping for a return on its investment. However, without such investment, we would not today have glass tonomer materials, nanofilied composites, self-etch dentine bonding agents, self-

It therefore may be considered disappointing to see the increasing number of the too' (aka, own label, private label) materials coming on to the market, some sold by companies who are also agents for the products developed at great cost by innovative manufacturers, which to me seems strange. Those who sell them may suggest that they are acting to help the customer in times of economic distress. However, it is difficult to see how these initiation materials can perform as well as those which have head the investment, since they may often be derived from materials of a previous generation. We will never know about their performance anyway, because the 'me too' company may be unlikely to invest in a clinical trial of their products as ethical and innovative manufacturers do.

There is another reason why clinicians should think twice before purchasing a cheap imitation product. The principal cost of a dental restoration is the clinician's time, rather than the cost of the material in the box. If a restoration fails prematurely as a result of a deficiency in the material, the clinician ultimately will face the cost of his/her time used replacing the nestoration at no cost to the patient. So, tempting though it may be in hard economic times to purchase a cheap version of a particular material, this may misfire because of inferior performance. The worst case scenario would be if veryone purchased 'me too' materials, so that research and development into new materials would be stitled and the amalgam substitute, the reliable bonding agent or the predictable mini implant, which are among the advances that many are hoping for, may never be seen. In this respect, *Dental Update* is a journal that supports research innovations and companies that provide materials with messanch and development potential as part of our editorial policy of clinical excellence. The message is to think twice when tempted to purchase that innition product.

Me too!

All articles published in Dental Update are subject to review by specialist referees in the appropriate dental disciplines.

There is no evidence base for "own label" Glass Ionomer materials

DentalMaterials



How Well are GIC Product Labels Related to Current Systematic Review Evidence?

Abstract: Systematic reviews have been recommended as providing the best source of evidence to guide clinical decisions in dentistry. They appraise evidence from trials focused on investigating clinical effects of dental material categories, such as conventional glassionomer cements (GIC) or resin-modified GIC. In contrast, the general dental practitioner is introduced to these categories of materials in the form of branded or private product labels that are marketed during dental conventions or through advertisements. Difficulties may arise in recognizing material categories that have been subjected to systematic reviews, because of the multitude of product labels on the current market. Thus, the value and relevance of published systematic review evidence concerning the material categories represented by these labels may remain obscure. Based on a systematic literature search, this article identifies glass-ionomer cement product labels used during clinical trials which, in turn, were subsequently reviewed in systematic review articles (published between 15 April 2009 and 14 April 2011). This article further clarifies how these product labels realet to the systematic review conclusions. The results show that the conventional and resin-modified glass-ionomer cements that were used in most trials were marketed by GC and 3M ESPE, respectively. The conventional GICs used in most of the reviewed trials were Fuji III and Fuji IX, while Vitremer was the most commonly used resin-modified suggests that GIC provides beneficial effects for preventive and restorative dentistry. However, more trials of higher internal validity are needed in order to confirm (or disprove) these findings. Only GIC products of branded labels and none of private labels were identified, suggesting that private label GIC products have little or no research back-up.

Clinical Relevance: Dental products, such as glass-ionomers cements (GIC), can only be judged as effective when they are based on sufficient research back-up. Systematic reviews of clinical trials provide such back-up at the highest level. Thus clinicians must be able to identify GIC products for which reliable evidence from systematic reviews of clinical studies is available and know about what such evidence contains.

Dent Update 2011; 38: 634-644

Me Too 3

Welcome to another year of Dental Update, a special 40th Anniversary year which will see the publication of a 40th Anniversary issue which will reflect upon the contents of the first issue from May 1973. I hope that you will enjoy it all.

I have previously written on the subject of own label adhesives, ¹² questioning the wisdom of purchasing cheaper materials which may not have been researched in the way that materials should be. A paper which I presented at a recent research meeting concludes my 'evidence' on this subject.

References 1. Burke FJT. Me too. Dent Update 2010; 37: 137. 2. Burke FJT. Me too 2. Dent Update 2011; 38: 586-592.

The evidence base for 'own label' resin-based dental restoratives

Abstract: There is anacdotal evidence that sales of 'own-label' (OL) or 'private label' dental products is increasing, as dentists become more cost conscious in times of economic downturn. However, the purchase of such (less expensive) products could be a false economy if their performance falls below accepted standards. So, while the examination of a reain-based product under research conditions alone may not guarantee success, it could be considered that a material which has been subjected to testing under research conditions will demonstrate its effectiveness under laboratory conditions or reveal its shortcomings; either of these being botter than the material not being examined in any way. It was therefore considered appropriate to determine the materials on which research uses carried out, with particular reference to OL brands.

Objective: To determine whether there is a research base behind OL resin-based restorative dental materials.

Methods

The abstract memory stick for the IADR meeting in March 2011 in San Diego was examined. All abstracts included in the 'Dentine adhesives' and Composite' sections were read in full and examined in order to identify the names of products mentioned in the abstracts. These were recorded and tabulated. Any product which did not state the manufacturer was further investigated by an internet search.

Product Name	Number of Mentions in Research Abstracts
Clearfil SE Bond (Kuraray)	40
Scotchband Multipurpose (3M ESPE)	29
Adper Easy Bond (3M ESPE)	17
Optibond Solo (Kerr)	17
Prompt L Pop (3M ESPE)	10
Optibond FL (Karr)	10
Optibond all-in-one (Kerr)	10

Table 1. Most frequently mentioned dentine-bonding agents in the 'Bonding agent' research abstracts.

ZERO evidence base for "own label" resin-based materials

Results

A total of 189 abstracts from the IADR classification 'dentine adhesives' were identified, although 31 of these did not mention specific bonding agents and two were on light-curing units. The results indicated that 84 different types of bonding agent inote that some of these may be discounted as some manufacturers may name the same bonding agent differently for different markets) had been subjected to research in the remaining 156 abstracts. A total of 353 bonding agents were tested in these abstracts. The most frequently researched bonding agents are presented in Table 1. Four materials did not specify their manufacturer, so these materials were investigated further in an internet search. and their manufacturers identified. No OL brands were identified during the search.

The same exercise was carried out for 255 'Composite' abstracts. Of these, 44 did not state the type of composite tested, eight were on the subject of light curing, one was on the subject of FTR and one on veneering porcelain. In the remaining 201 abstracts, there were 601 occasions when the name and manufacturer of the resin composite was stated. Most frequently mentioned materials are presented in Table 2. Nine materials did not specify their manufacturer, so these materials were investigated

Product Name	Number of Mentions in Research Abstracts
Filtek Supreme/Z350 (3M ESPE)	51
Filtek Z250 (3M ESPE)	35
Filtek Z100 (3M ESPE)	18
Venus Diamond (Heraeus Kulzer)	18
EsthetX (Dentsply)	18
Kalore (GC)	17
Premise (Kerr)	12 ::
Grandio (Voco)	10
Gradia Direct (GC)	10

Table 2. Most frequently mentioned resin composite materials in the Composite' research abstracts.

further in an internet search and their manufacturers identified. No OL brands were identified during the search.

Conclusion

Within the limitations of this study, which nevertheless involved the reading of 444 IADR abstracts as a source of 'evidence', there was no evidence of any OL product being subjected to testing in a research study. Further work is now indicated to provide 'evidence' for the effectiveness of these materials, by laboratory and, ideally, dinical evaluation of 'own label' brands of resin-based restorative dental products.

Acknowledgment

Thanks are due to Mrs Jeannette Hiscocks for tabulating the data.

Disclosure

The author is a member of the 3M ESPE Scientific Advisory Board but has no financial interest in any of the products mentioned.

Recent evidence against own label brands

Keywords Filer Degree of Cenversion GwnLabel Private Label Res in Cemposite Eleveral Madulus

Authors Dr Kathryn Shaw (woor (scs.tag.)) European Journal of Prosthodon ticls and Restorative Dentisty (2016) 24, 122-129

'Own-Label' Versus Branded Commercial Dental Resin Composite Materials: Mechanical And Physical Property Comparisons

ABSTRACT

A majority of dental materials are manufactured by comparies who have experience in the field. However, a number of "own label" materials have become available, principally marketed by distributors and others amparie swith lit to or no experience in the field. These materials are attractive because of their reduced cost, but they may have no research on which clinicians might base their potential performance. It is therefore the purpose of the

However, greater batch to batch variation in several mechanical & physical properties of the own-label materials was noted

Universal bonding agents:

new additions are on the way!

All contain the resin 10-MDP

Universal bonding agents tested in by VOCO in Cuxhaven

No advantage in etching the dentine



Fig. 1: Tensile bond strength values on enamel and dentine. The graph displays the self-etch mode and the total-etch mode of Futurabond U and Scotchbond Universal.

Therefore, don't do it!

SE= self etch, no dentine etch TE= total etch, dentine etched

10-MDP is important for the status of the bond reaction with HAP

Structure of Adhesive monomer MDP

Polymerizable group

Hydrophobic group

Hydrophilic group Forming the chemical bond with calcium and hydroxy apatite



How so-called self etch (and Universal bonding agents) work!

Without phosphoric acid etching, acidic monomers of self-etch adhesives do not remove the smear layer. Rather, the smear layer is partially demineralized and incorporated into the hybrid layer.



...other tips for optimal bonding..



Effects of moisture degree and rubbing action on the immediate resin-dentin bond strength Dal-Bianco K, Pellizzaro A, et al. Dent.Mater.2006 Conclusion:

High bond strength to dentine can be obtained under dry conditions when ethanol/ H_2O and acetone based systems are vigorously rubbed on the dentine surface. On wet surfaces, light rubbing may suffice.

