Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) <1946 to October 23, 2018>
Search Strategy:
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1 exp "Dental Restoration, Permanent/ (14729)
2 exp "Dentistry, Operative/ (20517)
3 (restorative or restoration$ or operative).ti. (64912)
4 limit 3 to dentistry journals (14476)
5 (dental$ or dentist$ or tooth or teeth).tw. (337742)
6 3 and 5 (9933)
7 1 or 2 or 4 or 6 (29155)
8 limit 7 to english language (23505)
9 limit 8 to ("review" or systematic reviews) (2034)
10 (review or systematic$).ti. and 8 (681)
11 9 or 10 (2135)
12 exp animals/ not humans/ (4507543)
13 11 not 12 (2118)
14 limit 13 to yr="2018 -Current" (65)
15 remove duplicates from 14 (64)

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Title
Interproximal Open Contacts Between Implant Restorations and Adjacent Teeth. Prevalence - Causes - Possible Solutions. [Review]
Source
VI 1
Status
Published
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Abstract
PURPOSE: To present the prevalence and contributing factors of interproximal contact loss (ICL) between implant restorations and adjacent teeth, and to provide recommendations for possible prevention and treatment of this complication.
MATERIALS AND METHODS: The authors explored the dental literature on PubMed on ICL between implants and adjacent teeth, interproximal contacts, open contacts, teeth migration causes, facial bone formation, and facial bone changes.
RESULTS: ICL between fixed implant prostheses and adjacent teeth has been reported. A literature search revealed 7 studies showing a high prevalence of ICL between implant prostheses and adjacent teeth. The literature indicates that this ICL is greater in the mesial aspect in comparison with the distal. As identified by the literature review, ICL in the maxilla ranged between 18% and 66% versus 37% to 54% in the mandible. ICL might occur as early as 3 months after prosthetic treatment. The literature review documented possible tooth migration causes, crown-related causes, and bone formation/growth-related causes of ICL.
CONCLUSIONS: ICL is a common multifactorial implant complication. The clinical condition will dictate if the implant crown needs to be modified/replaced or the natural tooth needs to be restored to reestablish interproximal contact between an implant prosthesis and adjacent tooth. Periodic evaluations of interproximal contacts between implant restorations and the adjacent teeth and the use of screw-retained restorations due to ease of removal is recommended to diagnose and mitigate the problem. An orthodontic retainer or occlusal guard may help prevent ICL between the implant restoration and the adjacent tooth.

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Title
Biostable, antidegradative and antimicrobial restorative systems based on host-biomaterials and microbial interactions. [Review]
Source

OBJECTIVES: Despite decades of development and their status as the restorative material of choice for dentists, resin composite restoratives and adhesives exhibit a number of shortcomings that limit their long-term survival in the oral cavity. Herein we review past and current work to understand these challenges and approaches to improve dental materials and extend restoration service life.

METHODS: Peer-reviewed work from a number of researchers as well as our own are summarized and analyzed. We also include yet-unpublished work of our own. Challenges to dental materials, methods to assess new materials, and recent material improvements and research directions are presented.

RESULTS: Mechanical stress, host- and bacterial-biodegradation, and secondary caries formation all contribute to restoration failure. In particular, several host- and bacterial-derived enzymes degrade the resin and collagen components of the hybrid layer, expanding the marginal gap and increasing access to bacteria and saliva. Furthermore, the virulence of cariogenic bacteria is up-regulated by resin biodegradation by-products, creating a positive feedback loop that increases biodegradation. These factors work synergistically to degrade the restoration margin, leading to secondary caries and restoration failure. Significant progress has been made to produce hydrolytically stable resins to resist biodegradation, as well as antimicrobial materials to reduce bacterial load around the restoration. Ideally, these two approaches should be combined in a holistic approach to restoration preservation.

SIGNIFICANCE: The oral cavity is a complex environment that poses an array of challenges to long-term material success; materials testing conditions should be comprehensive and closely mimic pathogenic oral conditions.
MATERIALS AND METHODS: Until February 2017, six databases were interrogated (two English, one Portuguese, one Spanish and two Chinese). Using six exclusion criteria, a group of six independent reviewers selected 43 publications from a total of 1958 potentially relevant studies retrieved. Confidence intervals and/or standard errors were calculated and the heterogeneity variance of the survival rates was estimated.

RESULTS: The survival percentages and standard errors of single-surface and multiple-surface ART restorations in primary posterior teeth over the first 2 years were 94.3% (+/- 1.5) and 65.4% (+/- 3.9), respectively; for single-surface ART restorations in permanent posterior teeth over the first 3 years, they were 87.1% (+/- 3.2); and for multiple-surface ART restorations in permanent posterior teeth over the first 5 years, they were 77% (+/- 9.0). The mean annual dentine-caries-lesion-failure percentages in previously sealed pits and fissures using ART sealants in permanent posterior teeth over the first 3 and 5 years were 0.9 and 1.9%, respectively.

CONCLUSIONS: ART single-surface restorations presented high survival percentages in both primary and permanent posterior teeth, whilst ART multiple-surface restorations presented lower survival percentages. ART sealants presented a high-caries-preventive effect.

CLINICAL RELEVANCE: ART is an effective evidence-based option for treating and preventing carious lesions in primary and permanent posterior teeth.
Monolithic zirconia restoration is an acceptable treatment option in restorative dentistry and a developing trend in esthetic dentistry. Digital dentistry has simplified fabrication of monolithic zirconia restorations. Zirconia ceramic has introduced an opportunity to achieve both aesthetic and mechanical requirements for restorations. This is rarely found for a ceramic in dentistry. Monolithic zirconia restorations represent an acceptable durability, comparable to metal-ceramic restorations, while they are superior to metal-ceramic restorations esthetically; however, difficulties to gain an optimal shade reproduction and a color match with monolithic zirconia restorations still remain. The color of these restorations may be influenced by manufacturing processes, laboratory procedures, and clinical factors. Manufacturing processes determine basic optical properties of zirconia ceramics. Different laboratory procedures may create optical changes in zirconia ceramics. Also clinical factors such as dental background, cement, and zirconia restoration features may affect the resulting color. This literature review aimed to discuss potent factors in the color of monolithic zirconia restorations. An electronic search of the PubMed/Google Scholar database was performed to find related English-language articles published between January 1, 2000, and October 31, 2017. The key terms of background, cement, ceramic, color, esthetics, shade, spectrophotometry, thickness, translucency, and zirconia were used both individually and simultaneously. Also, a manual search was conducted, and five classic articles of color science were added. Thus 192 articles were included. In the last decade, shade reproduction of monolithic zirconia restorations has been highly regarded; however, further improvements are required in the manufacturing process to produce tooth-like zirconia ceramics. An esthetic guideline named background-cement-ceramic color harmony was suggested in this study; however, more clinical practice guidelines should be established for monolithic zirconia restorations on esthetics, and therefore, more studies are required.

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Journal Article. Review.

Clinical performance of bulk-fill and conventional resin composite restorations in posterior teeth: a systematic review and meta-analysis.


Monolithic zirconia restoration is an acceptable treatment option in restorative dentistry and a developing trend in esthetic dentistry. Digital dentistry has simplified fabrication of monolithic zirconia restorations. Zirconia ceramic has introduced an opportunity to achieve both aesthetic and mechanical requirements for restorations. This is rarely found for a ceramic in dentistry. Monolithic zirconia restorations represent an acceptable durability, comparable to metal-ceramic restorations, while they are superior to metal-ceramic restorations esthetically; however, difficulties to gain an optimal shade reproduction and a color match with monolithic zirconia restorations still remain. The color of these restorations may be influenced by manufacturing processes, laboratory procedures, and clinical factors. Manufacturing processes determine basic optical properties of zirconia ceramics. Different laboratory procedures may create optical changes in zirconia ceramics. Also clinical factors such as dental background, cement, and zirconia restoration features may affect the resulting color. This literature review aimed to discuss potent factors in the color of monolithic zirconia restorations. An electronic search of the PubMed/Google Scholar database was performed to find related English-language articles published between January 1, 2000, and October 31, 2017. The key terms of background, cement, ceramic, color, esthetics, shade, spectrophotometry, thickness, translucency, and zirconia were used both individually and simultaneously. Also, a manual search was conducted, and five classic articles of color science were added. Thus 192 articles were included. In the last decade, shade reproduction of monolithic zirconia restorations has been highly regarded; however, further improvements are required in the manufacturing process to produce tooth-like zirconia ceramics. An esthetic guideline named background-cement-ceramic color harmony was suggested in this study; however, more clinical practice guidelines should be established for monolithic zirconia restorations on esthetics, and therefore, more studies are required.
least 1 year were included. The RevMan 5 program was used for meta-analysis, calculating the relative risk (RR) and 95% confidence interval (CI) of the dichotomous outcome (restoration failure or success).

RESULTS: Ten articles were selected, comprising 941 analyzed restorations. The mean follow-up period was 33.6 months (12-72 months). No statistically significant differences in the failure rate were observed between conventional and base/flowable bulk-fill resin composites (p=0.31; RR 1.49; 95% CI 0.69-3.25) or full-body/sculptable bulk-fill resin composites (p =0.12; RR 1.89; 95% CI 0.84-4.24).

