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.

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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

observed when the peripheral finish lines of the preparation were in enamel. In those situations, only small cohesive fractures or static fractures were observed and the overall success rate was greater than 90%.

A disturbing issue to consider is that current trends promote a more aggressive tooth preparation than 20 years ago, with less regard for maintaining an enamel substrate. Irrespective of advancements in adhesive technology to dentin, will debonding and leakage rates be substantially increased owing to this trend? What about re-treatment of failed porcelain veneer restorations? Do replacement veneers enjoy the same prognosis as the original restorations, or is the risk of failure increased? How much enamel is required for an adequate bond and a reliable seal? What role does occlusion play in the short-term fracture of veneer restorations, and should all patients wear a hard bite guard? Should dentists always consider the most conservative options, such as vital whitening or direct composites, in an effort to preserve natural enamel for as long as possible? These are not just clinical concerns related to the longevity of a dental restoration, but they raise important ethical issues as well.

The porcelain veneer restoration has been widely publicized as a conservative alternative to a traditional complete coverage porcelain restoration. As such, it has been promoted for elective esthetics on young patients and even as an option to orthodontic treatment. The term *instant orthodontics* has emerged, and many young patients are having restorative procedures performed in lieu of orthodontic care. These articles underscore the fact that even under ideal conditions, a certain percentage of porcelain veneer restorations are going to fracture, leak, and debond. It is reasonable to assume that short-term failure of a porcelain veneer may eventually result in its replacement with a metal-ceramic or all-ceramic crown. Esthetic demands often initiate the replacement of crowns within a 7- to 10-year period of time even if the restoration is functionally sound. A certain percentage of complete coverage restorations require endodontic therapy as a direct result of the restorative procedure, and the loss of a tooth from a complex restorative effort is certainly well within the realm of possibility.

The bottom line is that porcelain veneer restorations are never reversible if tooth preparation is performed. Although veneers can be fabricated without tooth preparation, excessive contours usually result. Therefore, the thoughtful clinician who is considering porcelain veneer restorations as part of a comprehensive treatment plan should not consider them to be a highly conservative procedure. Even if the operator uses the most judicious tooth preparation designs and impeccable technique, failures will be encountered. Some of those failures may result in re-treatment with complete coverage restorations, and that is certainly a procedure that should be avoided or at least postponed for as long as possible. When porcelain veneers are being considered strictly for elective esthetic reasons, every effort should be explored to achieve the esthetic objectives with a more conservative option.

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