Agitation works with 7 Universals!

ELSEVIER

journal homepage: www.intl.elsevierhealth.com/journals/jden



Does active application of universal adhesives to enamel in self-etch mode improve their performance?

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ARTICLE INFO

ABSTRACT

Article history:

Received 21 November 2014 Received in revised form 2 April 2015 Accepted 7 April 2015

Keywords:

Microshear bond strength Degree of conversion Enamel Etch-and-rinse Self-etch Universal adhesive systems Objectives: To evaluate the effect of adhesion strategy on the enamel microshear bond strengths (μ SBS), etching pattern, and in situ degree of conversion (DC) of seven universal adhesives.

Methods: 84 extracted third molars were sectioned in four parts (buccal, lingual, proximal) and divided into 21 groups, according to the combination of the main factors adhesive (AdheSE Universal [ADU], All-Bond Universal [ABU], Clearfil Universal [CFU], Futurabond U [FBU], G-Bond Plus [GBP], Prime&Bond Elect (PBE), and Scotchbond Universal Adhesive [SBU]), and adhesion strategy (etch-and-rinse, active self-etch, and passive self-etch). Specimens were stored in water (37 °C/24 h) and tested at 1.0 mm/min (µSBS). Enamel-resin interfaces were evaluated for DC using micro-Raman spectroscopy. The enamel-etching pattern was evaluated under a field-emission scanning electron microscope (direct and replica techniques). Data were analyzed with two-way ANOVA and Tukey's test ($\alpha = 0.05$). Results: Active self-etch application increased µSBS and DC for five out of the seven universal adhesives when compared to passive application (p < 0.001). A deeper enamel-etching pattern was observed for all universal adhesives in the etch-and-rinse strategy. A slight improvement in etching ability was observed in active self-etch application compared to that of passive self-etch application. Replicas of GBP and PBE applied in active self-etch mode displayed morphological features compatible with water droplets. The DC of GBP and PBE were not affected by the application/strategy mode.

Conclusions: In light of the improved performance of universal adhesives when applied actively in SE mode, selective enamel etching with phosphoric acid may not be crucial for their adhesion to enamel.

October 2015: The first clinical trial on Scotchbond Universal



Two-year clinical trial of a universal adhesive in total-etch and self-etch mode in non-carious cervical lesions☆



Nathaniel C. Lawson^{4,*}, Augusto Robles^b, Chin-Chuan Fu^c, Chee Paul Lin^d, Kanchan Sawlani⁴, John O. Burgess⁴

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October 2015: The first clinical trial on Scotchbond Universal

37 adults, 126 teeth with NCCLs,
42 in SBU total-etch group
42 in SBU self etch group
42 in SB Multipurpose group

Observed after 24 months

October 2015:The first clinical trial on Scotchbond Universal

5 failed restorations in total SBU total etch group had most "perfect" ratings and no restorations lost to retention But, this group had higher "sensitivity to cold" scores

Marginal discolouration greater in self etch group

October 2015: The first clinical trial on Scotchbond Universal CONCLUSIONS Scotchbond Universal in total etch or self etch modes performed similar to or better than Scotchbond Multipurpose But, more post-op sensitivity in total etch group

So, why bother to etch dentine when using Scotchbond Universal?

SUMMARY: Universal bonding agents:

Can be used in total etch, self etch, self etch, self etch,

Are compatible with direct & indirect procedures

Can be used with self & dual cure luting materials (with separate activator)

Are suitable primers for silica & zirconia

Can bond to different substrates (e.g.metal)



What's New in Dentine Bonding?: Universal Adhesives

Abstract: The ability to bond restorations to dentine successfully is central to minimally invasive restorative dentistry. While dentinebonding agents have gone through a variety of 'generations', it is the purpose of this paper to describe the latest dentine-bonding agents, the Universal Bonding Agents. These materials may be considered 'Universal' insofar as they may be considered to be capable of being used for direct *and* indirect dentistry, as well as being suitable for use in whichever etching modality the clinician considers appropriate, namely self-etch, etch and rinse or selective enamel etch. Laboratory investigations and initial clinical studies hold the promise that Universal Bonding Agents are a forward step in the quest for the ultimate bond to tooth substance. CPD/Clinical Relevance: New Universal Bonding Agents appear to present a promising advance in bonding to dentine. Dent Update 2017; 44: 177.72

Dentine-bonding agents play a strategic role in the sealing and retention (where necessary) of resin composite restorations, which are increasingly placed by dentists worldwide.¹ Bonding to dentine is also central to the practice of minimally invasive dentistry, given that bonded restorations do not require macro-mechanical retentive features such as locks and keys, which are a feature of non-adhesive (amalgam) cavity preparations.²

FJ Trevor Burke, DDS, MSc, MDS,

MGDS, FDS(RCS Edin), FDS RCS(Eng), FFGDP (UK), FADM, Primary Dental Care Research Group, University of Birmingham School of Dentistry, **Anna Lawson**, BDS, MSC, MPDC(RCS Edin), General Dental Practitioner, Nottingham, David JB Green, BDS(Hons), BSC, MFDS RCS(Edin), StR Restorative Dentistry, Birmingham Dental Hospital and Louis Mackenzle, BDS, General Dental Practitioner, Birmingham and University of Birmingham School of Dentistry, S Mill Pool Way, Pebble Mill, Birmingham BS 7EG, UK. A dentine-bonding agent should perform the following functions:³ Provide a strong, immediate and permanent bond to dentine; Seal the cavity and minimize leakage; Resist microbial or enzymatic degradation; Provide adhesion *per se* of the

restoration in cases where this is necessary; Prevent post-operative sensitivity:

Reduce the risk of recurrent caries;
 Prevent marginal staining;
 Be easy to use.

It is the intention of this paper to update readers on the new group of Universal Dentine Bonding Agents, this being a follow-up to a paper published in 2004 giving details of the last major innovation in bonding to dentine, the introduction of the so-called self-adhesive dentine bonding agents³ and to other Dental Update publications on the subject which readers may wish to read as background or a further update, such as those by Green and Banerjee⁴ and others.³⁶

A brief history of bonding to dentine

In the past, dentine-bonding agents were classified into generations.⁷ However, this means of identifying different groups of bonding agents fell into disarray because of the failure of authorities in the subject to agree on the type of bonding agent which fitted a given 'generation'. Until recently, the classification has therefore been simply, glass ionomer materials, and resin-based dentine-bonding agents, the latter being further classified into *etch and rinse* materials and *self-etch* materials, with some workers classifying the self-etch materials according to their pH.⁸

There are two principal means by which a bond to dentine may be achieved:⁹

First, glass ionomer materials (GIC – glass-ionomer cements) which were developed in the 1970s, initially being derived from the Fluoro-Alumino-Silicate glass used in the silicate cement materials which were used until the 1960s, but with the phosphoric acid used in silicate cements being substituted by a

Conclusion from this publication:

New Universal bonding agents are an advance in bonding

Avoiding post-op sensitivity when using dentine bonding agents Use a so-called self etch or Universal material Do not etch the dentine when using these materials

What is this?



This is a matrix metalloproteinase!

Latest *clinical* research on MMPs



Review article

Inhibition of hybrid layer degradation by cavity pretreatment: *Meta-* and trial sequential analysis



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ARTICLE INFO

ABSTRACT

Article history: Received 5 January 2016 Received in revised form 14 April 2016 Accepted 18 April 2016

Keywords: Chlorhexidine Dentin bonding Ethanol-wet bonding Matrix metallo-proteinase Mdpb Resin restorations *Objectives*: Inhibition of hybrid layer degradation, for example via inhibition of matrix-metalloproteinases (MMP) could reduce risk of retention loss and failure of adhesively placed restorations. This systematic review investigated such inhibitory pretreatment qualitatively and via *meta-* and trialsequential-analysis.

Data sources: We included randomized clinical trials comparing degradation inhibitory cavity pretreatment versus no, placebo or alternative treatments prior adhesive placement of resin-based restorations. Trials reporting retention loss or failure (graded bravo-delta in USPHS or similar criteria) were included. Trial selection, data extraction, and risk of bias assessment were conducted independently by two reviewers. Fixed- or random-effects intention-to-treat, per-protocol, and scenario *meta*-analyses were performed, and trial-sequential-analysis used to control for risk of random errors. Electronic databases (PubMed, Embase, Cochrane CENTRAL) were systematically screened, and hand searches and cross-referencing performed.

Study selection: The ten included trials involved 208 patients (695 cavities) and used chlorhexidine (seven trials), ethanol-wet-honding (two trials) and guaternary appropriate compounds for degradation

Regarding MMPs

The way to obviate problems is to protect the collagen by thorough resin infilatration

Take home message: Avoiding adhesive failures Use a material from a manufacturer with experience in the field and follow the instructions!! One bottle bonding (reduced risk of error) – new Universal materials are a significant advance Effective light curing (check your light regularly!)

Think seriously about selective enamel etching

PRACTICE restorative dentistry

Incisal edge reattachment: indications for use and clinical technique

D. F. Murchison,¹ F. J. T. Burke,² and R. B. Worthington,³

This article presents an overview of the evolution of the incisal edge reattachment procedure. Case reports are described of patients presenting with traumatised teeth in which the reattachment procedure was performed. A review is provided of present in vivo studies detailing long-term success rates in the clinical application of this procedure. Finally, a recommended technique for diagnosis and treatment is offered to improve success in this procedure which may benefit a significant segment of the paediatric and adolescent populations.