CONCLUSIONS: The present systematic review and meta-analysis indicate similar clinical performances of bulk-fill and conventional resin composites over a follow-up period of 12 to 72 months.

CLINICAL SIGNIFICANCE: Based on the results of this study, the bulk-fill resin composites could be an alternative for direct restorations in posterior teeth. However, clinical trials of longer duration are required.

Publication Type
Journal Article.
Year of Publication
2018
Treatment of an Adolescent Patient with Dentinogenesis Imperfecta Using Indirect Composite Restorations - A Case Report and Literature Review

Authors
Hao, Yu; Huang, Xiaoyu; Zhou, Xuedong; Li, Mingyun; Ren, Biao; Peng, Xian; Cheng, Lei.

Abstract

Oral biofilms attach onto both teeth surfaces and dental material surfaces in oral cavities. In the meantime, oral biofilms are not only the pathogenesis of dental caries and periodontitis, but also secondary caries and peri-implantitis, which would lead to the failure of clinical treatments. The material surfaces exposed to oral conditions can influence pellicle coating, initial bacterial adhesion, and biofilm formation, due to their specific physical and chemical characteristics. To define the effect of physical and chemical characteristics of dental prosthesis and restorative material on oral biofilms, we discuss resin-based composites, glass ionomer cements, amalgams, dental alloys, ceramic, and dental implant material surface properties. In conclusion, each particular chemical composition (organic matrix, inorganic filler, fluoride, and various metallic ions) can enhance or inhibit biofilm formation. Irregular topography and rough surfaces provide favorable interface for bacterial colonization, protecting bacteria against shear forces during their initial reversible binding and biofilm formation. Moreover, the surface free energy, hydrophobicity, and surface-coating techniques, also have a significant influence on oral biofilms. However, controversies still exist in the current research for the different methods and models applied. In addition, more in situ studies are needed to clarify the role and mechanism of each surface parameter on oral biofilm development.

Publication Type
Journal Article. Review.

Year of Publication
2018

Unique Identifier
30206577
challenging and error-prone, especially when occlusal adjustments are necessary. Since composite materials do not require a specific lamination strength and are easy to repair, they can be applied using the indirect technique, enabling conservation of more sound hard tissue than is possible when conventional restorations are used.

PATIENT AND METHODS: A young patient with dentinogenesis imperfecta type II underwent interdisciplinary full-mouth rehabilitation due to massive tooth wear and loss of vertical occlusion. First, a check bite was taken, and vertical occlusion was increased using overdentures. Six months later, a construction bite was taken over the existing overdentures (focusing on the sagittal dimension) to move the mandibular position more towards the anterior, correcting the skeletal Class II malocclusion. This resulted in a Class I intercuspitation with harmonization of the facial proportions. After a further six months, all teeth were restored using individually modeled indirect composite restorations, which preserved most of the sound hard tissue and restored esthetics and function.

CONCLUSION: Indirect composite restorations can be a valuable tool for improving occlusion, esthetics and function in the treatment of children and adolescents.

Authors Full Name
Shu X; Mai QQ; Blatz M; Price R; Wang XD; Zhao K.

Local Messages

Purpose: The primary objective of this systematic review was to compare treatment outcomes of direct and indirect permanent restorations in endodontically treated teeth, and provide clinical suggestions for restoring teeth after endodontic treatment.

MATERIALS AND METHODS: Electronic databases (Medline, EMBASE, CENTRAL) and gray literature were screened for articles in English that reported on prospective and retrospective clinical studies of direct or indirect restorations after endodontic treatment with an observation period of at least 3 years. Primary outcomes were determined to be short-term (<5 years) and medium-term (>5 and <10 years) survival. Secondary outcomes included restorative and endodontic success of restored teeth. The quality of included studies and risk of bias were assessed using Cochrane Collaboration's tool for RCTs (randomized controlled trials), the Newcastle-Ottawa Scale for cohort studies, and the Agency for Healthcare Research and Quality (AHRQ) methodology checklist for cross-sectional studies. The GRADE system was used for assessing collective strength of the overall body of evidence.

RESULTS: Of 2547 screened articles, only 9 (2 RCTs, 3 retrospective cohort studies, 3 cross-sectional studies) met the inclusion criteria, and 8 studies were used in the meta-analysis. In general, indirect restorations (mostly full crowns) showed higher 5-year survival (OR 0.28, 95% CI 0.19-0.43, p < 0.00001) and 10-year survival (OR 0.20, 95% CI 0.12-0.31, p < 0.00001) than direct restorations. However, there was no statistical difference in short-term (<5 years) restorative success (OR 0.32, 95% CI 0.05-2.12, p = 0.24) and endodontic success (OR 0.88, 95% CI 0.72-1.08, p = 0.22).

CONCLUSIONS: Based on current evidence, there is a weak recommendation for indirect restorations to restore endodontically treated teeth, especially for teeth with extensive coronal damage. Indirect restorations using mostly crowns have higher short-term (5-year) and medium-term (10-year) survival than do direct restorations using composite or amalgam (GRADE quality of evidence: low to moderate), but no difference in short-term (<5 years) restorative success (low quality) and endodontic success (very low quality). There is a need for high-quality clinical trials, especially well-designed RCTs.

Authors Full Name
Blatz M; Price R; Wang XD; Zhao K.

Local Messages

Purpose: The primary objective of this systematic review was to compare treatment outcomes of direct and indirect permanent restorations in endodontically treated teeth, and provide clinical suggestions for restoring teeth after endodontic treatment.
PURPOSE: The objective of this systematic review was to assess the impact of endodontic post insertion on the clinical performance of endodontically treated teeth (ETT).

MATERIALS AND METHODS: A specific PICO question was developed and a Medline search was performed in January 2017 using relevant terms in order to identify studies comparing the success/survival of dental restorations using endodontic posts or no posts. Additionally, the electronic databases "Oppengrey", "BBO", "LILAC" and "IBECS" were assessed and a hand search of cross references from original articles and reviews was performed. The methodological quality of the included studies was assessed independently by three referees using (1) the critical appraisal skills program (CASP) and (2) Cochrane checklist (version 5.1.0).

RESULTS: A total of 14 studies were included, among them 11 randomized controlled trials (RCT), two prospective clinical trials, and one retrospective clinical trial. The overall quality of the studies was good according to the CASP. However, the Cochrane rating showed that in seven studies, the risk of bias was high in > 40% of the items, indicating a relevant level of methodological flaws. Three studies showed a low risk of bias in > 80% of the items. The majority (10 out of 14) of the clinical studies included failed to show a positive effect of post placement. A post effect is possible when no cavity wall is present.

CONCLUSION: There is no unequivocal clinical evidence to support or reject the use of posts even for no-wall cavities, either for direct or indirect restorations.

Glass Ionomer Cements for the Restoration of Non-Carious Cervical Lesions in the Geriatric Patient. [Review]

BACKGROUND: The restoration of non-carious cervical lesions in geriatric patients is a demanding process. Glass ionomer cements can be promising materials for the management of these lesions in older adults. The aim of this literature review is to present the benefits of glass ionomers and how they can be used for the restoration of non-carious cervical lesions of older adults depending on the geriatric patient's profile.

DATA SOURCES: All available in vitro and in vivo studies from Google Scholar, PubMed and Scopus search engines corresponding to glass ionomer cements, geriatric dentistry, elderly patients, and non-carious lesions as key words were reviewed.

DATA SYNTHESIS: The advantages of glass ionomer cements, such as good retention and fluoride release, make them suitable for the restoration of non-carious cervical lesions. However, several factors related to the geriatric patient's profile determine the most suitable material type.

CONCLUSION: In general, the resin modified glass ionomer cements (RMGICs) appear to be preferred, but under certain circumstances the use of the conventional product is more appropriate, despite its poorer mechanical features. Further studies are required for more reliable data analysis and clinical interpretation of the relevant results.
Title
Longevity of defective direct restorations treated by minimally invasive techniques or complete replacement in permanent teeth: A systematic review. [Review]
Source
Status
In-Data-Review
Authors
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Abstract
OBJECTIVES: This systematic review aimed to verify if there is difference in the longevity of minimally invasive techniques compared to the complete replacement for the treatment of defective direct restorations in permanent teeth.
DATA: The data included randomized controlled clinical trials comparing the clinical performance of defective dental restorations treated by a complete replacement technique or minimally invasive techniques on permanent teeth. Evaluation of the risk of bias was performed using the Cochrane Collaboration common scheme for bias and the evidence was qualified using the GRADE tool.
SOURCE: A comprehensive search was performed in the electronic databases: PubMed, Scopus, ISI Web of Science, The Cochrane Library, LILACS, BBO, SIGLE, followed by manual search in the reference lists of the included studies, without any restrictions.
STUDY SELECTION: From 5554 retrieved studies, 10 met the eligibility criteria and were submitted to data extraction and quality assessment. The repair technique presented similar results to replacement and superior results when compared to sealing. In addition, refurbishment demonstrated to be a useful treatment for localized anatomical form defects. All the studies presented low risk of bias and high quality evidence for repair and refurbishment and moderate for the sealing technique.
CONCLUSIONS: The direct restorations treated by the repair, seal and refurbishment techniques did not present a significant difference in clinical longevity in comparison to the replacement technique in permanent teeth with overall moderate quality of evidence.
CLINICAL SIGNIFICANCE: The present findings demonstrated that the best treatment for defective restorations is conservative management. The evidence demonstrated here helps and encourages clinicians during the decision-making process. Moreover, it suggests not replacing imperfect restorations, but to managing them in a minimally invasive way, allowing the structure to be preserved.

