Expanded Structured Abstract

A 5-Year Prospective Clinical Study on Core Restorations Without Covering Crowns

Nico H. J. Creugers, DDS, PhD[a]/Cees M. Kreulen, DDS, PhD[b]/Wietske A. Fokkinga, DDS[c]/
Arno G. M. Mentink, DDS, PhD[d]

Traditionally, structurally compromised and endodontically treated teeth are restored with post-and-core restorations and covered with conventional crowns. The purpose of this study was to explore whether direct composite buildup restorations, with or without a post and not protected by a covering cast crown, can show acceptable durability over a 5-year observation period.

Materials and Methods: The present study was one part of a series of multipractice clinical trials in which the clinical behavior of various types of buildup restorations was the central theme. All patients and teeth included in the present trial were selected as previously described[1] and were chosen because they were either unwilling to have or could not afford a cast crown to cover the buildup restoration. They were treated with a direct composite crown.

This trial compared 99 of these restorations either with (n = 53) or without (n = 46) a prefabricated post (Radix or RS; Maillefer) in 87 patients (43 men, 44 women). Application of a post was assigned by balanced drawing. Cores were made from Clearfil Core resin composite (Kuraray), and the restoration was finally covered and finished with Clearfil Ray Posterior (Kuraray). The restorations were made in 27 molars, 54 premolars, and 18 anterior teeth (Fig 1). Operators (17 general practitioners and 1 university clinician) were instructed to strictly observe protocols, and the operative procedures were calibrated. Before entering the study, patients were informed about the protocol, and those who agreed signed an informed consent form. The patients were reviewed at regular 6-month recalls.

Life tables were constructed, and log-rank and Wilcoxon tests were used to test the variable "post" for its influence on restoration longevity, with a cutoff value of $P = .05$.

Results: None of the post-free restorations failed (100% survival). Two restorations with posts failed after almost 5 years (survival 96% ± 2%). Both failures were in the maxillary left second premolar and comprised dislodgment of the restorations, with tooth fracture above the cementoenamel junction. Survival difference was not statistically significant.

Discussion: The restoration of structurally compromised and endodontically treated teeth with complete composite buildup restorations has been previously described (Fokkinga et al[2]; Roeters[3]; and Smidt and Venezia[4]). However, the reports are in vitro and from short-term study periods. While direct comparison is inappropriate (no intertrial randomization between the present study and the parallel trial[1]), it is worth mentioning that the restorations in the present study showed a similar survival rate to the crowned buildup restorations in the parallel trial.

It therefore appears that the technique of direct teeth restorations with resin composite is both promising and feasible, particularly when transitional solutions are required for teeth that need longer evaluation periods. The need for posts in buildup restorations for cast crowns has been questioned in the dental literature. The present study does not support the need for posts for structurally compromised and endodontically treated teeth restored with composite buildups and not covered by cast crowns.

[a]*Professor and Chair, Department of Oral Function and Prosthetic Dentistry, College of Dental Science, University Medical Centre Nijmegen, University of Nijmegen, The Netherlands.*
[b]*Associate Professor, Department of Oral Function and Prosthetic Dentistry, College of Dental Science, University Medical Centre Nijmegen, University of Nijmegen, The Netherlands.*
[c]*Junior Researcher, Department of Oral Function and Prosthetic Dentistry, College of Dental Science, University Medical Centre Nijmegen, University of Nijmegen, The Netherlands.*
[d]*General Practitioner, Eindhoven, The Netherlands.*

Correspondence to: *Dr Nico H. J. Creugers, Department of Oral Function and Prosthetic Dentistry, College of Dental Science, University Medical Centre Nijmegen, University of Nijmegen, PO Box 9101, Nijmegen 6500 HB, The Netherlands. Fax: + 31 24 3541971. e-mail: n.creugers@dent.umcn.nl*

Int J Prosthodont 2005;18:40–41.

