

CASE REPORT

Esthetic and Functional Rehabilitation of moderately mutilated Dentition with Multidisciplinary Approach

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ABSTRACT

Treatment of patients with severely mutilated dentition is a challenging task for a dentist and needs specialized skills with multidisciplinary approach for treating a complex clinical situation. Multiple carious lesions, tilting and rotation of several teeth, grossly decayed teeth and loss of multiple teeth in the maxillary, and mandibular arch may lead to the severely mutilated dentition. Dentist doing oral rehabilitation of a severely mutilated dentition must be through and efficient with the principles of reconstruction as an architect who prepares detailed plans and specification for any building prior to construction. Careful treatment planning using fixed or removable prosthesis is required to manage such cases to get a favorable prognosis. A multidisciplinary approach is required to restore the severely mutilated dentition to achieve the freedom from all the dental diseases, to maintain the healthy periodontium, to stabilize the temporomandibular joints, to achieve a stable occlusion with optimum esthetics, and comfortable oral function.

Keywords: Diagnostic wax-up, Fiber post, Metal ceramic crown.

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INTRODUCTION

A complete oral rehabilitation of a severely mutilated dentition is of utmost importance which is a difficult and arduous task for a dentist. Patient's need and demand may vary individually and it should be assessed before the starting of the treatment. A complete treatment entails the performance of all the procedures necessary to produce healthy, esthetic, well-functioning, and self-maintaining masticatory mechanism. Dental disease with severely

mutilated condition rarely results from a single entity. It is almost always the result of a combination of factors. Because similar symptoms may result from different causes and variety of symptoms may result from same causative factor, treating symptoms alone is shortsighted therapy. It is always advantageous to determine the cause of both sign and symptoms and treat the dental condition. The severity of structural damage is often progressive if not treated with a complete treatment plan on time. Based on the various kinds of advertisements, most of the patients are aware of the tooth-colored restorations, especially in the anterior region of the mouth.^{1,2} The number of remaining natural teeth is one of the most widely used methods for evaluating oral health and the prosthetic treatment of patients with a mutilated dentition.^{3,4} Regardless of the clinical reason, the decision to carry out any treatment should be based on achieving oral health, function, esthetics, and comfort, and treatment should be planned around these rather than the technical possibilities.

CASE REPORT

A 20-year-old male patient reported with the chief complaint of multiple grossly decayed anterior and posterior teeth in the maxillary and mandibular region of the jaw and need for esthetic and functional restoration of the same with fixed dental prosthesis (Fig. 1). Intraoral examination revealed the grossly decayed teeth no. 14, 16, 22, 24, and 26 in the maxillary arch (Fig. 2). There were remaining root stumps no. 36 and 46 in the mandibular arch (Fig. 3). Dental caries were present in 11, 17, 21, 27, 35, 37, and 47.



Fig. 1: Intraoral frontal view with multiple carious lesions

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Fig. 2: Intraoral view of maxillary arch



Fig. 3: Intraoral view of mandibular arch



Fig. 4: Orthopantomograph showing impacted third molar and multiple grossly decayed teeth

Intraoral radiographs showed deep carious lesions approximating the pulp chambers (Fig. 4). The third molar was partially erupted in right side of the mandibular arch. The occlusion in the posterior region was a collapse due to the presence of multiple grossly decayed posterior teeth in the maxillary and mandibular arches (Fig. 5). Facebow transfer was made and patient's diagnostic casts were mounted in the maximum intercuspation on the Whip Mix semi adjustable articulator (Fig. 6).