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Journal Article. Review.
Year of Publication
2018
Unique Identifier
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Title
Comparison of ART and conventional techniques on clinical performance of glass-ionomer cement restorations in load bearing areas of permanent and primary dentitions: A systematic review. [Review]
Source
Status
In-Data-Review
Authors
Ruengrungsom C; Palamar JEA; Burrow MF.
Authors Full Name
OBJECTIVES: To review the clinical performance of GIC restorations using calculated annual failure rates (AFRs) and qualitative descriptions based on conventional and ART techniques from two aspects: occlusal and approximal cavities in permanent or deciduous posterior teeth.

SOURCES: Search strategies were undertaken of the PubMed database from January 1983 to March 2018. Additional articles were collected by hand searching.

STUDY SELECTION: The following basic search terms, "(glass ionomer cement) and (clinical performance or survival or ART or atraumatic restorative or high viscosity)" with inclusion and exclusion criteria according to PRISMA flow diagram were used.

DATA: A total of 904 articles were initially identified. Finally, 67 articles were included for quantitative and qualitative analysis after applying the inclusion and exclusion criteria. Assessment of risk of bias was performed for all included studies using ROBINS-I.

CONCLUSIONS: For single-surface occlusal or multi-surface GIC restorations, the conventional technique showed better survival than ART technique regardless of dentition type (primary or permanent). When comparing the same treatment technique, AFRs of approximal or multi-surface GIC restorations were greater than those of single-surface (occlusal) restorations, irrespective of dentition type. RMGIC-conventional technique seems to be promising for restoring approximal cavities of primary teeth compared to other restorative materials.

CLINICAL SIGNIFICANCE: The GIC-ART technique is an alternative option for single-surface (occlusal) restorations in permanent and primary teeth. However, the application of the GIC-ART technique for load-bearing approximal restorations should be carefully considered before employing this option, especially in primary teeth.
METHODS: Seven databases were searched without restrictions up to January 2018 for clinical studies on implant infraposition (IIP) or proximal contact point (PCP) loss to the adjacent teeth. After duplicate selection, data extraction, and risk of bias assessment according to the Cochrane guidelines, random-effects meta-analyses of odds ratios (OR) or mean differences (MD) and their 95% confidence intervals (CI) were performed, followed by meta-regression and sensitivity analyses.

RESULTS: A total of 27 nonrandomized studies with 1,572 patients (mean age 42.2 years/51.2% female) followed up to 18.5 years after implant placement were included. The pooled %prevalence of IIP was 50.5% (nine studies; 95% CI = 26.3-74.5%), and the pooled IIP extent was 0.58 mm (six studies; 95% CI = 0.33-0.83 mm), while IIP > 1 mm was seen for 20.8% of placed implants (five studies; 95% CI = 8.3-37.1%), and male patients were less prone to IIP than female patients (three studies; OR = 0.30; 95% CI = 0.10-0.88; p = 0.03). The pooled %prevalence of PCP loss was 46.3% (nine studies; 95% CI = 32.3-60.6%), with increase through observation time (two studies; OR = 1.09; 95% CI = 1.03-1.16; p = 0.004) and predilection for mesial PCPs (five studies; OR = 2.25; 95% CI = 1.06-4.77; p = 0.03). However, the quality of evidence was very low due to bias.

CONCLUSIONS: Patients and doctors need to be aware that long-term adverse effects of dental implants among natural teeth can be observed in terms of IIP and PCP loss to the adjacent teeth.
OBJECTIVES: Root-canal treated molars can be directly restored, usually using resin-based-composite restorations (RBCs), or indirectly restored using full or partial crowns (FCs/PCs). Both the initial treatment costs and the risks of restorative and endodontic complications differ between RBCs and FCs/PCs. We aimed to assess the cost-effectiveness of RBCs versus FCs/PCs for restoring root-canal treated molars.

METHODS: A mixed public-private payer’s perspective within German healthcare was taken. Risks of complications were extracted from large cohort studies or systematic reviews. Costs were estimated using fee-items catalogues of public and private German insurance. A Markov-model was constructed to follow up a root-canal treated molar receiving different restorations in an initially 50-year-old patient over his lifetime. Monte Carlo-microsimulations were performed to assess lifetime costs and effectiveness (tooth retention time), and the resulting cost-effectiveness.

RESULTS: RBCs were less costly than FCs/PCs (749 Euro versus 782 Euro), but also less effective (22 years versus 24 years), the incremental cost-effectiveness-ratio was 10.80 Euro/year. This ratio increased if costs for direct restorations decreased, or costs for indirect restorations increased. If no teeth were replaced, RBC was far more cost-effective (the incremental cost-effectiveness ratios was 52.95 Euro/year). If all teeth were replaced, FC was both more effective and less costly.

CONCLUSIONS: RBCs showed lower costs, but also lower effectiveness than FCs/PCs. Consequently, the cost-effectiveness of both strategies depended on the willingness-to-pay of patients or other payers, i.e. their willingness to invest in higher effectiveness. Clinically, a large number of tooth, patient and dentist-related factors will impact on decision-making and should be considered.

CLINICAL SIGNIFICANCE: We found composite restorations to be less costly, but also less effective than indirect restorations for root-canal treated teeth. Over a long-term period, the initial treatment costs and associated cost-differences between strategies may be outweighed by costs of follow-up treatments.
Main text: An electronic search was performed. Domestic studies were found using the keywords “zirconia abutments” and “zirconium abutment” in KMbase, KoreaMed, and the National Assembly Library, and international studies were found using the same keywords in PubMed. All identified studies were divided by evidence level from the viewpoint of the research type utilizing the evidence-based review manual. A total of 102 domestic studies (with Korean language) were found, and 9 of these studies were selected. In these nine studies, 3 had evidence level 3 and 6 had evidence level 4. According to the studies, zirconium abutments are mechanically, biologically, and esthetically stable, but the evidence level of these studies is low, and the follow-up duration is no longer than 5 years.

Conclusions: All examined studies verified the mechanical stability of zirconium abutments for a period no longer than 5 years. Therefore, a long-term clinical observation is needed. Zirconium abutments are thought to be biologically stable, but they are not superior to titanium abutments. As the aesthetic stability of such abutments had a low evidence level in the studies that examined here, a much higher evidence level is needed.

Conclusion Type: Journal Article. Review.

Year of Publication: 2018
**Title**
Short fiber-reinforced composite restorations: A review of the current literature. [Review]

**Source**

**Authors**
Garoushi S; Gargoum A; Vallittu PK; Lassila L.

**Abstract**
A newly-recommended method for restoring large cavities is the biomimetic approach of using short fiber-reinforced composite (SFRC) as dentine-replacing material. The aim of the current review was to present an overview of SFRC and to give the clinician a detailed understanding of this new material and treatment strategy based on available literature review. A thorough literature search was done up to December 2017. The range of relevant publications was surveyed using PubMed and Google Scholar. From the search results, articles related to our search terms were only considered. The search terms used were “short fiber-reinforced composite”, “everX posterior”, and “fiber-reinforced composite restorations”. Of the assessed articles selected (N = 70), most were laboratory-based research with various test specimen designs prepared according to the ISO standard or with extracted teeth; only four articles were clinical reports. A common finding was that by combining the SFRC as a bulk base with conventional composite, the load-bearing capacity and failure mode of the material combination were improved, as compared to plain conventional composite restoration. In the reviewed studies, the biomimetic restoration technique of using SFRC showed promising characteristics, and therefore, might be recommended as an alternative treatment option for large cavities.

**Title**
A Systematic Review of Amalgam Bonded Restorations: In vitro and Clinical Findings.

**Source**

**Authors**
Brian HC; Lam OL; Jagannathan N; Botelho MG.

**Abstract**
AIM: This article aims to systematically review the evidence reporting on physical properties of bonded amalgam, its clinical performance, and implications.

MATERIALS AND METHODS: An electronic search in “Medline” (search term: Amalgam and Dentin bonding) from 1987 to 2013 yielded 465 publications out of which 170 articles were selected for the analysis. Data were extracted relating to the bond strength of amalgam to dentin, microleakage, postoperative sensitivity, and longevity of bonded amalgam restorations. Majority of studies reported reduced microleakage when dentin bonding agents and resin-modified glass ionomer cements (RM-GICs) were used with...
amalgam. However, water stored, thermocycled, and spherical amalgam alloys resulted in higher microleakage. While bonded amalgam facilitated the retention of large restorations, reduction in postoperative sensitivity was not consistently observed between bonded and nonbonded amalgam restorations.

CONCLUSION: While bonded amalgam restorations reduce the need for mechanical retention conserving tooth structure and reducing the adverse effects of microleakage, there is lack of consistent evidence across all outcome domains to advocate the benefit of bonding of all amalgam restorations. Despite this, it can be considered the material of choice for large restorations and bonding enhances retention in vitro which can be considered beneficial clinically.

