

## **Glaskeramik und Universaladhäsiv – gesucht, gefunden?**

**Julia Detzer, Anja Liebermann, Prof. Dr. Bogna Stawarczyk**

**ZMK 33 (12) 2017, S. 878-893**

- [1] Haller B, Merz A: Neue Adhäsive - neue Möglichkeiten? BZB (7), 48-57 (2016).
- [2] Kern M, Beuer F, Frankenberger RAK: Vollkeramik auf einen Blick. Ettlingen: Eigenverlag Arbeitsgemeinschaft für Keramik in der Zahnheilkunde e.V.; 2015. 190 S. : p.
- [3] Liu P-R: A panorama of dental CAD/CAM restorative systems. Compendium 26 (7),507-13 (2005).
- [4] Stawarczyk B, Wimmer T: Die Teilkrone- materialwissenschaftliche Aspekte. teamwork 2, 128-37 (2016).
- [5] Höland W, Rheinberger V, Apel E, van 't Hoen C, Höland M, Dommann A, et al: Clinical applications of glass-ceramics in dentistry. Journal of Materials Science: Materials in Medicine 17 (11), 1037-42 (2006).
- [6] Frankenberger R, Blunck U: Adhäsive Zahnheilkunde. Köln: Dt. Zahnärzte-Verl.; 2013. XV, 370 S. : p.
- [7] Spies BC, Patzelt SB, Vach K, Kohal RJ: Monolithic lithium-disilicate single crowns supported by zirconia oral implants: three-year results of a prospective cohort study. Clinical oral implants research 27 (9),1160-8 (2016).
- [8] Bär G: Meisterkönnen für Zahntechniker. München: Verl. Neuer Merkur; 2004. 399 S. : p.
- [9] Fradeani M, Redemagni M: An 11-year clinical evaluation of leucite-reinforced glass-ceramic crowns: a retrospective study. Quintessence international (Berlin, Germany : 1985) 33 (7), 503-10 (2002).
- [10] Gehrt M, Wolfart S, Rafai N, Reich S, Edelhoff D: Clinical results of lithium-disilicate crowns after up to 9 years of service. Clinical oral investigations 17 (1), 275-84 (2013).
- [11] Reich S, Schierz O: Chair-side generated posterior lithium disilicate crowns after 4 years. Clinical oral investigations 17 (7), 1765-72 (2013).
- [12] Verfasser O. [Available from: <https://de.wikipedia.org/wiki/Monolith>.
- [13] Edelhoff D, Stawarczyk B: Transluzentes monolithisches Zirkonoxid. Quintessence Zahntechnik 39 (2),115-6 (2013).
- [14] Rinke S, Rodiger M, Ziebolz D, Schmidt AK: Fabrication of Zirconia-Reinforced Lithium Silicate Ceramic Restorations Using a Complete Digital Workflow. Case reports in dentistry 2015, 162-178 (2015).
- [15] Rinke S: Monolithische Restaurationen im Seitenzahnbereich: Ein Update zur klinischen Bewährung und Anwendung. ZWR-Das Deutsche Zahnärzteblatt 125 (04), 150-7 (2016).
- [16] Awad D, Stawarczyk B, Liebermann A, Ilie N: Translucency of esthetic dental restorative CAD/CAM materials and composite resins with respect to thickness and surface roughness. J Prosthet Dent 113 (6). 534-40 (2015).
- [17] Dietschi D, Maeder M, Meyer JM, Holz J: In vitro resistance to fracture of porcelain inlays bonded to tooth. Quintessence international (Berlin, Germany : 1985) 21 (10), 823-31 (1990).
- [18] Rosenstiel SF, Gupta PK, Van der Sluys RA, Zimmerman MH: Strength of a dental glass-ceramic after surface coating. Dental materials : official publication of the Academy of Dental Materials 9 (4), 274-9 (1993).
- [19] Borges GA, Caldas D, Taskonak B, Yan J, Sobrinho LC, de Oliveira WJ: Fracture loads of all-ceramic crowns under wet and dry fatigue conditions. Journal of prosthodontics : official journal of the American College of Prosthodontists 18 (8), 649-55 (2009).

