Fabricating a Crown Fitting an Existing Removable Partial Denture Using a Custom Resin Coping: A Clinical Report

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Abstract: A novel cost-effective technique for fabricating porcelain fused to metal crown to fit with an existing removable partial denture (RPD) is presented. A resin coping of the prepared tooth is fabricated, which is then adapted intraorally to fit the patient's existing RPD. The patient can continue to wear the RPD during the laboratory fabrication of the new crown. The fabricated crown had good adaptation, fit and esthetics.

Key words: Removable Partial Denture Resin Coping Crown

INTRODUCTION

More often, the dentists are faced with the situation to place a crown on a tooth fitting an existing removable partial denture (RPD). The situation is more complex when it is an abutment tooth for a RPD [1].

There are various techniques to fabricate a crown to fit an existing RPD [2-6]. Direct techniques may be accomplished intraorally, whereas indirect methods entail retaining the RPD during fabrication of the crown, requiring the patient to be without the RPD until the crown is complete [7].

The treatment planning must be made properly in situations when planning to fabricate a crown fitting an existing RPD. Careful consideration of the proposed treatment of the tooth relative to the RPD design as well as the tooth itself requires a thorough understanding not only of pre-existing conditions, but also of the final treatment plan in its entirety. Prior crown fabrication, the existing RPD should be satisfactory upon evaluation: retention, stability, support, passivity, occlusion, esthetics and phonetics [1]. This clinical report is presented a cost-effective technique for fitting new porcelain fused to metal crown to an existing RPD.

Clinical Report: A 52-year-old female presented to the Maxillofacial Prosthetic Clinic with a chief complaint of discolored upper front tooth. On reviewing her medical history, she had follicular lymphoma of submental area. Surgical resection of the tumor was done followed by radiation therapy of 38 Gy (19 sessions) and chemotherapy. Afterward, she has been followed up for 9 years and she does not present any recurrence lesion. She has been using maxillary RPD which was fabricated 2 years back and mandibular complete denture which was fabricated 1 year back.

On intra oral examination, restored and discolored tooth #21, porcelain fused to metal crown in teeth #11, 12, 23 and 24 were present in maxillary arch. Mandibular arch was fully edentulous. She was using maxillary removable partial denture and mandibular complete denture. On periapical radiograph of tooth #21, revealed restored in crown portion. Porcelain fused to metal was planned for tooth #21 due to discoloration and large restoration. However, the patient had no desire to leave the removable denture for crown fabrication. This case report described the combination of direct and indirect technique of crown fabrication to fit an existing RPD by using resin pattern analog.
Steps and Technique:

- Caries removal was done in tooth #21 and the tooth was restored with resin composite restoration (Z100™ Restorative, 3M ESPE, St. Paul, Minnesota, USA) (Fig. 2).
- Tooth preparation was done in a traditional manner to provide sufficient space between metallic plate of existing RPD and tooth for fabrication of crown (Fig. 3). The margins were placed subgingivally using retraction cord. The margins were, shoulder margin labially and chamfer margin palatally.
- Impression of the tooth #21 was made with alginate (Jeltrate, Dentsply, York, Pennsylvania, USA) and poured with Type IV dental stone (Lafarage, Prestia, Meiel, France) and resin coping (Pattern Resin, GC America Inc. Brooklyn, New York, USA) was fabricated. (Fig. 4)
- Resin coping was tried on patient and the palatal portion was thinned to 0.5 mm to make thin space between the palatal surface of the resin coping and the metallic plate of RPD resting on tooth #21 (Fig. 4).
- Resin pattern was applied over the resin coping by using “salt and pepper” technique. The RPD which was coated with very thin layer of petroleum gel was placed back in the mouth and stabilized. The patient was allowed to close into maximum intercuspation until the coping fully polymerized (Fig. 5).
- Then, the final impression of the prepared tooth #21 was made while the RPD was in placed with pick-up technique with Putty and Light bodied Polyvinyl Siloxane (Express, 3M ESPE, ST. Paul, Minnesota, USA) (Fig. 6).
- The impression along with the shade 4M-1 (Vitapan Classical, Zhengzhou, China) was sent to the laboratory for the fabrication of porcelain-fused to metal crown taking the resin coping as a guide. The laboratory fabricated the crown (Fig. 7) which was tried on patient and checked for the fit, adaptation, esthetics and function (Fig. 8). The patient was satisfied with the outcome.
- The porcelain fused to metal crown was cemented over the prepared tooth of #21 using the dual cure resin cement (Calibra, Dentsply, York, Pennsylvania, USA) (Fig. 9-10) and instructions were given regarding the hygiene maintenance. The patient was recalled after 1 week for recheck.
- On recall visit, she had no complaint regarding the crown (Fig. 11).

Fig. 1: Intraoral picture showing RPD in maxillary arch and CD in mandibular arch.

Fig. 2: A. Intraoral picture showing carious and discolored tooth #21. B). Caries removal and restoration with resin composite restoration.

Fig. 3: Tooth preparation done in a traditional manner.
Fig. 4: Resincoping made and tried on patient showing palatal clearance of 0.5 mm.

Fig. 5: Additional resin mixed and applied over the metallic plate of existing RPD and the RPD was put back in mouth.

Fig. 6: Pick-up impression made with Putty and Light bodied Polyvinyl Siloxane.

Fig. 7: Procelain fused to meal crown showing labial and palatal surfaces.

Fig. 8: The porcelain fused to metal crown tried on the patient.

Fig. 9: The porcelain fused to metal crown cemented on the patient using the dual cure resin cement.

Fig. 10: Porcelain fused to metal crown with RPD.

Fig. 11: Recall visit after 1 month after insertion of the crown.
DISCUSSION

Though there have been numerous reports over the past pertaining to the fabrication of a crown to fit an existing partial denture, one must reassess the types of crowns currently used. The reports are applicable to full cast crowns and porcelain fused to metal crowns which is commonly used at present. The coping procedure permits indirect fabrication of a crown to fit an existing RPD [8].

This clinical report has described the combined direct and indirect technique of crown fabrication to fit an existing RPD by using resin coping which was generated as a durable resin pattern. The advantages of this technique are: (1) the patient can wear the prosthesis during the lab phase of crown fabrication; (2) the method accurately reproduces the palatal surface of the crown fitting on RPD; (3) the resin coping replicates all critical factors for the fabrication of a crown to function harmoniously with the RPD component.

The resin coping is rigid enough to withstand typical laboratory manipulation while providing the actual RPD configuration at the tooth surface. Because the analog is not required for the occlusal adjustment phase, the thickness of the coping can be increased if additional strength or rigidity is desired. The RPD coping procedure is applicable to all types of crowns. It accommodates multiple unit prosthesis where only one of the crowns includes an RPD rest or where the lingual plate may extend onto additional units.

CONCLUSION

Porcelain fused to metal crown fitting an existing RPD was fabricated by combined direct and indirect technique using resin coping. The patient did not have to surrender the RPD for laboratory procedures. The final crown fitted well with satisfactory esthetic and function.

REFERENCES