CLINICAL SIGNIFICANCE: The use of adhesives to bond amalgam to the tooth structure offers potential advantages, as it helps in conservative cavity preparation without compromising the retention to tooth, making it a material of choice in large posterior restorations.

Publication Type
Journal Article.
Year of Publication
2018

<21>
Unique Identifier
29920942
Title
The effect of single tooth implant restorations on the survival, morbidity, pulpal, and periapical health of adjacent teeth: A chart review.
Source

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Abstract
PURPOSE: To determine whether the placement and restoration of a single tooth posterior implant affects the survival, morbidity, pulpal, and periapical health of adjacent natural teeth.

MATERIALS AND METHODS: A retrospective chart review identified patients who received single posterior tooth implants between August 2004 and July 2015 at the UNC SOD and met the study inclusion criteria. Preoperative and postoperative records were reviewed; survival and changes in coronal, pulpal, and periapical status of teeth adjacent to the implant and contralateral tooth were recorded. Dichotomous survival, restoration, and retreatment outcomes were analyzed using conditional logistic regression with patient as strata and implant versus control as the predictor. Exact odds ratio estimates and the 95% confidence intervals were obtained for the relationship of implant versus control side and outcomes.

RESULTS: Five hundred and fifty-five sites with follow-up time averaging 5 years +/- 30.8 months were reviewed. Teeth adjacent to implants had 1.75 (95% CI: 1.17, 2.64) times the odds of restorative retreatments as compared to controls (P = .005). On the implant side, 48 adjacent teeth (4.5%) were more heavily restored at follow up, while 84 (7.9%) experienced retreatment with comparable number of surfaces restored. On the contralateral side, 54 adjacent teeth (5.0%) were more heavily restored, and 56 (5.2%) experienced comparable levels of retreatment. In addition, 17 (1.7%) implant adjacent teeth required root canal treatment, compared to 12 (1.2%) on the contralateral side; 1 implant adjacent tooth required root canal retreatment. Forty-two teeth (3.8%) adjacent to implants were lost, compared to 35 (3.2%) adjacent to natural teeth.

CONCLUSIONS: The incidence for restorative retreatment was significantly higher on teeth adjacent to implant restorations as compared to the contralateral controls. There were no significant differences in the survival, morbidity, pulpal, or periapical health of teeth adjacent to single tooth implants compared to those adjacent to the contralateral natural tooth.
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RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

2018

<22>
Unique Identifier
29377372
Title
Restorative Treatment in Patients with Amelogenesis Imperfecta: A Review. [Review]
Source
VI 1
Status
In-Process
Authors
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Abstract
PURPOSE: To summarize the contemporary scientific evidence available regarding restorative dental treatment in patients with Amelogenesis imperfecta (AI).

METHODS: An electronic literature search was conducted using the search term "Amelogenesis imperfecta" and the PubMed/MEDLINE database as well as Google Scholar. Prospective and retrospective clinical studies that investigated the outcome of direct and/or indirect dental restorative treatment in patients with AI, were published in English, and had an observation time of at least 1 year were included in this review. The articles identified were screened and analyzed by two reviewers according to inclusion and exclusion criteria in three review rounds.

RESULTS: Six prospective or retrospective clinical studies analyzing longevity and complications associated with dental restorative treatment in patients with AI met the inclusion criteria. Extracted data suggest that in patients with AI, indirect restorations feature superior predictability and longevity than direct restorations.

CONCLUSIONS: As endodontic complications were infrequently observed and periodontal parameters regularly improve with the insertion of indirect restorations, dental treatment in patients with AI should focus on indirect restorations as soon as possible. While adhesive bonding techniques to enamel surfaces in patients with AI feature merely limited predictability and longevity and as the available data is scarce, further laboratory and clinical studies should be performed to investigate the performance of minimally invasive indirect restorations bonded to enamel in patients with AI.

RECOMMENDATION: Scientific evidence indicates that indirect restorations should be preferred over direct restorations in patients with AI.

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Journal Article. Review.
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30111908
Title
Retention failures in cement- and screw-retained fixed restorations on dental implants in partially edentulous arches: A systematic review with meta-analysis. [Review]
Source
The Journal of Indian Prosthodontic Society. 18(3):201-211, 2018 Jul-Sep.
VI 1
Status
PubMed-not-MEDLINE
Authors
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Number of events of complications was summarised. The most common complications were fracture or chipping of the veneer material, loss of retention and lost access hole fillings. Due to the heterogeneity of studies, and large variation in number of restorations per material group, no conclusive correlation between type of material and type of technical complication and/or failure could be established.

RESULTS: The initial search produced 2764 titles. After application of criteria, 47 publications were selected for analysis. Seventeen studies reported on 1447 single crowns and 30 studies reported on 2190 fixed dental prostheses. The most common complications were fracture or chipping of the veneer material, loss of retention and lost access hole fillings. Due to the heterogeneity of studies, and large variation in number of restorations per material group, no conclusive correlation between type of material and type of technical complication and/or failure could be established.

CONCLUSIONS: The review did not succeed in providing convincing evidence to answer the question concerning a possible relationship between restoration materials and prevalence of technical complications in implant-supported restorations.

MATERIALS AND METHODS: A strategy was set up using the PICO format and the search was performed using the PubMed database, including a hand search of reference lists. Two independent reviewers selected papers based on a set of criteria. The number of events of complications was summarised.

RESULTS: The initial search produced 2764 titles. After application of criteria, 47 publications were selected for analysis. Seventeen studies reported on 1447 single crowns and 30 studies reported on 2190 fixed dental prostheses. The most common complications were fracture or chipping of the veneer material, loss of retention and lost access hole fillings. Due to the heterogeneity of studies, and large variation in number of restorations per material group, no conclusive correlation between type of material and type of technical complication and/or failure could be established.

CONCLUSIONS: The review did not succeed in providing convincing evidence to answer the question concerning a possible relationship between restoration materials and prevalence of technical complications in implant-supported restorations.
BACKGROUND: An important tool in materials research, development and characterization regarding mechanical performance is the testing of fracture toughness. A high level of accuracy in executing this sort of test is necessary, with strict requirements given in extensive testing standard documents. Proficiency in quality specimen fabrication and test requires practice and a solid theoretical background, oftentimes overlooked in the dental community.

AIMS: In this review we go through some fundamentals of the fracture mechanics concepts that are relevant to the understanding of fracture toughness testing, and draw attention to critical aspects of practical nature that must be fulfilled for validity and accuracy in results. We describe our experience with some testing methodologies for CAD/CAM materials and discuss advantages and shortcomings of different tests in terms of errors in testing the applicability of the concept of fracture toughness as a single-value material-specific property.

OBJECTIVE: Clinical studies should be one main aspect underlying dentists' decision-making towards dental materials. Study design, conduct, analysis and reporting impact on the usefulness of studies. We discuss problems with current studies and highlight areas where improvement might be possible.

METHODS: Based on systematically and non-systematically collected data, we demonstrate where and why current studies in clinical dentistry deliver less-than-optimal results. Lending from general medicine, we suggest ways forward for clinical dental material science.

RESULTS: Randomized controlled (efficacy) trials remain a major pillar in dental material science, as they reduce selection bias and, if well-designed and conducted, have high internal validity. Given their costs and limited external validity, alternatives like practice-based or pragmatic controlled trials or observational studies can complement the evidence-base. Prior to conduct, researchers should focus on study comparators and setting (answering questions with relevance to clinical dentistry), and pay attention to statistical power, considering the study aim (superiority or non-inferiority trial), the expected event rate, and attrition.
Study outcomes should be chosen on the basis of a core outcome set or, if not available, involving patients and other stakeholders. Studies should be registered a priori, and reporting should adhere to standards. Possible clustering should be accounted for during statistical analysis.

SIGNIFICANCE: Many clinical studies in dental material science are underpowered, and of limited validity and usefulness for daily decision-making. Dental researchers should mirror existing efforts in other medical fields in making clinical studies more valid and applicable, thus contributing to better dental care.

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Clinical studies in restorative dentistry: New directions and new demands. [Review]

Abstract

Clinical research of restorative materials is confounded by problems of study designs, length of trials, type of information collected, and costs for trials, despite increasing numbers and considerable development of trials during the past 50 years. This opinion paper aims to discuss advantages and disadvantages of different study designs and outcomes for evaluating survival of dental restorations and to make recommendations for future study designs. Advantages and disadvantages of randomized trials, prospective and retrospective longitudinal studies, practice-based, pragmatic and cohort studies are addressed and discussed. The recommendations of the paper are that clinical trials should have rational control groups, include confounders such as patient risk factors in the data and analysis and should use outcome parameters relevant for profession and patients.
This systematic review was carried out to assess the clinical effectiveness of nanofilled and nanohybrid composites used for direct restorations in comparison with microhybrid composites. The guidelines for the preferred reporting items for systematic reviews and meta-analyses were followed. A search of articles published from July 1996 to February 2017 was performed in PubMed, SciVerse Scopus, Latin American and Caribbean Health Sciences, the Scientific Electronic Library Online, and the Cochrane Library. The present review selected only randomized controlled trials comparing the clinical performance of a nanofilled or nanohybrid composite for direct restorations with that of a microhybrid composite. The research found 201 studies. Twenty-one articles fulfilled the criteria of the present review. However, the included studies were characterized by great methodological diversities. As a general trend, nanofilled and nanohybrid composites were found to be capable of clinical performance, marginal quality, and resistance to wear similar to that of traditional composites without showing improved surface characteristics. The risk of bias of included studies was judged unclear or high. The clinical performance of nanofilled/nanohybrid composites was found to be comparable to that of traditional composites in the posterior area. The data concerning anterior and cervical restorations were insufficient. With regard to the esthetic properties, there is a compelling need for studies on anterior teeth in which the operators are kept unaware of the restorative material. Nanofilled/nanohybrid composites seem to be a valid alternative to traditional microhybrid composites, and at the moment, there is low-level evidence attesting a lack of their superiority.

