



Oral Rehabilitation of a Young Female Patient with Severely Worn Dentition Using a Systemic Approach: A Case Report

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ABSTRACT:

Successful management of severe tooth loss which is often a result of a multitude of factors is a challenge to the clinician. An accurate clinical, radiographic, and occlusal examination is imperative to deliver a restoration that harmonizes the stomatognathic system of the patient. The following case report highlights a systemic and practical approach to oral rehabilitation of a young female patient, with the ultimate goal of improving her quality of life.

1. Introduction

Technological advancements in Aesthetic dentistry have paved new vistas in the rehabilitation of severely mutilated teeth[1]. However, the restoration choice largely depends on the amount of remaining tooth structure and the existent occlusion. The knowledge and understanding of basic material science and the clinician's judgment are essentializing factors that dictate the balance between providing desirable esthetics and establishing a normal masticatory function[2]. The following case report archives the prosthetic rehabilitation of a young female patient with multiple carious teeth compromising her esthetics.

2. Case Report

An 18-year-old female patient reported to the Outpatients' section of the Department of Conservative Dentistry and Endodontics of the Dental College and Hospital with the chief complaint of pain in all four quadrants of her dentition, along with discolored teeth. She also reported diminished masticatory function and aesthetics affecting her social life. She reported suffering from anemia, which may have resulted due to her

inability to eat her food properly. She did not report any other known medical illnesses.

Extra-oral examination revealed normal temporomandibular joint and facial form(Figure 1).



Figure 1: Pre-operative Extra-oral view of the patient: a)Right Lateral, b)Frontal, and, c)Left Lateral

Intra-oral examination revealed multiple carious teeth concerning #13, #12, #11, #21, #22, #23, #24, #37, #36, #35, #34, #33, #32, #31, #41, #42, #43, #44, #45. Severe attrition was found in # 37,#47, and #48, and tooth #36 was found to be missing, due to an erstwhile extraction owing to caries as reported by the patient. Supra-eruption of maxillary posterior teeth and mandibular anterior teeth were found. The right mandibular second premolar was



found to be distally inclined and the right mandibular second molar was found to be mesially inclined (Figure 2a-2c). Occlusal analysis revealed a definite loss of vertical dimension in occlusion (VDO), determined by facial measurements, esthetics, and phonetics, along with loss of anterior and canine guidance during protrusion and lateral excursion respectively.