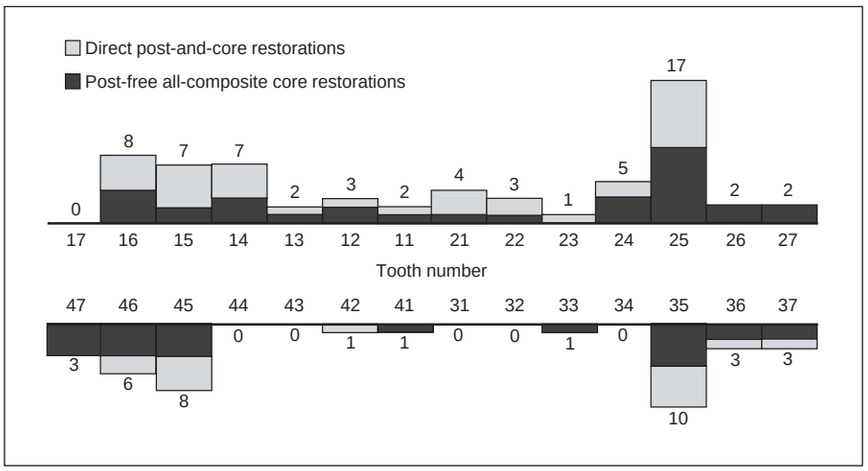

Fig 1 Distribution of restorations according to tooth number (Fédération Dentaire Internationale system).

References

1. Creugers NHJ, Mentink AGM, Fokkinga WA, Kreulen CM. 5-year follow-up of a prospective clinical study on various types of core restorations. Int J Prosthodont 2005;18:34–39.
2. Fokkinga WA, Le Bell A-M, Kreulen CM, Lassila LJV, Vallittu PK, Creugers NHJ. Ex vivo fracture resistance of direct resin composite complete crowns with and without posts on extracted maxillary premolars. Int Endodont J, accepted for publicaton.
3. Roeters FJM. Extended indications for directly bonded composite restorations: A clinician's view. J Adhes Dent 2001;3:81–87.
4. Smidt A, Venezia E. Techniques for immediate core buildup of endodontically treated teeth. Quintessence Int 2003;34:258–268.

Literature Abstract

Radiologic measurements of the mandible: A comparison between CT-reformatted and conventional topographic images

This study compared the accuracy of determination of the mandibular contour and the position of the mandibular canal in cadaver by the multiplanar reconstructed method (MPR-CT) with those by tomographic techniques. Using three imaging systems—Quantum CT Scanner, Scanora, and OP-100—a total of six sites were scanned in the molar regions of three cadaver mandibles. A set of transverse cross-sectional images prior to reformatting (Direct-CT) was also obtained. All images obtained were measured twice by four experienced radiologists. The anatomic structures measured were the height and thickness of the mandible, distance from the alveolar crest to the mandibular canal, and distance from the buccal cortical bone to the mandibular canal. After scanning, the scanned areas of the mandibles were sliced at thickness of 2 mm, and soft X-ray images of these slices were obtained. The values of the above four anatomic structures obtained by measurements in the soft X-ray radiograms using digital- display calipers were regarded as true values. When compared with true values, the errors in the distance from the alveolar crest to the mandibular canal were within 1 mm (±1 mm) in 93.7% of the measurements by Direct-CT, 89.6% of the measurements by MPR- CT, 87.5% of the measurements by Scanora, and 47.9% of the measurements by OP-100. The accuracy of the four methods were ranked: Direct-CT, MPR-CT, Scanora, and OP- 100. A statistically significant difference was also observed in the measurements of the other anatomic structures. This study concluded that MPR-CT allows more accurate measurements than by the other two tomographic techniques and can be a useful pre-operative examination for implant surgery.

Hanazawa T, Sano T, Seki K, Okano T. *Clin. Oral Implants Res* 2004;15:226–232 **Reference:** 10. **Reprints:** Tomomi Hanazawa, DDS, Dept of Radiology, Showa University School of Dentistry, 2-I-I, Kita-Shezoku, Ohta-ku, Tokyo 145-8515, Japan. e-mail: thana@senzoku.showa-u.ac.jp—*Tee-Khin Neo, Singapore*