Abstract

Owing to an increased demand for safe and esthetically pleasing dental materials, ceramics have been developed and optimized to rehabilitate anterior and posterior teeth. This evolution in ceramic materials is directly related to the development of sophisticated processing technologies and systems for use in dental medicine, particularly computer-aided design/computer-assisted manufacture (CAD/CAM) technology. This study is a systematic review outlining long-term clinical survival rates of single-tooth restorations fabricated with CAD/CAM technology with a minimum follow-up of 3 years. A bibliographic search up to September 2016 was performed using two databases: MEDLINE (PubMed) and Embase. Selected keywords and well-defined inclusion and exclusion criteria guided the search of relevant results. All articles were first reviewed by title, then by abstract, and subsequently by a full text reading. Data were assessed and extracted through a standardized form. The pooled results were statistically analyzed, and the overall failure rate was calculated by random effects model. Reported failures were analyzed by CAD/CAM system, type of restoration, restorative material, and luting agent. From a total of 2,916 single-tooth restorations with a mean exposure time of 7.0 years and 351 failures, the failure rate was 2.17% per year, estimated per 100 restoration years (95% confidence interval [CI]: 1.35% to 3.51%). The estimated total survival rate after 5 years was 89.7% (95% CI: 88.1% to 91.1%). The overall survival rate of single-tooth ceramic restorations fabricated with CAD/CAM technology was similar to those conventionally manufactured.

Abstract
BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

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Abstract
Various economic, time-efficient options in endodontic therapy are available for treating wide, flared, and/or unusual canals and re-treating flared canals. Conservation of tooth structure, minimal use of cement, and the strengthening of the core and/or remaining tooth structure when possible are critical treatment objectives. This article discusses new, progressive treatment modalities that minimize the amount of cement and composite resin needed, resulting in the conserving of remaining dentin. These modalities include the anatomic post-core, oval fiber post, individually formed fiber "bundle" post, fiber-augmented post, and accessory post techniques.

Publication Type
Journal Article.

Year of Publication
2018

Unique Identifier
29795498

Title
Restorations in primary teeth: a systematic review on survival and reasons for failures.

Source

Status
In-Data-Review

Authors
Anonymous.

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Abstract
The most common reason for failure of restorations in primary teeth is secondary caries.

Publication Type
Journal Article.

Year of Publication
2018

Unique Identifier
29649506

Title
Clinical performance of glass ionomer cement and composite resin in Class II restorations in primary teeth: A systematic review and meta-analysis. [Review]

Source

Status
In-Data-Review

Authors
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Maia, Lucianne Cople. Federal University of Rio de Janeiro, Department of Pediatric Dentistry, Rio de Janeiro, RJ, Brazil.
OBJECTIVES: This study compared the clinical performance of glass ionomer cement (GIC) compared to composite resin (CR) in Class II restorations in primary teeth.

DATA: Literature search according to PRISMA guidelines including randomized controlled trials comparing Class II restorations performed with GIC, compared to CR, in primary teeth.

SOURCES: PubMeb, Scopus, Web of Science, VHL, Cochrane Library, Clinical Trials and OpenGrey, regardless of date or language.

STUDY: Ten studies were included in qualitative synthesis, and 9 in the meta-analyses (MA). Six studies were classified as low risk of bias, and 4 as "unclear". Heterogeneity ranged from null to high (0% to 73%). GIC and CR presented similar failure patterns (risk difference -0.04 [-0.11, 0.03]; p=0.25, I<sup>2</sup>=51%), and the exclusion of studies with follow-up period <24 months, or grouping according to the type of GIC (conventional or resin-modified), or according to the type of isolation (cotton roll or rubber dam), or according to the evaluation criteria applied did not affect the pattern of the results obtained. GIC exhibited significantly lower values of secondary carious lesions (SCL) than CR (SCL: risk difference 0.06 [0.02, 0.10], p=0.008, I<sup>2</sup>=0%). The materials presented similar performance (p>0.05) regarding the overall effect, as well as for marginal discoloration, marginal adaptation and anatomical form. The superiority of GIC was maintained when resin-modified GIC and rubber dam isolation were analyzed separately.

CONCLUSIONS: GIC and CR presented similar clinical performance for all criteria analyzed, except for secondary carious lesions, in which GIC presented superior performance, especially for the resin-modified GIC and with rubber dam isolation.
Compared with CAD-CAM, most of the heat-pressed lithium disilicate crowns displayed equal or smaller MD values. Slip-casting crowns exhibited similar or better marginal accuracy than those fabricated with CAD-CAM. Cobalt-chromium and titanium implant infrastructures produced using a CAD-CAM system elicited smaller MD values than zirconia. The majority of cobalt-chromium restorations/infrastructures produced by DMLS displayed better marginal accuracy than those fabricated with the casting technique. Compared with copy milling, the majority of zirconia restorations/infrastructures produced by CAD-CAM milling exhibited better marginal adaptation. No clear conclusions can be drawn about the superiority of CAD-CAM milling over the casting technique and DMLS regarding marginal adaptation.

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The present article presents a short summary concerning the pathomechanisms and clinical presentation of foot deformities in Charcot-Marie-Tooth syndrome. Furthermore, a classification system is introduced and based on a recently performed review of the literature an operative treatment algorithm is provided. The operative technique of the following surgical procedures is described in more detail: 1. dorsiflexion osteotomy at the base of the 1st metatarsus, 2. dorsiflexion osteotomy at the base of a lesser metatarsal bone, 3. claw hallux correction including fusion of the first phalangeal joint, 4. claw toe correction, 5. transfer of extensor digitorum longus tendons to the peroneal tendons and finally 6. tibialis posterior tendon transfer to the dorsiflexors of the foot.

**Publication Type**
Journal Article. Review.

**Year of Publication**
2018

**Unique Identifier**
29628639

**Title**
Clinical performance of direct versus indirect composite restorations in posterior teeth: A systematic review. [Review]

**Source**

**Authors**
Azeem RA; Sureshbabu NM.

**Abstract**
Background: Composite resin, serves as esthetic alternative to amalgam and cast restorations. Posterior teeth can be restored using direct or indirect composite restorations. The selection between direct and indirect technique is a clinically challenging decision-making process. Most important influencing factor is the amount of remaining tooth substance.

Aim: The aim of this systematic review was to compare the clinical performance of direct versus indirect composite restorations in posterior teeth.

Materials and Methods: The databases searched included PubMed CENTRAL (until July 2015), Medline, and Cochrane Database of Systematic Reviews. The bibliographies of clinical studies and reviews identified in the electronic search were analyzed to identify studies which were published outside the electronically searched journals. The primary outcome measure was evaluation of the survival of direct and indirect composite restorations in posterior teeth.

Results: This review included thirteen studies in which clinical performance of various types of direct and indirect composite restorations in posterior teeth were compared. Out of the thirteen studies which were included seven studies had a high risk of bias and five studies had a moderate risk of bias. One study having a low risk of bias, concluded that there was no significant difference between direct and indirect technique. However, the available evidence revealed inconclusive results.

Conclusion: Further research should focus on randomized controlled trials with long term follow-up to give concrete evidence on the clinical performance of direct and indirect composite restorations.

**Publication Type**
Journal Article. Review.

**Year of Publication**
2018

**Unique Identifier**
28943362

**Title**
Understanding the management and teaching of dental restoration repair: Systematic review and meta-analysis of surveys. [Review]
BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

Source

VI 1

Status
In-Data-Review

Authors
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Abstract
OBJECTIVES: Repair instead of complete replacement is recommended to manage partially defective restorations. It is unclear if and why such treatment is taught at dental schools or practiced by dentists. We aimed to identify barriers and facilitators for repairs using a systematic review and meta- and qualitative analysis.

SOURCES: Electronic databases (PubMed, CENTRAL, Embase, PsycINFO) were searched.

STUDY SELECTION: Quantitative studies reporting on the proportion of (1) dentists stating to perform repairs, (2) dental schools teaching repairs, (3) failed restorations having been repaired were included. We also included qualitative studies on barriers/facilitators for repairs. Random-effects meta-analyses, meta-regression and a thematic analysis using the theoretical domains framework were conducted.