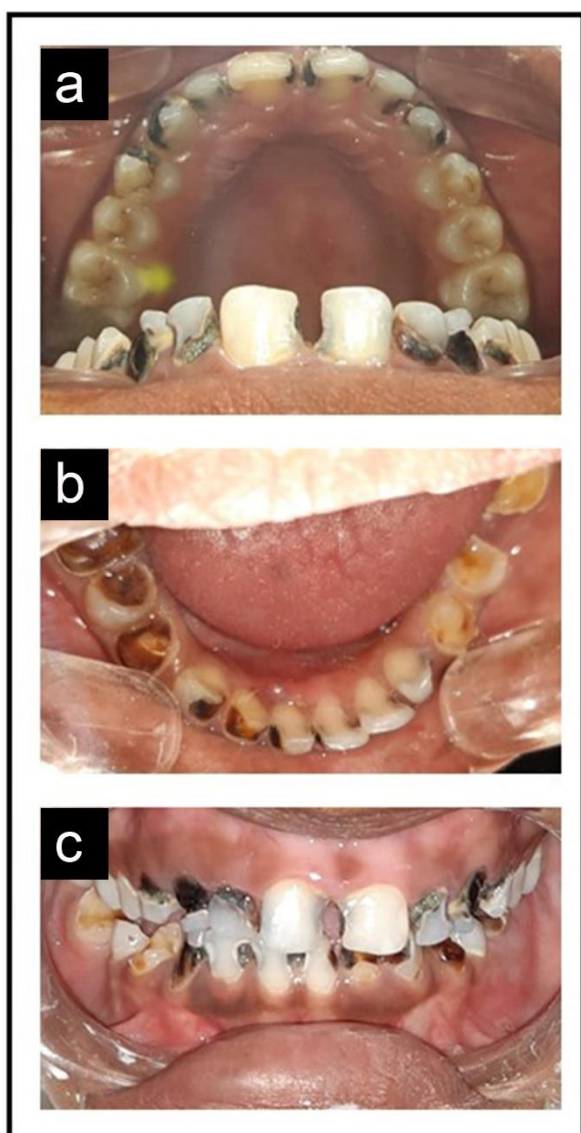


Figure 2: Pre-operative Intra-oral view of the patient: a) Maxillary arch, b) Mandibular arch, and, c) Both arches in occlusion

Radiographic examination (Figure 3) revealed that amongst the carious teeth, #12, #12, #22, #23, #35, #34, #33, #32, #31, #41, #42, #43, #44,

and #45 showed a radiolucency approximating the dental pulp, while the remaining showed deep dentinal caries. Additionally, due to severe loss of coronal structure concerning #13, #12, #22, #23, #34, #32, and #31, a post and core restoration was required to support the compromised tooth structure.

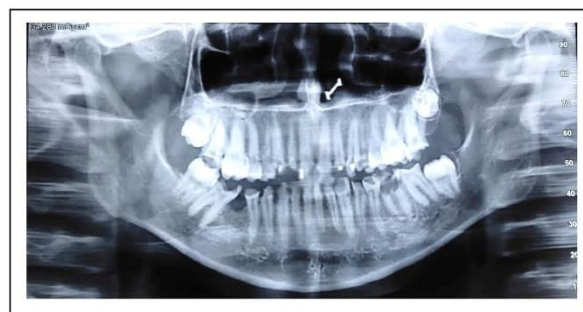


Figure 3: Pre-operative Orthopantomogram

Due to a midline crack existing in the mandibular left first molar, the teeth were indicated for extraction, making a presumptive diagnosis of a Kennedy's Class III modification I in the mandibular arch and a completely dentulous maxilla.

A diagnostic impression was then made using an irreversible hydrocolloid impression material (Zelgan Advanced Alginate, Dentsply Sirona, USA). The maxillary cast was mounted in a semi-adjustable articulator using an arbitrary face-bow and the mandibular cast was mounted in a centric relation (CR) using a Lucia jig and inter-occlusal records using a zinc-oxide eugenol impression paste (DPI, Mumbai, India) with an increased vertical dimension. The patient was then kept on a regime of muscle deprogramming.

Hence, the pre-prosthetic phase ensued which included extraction of #36 and root canal treatment of #12, #22, #23, #35, #34, #33, #32, #31, #41, #42, #43, #44, and #45 followed by fabrication of a post and core in concerning #13, #12, #22, #23, #34, #32, and #31 (Figure 4a & 4b) and a normal post-endodontic build-up in the remaining tooth. Tooth no. #14, #11, #21, and #24 were restored with composite resin (Tetric-N-Ceram, Ivoclar Vivadent, Schaan, Liechtenstein) after caries removal. Crown lengthening was done using a diode laser (DPI Dental Products, Mumbai, India) at 980 nm concerning the maxillary anterior gingival region to enhance esthetics. The gingiva was allowed to heal over 4 weeks before commencing the post-space preparation.

The patient reported after four weeks of satisfactory gingival healing. Then, post-space preparation was done



and an impression was made. The obtained cast metal post and core were then cemented into the respective teeth using a Type I Glass Ionomer cement (GC Gold Label Glass Ionomer Luting and Lining cement, GC Corporation, Tokyo, Japan) for all the teeth commissioned to receive a post and core restoration (Figure 4c). Following this, tooth preparation was done for the teeth in the maxillary arch to receive metallo-ceramic crowns. Impressions were made using the putty wash technique using a soft putty (Aquasil Soft Putty, Dentsply Sirona, USA) and a light body (Aquasil Ultra LV, Dentsply Sirona, USA) impression material. The prepared teeth were provisionalised while the permanent restorations were fabricated in the laboratory and were later cemented with Type I Glass Ionomer Cement (GIC) (GC Gold Label Glass Ionomer Luting and Lining cement, GC Corporation, Tokyo, Japan).

