Short Communication

Fabrication of Zirconium Primary Copings to Provide Retention for a Mandibular Telescopic Overdenture: A Clinical Report

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Because of their strength, zirconia ceramics may be used to restore removable partial denture abutments. This carries the advantages of elimination of the galvanic current between primary and secondary copings, along with thermal protection of abutment teeth. This article describes the fabrication of zirconium primary copings to provide retention for a mandibular telescopic overdenture. *Int J Prosthodont 2008;21:509–510.*

Overdenture treatment provides an esthetic and functional result that allows proper access for hygiene and maintenance.[1] All-ceramic systems are inert and resistant to corrosion and have low temperature and electrical conductivity.[2] In addition, with their improved strength, zirconia ceramics may be used to restore removable partial denture abutments in areas previously limited to metal or metal-ceramic restorations.[3] The electroforming process makes for a viable, convenient, and economic alternative to cast metal substructures[4] and was described previously for fabrication of secondary crowns of maxillary implant-supported telescopic overdentures opposing a mandibular implant-supported telescopic overdenture.[5]

This article describes fabrication of zirconium primary copings to provide retention for a mandibular telescopic overdenture in a patient suffering from thermal irritation caused by a previously fabricated cast primary coping–supported mandibular telescopic overdenture.

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Clinical Report

A 58-year-old woman was referred to the Department of Prosthodontics, Ankara University, Faculty of Dentistry, for prosthetic evaluation. The patient had received a telescopic-retained mandibular overdenture opposing a maxillary complete denture but had the major complaint of burning in her mouth and sensitivity in the abutment teeth supporting the primary copings. The radiographic examination revealed that the mandibular first premolars were present, with no periapical pathologies. Clinical examination revealed hyperemic gingiva and tattooing as a result of the cast chrome-nickel primary copings. No deficiency was noted with regard to fit of the primary copings. The mandibular overdenture was cast from a cobalt-chromium alloy, incorporating the secondary crowns, which were cast from the same alloy.

It was decided to fabricate a new maxillary complete denture and a mandibular telescopic overdenture retained by electroformed secondary copings with zirconia primary copings. A preliminary mandibular impression was made with elastomeric impression material (Speedex, Coltene/Whaledent) by putty-wash technique. The primary copings were fabricated with a pattern resin (Pattern Resin, GC Dental). The resin copings were scanned using a computer-aided design/computer-assisted manufacture system (Cercon Brain, Dentsply/Ceramco), and the copings were milled from zirconia blocks (Cercon Zirconia, Dentsply/ Ceramco). The milled copings were sintered according to the

Fig 1 Intraoral verification of primary copings.

Fig 2 Finished electroformed secondary copings.

Fig 3 Intaglio view of completed mandibular overdenture.

Fig 4 Intraoral view of the dentures.

manufacturer's recommendations. Fit of the copings was verified intraorally (Fig 1), and a pickup impression was made with a polyether-based impression material using a custom acrylic resin tray (Impregum Penta Soft Medium Body, 3M ESPE). Electroformed secondary copings were fabricated on the zirconia primary copings according to the manufacturer's instructions (Fig 2). The mandibular framework was cast with a base metal alloy (Biosil-F, Degussa) and evaluated intraorally. Horizontal and vertical maxillomandibular records were obtained with record bases and occlusion rims and transferred to a semiadjustable articulator (Denar Advantage, Teledyne Waterpik) using a facebow. Artificial teeth were selected and arranged (Major, Major Prodotti Dentari) on the record bases for a trial denture arrangement and evaluated intraorally for esthetics, phonetics, occlusal vertical dimension, and centric relation. A protrusive record was made to set the articulator's condylar elements and achieve a balanced occlusal arrangement. After application of an opaquer (Ropak Kompaktopaker UV, Bredent) to the framework, the dentures were processed, finished (Fig 3), and delivered to the patient (Fig 4). The patient was scheduled for follow-up visits every 3 months and reported no complaints during 1 year of follow-up.

Discussion

Electroformed crowns have a superior fit to conventionally cast crowns.[4] In the presented article, secondary copings fabricated by the electroforming process provided satisfactory retention and stability of the overdenture. However, further experimental studies about the retention of the electroformed copings will be useful. The main advantage of zirconia copings lies in the elimination of the galvanic current between the primary and secondary copings and thermal protection of the abutment teeth. However, they are bulky compared to conventionally cast primary copings.

References

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