Diagnostic wax-up was performed to evaluate the final outcome of the treatment with fixed restorations (Fig. 7). As there was no loss of vertical dimension, the wax-up was done without raising the height of the incisal pin for all the grossly decayed teeth in maxillary and mandibular arches. The grossly decayed tooth no. 26, root stumps no. 36, 46, and partially erupted third molar tooth no. 48 were extracted. After the healing period of extraction sockets, there was a considerable bone loss around the edentulous area necessitating the bone augmentation procedure for the stability of the implants. The patient did not agree to the proposed surgical treatment plan. The decayed tooth with dental caries teeth no. 11, 17, 21, 27, 35, 37, and 47 were restored with composite restoration. Root canal treatment for teeth no. 14, 16, 21, 22, and 24 was completed. Due to the insufficient remaining tooth structure for the retention of the crowns, fiber posts were cemented to the teeth 14, 16, 22, and 24 with dual-cure resin cement (Fig. 8). Core buildup was accomplished with composite resin. The crown lengthening procedure was carried out for the



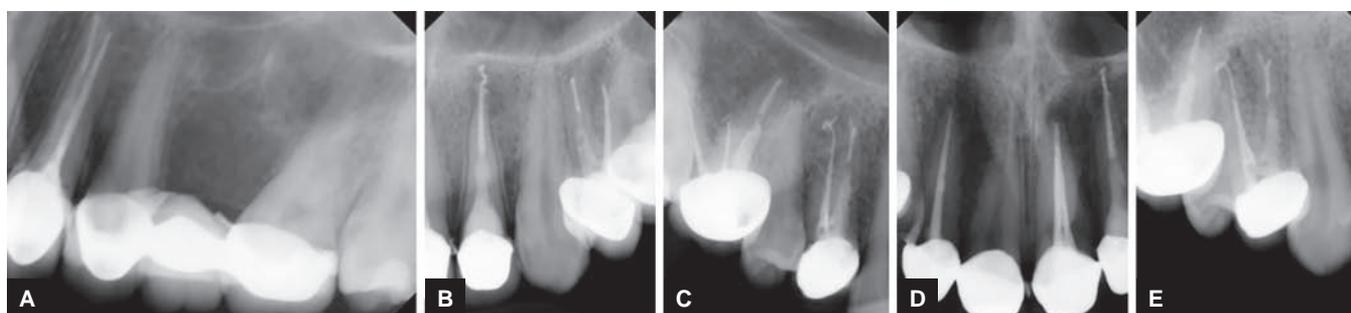
Figs 5A and B: Collapsed posterior bite due to grossly decayed teeth in left and right side



Fig. 6: Face-bow transfer



Fig. 7: Diagnostic wax-up to evaluate the final restoration



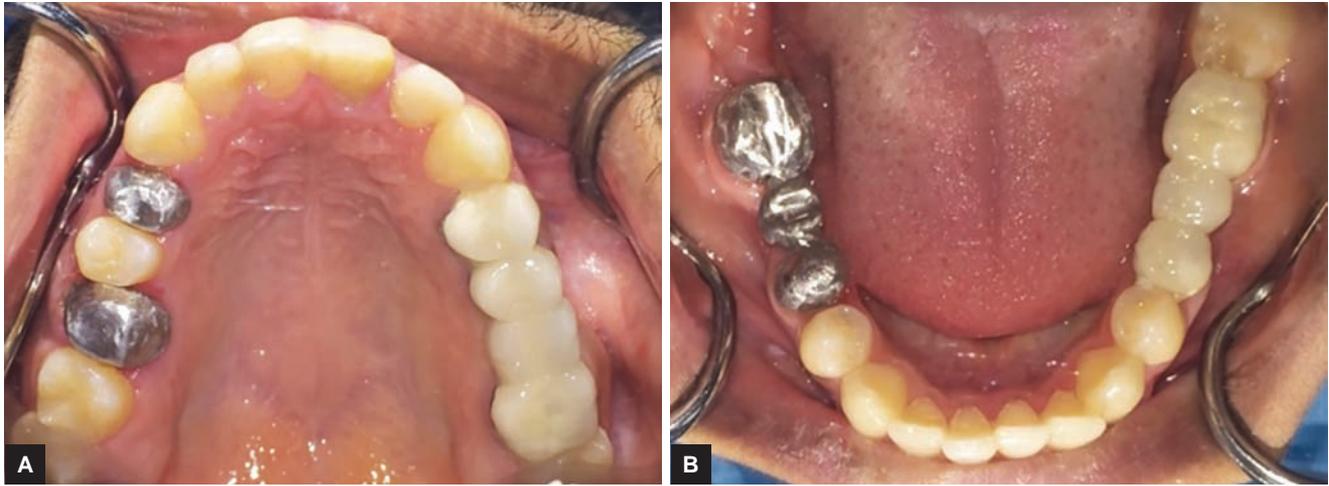
Figs 8A to E: Intraoral periapical radiograph showing root canal treated teeth with pre-fabricated fibre post and core