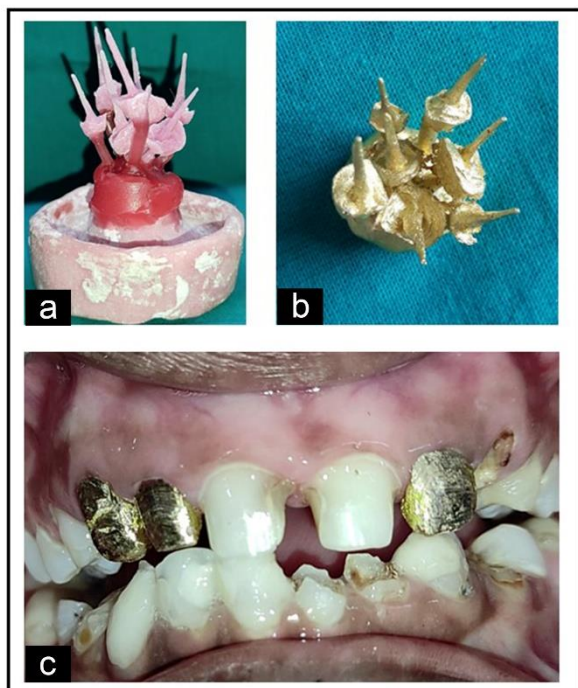


Figure 4: Post and Core a) post and core fabricated by acrylic resin with direct method, b) cast metal post and core, and, c) post and core cemented

Following this, tooth preparation was carried out for the mandibular arch, putty impressions were made, and provisional crowns and fixed-partial dentures were fabricated and cemented using an indirect method (Figure 5).



Figure 5: Provisional restorations fabricated with acrylic cemented on the mandibular teeth

The provisional restoration was adjusted in the patient's mouth by locating all excursive pathways from the CR to an edge-to-edge relationship for over six weeks. During this period, the patient's condition and functions, such as muscle tenderness, TMJ discomfort, mastication, and speech were evaluated. Improvement in the above parameters confirmed the patient's tolerance to the new mandibular position with the restored VDO. After determining the teeth' contours and form and locating the incisal edges, an elastomeric impression of both the arches was made, casts were prepared and mounted in an articulator using face-bow and inter-occlusal records. The definitive restorations were cemented using a Type I GIC on separate appointments for anterior and posterior segments respectively. Occlusion was verified as being free of any interferences during lateral excursion or anterior protrusion (Figure 6a-6c).