DATA: 401 articles were assessed and 29, mainly quantitative, studies included. 7228 dentists and 276 dental schools had been surveyed, and treatment data of 30,172 restorations evaluated. The mean (95% CI) proportion of dentists stating to perform repairs was 71.5% (49.7-86.4%). 83.3% (73.6-90.0%) of dental schools taught repairs. 31.3% (26.3-36.7%) of failed restorations had been repaired. More recent studies reported significantly more dentists to repair restorations (p=0.004). Employment in public health practices and being the dentist who placed the original restoration were facilitators for repairs. Amalgam restorations were repaired less often, and financial aspects and regulations came as barriers.

CONCLUSIONS: While most dentists state to perform repairs and the vast majority of dental schools teach repairs, the proportion of truly repaired restorations was low. A number of interventions to implement repair in dental practice can be deduced from our findings.

CLINICAL SIGNIFICANCE: Partially defective restorations are common in dental practice. While repairs are taught and dentists are aware of the recommendation towards repairs, the actually performed proportion of repairs seems low.

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Unique Identifier
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Title
Digital versus conventional impressions for full-coverage restorations: A systematic review and meta-analysis. [Review]

Source

VI 1

Status
In-Data-Review

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Abstract
BACKGROUND: The primary objective of this systematic review was to investigate the survival of full-coverage restorations fabricated by using digital impressions (DIS) versus that of those fabricated by using conventional impressions. The authors also compared secondary outcomes of marginal and internal fit and occlusal and proximal contacts.
Abstract
OBJECTIVES: A scoping review was conducted to explore the use of FDI criteria 10 years after their introduction. The first aim was to compare the amount of studies using the FDI and/or the modified USPHS criteria. The second aim was to analyse the use of the FDI criteria in clinical trials evaluating direct dental restorations.

DATA: Listing of studies using FDI and/or USPHS criteria per year since 2007. Clinical studies related to the assessment of direct restorations using FDI criteria.

SOURCE: Two systematic searches - regarding the use of FDI and modified USPHS criteria - were carried out on Medline/Pubmed in order to identify the studies published between 2007 and 2017. Authors of the included articles were contacted
Association of sleep bruxism with ceramic restoration failure: A systematic review and meta-analysis. [Review]

Source


VI 1

Authors Full Name

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Abstract

STATEMENT OF PROBLEM: Ceramic restorations are popular because of their excellent optical properties. However, failures are still a major concern, and dentists are confronted with the following question: is sleep bruxism (SB) associated with an increased frequency of ceramic restoration failures?

PURPOSE: The purpose of this systematic review and meta-analysis was to assess whether the presence of SB is associated with increased ceramic restoration failure.

MATERIAL AND METHODS: Observational studies and clinical trials that evaluated the short- and long-term survival rate of ceramic restorations in SB participants were selected. Sleep bruxism diagnostic criteria must have included at least 1 of the following: questionnaire, clinical evaluation, or polysomnography. Seven databases, in addition to 3 nonpeer-reviewed literature databases, were searched. The risk of bias was assessed by using the meta-analysis of statistics assessment and review instrument (MAStARI) checklist.
RESULTS: Eight studies were included for qualitative synthesis, but only 5 for the meta-analysis. Three studies were categorized as moderate risk and 5 as high risk of bias. Clinical and methodological heterogeneity across studies were considered high. Increased hazard ratio (HR=7.74; 95% confidence interval [CI]=2.50 to 23.95) and odds ratio (OR=2.52; 95% CI=1.24 to 5.12) were observed considering only anterior ceramic veneers. Nevertheless, limited data from the meta-analysis and from the restricted number of included studies suggested that differences in the overall odds of failure concerning SB and other types of ceramic restorations did not favor or disfavor any association (OR=1.10; 95% CI=0.43 to 2.8). The overall quality of evidence was considered very low according to the GRADE criteria.

CONCLUSIONS: Within the limitations of this systematic review, the overall result from the meta-analysis did not favor any association between SB and increased odds of failure for ceramic restorations.

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2018

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Title
Use of digital impression systems with intraoral scanners for fabricating restorations and fixed dental prostheses. [Review]
Source

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Abstract
Accurate impressions are essential in fabricating dental restorations and fixed dental prostheses. During the last decade, digital impression systems have improved substantially. This review discusses the accuracy of digital impression systems for fabrication of dental restorations and fixed dental prostheses. A literature search in PubMed was performed for the period from July 2010 through June 2017. The search keywords were Cerec, digital impression, direct digitalization, indirect digitalization, and intraoral scanner. Only relevant studies are summarized and discussed in this review. In general, the latest systems have considerably reduced the time required for impression making, and the accuracy and marginal fit of digital impression systems have recently improved. Restorations and fixed dental prostheses fabricated with currently available digital impression systems and intraoral scanners exhibit clinically acceptable ranges of marginal gap in both direct and indirect procedures.

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Does Finishing and Polishing of Restorative Materials Affect Bacterial Adhesion and Biofilm Formation? A Systematic Review. [Review]
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Authors
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Authors Full Name
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PURPOSE: To investigate if the presence of a cantilever influences the survival and success of partial fixed implant-supported prostheses, through a systematic review and meta-analysis, with additional analysis of the survival and marginal bone loss rates and prosthesis complications.

MATERIALS AND METHODS: The register protocol of the review in the PROSPERO database is CRD42016052008. The MEDLINE and Scopus databases were used for an electronic search of relevant studies up to November 2016, by means of two independent reviewers. The keywords included the combinations “fixed partial denture” with “dental implants”, and with “extension” or “cantilever”; and “implant-supported dental prosthesis” with “extension” or “cantilever”. The inclusion criteria were randomized clinical trials and prospective and retrospective clinical studies in English that addressed the comparison of success and survival of the use of implant-supported fixed prostheses, with and without cantilevers. Data from the selected studies were used to perform the statistical analysis.

RESULTS: Among the 408 articles identified, 4 articles met the eligibility criteria. The presence of a cantilever did not compromise marginal bone loss or the survival of the prostheses. However, minor complications were encountered for the group of partial fixed prostheses without cantilevers, with a statistical difference (P = .008).

CONCLUSION: Cantilevers can be used in fixed prostheses and do not interfere negatively in the survival or success of the prosthesis or the marginal bone loss. However, there are minor complications when prostheses without cantilevers, or short cantilevers, are used.

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PURPOSE: To assess studies on edentulous patients rehabilitated using mandibular implant-supported profile prostheses and analyze the impact of different numbers of implants used on the implant survival rate, peri-implant bone loss, and prosthesis survival rate.

MATERIALS AND METHODS: This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement and was registered on PROSPERO. The PubMed/MEDLINE database was searched for articles published before July 18, 2016. The study attempted to answer the following PICO question: In edentulous patients, do full-arch fixed prostheses supported by three implants have a satisfactory implant survival rate, marginal bone loss, and prosthesis survival rate compared with those supported by different numbers of implants? Evidence levels of each study were evaluated using the Oxford Centre for Evidence-Based Medicine (OCEBM); methodologic quality was evaluated using the Methodological Index for Nonrandomized Studies (MINORS) scale and Cochrane Risk of Bias Tool. Descriptive statistics were performed when applicable. Implant survival curves were constructed using the Kaplan-Meier method, and marginal bone loss was analyzed using the Kruskal-Wallis, Dunn's, and Mann-Whitney tests.

RESULTS: This analysis included 21 published studies of 4,712 implants and 1,245 mandibular implant-supported profile prostheses in 1,245 patients. The patients were grouped by the number of implants used: group 1 (three implants) had an implant survival rate of 90%; group 2 (four implants) had a rate of 95%; and group 3 (five implants) had the lowest rate, 74%. Groups 1 and 3 had the lowest first-year bone losses (median: 0.73 and 0.70 mm, respectively), and were significantly different from group 2 (median: 1.31 mm; P < .001).

CONCLUSION: Despite the limitations in the studies with low levels of evidence and the methodology of MeSH term research, it was concluded that the implant survival rate and first-year bone loss of full-arch fixed prostheses supported by three implants were satisfactory. However, the prosthesis survival rate was inferior to that of other groups, which suggests a longer follow-up of these rehabilitations.
Hair restoration has become increasingly popular in recent years with both men and women. New technologies such as follicular unit extraction and grafting have made it possible for patients to get a natural looking result with minimal downtime. Men usually experience hairline recession as a result of androgenic alopecia, while women most commonly experience thinning of the crown and vertex, with the preservation of the hairline. However, there is a growing population of women who wish to advance their hairline forward because of congenital high hairline, traction alopecia, or previous facial cosmetic surgery. There are several key differences between the female and male hairline. Understanding such differences and following certain guidelines will help the facial plastic surgeon to obtain beautiful and natural appearing results.