Recent investigations into the incidence knowledge level concerning management of dental trauma, especially in the paediatric and adolescent populations, have made it clear that this particular injury is of a significant nature and effects up to one-third of patients in this age group.1 Prior studies have reported estimates that about one out of every four persons under the age of 18 will sustain a traumatic dental injury in the form of an anterior study demonstrated that the presence of crown fracture.2,3 More recent investigations through clinical examinations of restored, exhibits a low resistance to labilarge adolescent populations and surveys ally applied forces which mimic trauma of lay knowledge on the management of force vectors, but may exhibit higher avulsed teeth provide dentoalveolar trauma incident estimates ranging from 6-34%,1,3-6 These reports confirm that dentists are confronted with managing dental trauma and restoring fractured teeth on a regular basis. Techniques that speed and simplify treatment, restore aesthetics, and improve long-term success rates are therefore of potential value and should be considered. The recent investigation by Hamilton et al. however, revealed high failure rates for treatments extended to adolescents experiencing dentoalveolar trauma, as well as a low

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of specific traumatic injuries.5 A review of 25 published case reports indicates that 85% of traumatised incisors fracture in an oblique fashion from the labial to lingual aspects with the fracture line proceeding in an apical direction. This tendency has been confirmed in an in vitro investigation by Stokes.7 This

this unfavourable fracture pattern, once

In brief

 Anterior crown fractures are commonplace in children and adolescents and may affect up to 25% of this patient population. If an intact tooth fragment is present after trauma, the incisal edge reattochment procedure presents a conservative, simple and aesthetic treatment Clinical trials and long-term

follow-up have reported that reattachment using modern dentine bonding agents or adhesive luting systems may achieve functional and aesthetic success for up to 7 years. Reattachment failures may occur with new trauma, parafunction, or horizontal traction. Athletic soft mouthquards and patient education may enhance clinical success.

resistance to horizontal traction forces which occur with incising or tearing food. Other laboratory investigations have been published using models addressing a variety of materials and preparation designs in an attempt to optimise the strength and consistency of the reattachment procedure.8-13

The dental profession has attempted to educate the lay public to the prompt and appropriate management of avulsed teeth.2,14 Numerous international campaigns to improve the emergent response necessary to optimise the prognosis in replantation cases have been carried out in Australia, Denmark, Brazil, Argentina, and the United States.14 These educational attempts may result in patients (or parents) presenting with intact avulsed teeth, as well as fractured coronal tooth fragments. This article will address the treatment regimen for incisal edge reattachment, a treatment option that offers advantages of simplicity, immediate aesthetics, and conservatism in cases of dental trauma

Historical perspective

The first published case reattaching a fractured incisor fragment was reported in 1964 by paediatric dentists at Hebrew University, Hadassah School of Dentistry.¹⁵ In an era of dentistry prior to commonplace acid-etching and bonding, the authors termed this treatment a temporary restoration. Other reports espousing a variety of preparation design features and materials for reattachment have appeared in the literature restoring teeth presenting with and without pulpal or periodontal complications, 16-43 Though some in vitro investigations attempted to define optimised materials and reattachment regimens, the majority of design features had been chosen empirically.

Reattachment techniques have been described in demanding clinical situations,34,38 including one case reported by Simonsen in which an incisor fragment was reattached and the tooth subsequently subjected to orthodontic treat-

Read more! Br.Dent.J.1999:186: 614-617

In brief

- Anterior crown fractures are commonplace in children and adolescents and may affect up to 25% of this patient population.
- If an intact tooth fragment is present after trauma, the incisal edge reattachment procedure presents a conservative, simple and aesthetic treatment.
- Clinical trials and long-term follow-up have reported that reattachment using modern dentine bonding agents or adhesive luting systems may achieve functional and aesthetic success for up to 7 years.
- Reattachment failures may occur with new trauma, parafunction, or horizontal traction. Athletic soft mouthguards and patient education may enhance clinical success.

Andreasen FM, Noren JG, Andreasen JO, Englehardsen S. et al., Quintessence Int.1995:26:669-681.

- Good fragment retention, acceptable aesthetics
- Use of a dentine bonding agent with acid etching provides greater strength
- Fragment loss was usually due to a second blow

 Not a successful means of managing crown-root froatures Approx 25% of 334 rebonded fragments were retained at 7 years after bonding

"...reattachment of the coronal fragment is a realistic alternative" It's not perfect, ít's pragmatic aesthetics!

The literature states that patient appreciation is high

Poyser NJ, Briggs PFA, Chana HS, Kelleher MJD et al. Evaluation of direct composite restorations for the worn mandibular anterior dentition – clinical performance and patient satisfaction. J.Oral Rehabil.2007:34:361-376

Burke FJT, Kelleher MGD, Wilson NA, Bishop K. Introducing the Concept of Pragmatic Esthetics, with Special Reference to the Treatment of Tooth Wear, Journal of Esthetic and Restorative Dentistry.2011:23:277–293.



What's new in polishing?

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How much time and effort do you spend creating beautiful smiles? Whether you currently use a rubberized finishing and polishing system or an intraoral diamond polish, the process can be time-consuming. And, even with your best effort, the gloss may not last. 3M has a simple solution for both problems, using two of our innovative technologies.

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Sof-Lev"

(nink)

Diamond Polishing Spiral

*Compared to other finishing and polishing tools.

You can create a diamond paste-like gloss with just two steps.





A difference that you can see!



Filtek[™] Supreme Ultra Universal Restorative polished with Sdr-Lex[™] Diamond Polishing System (loft) vs. TPH Spectra® Universal Composite polished with Enhance® Finishing System and PoGo® Polishing System (right). Notice a clearer reflection with the Sdr-Lex[™] Diamond Polishing System.

Summary of advantages

- Imparts paste-like gloss in the convenience of a rubberized system
 Unique, flexible shape adapts to all tooth surfaces
 Fast and easy to use
 Multi-use, can be sterilized and reused
- High, long-lasting gloss when used with Filtek^{Te} Supreme Ultra Universal Restorative

I think that the Soflex Diamond Spiral is terrific!



Take home messages

Dentine bonding is now reliable and effective

Self etch adhesives do not produce bond strengths as high as etch & rinse systems

Selective etching of enamel is a good idea

Universal bonding materials with MDP are now the business

Take home message **Bonding restorations** is more minimally invasive, and, potentially therefore less likely to have a bad medicolegal outcome

But, others are still adopting an invasive approach (and being sued!) **Reasons to adopt minimal intervention** Patients like it (if you advise them of your philosophy) Teeth like it (fewer die!) It's easier for dentists (fewer die: better for their blood pressure!) Lawyers hate it (fewer dentists get sued!) We now have materials to make this work

The database

- SN7024, available from UKDataService.ac.uk contains anonymized longitudinal data on patients attending the General Dental Services in England and Wales (UK)
- Over three million different patients
- Over 25 million courses of treatment, between 1990 & 2006
- Modified version of Kaplan-Meier methodology used to plot survival curves for different sub-groups
"it is unrealistic to expect controlled longitudinal studies to last more than ten years" **Mjor et al, 1990**

Therefore, large scale

The big numbers game But some things are lost

I can give you lots of tables & figures!

	Survival (%) at				
Type of Treatment	1 year	5 years	10 years	15 years	n
Amalgam	91	66	51	41	7,292,564
Composite Resin	87	59	43	34	3,504,225
Glass-ionomer	84	53	37	28	1,592,566
Crown	93	77	63	53	1,202,005
Inlay	90	67	49	37	86,189
Veneer	90	69	52	42	66,509
Multiple types	88	59	41	30	151,990
All Restorations	89	64	48	39	13,896,048

a total of 13,896,048 tooth restorations

First, a brief lesson in Kaplan Meier

The goal is to estimate a population survival curve from a sample. If every patient is followed until death, the curve may be estimated simply by computing the fraction surviving at each time.

However, in most studies patients tend to drop out, become lost to follow up, move away, etc.

A Kaplan-Meier analysis allows estimation of survival over time, even when patients drop out or are studied for different periods of time.

First, a brief lesson in Kaplan Meier

For restorations, the observation time starts at time 0 in the graph. Restorations that fail result in a drop in the graph. Restorations that have not failed by the end of the study are called *censored* observations and these are included for only as long as they are observed. Since information of both failed and nonfailed restorations is used, the Kaplan Meier method is considered the gold standard in longevity assessment.

n=10 hypothetically Kaplan Meier



Vertical axis represents estimated probability of survival for a hypothetical cohort, not actual % surviving.



In Stephen Hancocks' October 26, 2018 editorial, he compares Kaplan Meier to a line of ants!



'We can apply what we have observed of actual behaviour from the past to our decision making in the future...' Looking at what has happened will give us a handle on how well restorations (and restored teeth) might survive

This is important when advising patients on how well their treatment might perform, because patients are sueing dentists more each year

Experts in the field consider Kaplan Meier to be the method of choice for assessing restoration survival

Dentistr

JOURNAL OF DENTISTRY 39 (2011) 225-230



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journal homepage: www.intl.elsevierhealth.com/journals/jden

Age of failed restorations: A deceptive longevity parameter

Conclusion: In absence of all dates of placement and failure for a series of restorations a reliable measure of restoration longevity is not yet available. Kaplan–Meier statistics remains the preferred method of calculating longevity of a group of dental restorations.

Article history: Received 22 September 2010 Received in revised form 8 December 2010 Accepted 10 December 2010

Keywords: Longevity Survival Median Dental restoration Cross-sectional There is pressing need to enhance evidence base in respect of longevity of restorations. Currently, there is lack of appreciation of differences between survival data based on the age of failed restorations as compared to gold standard Kaplan-Meier statistics.

Objectives: This study was undertaken to compare and contrast longevity data for a number of data sets. It investigated if restoration longevity, as calculated by the Kaplan–Meier method, is different from longevity according to the median survival time of failed restorations.

