



Critical Appraisal

PORCELAIN VENEER OUTCOMES, PART II

Authors

Edward J. Swift Jr, DMD, MS*

Mark J. Friedman, DDS†

Associate Editor

Edward J. Swift Jr, DMD, MS

Etched porcelain veneers have now been used clinically for about 20 years. The profession was originally very skeptical about bonding thin shells of a brittle ceramic material to teeth. However, ceramic veneers have proved to be not only very esthetic but also extremely durable restorations. This article continues the Critical Appraisal from the previous issue of JERD and describes articles related to veneer longevity and clinical factors contributing to—or detracting from—longevity.

A PROSPECTIVE TEN-YEAR CLINICAL TRIAL OF PORCELAIN VENEERS

M. Peumans, J. De Munck, S. Fieuws, P. Lambrechts, G. Vanherle, B. Van Meerbeek

Journal of Adhesive Dentistry 2004 (6:65–76)

ABSTRACT

Objective: The purpose of this prospective clinical study was to evaluate the performance of porcelain veneers after 5 and 10 years of clinical service.

Materials and Methods: A single experienced clinician placed 87 porcelain veneers in 25 patients in 1990 and 1991. The teeth included maxillary central incisors to first premolars. As described in the 5-year report of this study, preparations included a chamfer margin, 0.3 to 0.7 mm labial enamel reduc-

tion, and incisal edge coverage. A single laboratory technician fabricated the veneers using feldspathic porcelain on refractory dies. Internal surfaces were etched with 5% hydrofluoric acid and silanated. Teeth were isolated with a rubber dam prior to veneer placement. All veneers were bonded with a light-activated resin cement. Patients were recalled at 5 to 6 years and at 10 years after initial veneer placement. Two evaluators examined each veneer for retention, fractures, color match, surface roughness, marginal adaptation, leakage,

recurrent caries, pulp vitality, and patient satisfaction. Marginal adaptation was assessed further using scanning electron microscopy to examine epoxy replicas.

Results: Five years after placement, all 87 veneers remained in place and had “perfect” color match and surface smoothness. Four veneers had fractures, but only one of those required repair. Ninety-nine percent of the veneers had clinically acceptable marginal adaptation, although just 14% of the veneers had “perfect” marginal adaptation at all

*Professor and chair, Department of Operative Dentistry, University of North Carolina, Chapel Hill, NC, USA

†Private practice, Encino, CA, and clinical professor, University of Southern California School of Dentistry, Los Angeles, CA, USA

margins. One had clinically unacceptable staining from leakage. Recurrent caries was present at the proximal margin of two veneers. At the 10-year evaluation, which had a 93% recall rate, color match and surface roughness remained optimal. Thirteen of 22 patients were very satisfied with the esthetic result, whereas 7 complained of minor esthetic problems. The fracture rate increased substantially, to 34% at the 10-year recall. However, only 11% of the fractures were clinically unacceptable. None of the veneers had debonded, but the percentage of veneers with “perfect” marginal adaptation had declined to only 4%. Leakage was now evident around two-thirds of the veneers, and eight restorations had recurrent caries.

Conclusion: Porcelain veneers are a reliable and effective means for conservative esthetic treatment of

anterior teeth in the long term. After 10 years of clinical service, esthetic results remained good, patient satisfaction was high, and the retention rate was excellent. The number of irreparable fractures was low. Appropriate preparation design, occlusion, and use of adhesive materials contribute to the ultimate outcome.

COMMENTARY

This study was somewhat limited in scope; fewer than 100 veneers were evaluated, and all were prepared and bonded by a single clinician and fabricated by a single laboratory technician using a single ceramic material.

Certainly, the veneers were not perfect after 10 years of clinical service. However, most problems were minor, and both the patients and the clinician evaluators were satisfied with the results.

Nevertheless, it is worth noting that the veneers were not completely free of problems, either at 5 or 10 years after placement. Veneer problems are likely to increase when, for example, appropriate preparation guidelines are not followed. The clinician who is considering veneers for a particular patient should remember that the veneers will not last forever and will almost certainly require replacement at some point.

SUGGESTED READING

- Chen J-H, Shi C-X, Wang M, et al. Clinical evaluation of 546 tetracycline-stained teeth treated with porcelain laminate veneers. *J Dent* 2005;33:3–8.
- Fradeani M. Six-year follow-up with Empress veneers. *Int J Periodontics Restorative Dent* 1998;18:216–25.
- Nordbo H, Rygh-Thoresen N, Henaug T. Clinical performance of porcelain laminate veneer restorations without incisal overlapping: 3-year results. *J Dent* 1994;22:342–5.
- Walls AWG. The use of adhesively retained all-porcelain veneers during the management of fractured and worn anterior teeth: part 2. Clinical results after 5 years of follow-up. *Br Dent J* 1995;178:337–40.

