Technical Report: Crown Fabrication Without an Impression

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Prosthetic treatment for elderly patients is a challenge that addresses both patient- and technology-mediated dental concerns. This report describes the fabrication of a cobalt-chromium crown without an impression using a digitized and scanned temporary crown to provide excellent integration. Int J Prosthodont 2018;31:226–227. doi: 10.11607/ijp.5614

Prosthetic rehabilitation for elderly and dependent individuals with special needs must address concerns regarding comfort, function, and quality of life for these patient cohorts. These patients require more frequent dental visits to monitor tooth wear, pain, and associated medication effects, as well as higher incidence of poor oral hygiene.1,2 More periodontal disease and dental caries (particularly root caries) are encountered in this cohort compared to the general population.3 This clinical report describes the restoration of a tooth in an elderly patient with special needs without using a traditional impression protocol.

Clinical Report

An 86-year-old patient with Parkinson disease and conspicuous mobility disorders sought treatment for the maxillary right second molar, which had been successfully endodontically treated but had lost its large amalgam restoration. All teeth were present except for the maxillary right central incisor, which had been replaced by a removable prosthesis.

Mobility difficulties and past inability to remain seated for long periods of time motivated the present authors to determine a quick, reliable method to crown the tooth. The tooth was retained to facilitate mastication and to allow the patient to continue eating his preferred foods. A cobalt-chromium (Co-Cr) alloy crown was proposed. Patient occlusion was already bilaterally balanced, and this occlusal scheme was kept. The tooth had a horizontal gingival and bone recession was optimal (Fig 3).

A core build-up of composite resin (Gradia Core, GC) was followed by supragingival chamfer margin preparation. Dental plaque remaining at the bottom of the sulcus (Fig 1) was cleaned ultrasonically. A temporary uniform resin crown (Unifast III, GC) was made, the occlusion was verified with articulating paper (Bausch), and the crown was cemented temporarily (Temp-bond, Kerr Dental). Following an asymptomatic 2-week interval, the crown was removed and sent to the dental laboratory.

The dental technician created a silicone impression of the intaglio surface of the temporary tooth to obtain a silicone die (Figs 2a and 2b), which was then scanned along with the external surface of the crown using CFAO Software (model 7Series, Dental Wings; Figs 2c and 2d). This scanner does not have the ability to record the intaglio surface due to too many shadows inside; therefore, it was preferable to scan a positive model to fabricate the silicone die.

The images were then matched in the software to obtain the final digital image design of the crown. This was then sent for milling (M1 Wet Heavy Metal Milling Unit, Zirkonzahn), and the crown was finished and polished.

After receiving the Co-Cr crown, necessary marginal, proximal contact point, and minor occlusal adjustments were carried out.

The intaglio surface was sandblasted with alumina (50 micrometers), and the crown was cemented using RelyX Unicem Self-Adhesive Universal Resin Cement (3M ESPE).

The patient and family were advised about follow-up hygiene and home care for optimal gingival health, as well as the patient’s high risk for caries. At the 6-month follow-up, dental adaptation and occlusion were optimal (Fig 3).

Discussion

Patients with mobility constraints may require assistance when moving in and out of the dental chair and to and from the dental office.4 Given this particular patient’s involuntary movements and tremors, obtaining computer-aided design (CAD) optical impressions of the two arches could have produced unacceptably large errors. Digital impression technology may not necessarily have improved the outcome of the final impression, especially as careful isolation of the soft tissue would have been required before obtaining the digital impression. The time lapse between the removal of the temporary crown and cementation of the final
The tooth crown was only a few hours, and because the tooth was not vital, there was no sensitivity concern. A chamfer was chosen for the margins of the preparation because the final crown was to be a metal restoration. Because the tooth is in the posterior area, there were no major esthetic imperatives.

In this kind of clinical situation, in order to preserve the tooth, the tooth could have been restored with amalgam or composite. However, the optimal conditions to perform these reconstructions were not found here for this type of patient. Moreover, choosing a peripheral reconstruction protects the tooth from root lesions. Cured resin could also have been used as the material, but this is less solid and more porous. Metal was therefore the most comfortable and simple therapeutic solution in this situation.

**Conclusions**

The unique needs of geriatric and special needs patients present important public health challenges. A thoughtful combination of materials and technologies can provide satisfactory results for all patients requiring comparable prosthetic interventions.

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**References**