Methods: Existing clinical datasets of dental restorations and an artificial dataset were used to calculate longevity according to Kaplan–Meier statistics and by means of calculation of median age of failed restorations.

Results: The findings indicate that median age of failed restorations may be considered as a deceptive measure of restoration longevity. Specially extending the duration of longitudinal studies of restorations apparently leads to higher values for median age of failed restorations. Restorations of materials that tend to exhibit early failures may have lower values for median age of failed restorations, compared to restorations of different materials which tend to exhibit failures later in clinical service, and thereby not giving a true measure of overall restoration longevity.

Conclusion: In absence of all dates of placement and failure for a series of restorations a reliable measure of restoration longevity is not yet available. Kaplan-Meier statistics remains the preferred method of calculating longevity of a group of dental restorations. © 2011 Elsevier Ltd. All rights reserved.

If you don't believe Trevor!

The effect of cavity design on amalgam restoration survival

The ultimate guide to restoration longevity in England and Wales. Part 2: Amalgam restorations – time to next intervention and to extraction of the restored tooth

F. J. T. Burke^{*1} and P. S. K. Lucarotti¹

Key points

Circa 7.3million amalgam restorations were included, of which 2.5million had a re-intervention at 15 years. Kaplan Meier Analysis revealed that, overall, 41% of amalgam restorations had not required a re-intervention at 15 years. Larger restorations survived less well to re-intervention than small restorations, with similar findings for time to extraction of the restored tooth. The placement of a dentine pin in restorations resulted in poorer performance of restorations. Amalgam restorations in younger patients performed better than those in older patients, both in terms of time to re-intervention and time to extraction of the restored tooth.

RESEARCH

Aim It is the aim of this paper to present data on the survival of amalgam restorations by analysis of the time to re-intervention on the restorations and time to extraction of the restored tooth, and to discuss the factors which may influence this. Methods A data set was established, consisting of General Dental Services' patients, this being obtained from all records for adults (aged 18 or over at date of acceptance) in the GDS of England and Wales between 1990 and 2006. The data consist of items obtained from the payment claims submitted by GDS dentists to the Dental Practice Board (DPB) in Eastbourne, Sussex, UK. This study examined the recorded intervals between placing an amalgam restoration and re-intervention on the tooth. Direct placement restorations: amalgam

7,425,049 amalgam cases included, of which 2,537,331, of which had a re-intervention

Amalgam Restoration Survival by Type of Cavity



Take home message Keeping restorations as small as possible is therefore important

We can only do this with adhesive dentistry

Which brings us to resin composite for posterior teeth!





These need a topping because their wear resistance isn't good enough









Smart Dentin Replacement

The Minamata Convention Final agreement, 10th & 11th October 2013, 147 countries signed up

From 1st July 2018, amalgam banned in children under 15 and pregnant/nursing women

"Worldwide reduction and ultimate ban on mercury containing products" And, don't forget that patients seem to like tooth-coloured restorations in their back teeth!

Dent.Update.1989: 16.114-116

RESEARCH

IN BRIEF

- One hundred and eighty dental surgeries were tested for environmental mercury.
- Sixty eight per cent had environmental mercury readings over the occupational exposure standard.
- Greater emphasis is needed in the safe handling of mercury.
- Dentists were more likely to have suffered a kidney disorder than the control group.

Another reason

Mercury vapour levels in dental practices and body mercury levels of dentists and controls

K. A. Ritchie,¹ F. J. T. Burke,² W. H. Gilmour,³ E. B. Macdonald,⁴ I. M. Dale,⁵ R. M. Hamilton,⁶ D. A. McGowan,⁷ V. Binnie,⁸ D. Collington⁹ and R. Hammersley¹⁰

Aim A study of 180 dentists in the West of Scotland was conducted to determine their exposure to mercury during the course of their work and the effects on their health and cognitive function.

Design Data were obtained from questionnaires distributed to dentists and by visiting their surgeries to take measurements of environmental mercury.

Methods Dentists were asked to complete a questionnaire including items on handling of amalgam, symptoms experienced, diet and possible influences on psychomotor function such as levels of stress

significantly associated with their level of mercury exposure as measured in urine. One hundred and twenty two (67.8%) of the 180 surgeries visited had environmental mercury measurements in one or more areas above the Occupational Exposure Standard (OES) set by the Health and Safety Executive. In the majority of these surgeries the high levels of mercury were found at the skirting and around the base of the dental chair. In 45 surgeries (25%) the personal dosimetry measurement (ie in the breathing zone of dental staff) was above the OES.

CONCLUSIONS

- Dentists short-term memory worse than controls
- Periodic health surveillance of DHCWs indicated
- Kidney disorders not correlated with surgery Hg vapour levels
- Safer handling of amalgam needed
- Further studies indicated on all members of the dental team

1991, Directorate to reduce amalgam use 2003, National clinical guidelines - encouragement to reduce amalgam use. Amalgam no longer the material of choice for posterior teeth, informed consent needed from the patient if amalgam used 2007, Restrictions on mercury vapour emissions from crematoria 2008, Partial ban on amalgam use 2011, Complete ban, although dentists can apply for exemptions

Lynch CD, Wilson NHF. Br.Dent.J.2013:215:159-162

Environmental concerns......YES Toxicity issues......NO

No toxicity issues for patients: ?? for dentists??

Slide made in 1996

The verdice on amalgam?

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BACK IN FIVE MINUTES

Contemporary UK dental practice 2015/16: Comparison with previous results: premolars Amalgam for Class II, 2002....86% Amalgam for Class II, 2008....59% Amalgam for Class II, 2015....40% 25% of respondents stated that amalgam should continue to be used freely, 41% considered that it should be

Burke FJT, Wilson NHF, Brunton PA, Creanor S.BDJ 2019

Reinforced Glass ionomer materials

- Y Smaller particle size leads to faster reaction
- Y Higher loading brings improved physical properties
- Y Exhibits plastic features can be condensed and packed
- Y Still a need for improved wear resistance
- **Y** Typical glass ionomer features

Clinical performance of reinforced GIC materials in loadbearing situations



FJ Trevor Burke

Dental Materials- What Goes Where? The Current Status of Glass Ionomer as a Material for Loadbearing Restorations in Posterior Teeth

Abstract: Glass ionomer materials have been available for 40 years, but have not been indicated for loadbearing restorations, other than when used in the ART concept. However, there is anecdotal evidence that dentists are using the reinforced versions of this material in posterior teeth, possibly as a result of demands from patients to provide them with tooth-coloured restorations in posterior teeth at a lower cost than resin composite. This paper reviews the existing literature on reinforced glass ionomer restorations in posterior teeth, concluding that, under certain circumstances (which are not fully elucidated) these materials may provide reasonable service. However, the patient receiving such restorations should be made aware of the minimal amount of evidence for the success of these restorations and the potential need for the restorations to be re-surfaced in due course.

8 papers on GI in posterior teeth included

Conclusions

In clinical situations where there are no adverse situations at work (such as high occlusal loading or an acidogenic plaque), certain restorations in reinforced GI materials (such as Fuji IX) may provide reasonable longevity. However, the conditions for longevity are not readily identified. Two of the studies (Scholtanus and Huysmans, 2007: Basso, 2013) demonstrate higher than desirable failure rates for GI restorations in posterior teeth, especially in the longer term.

Trevor's view

Until more high quality evidence becomes available, for practitioners using reinforced GI materials in loadbearing situations in posterior teeth, it is prudent to advise patients of the relative paucity of good quality evidence for the success of the restorations that they are placing.

Gls in posterior teeth – a medicolegal perspective

- Tell the patient that it is a glass ionomer that the evidence base is variable and limited
- Definitive restoration or long term provisional?
- The restorations may need re-surfacing with composite
- Alternatives are more expensive
- May not do harm

Possibly OK in class I cavities?

And, reinforced glass ionomers are a Godsend to special care dentists

What does F stand for in dental materials?

Glass-ionomer Restoratives: A Systematic Review of a Secondary Caries Treatment Effect

concise perfew "F" word

R.C. Randall* and N.H.F. Wilson

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Abstract. It is generally accepted that glass ionomers inhibit secondary caries *in vivo*, and data from *in vitro* studies support this effect. The aim of this review was a systematic assessment, from the literature, of clinical evidence for the ability of glass-ionomer restoratives to inhibit secondary caries at the restoration margin. Inclusion and exclusion criteria for selection of the review papers were established prior to commencement of the literature search. Papers which conformed to these criteria, and reported on secondary caries as an outcome, were selected (N = 52). Primary and secondary lists of systematic criteria for use in

Introduction

There is increasing interest in evidence-based dentistry (Antczak-Bouckoms *et al.*, 1994; 1 Lawrence, 1995), echoing similar discussions The intention of this approach is to base treatn for patients on a combined use of current best individual clinical expertise (Sackett *et al* application of treatments for which valid effectiveness is judged to have been establishe

Fraud **Fiction** Fudge False Fools **Fairies**

The F-word Fluoride /S released by glass ionomers but its effect is small. Fluoride released by F-containing composites is negligible

28 papers included No conclusive evidence for or against inhibition of secondary caries by glass ionomer restoratives

Equia Forte seems to hold promise



Differences from Fuji IX

New ultrafine highly reactive glass particles added

Higher molecular weight polyacrylic acid

20% improved flexural strength, 21% improvement in acid resistance, 40% wear resistance

Improved fluoride release





Enhanced CPD DO C



F J Trevor Burke

Louis Mackenzie and Adrian CC Shorthall

The conclusion gleaned from the above cohort studies is that resin composite restorations have acceptable survival rates when placed in loadbearing situations in posterior teeth, with AFRs generally within the range 2% to 3%, which the authors consider to