Figs 9A and B: Metal try-in in left side of maxillary and mandibular arches

teeth no. 16 and 22 to provide the sufficient ferrule effect. After the healing period of 6 weeks, tooth preparation for porcelain fused to metal restorations were completed for teeth no. 24, 25, 27, 35, and 37 and metal try-in was carried out together on the left side of the maxillary and mandibular arch (Fig. 9). The metal framework was fabricated with nonprecious alloy. Porcelain fused to metal single crown for tooth no. 24 and bridges no. 25, 26, 27 in the maxillary arch and bridges no. 35, 36, and 37 were cemented with Glassionomer luting cement in the man-

dibular arch. Then tooth preparation for teeth no. 24 and 26 in maxillary arch and 45 and 47 was carried out in the mandibular arch at the same time (Fig. 10). Metal try-in was done and special attention was given for sufficient space for the ceramic buildup on the occlusal surfaces (Fig. 11). Two single porcelain fused to metal single crowns were cemented in the maxillary arch and one bridge was cemented in the right side of the mandibular arch with glass ionomer luting cement. The occlusion was verified in centric and eccentric mandibular positions and it was



Figs 10A and B: Cemented bridge & crown in the left side and metal try-in on the right side



Fig. 11: Intraoral view showing sufficient space of porcelain for metal framework



Fig. 12: Tooth preparation with retraction cord in maxillary anterior arch

made sure that there were no interferences in both centric and eccentric mandibular positions.

After the complete restoration of the posterior arches in the maxillary and mandibular regions, anterior teeth for zirconia crowns for teeth no. 11, 12, 21, 22 were prepared in the maxillary arch. The axial reduction of approximately 1.2 to 1.5 mm and incisal reduction of 1.5 to 2.0 mm was carried out. All the line angles and point angles were rounded off with the taper of 5 to 15 degree.⁵ A heavy chamfer finish line was prepared circumferentially for all the individual teeth. The incisal clearance was kept 1.5 to 2 mm. Retraction cord of size no. 00 was placed in the gingival sulcus to record the finish line properly in the final impression (Fig. 12). Secondary impression was made with addition silicone impression material and provisional crowns were cemented on the prepared tooth.

The secondary impression was poured with type V dental stone and master cast with removable individual dies were fabricated. The scanning of each individual prepared die was performed with a computer-aided design/Manufacturing (CAD/CAM) machine. Zirconia copings try-in was done for teeth no. 11, 12, 21, and 22

in the patient's mouth and checked for any occlusal interference. The occlusal evaluation for any occlusal interference in centric and eccentric positions was verified. The cementation surfaces of zirconia crowns were etched with hydrofluoric acid. The silane coupling agent was applied and then air-dried. The tooth surfaces were also acid-etched and air-dried before the cementation procedure. All the four zirconia crowns were cemented with light cure resin bonded cement (RelyX, 3M ESPE) (Fig. 13). Post cementation instructions were given to the patient. Patient was recalled after 1 week. Patient was highly satisfied with the final esthetic result that demanded to be natural looking (Figs 14–16). The final prosthesis was evaluated for further 3 months and postoperative Orthopantomogram was taken (Fig. 17). After 3 months, there was noticeable improvement in health of periodontium and overall general oral hygiene and health of patient (Fig. 18).