- [20] Attia A, Abdelaziz KM, Freitag S, Kern M: Fracture load of composite resin and feldspathic all-ceramic CAD/CAM crowns. *J Prosthet Dent* 95 (2), 117-23 (2006).
- [21] Ernst C-P: Die korrekte Vorbehandlung indirekter Restaurationen zur adhäsiven Befestigung. *ZMK* 33 (3), 98-110 (2017).
- [22] Verfasser O: [Available from: <http://www.ivoclarvivadent.ch/zoolu-website/media/document/30596/Monobond+Etch+%26+Prime>].
- [23] El-Damanny HM, Gaintantzopoulou MD: Self-etching ceramic primer versus hydrofluoric acid etching: Etching efficacy and bonding performance. *Journal of prosthodontic research* (2017).
- [24] Roman-Rodriguez JL, Perez-Barquero JA, Gonzalez-Angulo E, Fons-Font A, Bustos-Salvador JL: Bonding to silicate ceramics: Conventional technique compared with a simplified technique. *Journal of clinical and experimental dentistry* 9 (3), e384-e6 (2017).
- [25] Siqueira FS, Alessi RS, Cardenas AF, Kose C, Souza Pinto SC, Bandeca MC, et al: New Single-bottle Ceramic Primer: 6-month Case Report and Laboratory Performance. *The journal of contemporary dental practice* 17 (12), 1033-9 (2016).
- [26] Verfasser O: [Available from: <https://tokuyama-dental.de/de/universal-bond/>].
- [27] Bischof C, Wulff P, Valentin PL: [Available from: <https://de.wikipedia.org/wiki/Adh%C3%A4sion>].
- [28] Buonocore MG: A simple method of increasing the adhesion of acrylic filling materials to enamel surfaces. *Journal of dental research* 34 (6), 849-53 (1955).
- [29] Lehmann KM, Hellwig E, Wenz H-J: Zahnärztliche Propädeutik: Einführung in die Zahnheilkunde; mit 32 Tabellen: Deutscher Ärzteverlag (2012).
- [30] Nakabayashi N, Nakamura M, Yasuda N. Hybrid layer as a dentin-bonding mechanism. *Journal of esthetic dentistry* 3 (4), 133-8 (1991).
- [31] Frankenberger R: Adhäsiv-Fibel. Balingen: Spitta; 2013. 258 S. : p.
- [32] Tay FR, Pashley DH: Aggressiveness of contemporary self-etching systems. *Dental Materials* 17 (4), 296-308 (2001).
- [33] Rosa WLdOd, Piva E, Silva AFd: Bond strength of universal adhesives: A systematic review and meta-analysis. *Journal of Dentistry* 43 (7), 765-76 (2015).
- [34] Suzuki T, Takamizawa T, Barkmeier WW, Tsujimoto A, Endo H, Erickson RL, et al: Influence of Etching Mode on Enamel Bond Durability of Universal Adhesive Systems. *Oper Dent* 41 (5), 520-30 (2016).
- [35] Wagner A, Wendler M, Petschelt A, Belli R, Lohbauer U: Bonding performance of universal adhesives in different etching modes. *Journal of Dentistry* 42 (7), 800-7 (2014).
- [36] Behr M, Rosentritt M, Fischer L: Was kostet die Befestigung einer Krone? *Deutsche Zahnärztliche Zeitschrift* 72 (3), 198-201 (2017).
- [37] Zhang ZY, Tian FC, Niu LN, Ochala K, Chen C, Fu BP, et al: Defying ageing: An expectation for dentine bonding with universal adhesives? *J Dent* 45, 43-52 (2016).
- [38] Lohbauer U, Rosentritt M, Ilie N: Universaladhäsive – hält der Name was er verspricht? *ZWR-Das Deutsche Zahnärzteblatt* 125 (11), 546-70 (2016).
- [39] Ohne V. [Available from: <http://kuraraydental.com/key-technologies-innovations/mdp-monomer>].
- [40] Yoshida Y, Yoshihara K, Nagaoka N, Hayakawa S, Torii Y, Ogawa T, et al: Self-assembled Nano-layering at the Adhesive interface. *Journal of dental research* 91 (4), 376-81 (2012).
- [41] Yoshihara K, Nagaoka N, Okihara T, Kuroboshi M, Hayakawa S, Maruo Y, et al: Functional monomer impurity affects adhesive performance. *Dental materials : official publication of the Academy of Dental Materials* 31 (12), 1493-501 (2015).