Survival Rates of Resin Composite Restorations in Loadbearing Situations in Posterior Teeth

Abstract: The use of resin composite for routine restoration of cavities in posterior teeth is now commonplace, and will increase further following the Minamata Agreement and patient requests for tooth-coloured restorations in their posterior teeth. It is therefore relevant to evaluate the published survival rates of such restorations. A Medline search identified 144 possible studies, this being reduced to 24 when inclusion criteria were introduced. Of these, ten directly compared amalgam and composite, eight were cohort studies, and six were systematic reviews. It was concluded that posterior composites may provide restorations of satisfactory longevity and with survival rates generally similar to those published on amalgam restorations. However, the ability of the operator in placing the restoration may have a profound effect. **CPD/Clinical Relevance:** With the increasing use of composite for restorations in posterior teeth, it is relevant to note that these may provide good rates for survival. **Dent Update 2019; 46: 523–535**

Resin composite has been an alternative material to dental amalgam since the first

use of resin composite materials in posterior teeth (hitherto termed 'posterior composites')

need for high-quality evidence from primary dental care'. It has also been noted that RCCTs

144 studies identified, 24 included

The conclusion gleaned from the above systematic reviews is that resin composite restorations have acceptable survival rates when placed in loadbearing situations in posterior teeth, with AFRs generally within the range 2% to 3%. Risk factors for premature failure include patients at high risk of caries and the presence of a liner or base beneath the resin composite restoration.

> Dent.Update. 2019:46: 523-535

shrinkage STRESS is the problem Stress is a function of materials factors such as: **Polymerisation shrinkage** Modulus of elasticity/filler load Degree of conversion
Five ways: **1.Increase the filler loading** 2.Reduce resin shrinkage **3.Reduce % resin conversion** 4.Bulk fill low stress material 5.Use a high molecular wt. resin

The Filtek[™] Silorane System

The first composite to achieve 1% shrinkage

Weinmann W, Thalacker C, Guggenberger R. Siloranes in dental composites. Dent.Mater. 2005:21:68-74

Silorane: good results at 5 years

cavities.²⁴ The lack of post-operative sensitivity when using a low shrinkage stress material, in conjunction with its self-etch adhesive, is considered to be a significant benefit by the present authors, with their advice to clinicians to determine the shrinkage stress of materials that they are considering using in posterior teeth.

Keywords

Clinical Evaluation Restarative Dentistry Resin Composite Low Shrinkage Stress

Authors
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Glanical Lecturer, University of Birmingtoni School of Dentistry, College of Medical and Dentistry, College of Medical and

Five Year Clinical Evaluation of Restorations Placed in a Low Shrinkage Stress Composite in UK General Dental Practices

ABSTRACT

This paper evaluates the five year clinical evaluation of restantions formed in a lowslowbage stores near a comparise material GM ESPE (File) Simone. South Commonly, and place in the operand instal pacefores of the runnelse at the PHEP Panel, a group of UR pacefore based researchers. Results indicated satisfactory performance of the material andre valuation, other than for marginal statistic, which affected GGA of the material andre valuated affection, which with hose hand USs of the clinical motion these andres of the five panel, about with hose hand USs of the clinical the extension on gate evaluated and clinical performance in the majority of parameters which new assumed a line years.

INTRODUCTION

PRACTICE BASED RESEARCH

The value of practice-based research has been previously discussed, with the areas of general dental practice having been considered the ideal environment in which to carry out evaluations of the handling of dental materials and their clinical effectiveness. It is the "real world" in which the majority of dental care is provided, worldwide.

A UK-haved group of practice-based researchers is the PBEP (Product Research and Evaluation by Practitioners) Panel. This group, established in 1999, have completed over 70 projects - including elght clinical evaluations of rustorations placed under general dental practice conditions, H is apparent that the advantages of practice-based research are now being

CONCLUSION

Restorations formed in a low shrinkage stress resin composite restorative system and placed under general dental practice conditions in the UK, were found to provide good clinical service at five years, albeit with a high incidence of marginal staining at some sites around the restorations.

Take home message

Indications at 5 years are that a low shrink composite, Filtek Silorane, is a viable alternative for restoration of posterior teeth What we leant was that low shrinkage stress is important in reducing post-operative sensitivity

Filtek Bulk Fill Posterior Restorative: Advantages over Silorane

- One-step placement
 5 mm depth of cure
 Can use dentine bonding agent of choice
 Therefore, faster than Silorane Bond
 Easier polishing due to nanofiller
- Potentially better aesthetics
 BUT
- Still excellent stress relief
 Still excellent handling and sculptability



New Methacrylate Monomers for Lower Shrinkage and Stress Relief



AFM: Addition-fragmentation (AF) monomer



Filtek[™] One Bulk Fill Restorative

Filler (total inorganic filler loading = ~76.5 wt%, 58.5 vol%)

NANO!

\NO!

- Silica filler, 20nm, non-agglomerated
- Zirconia fille
 - ^{fille} Nanofiller technology enables ...
- Zirconia/silio
- Ytterbium tr
- Excellent polish retention
- Management of opacity and translucency
- High strength
- Low potential for voids
- Excellent wear resistance



My new classification for **BULK FILL** materials: BULK FILL BASE MATERIALS (which need a capping because their wear resistance isn't good enough)

BULK FILL RESTORATIVE MATERIALS (satisfactory wear resistance)



These need a topping because their wear resistance wasn't good enough

So, the original bulk fill base materials are now history!



Flowable Restorative

Bulk fill started with the bulk-fill flowable base materials



NOW!



New bulk fills that don't need a topping!

My new classification for **BULK FILL** materials:

LKFILL

BULK FILL RESTORATIVE MATERIALS (satisfactory wear resistance)



BUL

Faster posterior composites without compromise!



Tetric EvoCeram[®] Bulk Fill Nano-Hybrid Composite with Ivocerin[®]



IS I

Advantages of Bulk Fill Restorative materials • Time saving, no need for complex layering technique • Easier handling • Fewer increments, fewer voids

- Simpler shade selection,
 - due to fewer shades

Are new bulk fill composites quicker to place?

Title: 1407 - Clinical-time and Postoperative-sensitivity When Using Bulk-Fill Composites With Universal Adhesives

Authors:

Chane Tardem Pereira (**Presenter**) Fluminense Federal University

Elisa Albuquerque, Federal Fluminense University Sthefane Barbosa, Fluminense Federal University Leticia Lopes, Fluminense Federal University Fernanda Calazans, Fluminense Federal University Stella Marins, Fluminense Federal University Luiz Augusto Poubel, Fluminense Federal University Roberta Barcelos, Fluminense Federal University Marcos Barceleiro, Fluminense Federal University

Abstract:

Objectives: The first objective of this double-blind randomized clinical trial was to compare the different clinical-time using Scotchbond Universal adhesive (3M ESPE), in self-etch or selective enamel-etching strategy, associated with incremental or bulk-fill composite in posterior restorations. The second objective was to compare the postoperative sensitivity, 24h and 48h after the restorations.

Methods: A total of 196 restorations were placed in 43 patients according to the following groups: SETB– Self-etch/bulk fill; SETI– Self-etch/incremental; SEEB- Selective enamel-etching/bulk-fill and; SEEI– Selective enamel-etching/incremental. Filtek Z350XT composite (3M ESPE) was incrementally placed and Filtek Bulk Fill (3M ESPE) was placed using Bulk-fill technique. The adhesive system was used according to manufacturer's instructions. Postoperative-sensitivity was evaluated using two scales (NRS and VAS).

196 restorations in 43 patients

Filtek Z350 vs Filtek Bulk Fill, both placed with SB Universal

"Less time consuming"

Conclusions: The simultaneous use of the tested Universal adhesive using the self-etching strategy with the tested Bulk-fill composite is less time consuming and does not increase the postoperative risk or intensity when compared with traditional incremental technique.

Keywords

Evaluation Composite Resins BuildFill Headling Properties

Authors

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European Journal of Prostho dont ics and Restonative Denti sty (2016) 24, 152-157

...............................

A Practice-Based Clinical Evaluation of a Bulk Fill Restorative Material

ABSTRACT

Objective: To evaluate the handling, by a group of practice-based researchers, of a recently introduced holk III resid-based compaste restorative material, Fitak Balk Bal Restorative COM ESFE1. Methods: The twelve selected evaluators were sent explanatory letters, a pack of the material under investigation to use for 8 weeks, and a questionnaire. Results: The evaluators raised the ease of use of the bolk III restorative the same as the previously used poster in compositematerial. The previous of one shade only for evaluation may have compromised the score for a esthetic quality. No post-operative sensitivity was reported. Conclusions: The bolk III material was well received as indicated by the high number of evaluators who would both purchase the material and recammend it to calle agrees. Chick al relevance: A recently introduced bulk III restarative material achieved a cating for handling which was similar to the evaluators' previously used resis composite, although there were some concerns regarding the translocency after instantial.

INTRODUCTION

PRACTICE BASED RESEARCH

The value of practice-based research has been previously discussed,¹ with the arena of general dental practice having been considered the ideal environment in which to carry out evaluations of the handling of dental materials and their clinical effectiveness. In this regard, a wide variety of research projects may be considered to be appropriate to general dental practice, including¹ assessment of materials, devices and techniques, clinical triats of materials, assessment of treatment trends and, patient satisfaction with treatment.