Zirconia ceramic is a popular trend in esthetic and restorative dentistry. Computer-aided design/computer-aided manufacturing (CAD/CAM) systems have been well developed to fabricate zirconia frameworks and restorations with acceptable mechanical properties. Zirconia ceramics have excellent optical characteristics; however, achieving optimal esthetic outcomes with zirconia-based restorations is still challenging due to multiple effective factors on the final color. These factors are different layers of a zirconia-based restoration and its underlying structures including: dental substrate, cement, zirconia coping, veneering ceramic, and glaze. Moreover, the laboratory procedure of these restorations' fabrication is another effective factor on the resultant color. Unpredictable esthetic results may be obtained without estimation of the role of each factor and its effect on the final color. This review discussed the color aspect of zirconia-based restorations according to these factors and based on the literature. In the past decade, investigators have been concerned with the shade reproduction with zirconia-based restorations; however, there are no sufficient clinical guidelines on how to reproduce the appearance of natural teeth with these restorations. Zirconia-based restorations have presented a new chance for accomplishing optimum esthetics. Nonetheless further investigations are needed on these restorations to establish clinical guidelines on esthetics.
This study reviews the clinical and radiographic outcomes of Mini-implants (MI) and Narrow Diameter Implants (NDI) as mandibular overdenture (MO) retainers. Six databases were consulted for clinical studies that evaluated implants with diameter <3.5 mm. Data on the MI and NDI for survival and success rate and peri-implant bone loss and were collected and submitted to meta-analysis. Thirty-six studies were included, 24 reporting MI performance and 12 describing NDI results. The MI group comprised data from 1 cross-sectional clinical study, 3 retrospective longitudinal (RL) clinical studies, 13 prospective longitudinal (PL) clinical studies and 7 randomised clinical trials (RCT) with follow-up periods ranging from 1 day to 7 years. Eight studies used conventional loading, thirteen used immediate loading, two studies used both loading types, and one study did not report. The NDI group comprised data from 3 RL clinical studies, 6 PL clinical studies and 3 RCT with follow-up ranging from 6 months to 10 years. Ten studies used conventional loading, 1 study used immediate loading, and 1 study did not report. The average survival rates of MI and NDI studies were 99% and 98%, respectively, while the average success rates were 93% and 96%, respectively. The average peri-implant bone loss after 12, 24 and 36 months was 0.89, 1.18 and 1.02 mm for MI and 0.18, 0.12 and 0.32 mm for NDI. Both MI and NDI showed adequate clinical behaviour as overdenture retainers. The NDI showed a better long-term predictability to retain OM with most studies adopting conventional loading.
BACKGROUND: Several restorative materials with specific indications are used for filling cavities in primary teeth. One of the main reasons for failure observed was secondary caries (36.5%).

AIM: To systematically review the literature in order to investigate the longevity of primary teeth restorations and the reasons for failures.

RESULTS: Thirty-one studies were included, and a high bias risk was observed. Overall, 12,047 restorations were evaluated with 12.5% of failure rate. A high variation on annual failure rate (AFR) was detected (0-29.9%). Composite resin showed the lowest AFRs (1.7-12.9%). Stainless steel crowns (SSC) had the highest success rate (96.1%). Class I restorations and restorations placed using rubber dam presented better AFR. The main reason for failure observed was secondary caries (36.5%).
CONCLUSIONS: An elevated number of failures were observed due to recurrent caries, highlighting the need for professionals to work with a health-promoting approach. The high variation on failure rate among the materials can be due to children's behavior during the procedure, which demands short dental appointments and a controlled environment.

Abstract
STATEMENT OF PROBLEM: Yttria-stabilized tetragonal zirconia polycrystal has been used as a dental biomaterial for several decades because the fracture toughness and bend strength are increased by a stress-induced transformation-toughening mechanism. However, its esthetics are compromised by its poor translucency and grayish-white appearance.

PURPOSE: The purpose of the present systematic review was to assess information on the mechanical, chemical, and optical requirements of monolithic zirconia dental restorations.

MATERIAL AND METHODS: The following databases (2010 to 2015) were electronically searched: ProQuest, EMBASE, SciFinder, MRS Online Proceedings Library, Medline, Compendex, and Journal of the American Ceramic Society. The search was limited to English-language publications, in vitro studies, experimental reports, and modeling studies.

RESULTS: The data from 57 studies were considered in order to review the intrinsic and extrinsic characteristics of zirconia and their effects on the optical properties.

CONCLUSIONS: The materials and microstructural issues relevant to the esthetics and long-term stability of zirconia have been considered in terms of monolithic restorations, while there also are restorations specifically for esthetic applications. Although zirconia-toughened lithium silicate offers the best esthetic outcomes, transformation-toughened zirconia offers the best mechanical properties and long-term stability; cubic stabilized zirconia offers a potential compromise. The properties of these materials can be altered to some extent through the appropriate application of intrinsic (such as, annealing) and extrinsic (such as, shade-matching) parameters.
OBJECTIVE: This systematic review was performed to answer the following question: do contracted endodontic cavities (CECs) increase resistance to fracture in extracted human teeth compared to traditional endodontic cavities (TECs)?

METHODS: A literature search without restrictions was carried out in PubMed, Science Direct, Scopus, Web of Science, and Open Grey databases. Articles were selected by two independent reviewers. In addition, a reference and hand search was also performed.
fulfilled. All included in vitro studies evaluated the influence of CECs on strength to fracture in extracted human teeth and compared to TECs. The quality of the selected studies was evaluated and they were classified as having a low, moderate or high risk of bias.

RESULTS: A total of 810 articles were obtained in the electronic search. After the application of the eligibility criteria, reference and hand search, and duplicate removal, six studies were included in this systematic review. All included studies evaluated the influence of CECs on strength to fracture in extracted human teeth and compared to TECs. Characteristics investigated in the selected articles included the sample size and tooth type, access cavity design, filling and restoration procedures, load at fracture test characteristics, and results. The studies demonstrated large variability among the fracture resistance values and standard deviations and low power. Three of the reviewed studies presented low risk of bias and the other three showed medium risk of bias.

CONCLUSION: Overall, this systematic review of in vitro studies showed that there is no evidence that supports the use of CECs over TECs for the increase of fracture resistance in human teeth.

CLINICAL RELEVANCE: Recently, CECs have gained attention in endodontics due to maximum tooth structure preservation including the pericervical dentin, which could improve the strength to fracture of endodontically treated teeth. However, the influence of access cavity design on fracture resistance remains limited and controversial.

Pubmed ID: 2896692
Title: Short implants versus bone grafting and standard-length implants placement: a systematic review. [Review]
Abstract: The objective of the present systematic review was to compare the survival rates between short implants (< 10 mm) versus standard-length implants (>= 10 mm) inserted in grafted bone. As secondary outcomes, marginal bone loss and survival rates of the implant supported prostheses were also analysed.

MATERIALS AND METHODS: Randomised controlled trials (RCT) that compared both techniques were searched on three electronic databases till June 2016, a manual search was performed on the bibliography of the collected articles, and the authors were contacted for additional references. The estimates of the interventions were expressed in relative risk (RR), mean implant survival rates and mean differences in marginal bone.

RESULTS: Eight RCTs were included in this study. From a total of 458 short implants, 15 failed (mean survival rates = 96.7%), while from 488 regular implants, 13 failed (mean survival rates = 97.3%). The technique did not significantly affect: the implant failure rate (P > 0.05), with RR of 1.34 (95% CI 0.67-2.87), the mean differences of marginal bone loss (P = 0.18; MD - 0.04 mm [-0.10; 0.02] 95% CI), at loading or prosthesis failures rates (RR:0.98; 95% CI 0.40-2.41). The mean differences of marginal bone at
1 year follow-up (post loading) presented significant marginal changes in the short implant group (P = 0.002; MD - 0.10 mm [-0.16; - 0.03] 95% CI) although a significant high heterogeneity was found between groups.

CONCLUSIONS: This systematic review suggests no difference between both techniques in the treatment of atrophic arches. However, more long-term RCTs are needed to evaluate the predictability at the long run.

CLINICAL RELEVANCE: The use of short implants might be considered an alternative treatment, since it usually requires fewer surgical phases and tends to be a more affordable option.

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A Review on Cervical Margin Relocation in Indirect Adhesive Restorations: A Literature Review

PURPOSE: The aim of this review was to summarize the existing scientific literature investigating on cervical margin relocation (CMR) performed prior to the adhesive cementation of the indirect restorations.

STUDY SELECTION: An electronic search with no date restriction was conducted in the MEDLINE database, accessed through PubMed. The following main keywords were used: "cervical margin relocation", "coronal margin relocation", "deep margin elevation" and "proximal box elevation".

RESULTS: Seven in vitro studies and 5 clinical reports investigating on CMR are taken into consideration for the present review. The most frequently investigated parameter in almost all of the in vitro studies was the marginal adaptation of the indirect restorations. One study additionally assessed the influence of CMR on the fracture behavior of the restored teeth and one study assessed the bond strength of the indirect composite restoration to the proximal box floor. Clinical reports provided documentation with a detailed description of the treatment protocol. In the current literature no randomized controlled clinical trials or prospective or retrospective clinical studies on CMR technique could be found.

CONCLUSIONS: On the basis of the reviewed literature, it can be concluded that currently there is no strong scientific evidence that could either support or discourage the use of CMR technique prior to restoration of deep subgingival defects with indirect adhesive restorations. Randomized controlled clinical trials are necessary to provide the reliable evidence on the influence of CMR technique on the clinical performance, especially on the longevity of the restorations and the periodontal health.

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A Review on Translucent Zirconia

PURPOSE: The aim of this review was to summarize the existing scientific literature investigating on cervical margin relocation technique (CMR) performed prior to the adhesive cementation of the indirect restorations.