- [42] Tian T, Tsoi JK-H, Matinlinna JP, Burrow MF: Aspects of bonding between resin luting cements and glass ceramic materials. *Dental materials* 30 (7), e147-e62 (2014).
- [43] Kalavacharla VK, Lawson NC, Ramp LC, Burgess JO: Influence of Etching Protocol and Silane Treatment with a Universal Adhesive on Lithium Disilicate Bond Strength. *Oper Dent* 40 (4), 372-8 (2015).
- [44] Venturini AB, Prochnow C, May LG, Bottino MC, Valandro LF: Influence of hydrofluoric acid concentration on the flexural strength of a feldspathic ceramic. *Journal of the mechanical behavior of biomedical materials* 48, 241-8 (2015).
- [45] Yoshihara K, Nagaoka N, Sonoda A, Maruo Y, Makita Y, Okihara T, et al: Effectiveness and stability of silane coupling agent incorporated in 'universal' adhesives. *Dental materials : official publication of the Academy of Dental Materials* 32 (10), 1218-25 (2016).
- [46] Lung CYK, Matinlinna JP: Aspects of silane coupling agents and surface conditioning in dentistry: An overview. *Dental Materials* 28 (5), 467-77 (2012).
- [47] Passia N, Lehmann F, Freitag-Wolf S, Kern M: Tensile bond strength of different universal adhesive systems to lithium disilicate ceramic. *The Journal of the American Dental Association* 146 (10), 729-34 (2015).
- [48] Yoshida F, Tsujimoto A, Ishii R, Nojiri K, Takamizawa T, Miyazaki M, et al: Influence of surface treatment of contaminated lithium disilicate and leucite glass ceramics on surface free energy and bond strength of universal adhesives. *Dental materials journal* 34 (6), 855-62 (2015).
- [49] Haller B, Merz A: Standortbestimmung Universaladhäsive Teil 2. Der Einfluss der Komposithärtung und die Haftung an Werkstücken. *zm online* 107 (6), 66-83 (2017).
- [50] Kim RJ-Y, Woo J-S, Lee I-B, Yi Y-A, Hwang J-Y, Seo D-G: Performance of universal adhesives on bonding to leucite-reinforced ceramic. *Biomaterials Research* 19 (1), 11 (2015).
- [51] Elsayed A, Younes F, Lehmann F, Kern M: Tensile Bond Strength of So-called Universal Primers and Universal Multimode Adhesives to Zirconia and Lithium Disilicate Ceramics. *The journal of adhesive dentistry* 19 (3), 221-8 (2017).
- [52] Chen L, Shen H, Suh BI: Effect of incorporating BisGMA resin on the bonding properties of silane and zirconia primers. *J Prosthet Dent* 110, 402-7 (2013).
- [53] Schittly E, Bouter D, Le Goff S, Degrange M, Attal JP: Compatibility of five self-etching adhesive systems with two resin luting cements. *The journal of adhesive dentistry* 12 (2), 137-42 (2010).
- [54] Ernst C-P: Universaladhäsive - universelle Problemlöser für alles? *ZMK* 31 (10), 620-9 (2015).