A UK-based group of practice-based researchers is the PREP (Product Re-

Filtek[™] Bulk Fill Posterior Restorative

The PREP Panel evaluation

FBFR assessment Conclusions 75% of evaluators would purchase 92% (n=11) would recommend to colleagues

> The new Filtek[™] One Bulk Fill Restorative handles similarly

How do manufacturers do it?

SUMMARY

More potent/efficient initiator systems Increasing the translucency of the filler For some, improved resin systems

Avoiding post-op sensitivity with posterior composites Use a so-called self etch or Universal Material, AND do not etch the dentine Use a low shrinkage stress composite Ensure good adaptation at the gingival margin Ensure adequate light luring **Use a reliable manufacturer's material**

An amalgam substitute should: Be self adhesive Have 5mm depth of cure Have low shrinkage stress Have good physical properties and good wear resistance Be quick & easy to place Be non toxic

In addition, today, adequate aesthetics for back teeth



Optiview:Kerr

Evaluation of a novel flexible lip retraction system by UK practitioners.

R J Crisp^{*}and F J T Burke. (University of Birmingham, UK) Program number 608

INTRODUCTION

>1993 saw the establishment of a group of practicing dental practitioners, the PREP (Product Research and Evaluation by Practitioners) Panel¹, who were prepared to complete evaluations of new materials and techniques in the practice environment. To date, over 40 evaluations, including handling evaluations and clinical trials², have been completed. The PREP panel presently has 29 members (61% holding post-graduate qualifications) with an average time since graduation of 21 years. The Panel has a UKwide distribution and a wide range of dental interests facilitating the assessment of a full range of products and techniques.

> The purpose of this study is to evaluate the handling properties of a new flexible lip retraction system (Optragate, Ivoclar Vivadent UK), which consists of 2 flexible plastic rings connected by a latex free plastic material. (Fig. 1) It was tested in 2 sizes, Regular and Small but is also now available in a Junior sizing for young patients.



METHOD

Twelve dental practitioners from the PREP Panel were chosen at random and sent twenty of the retractors along with a questionnaire designed to evaluate the presentation, handling and ease of use of the system. Most responses were given on a visual analogue scale (VAS). The evaluators were also asked the reasons for use of lip retraction systems, and to compare the currently used system with the new retractor.

BACKGROUND INFORMATION

Ten (83%) of the evaluators currently used a lip retraction system. All but one evaluator used the plain plastic photographic type of retractor. Nine (75%) used the retractors for photography and 4 (33%) for an aid to isolation. The evaluators rated the ease of use of the currently used lip retraction system on a VAS (where 1 = difficult to use & 5 = easy to use) as follows:



ESULTS

Six (50%) of the evaluators stated that the sizes provided were adequate. The remaining 50% all stated that the regular size was too large and a smaller size than 'small' was required. (See note in Introduction).

- When asked if Optragate adequately protected the lips, 9 (75%) stated that it did. The remaining three evaluators (25%) all stated that the bottom lip slipped out.
- -58% (n=7) of the evaluators encountered difficulties initially with the use of Optragate. Comments made by these evaluators included:
- "Initially difficult but with practice and Vaseline- I could slip it on almost undetected!" and "Needs to be moist to fit"
- Patient comments reported included:
- "Easier to keep my mouth open", "More comfortable then rubber dam" and "Uncomfortable behind lower lip"
- > Just one evaluator reported a symptom or side effect from the use of Optragate, and that was hypersalivation in 2 cases.
- Eight (67%) of the evaluators stated that they would purchase the Optragate system and 9 (75%) that they would recommend the system to colleagues.
- The evaluators rated the ease of use of the currently used lip retraction system on a VAS (where 1 = difficult to use & 5 = easy to use) as follows:



> Final comments included:

"I use them all the time for surgical procedures now, especially implant placements - it helps keep the patient's mouth open, and is more gentle on the tissues than a conventional retractor. It also allows both me and my nurse an extra hand as we are not having to retract!" and "Innovative and effective – a joy!"

CONCLUSIONS

The Optragate lip retraction system has been subject to an extensive clinical evaluation in which it scored better for ease of use than the lip retraction system used previously. The majority of evaluators would both purchase the system and recommend it to colleagues. The sizes of Optragate provided for this evaluation did prove problematic, with 50% of the evaluators requiring a smaller size (now provided). This was a product that seemed to gain favour and find more applications the more it was used.

ACKNOWLEDGEMEN"

The support of lvoclar Vivadent UK is acknowledged. The authors also wish to thank the participating practitioners.

REFERENC

5

1.Burke F J T, Wilson N H F. Introducing the PREP panel. Dent. Pract 1994; 32 (18): 30.

 Burke, F J T, Crisp R J et al. Two-year evaluation of restorations of a packable composite placed in UK general dental practices. BDJ 2005; 199(5): 293-296

Latest research on restoration survival



Because of the size of the dataset, we can now look at the effect of the restoration on survival of the *tooth*



General Rules for survival Contractions & teeth

These "rules" apply throughout the dataset

The effect of root filling on restoration survival



...with apologies to my endodontist friends!

The effect of root filling on survival of the restored tooth is even more dramatic



The message therefore is... prevention, and educating patients that restoring a tooth before the pulp is involved is a good idea! Or, sealing in caries in a vital, asymptomatic tooth.

Edwina Kidd's paper in Dental Update on this topic is essential reading

Cariology





Edwina Kidd

Ole Fejerskov

Bente Nyvad

Infected Dentine Revisited

Abstract: Dentine becomes infected as a result of caries lesion formation on root surfaces and when lesions progress following cavitation of enamel lesions. However, this infection is unimportant because the driving force for lesion formation and progression is the overlying biofilm. This explains why root surface caries can be controlled by mechanical plaque control and fluoride, and restorations are not needed to arrest these lesions. Similarly, the infected dentine in cavitated coronal lesions does not have to be removed to arrest the lesion. If the lesion is either accessible or opened for cleaning by the patient or parent, the lesion can be arrested. Sealing of infected dentine within the tooth, either by a Hall crown in the primary dentition or by partial caries removal prior to placing a well-sealed filling, will also arrest the lesion. When restoring deep lesions in symptomless, vital teeth, vigorous excavation of infected dentine is likely to expose the pulp and make root canal treatment necessary. Thus 'complete excavation' is not needed and should be avoided. **CPD/Clinical Relevance:** Root surface caries can be arrested by cleaning and fluoride application. Restorations are not essential. Vigorous excavation of softened dentine in deep cavities of symptomless, vital teeth is contra-indicated. It is not needed and increases the risk of

Kidd E, Fejerskov O, Nyvad B. Infected dentine revisited. Dent.Update.2015:42:802-809.

CONCLUSIONS





Edwina Kidd

Ole Fejerskov

Bente Nyvad

When restoring deep caries lesions in vital, asymptomatic teeth, vigorous excavation is likely to expose the pulp. This complete excavation is not needed and should be avoided.

Always produce a sound cavity margin for bonding.

make root canal treatment necessary. Thus complete excavation is not needed and should be avoided. CPD/Clinical Relevance: Root surface caries can be arrested by cleaning and fluoride application. Restorations are not essential. Vigorous excavation of softened dentine in deep cavities of symptomless, vital teeth is contra-indicated. It is not needed and increases the risk of JOURNAL OF DENTISTRY 43 (2015) 1-15



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Review

Effects of using different criteria for caries removal: A systematic review and network meta-analysis



Falk Schwendicke^{a,*}, Sebastian Paris^a, Yu-Kang Tu^b

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ARTICLE INFO

Article history: Received 29 September 2014 Received in revised form 10 October 2014 Accepted 13 October 2014

Keywords: Bayesian Carisolv Criteria Dental Excavation Fluorescence ABSTRACT

Objectives: Conventionally, caries excavation is performed until only hard dentine remains, while more selective and reliable criteria might be available. We aimed at systematically comparing the effects of using different excavation criteria via network meta-analysis. Sources: Electronic databases were searched for randomised or non-randomised clinical trials (RCTs/NRCTs) evaluating excavation of cavitated lesions.

Data: Criteria were divided into six groups: Excavation until pulpo-proximal dentine on the cavity floor was (1) either hard on probing, (2) slightly softened on probing, (3) not stainable by caries-detector-dye, or until (4) self-limiting polymer burs, (5) fluorescence-assisted devices or (6) chemo-mechanical gels indicated termination of the excavation. Evaluation of risk of complications, risk of pain/discomfort, excavation time, and number of remaining bacteria were then undertaken using Bayesian network meta-analysis.

Study selection: 28 studies (19 RCTs, 9 NRCTs) with 1782 patients (2555 lesions), most of them investigating primary teeth, were included. Risk of complications was highest when excavating until only non-stainable dentine remained, and lowest when not attempting to remove all softened dentine. Risk of pain significantly decreased if self-limiting chemomechanical excavation or fluorescence-assisted lasers were used instead of excavating until all dentine was hard. When not attempting to remove all softened dentine, the time required for excavation was shortest, whilst the greatest number bacteria remained.

Conclusions: Not attempting to remove all softened or stainable dentine might reduce the risk of complications. Data regarding self-limiting excavation is insufficient for definitive conclusions. Excavation criteria should be validated against clinically relevant outcomes. Clinical significance: Given current evidence, dentists might not need to attempt excavation until only hard dentin remains in proximity to the pulp. Instead, their choice of excavation criterion or method should be guided by clinical requirements and outcomes.

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Systematic review: 28 studies

Conclusions:

JOURNAL OF DENTISTRY 43 (2015) 1-15



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journal homepage: www.intl.elsevierhealth.com/journals/jden

Review

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Falk Schwendicke^{a,*}, Sebastian Paris^a, Yu-Kang Tu^b

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Removal of all softened biomass until only hard dentine remains was clinically inefficacious

No studies indicated that complete excavation had any advantages to removing only soft dentine

Not attempting to remove all softened dentine could reduce the risk of complications

CONCLUSION

The seal's the deal!