STUDY SELECTION: An electronic search with no date restriction was conducted in the MEDLINE database, accessed through PubMed. The following main keywords were used: "cervical margin relocation", "coronal margin relocation", "deep margin elevation" and "proximal box elevation".

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Abstract

INTRODUCTION: Zirconia is suggested in many clinical situations due to acceptable biocompatibility, lower price compared with gold restorations, and better appearance than traditional metal ceramic restorations. New translucent monolithic zirconia has been developed to merge strength with improved tooth-colour matching. This work aims to review relevant articles on new translucent zirconia restorative materials.

METHODS: The published articles on translucent zirconia were searched through PubMed, Medline, Google scholar, and indexed journals using the following keywords: translucent zirconia, transparent zirconia, and tooth colored zirconia. The most relevant articles were selected and reviewed.

RESULT: Introduction of translucent zirconia, has brought the advantages such as less tooth preparation, biological compatibility, high strength, good mechanical properties, and less antagonist wear. However, the effects of altering material constituents to increase translucency on properties such as phase transformation and low temperature degradation may warrant further investigations.

CONCLUSION: Translucent zirconia can be prescribed in many clinical situations and may provide less complicated procedures compared with the production of multilayer restorations of opaque zirconia cores and translucent feldspathic veneers. This may otherwise decrease fabrication time and defects, improve biological properties, reduce abutment tooth reduction, and result in less antagonist tooth attrition.

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Abstract

AIMS: The purpose of this study was to methodically review the literature concerning the success and survival rates of zirconia based fixed dental prostheses (FDPs).

METHODS: A systematic search was conducted of MEDLINE, Elsevier and the Cochrane Library to identify relevant articles about zirconia FDPs. In order to obtain suitable articles, rigorous criteria were applied. The minimum follow-up period was five years.

RESULTS: From a total of 986 articles identified in the first electronic search, only 10 matched the inclusion criteria. A total of 368 patients with 430 zirconia FDPs were included in this systematic review. The survival rate was 89.43% +/- 10.01% and chipping of the veneering ceramic occurred in 16.97% of the cases.

CONCLUSION: Zirconia-based fixed dental prostheses perform reasonably well and can serve as an alternative to metal-ceramic fixed dental prostheses.
**Title:** Prognosis of Combining Remaining Teeth and Implants in Double-Crown-Retained Removable Dental Prostheses: A Systematic Review and Meta-Analysis. [Review]


**Authors:** Lian, Meifei; Zhao, Kai; Feng, Yunzhi; Yao, Qian.

**Abstract:**

PURPOSE: The reliability of combining natural teeth and implants in one removable prosthesis is controversial. This systematic review was conducted to evaluate the prognosis of combined tooth/implant-supported double-crown-retained removable dental prostheses (DCR-RDPs) and to compare them with solely implant-supported prostheses with a minimum observation period of 3 years.

MATERIALS AND METHODS: Electronic database (PubMed, Embase, Central, and SCI) and manual searches up to August 2016 were conducted to identify human clinical studies on tooth/implant-supported DCR-RDPs. Literature selection and data extraction were accomplished by two independent reviewers. Meta-analyses of survival and complication rates were performed separately for combined tooth/implant-supported and solely implant-supported DCR-RDPs.

RESULTS: Among the initially identified 366 articles, 17 were included in a quantitative analysis. The estimated overall cumulative survival rate (CSR) for implants in combined tooth/implant-supported DCR-RDPs was 98.72% (95% confidence interval [95% CI]: 96.98% to 99.82%), and that for implants in solely implant-supported DCR-RDPs was 98.83% (95% CI: 97.45% to 99.75%). The summary CSR for abutment teeth was 92.96% (95% CI: 85.38% to 98.12%). Double-crown-retained dentures with both abutment types showed high CSRs, most of which were approximately 100%. Regarding prosthetic maintenance treatment, the estimated incidence for patients treated with combined tooth/implant-supported DCR-RDPs was 0.164 (95% CI: 0.089 to 0.305) per patient per year (T/P/Y) and that for patients restored with solely implant-supported RDPs was 0.260 (95% CI: 0.149 to 0.454) T/P/Y. Based on four studies with combined tooth/implant-supported DCR-RDPs, no intrusion phenomena were encountered.

CONCLUSION: Subject to the limitations of the present review, combining remaining teeth and implants in DCR-RDPs is a reliable and predictable treatment modality for partially edentulous patients. Comparable high survival rates and minor biological or technical complications are observed for combined tooth/implant-supported and solely implant-supported DCR-RDPs. Due to the heterogeneity of the included studies, the results must be interpreted with caution.

**Title:** Estimating the Importance of Significant Risk Factors for Early Dental Implant Failure: A Monte Carlo Simulation.


**Authors:** Buhara, Oguz; Pehlivan, Sahali.

**Abstract:**

PURPOSE: The purpose of this study was to develop a probabilistic estimation of the strength of risk factors associated with early dental implant failure and rank them by importance.
RESULTS: The performed simulation model has shown a significant difference in terms of estimated effects of the risk factors on early failure rate. As a result, the most sensitive risk factor was found to be "periodontitis" with the second being "adjacent teeth" and the third "smoking." The least sensitive factor for early failure was "wide implants."

CONCLUSION: This study develops a better understanding of the importance of risk factors for early dental implant failure by an estimated ranking.
This study aimed to compare the longevity of different conventional restorative materials placed in posterior primary teeth. A network meta-analysis was performed to compare the risk of failure between the materials. The materials included were composite resin, modified glass ionomer cement, amalgam, and composite resin. The meta-analysis was conducted using a comprehensive electronic search of PubMed/MEDLINE, Cochrane Central Register of Controlled Trials, Scopus, Turning Research Into Practice (TRIP) and Clinical Trials databases up to January 2017. Eight randomized controlled trials were included in the analysis, and the results showed no significant differences in failure rates between the materials. The Cochrane Risk of Bias tool was used to assess the quality of included studies. The conclusions of the review should be interpreted with caution, as the present review is underpowered and the included randomized controlled trials were considered to be at high risk of bias.
Polymerization shrinkage of resin composite can compromise the longevity of restorations. To minimize this problem, the monomeric composition of composites have been modified. The objective of this study was to conduct a meta-analysis to assess the clinical behavior of restorations performed with low polymerization shrinkage resin composite in comparison with traditional methacrylates-based resin composite. This systematic review was registered at Prospero data system (CRD42015023940).

Studies were searched in the electronic databases PubMed, Web of Science, Scopus, Lilacs and EMBASE according to a predefined search strategy. The inclusion criteria were as follow: (1) randomized controlled clinical trials with at least six months of follow-up; (2) studies investigating composites with monomers designed to reduce polymerization shrinkage; (3) studies conducted with class I or II restorations in the permanent dentition; and (4) studies that assessed at least one of the following criteria: marginal integrity/adaptation, marginal discoloration, recurrent caries, retention of composite restorations, and postoperative sensitivity. Two independent reviewers analyzed the articles to determine inclusion and risk of bias. The search conducted in the databases resulted in a total of 14,217 studies. After reviewing the references and citations, 21 articles remained. The longest clinical follow-up time was 60 months. The meta-analysis of the data in the included studies demonstrated that only one variable (marginal adaptation after 12 months) showed statistically significant outcomes, in which methacrylates-based composites presented significantly better results than resin composites containing modified monomers. The good level of the scientific evidence as well as the overall low risk of bias of the included studies indicate that composites with silorane, ormocer or bulk-fill type modified monomers have a clinical performance similar to conventional resin composites.

**Purpose:** To evaluate the current status of all-ceramic inlay-retained fixed dental prostheses (CIR-FDPs) for the replacement of posterior teeth.

**Abstract**

STUDY SELECTION: Screening of titles and abstracts, full-text analysis for inclusion eligibility, quality assessment, data extraction and evaluation of the scientific evidence were performed independently by two reviewers. The electronic databases
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RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

MEDLINE/PubMed, EMBASE, Cochrane Central Register of Controlled Trials, and Compludoc were searched with no restriction to publication date or language. The quality of the studies was evaluated through: the original ‘QDP’ (‘Questionnaire for selecting articles on Dental Prostheses’) (for research papers); the ‘Guidelines for managing overviews’ of the Evidence-Based Medicine Working Group (for reviews); the Cochrane risk of bias tool; and the GRADE scale for grading scientific evidence.

RESULTS: This review started with 4942 articles, which were narrowed down to 23 according to the selection criteria. The data was not statistically treated because of the heterogeneity of the studies. Zirconia-based CIR-FDPs may be recommended for restoring posterior single missing teeth, although the prosthesis/tooth bonded interface has yet to be improved. The addition of lateral wings to the classical inlay preparation seems promising. The weakest parts of CIR-FDPs are the connectors and retainers, while caries and endodontic problems are the most common biological complications. The fabrication of CIR-FDPs with monolithic zirconia may eliminate chipping problems.

CONCLUSIONS: A three-unit CIR-FDP is a viable treatment option for replacing a posterior missing tooth. Appropriate case selection, abutment preparation and luting procedures may be decisive for clinical success.

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