ABSTRACT

Treatment of multiple partial edentulous spaces is always a challenge for dentists. This article reports the management of a 45-yr-old patient with multiple missing teeth with an inlay retained fixed partial denture combined with a full crown preparation opposing a cast partial denture. A conventional cast partial denture was fabricated for the maxillary arch and a conventional cast preparation on the mandibular abutment teeth with absence of heavy forces from opposing teeth.

For many years, the only prosthetic application used to deal with cases for single missing tooth was a fixed partial denture, however, the preparation of two teeth required for correcting a single tooth deficiency causes unnecessary dental tissue loss. Full-coverage metal–ceramic fixed partial dentures are still viewed as a standard for tooth replacement, event though they exhibit relative disadvantages like decreased capacity of retention, associated soft-tissue pigmentation and an opaque-to-dark discoloration in the cervical area of the abutment teeth. Minimal preparations bridges are a good alternative to conventional types because they are less expensive and allow greater preservation of tooth structure with easy periodontal assessment. Inlay retained fixed partial dentures are indicated in the presence of amalgam restoration or caries in abutment teeth adjacent to edentulous space with opposing artificial teeth. They are also indicated when there is slight drifting of abutment teeth with absence of heavy forces from opposing arch. A Combination type of fixed partial denture prosthesis includes a minimal or inlay bonded retainer in one of the abutment teeth and a conventional cast preparation on the other. This article presents a two-year clinical performance of an inlay retained fixed partial denture combined with a full crown preparation opposing a cast partial denture.

CASE REPORT

A 45-year-old male patient reported to the Dental Hospital at College of Dentistry, King Khalid University, seeking artificial replacement of missing teeth. After a detailed history and screening of the case with intra-oral examination and full mouth radiograph, the patient was referred to the prosthetic department. The treatment started with extra-oral examination and intra-oral charting, interpretation of periapical and panoramic radiographs (Figure 1). There were remaining roots in relation to 14, 15, 16, 24, 25, 26 and 38. Grossly destructed 35 had periapical radiolucency. Both the lower second molars were mesially inclined and had occlusal caries. Tooth number 36 and 46 were found missing. Maxillary and mandibular primary impressions were made for preparation of study casts. At this stage scaling, root planning and polishing were performed and oral hygiene instructions given.

Subsequently extraction of remaining roots of teeth number 14, 15, 16, 24, 25 and 26 and 38 were done. In the following appointment teeth number 17 and 27 were restored with composite. The restored teeth served as abutments for a cast partial denture. The next phase was mouth preparation and maxillary final impression using double mixing technique for the cast partial denture. The mandible metal frame work try-in, interocclusal registration with occlusal rims and teeth shade selection were done in the same visit. A try-in of the cast partial denture was done. After acrylization the processed cast partial denture was delivered with post-insertion instructions (Figure 2,3). The mandibular arch was restored in the following manner. The first step involved endodontic treatment of tooth number 35 (Figure 4). Following root canal treatment the tooth received fiber post and composite build up. Surgical crown lengthening and gingival re-contouring was also performed to improve esthetics.

Tooth number 35 was used as an abutment for a fixed partial denture, which received a full porcelain fused to metal crown. Tooth number 37 was used as the second abutment. Occlusal caries were excavated and a cavity was prepared to receive an inlay. A combination fixed partial denture with a full porcelain fused metal crown for 35 and inlay for 37 was planned to replace the missing 36. After the preparation of abutments, final impressions were made. Provisional crown for 35 and temporary restoration for 37 were cemented. Metal try-in was done followed by tooth shade selection using the digital shade guide VITA System 3D-Master. Porcelain build-up and try-in allowing adjustment of occlusion, during centric and eccentric movements was carefully done. Finally the glazed bridge
was cemented with resin cement following the manufacturer instructions (Figure 5,6). The fourth step of the treatment involved the preparation of inlays for fixed partial denture in the mandibular quadrant. Both the abutments in this quadrant had occlusal caries with minimal drifting. The caries were excavated and cavities were prepared to receive inlays which to be the retainers for the pontic. This was followed by final impressions and temporary restorations. After routine metal try-in and remaining steps of bridge construction the inlay retained fixed partial denture was cemented (Figure 7-9). Post-operative panoramic radiographic was taken after complete oral rehabilitation of the patient. The patient was then followed-up for maintenance appointments at 36, 12 and 24 months (Figure 10,11).

Discussion

When the needs of the patient have been identified and appropriate corrective measures determined, a logical sequence of treatment steps must be decided on. The steps should address the symptoms, stabilization of deteriorating condition, definitive therapy and a program of follow-up. Careful planning is considered crucial, especially when a combination of cast partial denture, and fixed partial denture are planned in opposing arches. In this case, after carefully recording patients’ complain the possible treatment options were discussed. The number of patient visits, laboratory steps involved and the overall time required for completing the oral rehabilitation process was clearly explained after studying mounted study casts and radiographic interpretation of oral structures. Starting the treatment with periodontal therapy was preferred prior to extraction of remaining roots. A trial maxillary denture is normally fabricated with a mandibular fixed prosthesis prior to replacing it with a cast partial denture. This facilitates effective intercusception of upper and lower teeth and a well aligned occlusal plane. The fabrication of cast partial denture alongside the endodontic treatment of the abutment resulted in maintaining the vertical dimension. When abutment teeth have previously been restored, inlay retained prosthesis based on an adhesive approach offer an excellent alternative to conventional retained full-crown fixed partial denture. In the same way inlay retained bridges with adhesive cement performed proved to be an effective restoration solution in missing posterior teeth. The single biggest advantage of this treatment option was the preservation of natural tooth structure.

Inlay retained bridges are considered good alternative to conventional bridges, as they are less expensive, less destructive to abutment teeth and allow easier periodontal health assessment. The concept of maximum conservation of tooth structure involving box-shape proximal preparation to the abutment was chosen for this patient. The walls of the cavity were flared between 5° to 15° with rounded internal angles. The decision to restore the teeth with inlay fixed partial denture was primarily influenced by size of the carious defect. Pre-existing fillings minimize the need to remove tooth structure and promote retention of the inlay-retained fixed partial denture and reduce the heavy forces from opposing teeth.

The case was followed up for two years for maintenance. Patient’s cooperation in following oral hygiene instruction and keeping up with the appointments was satisfactory. Post-operative sensitivity, de-bonding of the inlay retainers and signs of secondary caries were evaluated during the follow up visits. Marked improvement of oral hygiene, function along with self perceived satisfaction and positive psychological status were reported. This was similar to the observations made by Cenci et al and Jevremovic et al. Prosthodontic treatment is known to improve the oral and psychological health of the patient.

Conclusion

In this case report we reiterate that bilateral inlay retained fixed partial dentures are an excellent conservative choice of treatment in the presence of occlusal caries or restorations on both abutment teeth. However, a combination of full crown and inlay retained fixed partial denture should be considered as a good option if one of the abutments is endodontically treated. It can be safely conveyed that both inlay retained and combination of full crown and inlay retained fixed partial dentures are suitable in the presence of an opposing cast partial denture.

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