HOT under the collar? CONCLUSION: The evidence base for this is building



Another way of managing deep caries in a vital tooth

Biodentine^m

Bioactive Dentine Substitute







Biodentine[™]

Tricalcium Silicate technology

septodont



SEPTODONT 58, rue du Pont de Créteil 94107 Saint-Maur-des-Fossés Cedex France Tel : 33 (0) 1 49 76 70 00

ACTIVE BIGSILICATE TECHNOLOGY

each grain of calcium silicate. The hydrated arcium hydroxide tend to precipitate at the surface of es of the powder, due to saturation of the medium. This







Problems involving dentine





Can one material be used instead?



Indications

Crown	Root
Permanent dentine restorations	Root perforations
Deep cavities	Pulpal floor perforations
Pulp capping	Internal/External resorptions
Pulpotomy	Apexification
Temporary enamel restoration	Apical surgery


The



evidence base is building

ARTICLE IN PRESS

al Research

Abstract

Respons and Mir

Alicja Nowic Katarzyna S Anita Kosier and Jadwiga

Abstract

Introduction: Bio that is similar to the gate (MTA). It has which may be cons indications of denti direct pulp capping was to compare the in human teeth afte cium silicate-base Methods: Pulps in ular permanent in extraction for orth exposed and assig Biodentine or MTA, ical response and c After 6 weeks, the hematoxylin-eosin, scoring system. Re showed complete absence of inflam well-arranged odo were found to form tin. Statistical analy between the Bioder during the observa the limitations of t efficacy in the clin an interesting alten ment during vital p

Introduction: Biodentine is a new bioactive cement that is similar to the widely used mineral trioxide aggregate (MTA). It has dentin-like mechanical properties, which may be considered a suitable material for clinical indications of dentin-pulp complex regeneration such as direct pulp capping. The purpose of the present study was to compare the response of the pulp-dentin complex in human teeth after direct capping with this new tricalcium silicate-based cement with that of MTA. Methods: Pulps in 28 caries-free maxillary and mandibular permanent intact human molars scheduled for extraction for orthodontic reasons were mechanically exposed and assigned to 1 of 2 experimental groups, Biodentine or MTA, and 1 control group. Assay of periapical response and clinical examination were performed. After 6 weeks, the teeth were extracted, stained with homotopulin opcin, and extensional hyucing a histologi

scoring system. Results: The majority of specimens showed complete dentinal bridge formation and an absence of inflammatory pulp response. Layers of well-arranged odontoblast and odontoblast-like cells were found to form tubular dentin under the osteoden-

between the Biodentine and MTA experimental groups during the observation period. **Conclusions:** Within the limitations of this study, Biodentine had a similar efficacy in the clinical setting and may be considered an interesting alternative to MTA in pulp-capping treatment during vital pulp therapy. (LEndod 2013: 11-5) ntine

 $PbD,^{\sharp}$

ects the pulp-dentin icity of the material erous studies have the available pulp-Ca(OH)₂ does not cent to the material

be used as an alter formation of dentin ally leading to pulp 13-16). However. tical and histologic domized controlled toomes as calcium A is a bioactive. high sealing ability ecause of its long the discoloration de to improve the a dual functional ased immediate pH properties (1, 19, MTA formula with ting time compared

w calcium silicatehich can be used as 3, 4, 22–26). It has ation (3, 4, 26, 27). of reparative dentin er mainly contains

Key Words

evidence base is building

In Vitro Microleakage of Biodentine as a Dentin Substitute Compared to Fuji II LC in Cervical Liningsence Restorations

Anne Raskina / Geoffroy Eschrich^b / Jacques Dejou^c / Imad About^d

Purpose: 1) To evaluate the marginal sealing efficacy of Biodentine at the cervical margins of approximal cavities placed in molars; 2) to evaluate and compare the use of Biodentine in combination with resin-based adhesives and a resin composite, compared with a resin-modified glass-ionomer cement (Fuji II LC).

Materials and Methods: Sixty approximal cavities were prepared on mesial and distal surfaces of 30 extracted human third molars. The teeth were randomly assigned into 6 groups of 10 cavities each: (G1) Biodentine, (G2) Fuji II LC as a filling material, (G3) Biodentine as a base + Optibond Solo Plus + silane + Filtek Z250, (G4) as in G3 without silane, (G5) Biodentine as a base + Septobond SE + Filtek Z250, (G6) Fuji II LC as a base + Optibond Solo Plus + Filtek Z250. The materials were applied according to the manufacturers' instructions. Biodentine required no dentin or enamel surface conditioning treatment. The teeth were thermocycled 2500x (5°C to 55°C). The specimens were then sealed with a 1-mm window around the marginal interface. Samples were immersed in a 50% w/v silver nitrate solution and exposed to a photodeveloping solution. The teeth were embedded in resin (Sody 33) and sectioned through the restorations. The silver penetration was directly measured using a light microscope. The results were expressed as ordinal scores from 0 to 3 at cervical, interfacial, and enamel margins. The data were analyzed with the nonparametric Kruskal-Wallis, Games Howell, and Wilcoxon signed rank tests (p < 0.05).

Results: No statistically significant differences were found between the 6 groups, neither for the dentin cervical margins nor for cervical lining (Biodentine or Fuji II LC)/resin composite interfaces. Statistically significant differences were observed between G5 (median score = 2.0) and the other groups (median score = 1.0) for the enamel margins. Statistically significant differences were found between enamel and dentin cervical margins in G2 (enamel median score = 1.0; dentin median score = 1.5) and G5 (enamel median score = 2.0; dentin median score = 1.0)

Conclusion: Within the limits of this in vitro study, Biodentine as dentin substitute in cervical lining restorations or as a restorative material in approximal cavities when the cervical extent is under the CEJ seems to perform well without any conditioning treatment. However, the operating time is longer than when a RMGIC (Fuji II LC) is used.

Keywords: Ca3SiO5-based dentin substitute, resin-modified glass-ionomer cement, microleakage.

J Adres Dent 2012; 14: 535-542. doi: 10.3290/j.jad.a25690

Biodentine"

The

Submitted for publication: 22.06.10; accepted for publication: 08.12.11

Bioactivity of Biodentine



Present and future of glass-ionomers and calcium-silicate cements as bioactive materials in dentistry: Biophotonics-based interfacial analyses in health and disease



Timothy F. Watson*, Amre R. Atmeh, Shara Sajini,

CONCLUSION:

"There is a clear need to improve the bioactivity of restorative dental materials and calcium silicate systems offer exciting possibilities in achieving this goal"

Most recent research on Biodentine

RESEARCH

How does the pulpal response to Biodentine and ProRoot mineral trioxide aggregate compare in the laboratory and clinic?

R. Careddu¹ and H. F. Duncan^{*1}

MEDLINE search

It works!

RESEARCH	

material efficacy. Other physical characteristics diverge with Biodentine setting quicker and staining less than ProRoot-MTA, however, the radiopacity of Biodentine is below testing standards making identification difficult. **Conclusions** Biodentine does present an evidence-based biologically-based alternative VPT material to ProRoot-MTA. Future research should be directed at long-term clinical outcome studies and the interaction of Biodentine with the dentine matrix.



Fig. 1 Schematic theoretical representation of the process of reparative dentinogenesis after a VPT procedure using calcium silicate cement

BiodentineTM Advantages & disadvantages Advantages Disadvantages Maintains pulp vitality Technique sensitive Biocompatibility Long working time Long working time Idiosyncratic handling Suitable for use with the "thumb" technique Mixing sensitive But, I used Biodentine only a few weeks' ago, and it handled much better!

Calcium hydroxide on steroids!

H₂SiO₄²⁻ H₂O Ca²⁺ OH CSH BiodentineTM Particle

When in contact with water, the surface of Biodentine particles ge and releases Calcium Hydroxide and Calcium Silicate Hydrates, results in a highly alkaline pH

Professor

Tim Watson

....not just me who is convinced!!

TechniqueTips

Technique Tips - A'Get Out of Jail' Material



Figure 1. Rediograph shows deep caries UR67, in patient with high caries activity.



Figure 2. Deep caties with exposure risk.

The treatment of deep caries lesions may be traught with difficulty, and total removal of deep caries in an asymptomatic tooth may searl in a pulp exposure. The scaling of caries into the tooth has been suggested following the work of Metz-Faithurst et al." but the recent introduction of a matorial (Siedentine, Septedont, UK), which has demonstrable dentine repair properties,²⁴ may be of value. This material is composed of a purified tricalcum silicate powder which is mixed with water in a capsule, with the reaction releasing calcum hydroxide. Deep caries was noted on a

bitewing radiograph (Figure 1) in a number of otherwise symptom free backh in a 22-year-old female patient with high carties



Figure 3. Biodentine restorations at placement.



Figure 4. Restorations at 9 month review.

References

- teeth tested vital. After removal of wet 1. Mertz-Fairhurst EJ, Curtis JW, Ergle JW; and infected dentine, it was decided that Rueggeberg FA, Adair SW. a pulpal exposure was likely if excavation Ultraconservative and cariostatic was to be continued (Figure 2). Accordingly, sealed restorations: results at year 10. excavation was stopped and Biodentine J Am Dant Assoc 1998: 129: 55-65. placed in the cavities and, after 15 minutes' 2. Laurent P, Camps J, About L setting time, basic carving could be Biodentine Induces TGF-b1 release carried out (Figure 3). After 9 months, from human pulp cells and the restorations were intact (Figure 4) early dental pulp mineralisation. and the tooth symptom free. A decision Int Dent J 2011: doi:10:1111 will be made in due course regarding the /1365-2591.2011.01995. need for replacement of the restorations 3. Atmeh AR, Chong EZ, Richard G, and whether removal of the remaining carles will be carried out, or simply that
 - Festy F, Watson TF. Dentin-cement Interfacial Interaction: calcium silicates and polyalkenoates. J Dent Res Online: doi:10:1177/0022034512443068.