DISCUSSION

Replacement of missing teeth with conventional fixed partial denture can be highly effective in replacing missing teeth, restoring oral function and esthetics and result in



Figs 13A and B: Intraoral frontal view before and after treatment



Figs 14A and B: Intraoral view of maxillary arch before and after treatment



Figs 15A and B: Intraoral view of mandibular arch before and after treatment

high levels of patient satisfaction. The maintenance of the vertical dimensional of occlusion is a crucial element in restoration of multiple missing teeth in the posterior side of maxillary and mandibular region.^{6,7} When undertaking relatively small amounts of restorative treatment, e.g., up to two or three units of crown and bridge work, it is often acceptable and it is often advisable to adopt a

confirmative approach, i.e., to construct the restoration to conform to the patient's existing intercuspal position. The decision to reorganize a patient's occlusion may be made on the grounds either that the existing maximum intercuspal position is unacceptable and needs to be changed, or where a very large amount of treatment is to be undertaken and the operator has the opportunity



Figs 16A and B: Right and left side maxillary and mandibular arches in occlusion

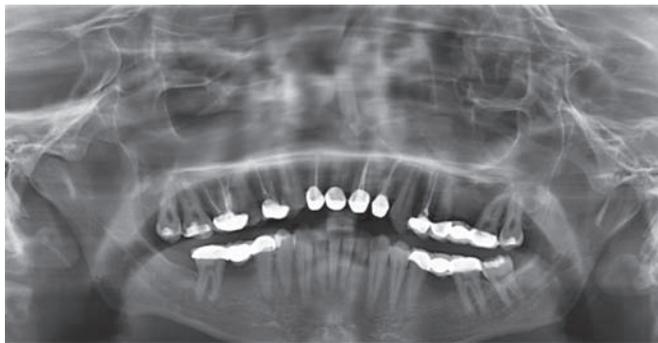
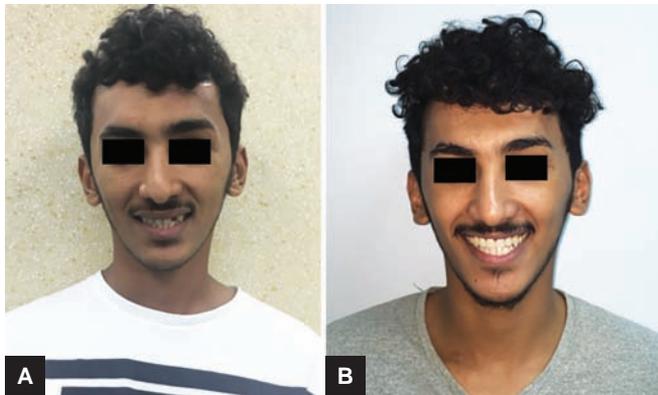


Fig. 17: Orthopantomograph after the complete treatment



Figs 18A and B: Extraoral view before and after the treatment

to optimize patient's occlusion. The decision should, and can, only be made after a detailed and careful examination of the occlusion, preferably with the use of accurate study casts mounted in a semi-adjustable articulator.

As the patient desired a high level of esthetics, full ceramic restorations with CAD CAM zirconia were chosen for maxillary anterior restorations. The minimum core thickness for this advanced ceramic system is 0.4 mm, which enabled the conservation of tooth structure and achievement of reasonable esthetics simultaneously.⁸ Full coverage zirconia-based ceramic crowns with knife

edge preparations can offer a good esthetic result with minimum tooth preparation combining strength and could be considered a treatment option in selected clinical cases.

CONCLUSION

The prosthetic rehabilitation of a severely mutilated dentition is always a challenge for the clinician. Prudent clinical judgment and careful balancing of the risks and benefits of different treatment options are essential for a predictable long-term treatment outcome for prosthodontic treatment.

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