## **Spezielle Zahnpflege bei Dentinhypersensibilität**

**Frederic Meyer, Helge-Otto Fabritius, Joachim Enax**

**ZMK 33 (12) 2017, S. 865-869**

- [1] Absi EG, Addy M, Adams D: Dentine hypersensitivity. A study of the patency of dentinal tubules in sensitive and non-sensitive cervical dentine. *J Clin Periodontol* 14 (5), 280-4 (1987).
- [2] Ajcharanukul O, et al: Effects of potassium ions on dentine sensitivity in man. *Arch Oral Biol* 52 (7), 632-9 (2007).
- [3] Ayad F, et al: Comparing the efficacy in providing instant relief of dentin hypersensitivity of a new toothpaste containing 8.0% arginine, calcium carbonate, and 1450 ppm fluoride to a benchmark desensitizing toothpaste containing 2% potassium ion and 1450 ppm fluoride, and to a control toothpaste with 1450 ppm fluoride: a three-day clinical study in Mississauga, Canada. *J Clin Dent* 20 (4), 115-22 (2009).
- [4] Bae JH, Kim YK, Myung SK: Desensitizing toothpaste versus placebo for dentin hypersensitivity: a systematic review and meta-analysis. *J. Clin. Periodontol* 42, 131-141 (2015).
- [5] Bennadi D, Reddy CV: Oral health related quality of life. *J Int Soc Prev Community Dent* 3 (1), 1-6 (2013).
- [6] Chidchuangchai W, Vongsavan N, Matthews B: Sensory transduction mechanisms responsible for pain caused by cold stimulation of dentine in man. *Arch Oral Biol* 52 (2), 154-60 (2007).
- [7] Chung G, Jung SJ, Oh SB: Cellular and Molecular Mechanisms of Dental Nociception. *Journal of Dental Research* 92 (11), 948-955 (2013).
- [8] Cummins D: Recent advances in dentin hypersensitivity: clinically proven treatments for instant and lasting sensitivity relief. *Am J Dent* 23 Spec No A, 3A-13A (2010).
- [9] Dorozhkin SV, Epple M: Biological and medical significance of calcium phosphates. *Angew Chem Int Ed* 41, 3130-3146 (2002).
- [10] Enax J, Epple M: Die Charakterisierung von Putzkörpern in Zahnpasten. *Deutsche Zahnärztliche Zeitung*, In press (2017).
- [11] Forien J-B, et al: Water-mediated collagen and mineral nanoparticle interactions guide functional deformation of human tooth dentin. *Chem. Mater* 28, 3416-3427 (2016).
- [12] Gillam DG: Dentine hypersensitivity: Advances in diagnosis, management, and treatment. 2015: Springer International Publishing.
- [13] Hannig C, Hannig M: Natural enamel wear - A physiological source of hydroxylapatite nanoparticles for biofilm management and tooth repair? *Med. Hypotheses* 74, 670-672 (2010).
- [14] Huettemann RW, Doenges H: Untersuchungen zur Therapie überempfindlicher Zahnhälse mit Hydroxylapatit. *Dtsch. Zahnärztl Z* 42, 486-488 (1987).
- [15] Imfeld TS, B: In-vitro-Untersuchung der mechanischen Wirkung von Whitening-Zahnpasten des Schweizer Marktes. *Acta Med Dent Helv* 4, 195-200 (1999).
- [16] Irwin CR, McCusker P: Prevalence of dentine hypersensitivity in a general dental population. *J Ir Dent Assoc* 43 (1), 7-9 (1997).
- [17] John MT, et al: Oral health-related quality of life in Germany. *Eur J Oral Sci* 111 (6), 483-91 (2003).
- [18] Kensche A, et al: Efficacy of a mouthrinse based on hydroxyapatite to reduce initial bacterial colonisation in situ. *Arch Oral Biol* 80, 18-26 (2017).

- [19] Kulal R, et al: An In-vitro Comparison of Nano Hydroxyapatite, Novamin and Proargin Desensitizing Toothpastes - A SEM Study. *J Clin Diagn Res* 10 (10), ZC51-ZC54 (2016).
- [20] Lopes MB, et al: Comparative study of tubular diameter and quantity for human and bovine dentin at different depths. *Braz Dent J* 20, 279-283 (2009).
- [21] Loveren Cv: Toothpastes. Monographs in Oral Science, ed. A.L. M. C. D. N. J. M. Huysmans, H.-P- Weber. Vol. 23. 2013, Basel: Karger.
- [22] Najibfard K, et al: Remineralization of early caries by a nano-hydroxyapatite dentifrice. *J Clin Dent* 22, 139-43 (2011).
- [23] Nocerino N, et al: Biological activity of lactoferrin-functionalized biomimetic hydroxyapatite nanocrystals. *Int J Nanomedicine* 9, 1175-84 (2014).
- [24] Orsini G, et al: A double-blind randomized-controlled trial comparing the desensitizing efficacy of a new dentifrice containing carbonate/hydroxyapatite nanocrystals and a sodium fluoride/potassium nitrate dentifrice. *J Clin Periodontol* 37, 510-517 (2010).
- [25] Orsini G, et al: A 3-day randomized clinical trial to investigate the desensitizing properties of three dentifrices. *J Periodontol* 84, 65-73 (2013).
- [26] Peetsch A, Epple M: Characterization of the solid components of three desensitizing toothpastes and a mouth wash. *Materialwiss Werkstofftech* 42, 131-135 (2011).
- [27] Porciani PF, Chazine M, Grandini S: A clinical study of the efficacy of a new chewing gum containing calcium hydroxyapatite in reducing dentin hypersensitivity. *J Clin Dent* 25, 32-36 (2014).
- [28] Schilke R, et al: Comparison of the number and diameter of dentinal tubules in human and bovine dentine by scanning electron microscopic investigation. *Arch Oral Biol* 45 (5), 355-61 (2000).
- [29] Schmalz G, et al: Dentin Protection of Different Desensitizing Varnishes During Stress Simulation: An In Vitro Study. *Oper Dent* 42 (1), E35-E43 (2017).
- [30] Sharma D, Hong CX, Heipp PS: A novel potassium oxalate-containing tooth-desensitising mouthrinse: a comparative in vitro study. *J Dent* 41 Suppl 4, S18-27 (2013).
- [31] Splieth CH, Tachou A: Epidemiology of dentin hypersensitivity. *Clin Oral Investig* 17 Suppl 1, S3-8 (2013).
- [32] Teaford MF, Smith MM, Ferguson MWJ: Development, function and evolution of teeth. 2000, Cambridge: Cambridge University Press.
- [33] Vano M, et al: Reducing dentine hypersensitivity with nano-hydroxyapatite toothpaste: a double-blind randomized controlled trial. *Clin Oral Investig*, (2017).