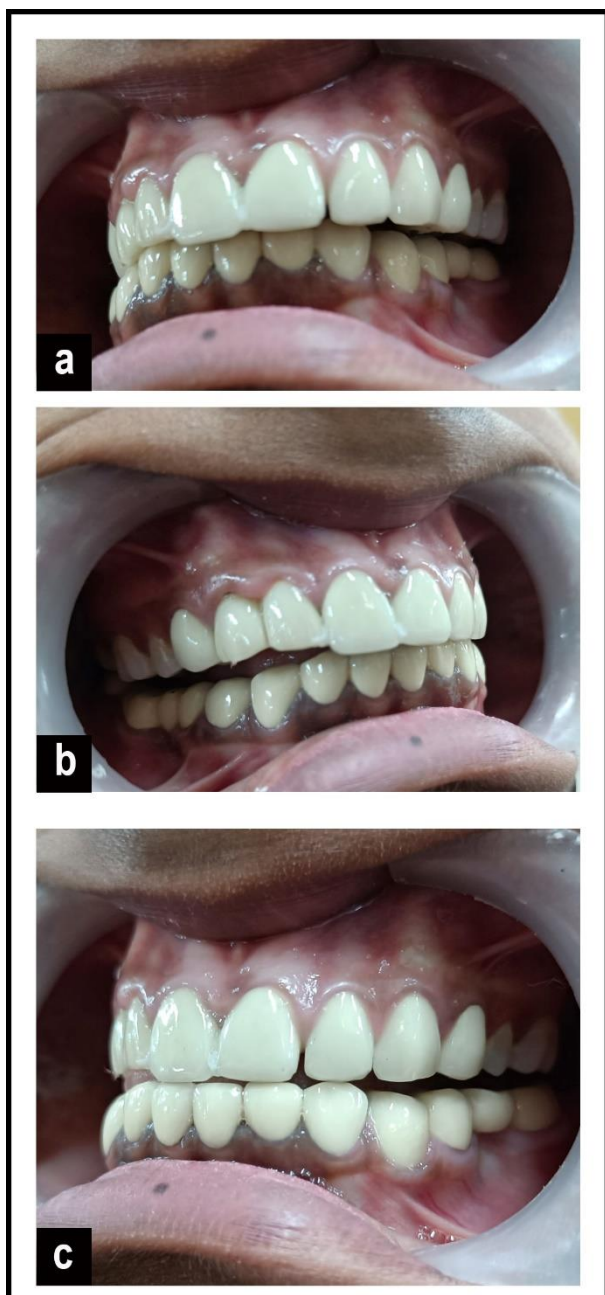


Figure 6: Figure showing no occlusive interferences during a)Right lateral excursion b)Left lateral excursion and, c) Anterior Protrusion

Figure 7 illustrates the final clinical post-operative view with the teeth in occlusion and Figure 8 depicts the post-operative Orthopantomogram. The patient reported being highly satisfied with the final treatment outcome, especially due to an enhancement of her facial esthetics and improved masticatory effectiveness. Figure 9a-9c shows the extra-oral view of the patient.



Figure 7:Post-operative Intra-oral view of the patient in occlusion showing porcelain-fused-to-metal crown cemented



Figure 8: Post-operative Orthopantomogram



Figure 9: Post-operative Extra-oral view of the patient: a)Right Lateral, b)Frontal, and, c)Left Lateral

3. Discussion

Restoration of a severely mutilated dentition has always been a challenge for the clinician. Occlusal rehabilitation invariably seeks to alter all unfavorable forces on the teeth which unavoidably induce pathologic conditions, into favorable forces, thus permitting normal function and therefore inducing healthy conditions[3].

It also aims to restore and maintain health, function, and esthetics pertaining to the stomatognathic system [4,5].



Restoring a patient to a state of physiologic health improves the quality of life of the patient and can be achieved only through a thorough knowledge of a wide range of treatment modalities and often involves a multidisciplinary approach. A detailed diagnosis is of prime importance when dealing with such cases as the final treatment outcome is multi-faceted and depends on the harmonious re-establishment of the stomatognathic system.

In the present case report, a multimodal approach was considered involving restoring the vital teeth affected with caries with composite resin [6], metal post core in a pulpless tooth with severe coronal structure loss, and porcelain fused to metal (PFM) crown[2]. In the current case report, the fabrication of the post and core was done using a direct method using an acrylic resin with an acrylic sprue[7]. The direct method was chosen to curtail the hassle of distortions which are inherent when an indirect method is used to make an impression with elastomers[8]. An acrylic resin was used to fabricate the direct wax pattern instead of an inlay wax to prevent any warpage due to its high coefficient of thermal expansion [9]. Nevertheless, the post-space preparations were smoothed to an optimum to prevent the interlocking of the acrylic resin within the canal walls [10].

Another significant challenge that exists in the present case is tooth surface loss owing to grossly carious teeth leading to loss of coronal tooth structure and attrition. All of these conditions lead to a decreased VDO and a lesser amount of available space to restore normalcy. The VDO was measured during the initial diagnosis and was increased gradually, in harmony with the patient's comfort, esthetics, and speech. Subsequent follow-ups were carried out to reconfirm the stability of the CR contacts as any deflection from the CR position can cause severe TMJ problems [11,12].

4. Conclusion

The key to the long-term success of restorations involved in oral rehabilitation of the patient depends on the clinician's knowledge of newer and improved materials, besides a detailed diagnosis and methodical analysis of the existing situation.

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