DIRECT VERSUS INDIRECT VENEER RESTORATIONS FOR INTRINSIC DENTAL STAINS

J. Wakiaga, P. Brunton, N. Silikas, A.M. Glenny

The Cochrane Database of Systematic Reviews 2004 (1:CD004347)

ABSTRACT

Objective: The purpose of this study was to examine the effectiveness of indirect and direct veneer restorations, particularly with regard to longevity and patient satisfaction.

Materials and Methods: This study evaluated the literature on randomized clinical trials compar-

ing direct and indirect veneers on anterior teeth. The search strategy involved *Medline* and other databases and was followed by contacting authors to determine whether any additional published or unpublished studies were available.

Relevant studies were assessed for factors such as quality of random-

ization, outcome assessment, and completeness of recall evaluation. Data from the studies were extracted by three independent reviewers using special forms. Authors were contacted for clarification and missing data. Study details such as dates, demographics of the sample, and outcomes were recorded.

Results: The electronic searches identified 29 clinical trials and 1 systematic review. Six of those were screened as potentially relevant to the review, but following a more detailed screening, only one study (Meijering and colleagues, 1998) met all of the inclusion criteria. In the 2-year recall of that study, the overall survival rates were 94% for porcelain, 90% for indirect composite, and 74% for direct composite veneers. The survival rate was higher when the incisal edge was reduced. Patient satisfaction rates were 93% for porcelain, 82% for indirect composite, and 67% for direct composite.

Conclusion: Very little reliable evidence compares the effectiveness of indirect versus indirect veneers. For an individual patient, the choice between the two options should

take into account patient preference and the clinician's experience.

COMMENTARY

As this Cochrane review shows, there is very little scientific evidence concerning the longevity of porcelain veneers compared with that of direct resin veneers. Only one randomized clinical trial met the inclusion criteria of the review. That study did show greater technical success and patient satisfaction for the porcelain veneers but involved less than 200 restorations at only 2.5 years after placement.

The most revealing aspect of this Cochrane review is that, as clinicians, we cannot provide our patients with the highest level of scientific evidence regarding veneers simply because that evidence is not available. Certainly, one would

expect porcelain veneers to provide longer service and greater patient satisfaction than direct veneers, and clinical experience supports this expectation. However, direct veneers continue to have a place for some clinicians and patients.

SUGGESTED READING

Kreulen CM, Creugers NHJ, Meijering AC. Meta-analysis of anterior veneer restorations in clinical studies. *J Dent* 1998;26:345–53.

Meijering AC, Creugers NH, Roeters FJ, Mulder J. Survival of three types of veneer restorations in a clinical trial: a 2.5-year interim evaluation. *J Dent* 1998;26:563–8.

Spear FM. Esthetic correction of anterior dental malalignment: conventional versus instant (restorative) orthodontics. *J Esthet Restor Dent* 2004;16:149–62.

Reprint requests: Mark J. Friedman, DDS, Center for Dental Aesthetics, 16830 Ventura Blvd., Suite 258, Encino, CA 91436; e-mail: mfriedmandds@mac.com

©2006 Blackwell Publishing, Inc.

THE BOTTOM LINE: PORCELAIN VENEER OUTCOMES

The most interesting issue that is revealed by these investigations is the significant variation in clinical success of bonded porcelain veneer restorations. Naturally, there are multiple clinical factors that will influence the relative success and failure of any restorative dentistry technique. The ultrathin porcelain veneer restoration is a particularly demanding procedure. It is reasonable to assume that all the investigators exercised great care to be as precise and consistent as possible.

In Part I, Shaini and colleagues found that the porcelain veneer restorations placed by one group of operators resulted in a nearly 50% failure rate at 6 years. Dumfahrt and Schäffer reported 90% success at 10 years. Peumans and colleagues reported similar success rates at 10 years, but 34% of the restorations in this prospective study exhibited noticeable fractures and only 4% demonstrated “perfect” marginal adaptation. This evidence suggests that at least some porcelain veneer restorations are likely to require repair or replacement within a decade of service or even sooner. All the investigators attempted to ensure that the porcelain veneer restorations were bonded to an enamel substrate and reported less success when veneers were bonded to dentin or existing restorations. Friedman reported that catastrophic failures of porcelain veneer restorations were most common when the restorations were bonded to dentin. Debonding and leakage were not

Copyright of Journal of Esthetic & Restorative Dentistry is the property of Blackwell Publishing Limited and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.