F J Trevor Burke, DDS, MSc, MGDS FDS RCS(Edin), FDS RCS(Eng), FFGDP FADM Professor of Dental Primary Care, University of Birmingham School of Dentistry, S1 Chad's Queensway, Birmingham B4 6NN, UK.

the restorations be resurfaced with resin

composite.

activity. The maxillary 1st and 2nd molar

My conclusion

300 DentalUpdate

How to make the sealed caries concept work in your practice

 Make sure that the patient understands the PIL (consent)
Advise the patient that (s)he is having a therapeutic (healing) filling
That (s)he will have to pay for that and again in 9-12 months to have it resurfaced

The PIL is published in Dental Update (March 2018) and on my web site as a Word document

As a patient, what you need to know is:

Dental decay (caries), one of the commonest diseases on earth, has caused a deep hole in your tooth. The decay is close to the nerve but the tooth is still alive and not causing pain. One way of treating deep decay is to drill or scrape out all the decay and risk exposing the nerve of the tooth. Your dentist will then need to carry out extensive treatment on the affected tooth: this may involve placement of a root filling and a crown or other restoration to protect the cusps of the root-filled tooth.

The methods of treatment for deep decay in teeth which are alive and not causing symptoms have changed! With your permission, I propose to avoid scraping out all the decay because this could expose the nerve and then a root filling or extraction would be needed. Having removed part of the decay, I will fill the tooth and this will stop the progress of the decay. I will review the tooth in 6 to 12 months and take an X-ray then (or earlier should you have any discomfort). Provided the tooth remains alive, no further treatment should be needed. Please note that, on the follow-up X-ray, the decay that I left will show as a black area.

You should be aware that this technique has gained credibility for vital teeth as the research base for this has expanded and become positive.

As a patient, what you also need to know is:

If you change dentists and you have a subsequent X-ray on the tooth with deep decay, your new dentist could say that the previous dentist has left decay in a tooth when, in fact, (s)he has done this based on good clinical research. That's why you need to know what your dentist has been trying to achieve.

Placing a well-sealed filling over the decay will ensure that the decay doesn't come back. There is, however, always a small chance that your tooth will die and a root filling will be needed, but this is much less than if the nerve of the tooth is exposed by drilling away all the decay.

• You have had deep decay in your tooth. That therefore means that you have a problem with your diet and/or with your oral hygiene/ toothbrushing. You will therefore need to address this – your dentist and/or his/her hygienist will give you advice on this.

Table 1. Patient Information Leaflet for patients for whom deep decay has been sealed into a tooth.



TechniqueTips

Technique Tips: Patient Information Leaflet Information for Patients for whom Deep Caries has been Sealed into a Vital Asymptomatic Tooth

The concept of sealing deep caries into a vital asymptomatic tooth, rather than removing all caries and risking a pulpal exposure with all the inevitable sequelae (ranging from pulp-capping to root canal-filling), has gained increasing acceptance from the time when Mertz-Fairhurst and colleagues published their ten-year randomized controlled trial in 1998.¹ In this work, in a split mouth research design study, all patients received an amalgam restoration (50% of which were sealed after restoration placement) and a resin composite



Take home message

Sealing caries into a vital asymptomatic tooth is now considered good practice. The literature is increasingly showing that it works! Fewer teeth will require RCT.

Molar teeth

The effect of crowns

Crowns: Conclusions

- While crowns provide a patient with a restoration which requires the least number of re-interventions, they perform poorly (indeed, as poorly as GI) when time to extraction is examined.
- Factors influencing crown survival are patient age and patient treatment need, with patients with high treatment need having crowns which perform suboptimally.

Crowns: Conclusions

- Factors influencing crown survival also include dentist age, but, in comparison with direct restorations in which younger dentists out-perform older dentists, for crowns, dentists in the 30 to 60 age group provide crowns with optimum performance.
- Crowns placed on upper canine teeth perform worse than crowns placed on any other tooth: crowns perform best on first molar teeth
- Placing a pinned core appears to enhance the longevity of the subsequent crown, whereas the placement of a root filling or a metal post does not.

Rules for survival of restorations & teeth

It's only in older patients that crowning a molar tooth is a good idea!

Too many crowns?

uring 2012, about 54.5 million indirect tooth unit replacements-including single crowns, pontics and abutments-were placed in the United States (Bennett Napier, chief staff executive, National Association of Dental Laboratories, oral communication, July 15, 2013). As of May 27, 2013, the United States had a total resident population of 315,930,912.1 Approximately one-fourth of the U.S. population was younger than 20 years (23.7 percent) in 2009.2 Therefore, assuming that about 75 percent of the current U.S. population is older than 20 years, there are about 237 million adults in the United States. These statistics, taken together, lead to the conclusion that about one indirect tooth unit was placed per 2.3 adults during 2012. However, the number of crowns per patient actually is higher when one considers that many adults do not see a dentist on an annual basis.

In my opinion, the quantity of crowns placed probably is higher than needed or expected. I am not the only clinician uneasy about this; many participants in my continuing education courses also have expressed concern. What are the indications for crowns? Are these indications clearly identifiable to practitioners, or are they debatable? What are the reasons for the placement of so many crowns? Could some of the patients who received these crowns have been treated more conservatively?

This column provides my observations on the subject as a board-certified prosthodontist who is active in international continuing education and who has had several decades of practice and research experience.

INDICATIONS FOR CROWNS

Some readers may not agree with the following points. However, when perusing the available meta-analyses reported in the dental literature on the subjects below, one can find evidence to support or refute any of these points. It is not my intention in this column to debate the indications for crowns. It is my purpose to express my own observations on the subject as an experienced clinician. educator and researcher. For the purpose of this discussion, my definition of "crown" includes indirect onlay restorations covering all tooth cusps, as well as conventional full-coverage crowns.

Teeth with large, previ-

ously placed defective restorations or active carious lesions. Although controversial, the following are my personal guidelines regarding indications for a crown in specific situations. Posterior teeth that require removal of one-half or more of the facial-lingual cusp-tip-to-cusp-tip occlusal distance are best treated with crowns or onlays. If restored with intracoronal restorations instead of crowns, such posterior teeth have three nearly free-standing sections: the remaining facial tooth structure, the lingual tooth structure and the restorative material, which usually is resin-based composite or amalgam. This division of tooth strength often allows breakage of either the facial or lingual tooth structure from the intracoronal restoration during service.

For anterior teeth, my observations show that the need for crowns is related to teeth that are missing at least one-half of the coronal tooth structure because of caries or previously placed defective restorations. The location of the remaining tooth structure is not predictable and can be any coronal one-half of the clinical crown.

Bonding the remaining tooth structure, usually dentin, with restorative material appears to reduce the breakage of tooth

conservative procedures that can be used instead of crowns. Are dentists placing too many crowns in the United States? My candid answer is "Yes," and I call for practitioners to observe their own clinical behavior and strongly consider conservative treatment when appropriate. Dentistry has yet to discover a restorative material that serves better than human enamel and dentin.

54 million crowns in 2012 in USA, population 315 million, one indirect tooth unit placed per 2.3 adults

1174 JADA 144(10) http://jada.ada.org October 2013

Gordon J. Christensen, DDS, MSD, PhD

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Take home message In no age group does crowning an anterior tooth preserve the lifespan of an incisor tooth. This confirms the concept of keeping worn teeth going with direct restorations.

Premolar teeth



Take home message

Keeping MOD restorations off premolar teeth seems a good idea.

Canine teeth:1,232,041 restorations

Regarding reintervention, veneers and crowns outperform other restoration types, with 45% and 40% respectively surviving to re-intervention at 15 years and with glass ionomer restorations performing least well.

However, regarding to time to extraction of the restored canine tooth, veneers continue to perform optimally (around 93%) cumulative survival at 15 years) but crowns represent the worst performing restoration at 15 years (66%) cumulative survival),

Take home message

Crowning a canine tooth leads to a reduced lifespan of the crowned tooth. Root fillings perform worse in canines than in any other tooth. Patients must be told!

The new restoration survival parameter is survival of the tooth For time to extraction, incisors are worst, molars best In jaws, upper canines dominates bad performance 1 in 5 crowned teeth receive a root filling in the same course of treatment (includes post crowns)

Glass ionomers do not perform as well as other materials

Amalgams are cheap, but may provide value for £s



There may be some confounding factors Like fewer crowns on canines Patients who are exempt from payment receive treatments that fail sooner The older the patient, in general, the greater the treatment need But, overall, we are observing an existing historical population, with dentists making decisions in the best interests of the oral health of their patients

Crowns in canine teeth perform worse than in any other tooth (time to extraction)

Crowns

Tooth type	
Incisors	75%
Canines	66%
Premolars	78%
Molars	83%

WHY?

Is it time to reexamine the concept of canine guidance when crowning canine teeth?

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"The patient's need is the continued preservation of what remains of his chewing apparatus rather than the meticulous restoration of what is lost, since what is lost is irretrievably lost" deVan, 1952 Reprinted 2006

DeVan MM Basic principles of impression taking. J.Prosthet.Dent.1952:2:26-75 DeVan MM. Basic principles of impression taking.J.Prosthet.Dent.2006:93:503-508



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