## **Füllungstherapie bei Kindern**

**Dr. Sabine Runge**

**ZMK 33(9) 2017, S. 860-864**

- [1] Anderson M, Stecksén-Blicks C, Stenlund H, Ranggård L, Tsilingardis G, Mejare I: Detection of approximal caries in 5-year-old Swedish children. *Caries Res* 39, 92-99 (2005).
- [2] Björndal L, Darvann T, Thylstrup A: A quantitative light microscopic study of the odontoblast and subodontoblastic reaction to active and arrested enamel caries without cavitation. *Caries Res* 32, 59-69, (1998).
- [3] Borutta A, Kneist S, Chemnitz P, Hufnagl S: Veränderungen im Ernährungsverhalten und in der Mundgesundheit von Vorschulkindern. *Oralprophylaxe Kinderzahnheilkd* 27, 100-104 (2005).
- [4] Conxyl DI, Quarrell I, Mc Call DR, Gilmour H, Bedi R, Macpherson LMD: Dental caries in 5-year-old children attending multi-ethnic schools in Greater Glasgow – the impact of ethnic background and levels of deprivation. *Community Dent Health* 24, 161-165 (2007).
- [5] Ferreira JM, Pinheiro SL, Samaio FC, de Menezes VA: Caries removal in primary teeth-a systematic review. *Quintessence Int* 43, 9-15 (2012).
- [6] Gussy MG, Waters EG, Walsh O, Kilpatrick NM: Early childhood caries: Current evidence for aetiology and prevention. *J Paediatr Child Health* 42, 37-43 (2006).
- [7] Hirsch CH, Blechschmidt B, Kleeberg L, Lautenschläger CH, Waurick M: Risikofaktoren für das Nursing-Bottle-Syndrom. *Oralprophylaxe* 22, 103-109 (2000).
- [8] Krämer N, Frankenberger R: Füllungstherapie im Milchgebiss. *Oralprophylaxe & Kinderzahnheilkunde* 26, 78-84 (2004).
- [9] Lula EC, Almeida LJ Jr, Alves CM, Monteiro-Neto V, Ribeiro CC: Partial caries removal in primary teeth: association of clinical parameters with microbiological status. *Caries Res* 45, 275-280 (2011).
- [10] Micheelis W, Schiffner U: Vierte Deutsche Mundgesundheitsstudie (DMS IV). Institut der Deutschen Zahnärzte, Deutscher Zahnärzte-Verlag, Köln 2006.
- [11] Pieper K: Epidemiologische Begleituntersuchung zur Gruppenprophylaxe 2004. Deutsche Arbeitsgemeinschaft für Jugendzahnpflege, Bonn 2005.
- [12] Poorterman JHG, Aartman ICH, Kieft JA, Kalsbeek H: Value of bite-wing radiographs in a clinical epidemiological study and their effect on the DMFS index. *Caries Res* 34, 159-163 (2000).
- [13] Sanatamaria M, Innes N, Christiansen J, Splieth CH: Paradigmenwechsel bei der Karies an Milchzähnen. *Oralprophylaxe & Kinderzahnheilkunde* 35, 57-59 (2013).

[14] Schilke R, Felgenhauer F, Grigull L: Zahnärzte haben hohe Verantwortung. Zm 99, 60-65 (2016).

[15] Schopen M: The implementation of the International Classification of Diseases (ICD-10) in Germany. Tools and information on the internet (Article in German). Anaesthesist 48, 924-930 (1999).

[16] Sperling S, Buske G: Zur Entwicklung der frühkindlichen Karies in den letzten 20 Jahren. Vortrag zur Jahrestagung der Deutschen Gesellschaft für Kinderzahnheilkunde, Dresden (2008).

[17] Truin GJ, van Rijkom HM, Mulder J, van't Hof MA: Caries trends 1996-2002 among 6- and 12-year-old children and erosive wear prevalence among 12years-old children in The Hague. CariesRes 39, 2-8 (2005).