FULL MOUTH REHABILITATION INVOLVING SINGLE TOOTH SUPPORTED OVERDENTURE OPPOSING MULTIPLE FIXED PARTIAL DENTURE: A CASE REPORT

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ABSTRACT:

Complete oral rehabilitation is a general term that may range from placing an entire implant supported prosthesis or it may include a specific one type of prosthesis design (like a fixed partial denture). There are many less cases that present different prosthetic designs in single complete oral rehabilitation. The main feature of such treatment is the restoration of the occlusal scheme which must be physiologic in nature since ideal occlusion is difficult to replicate. An elderly female patient was referred to the Prosthodontic department for her missing teeth. Existing dentition had few natural teeth remaining in the maxillary arch while mandibular arch had a Kennedy class 2 modification 2 situation. A treatment plan that was consented by the patient included an overdenture for a maxillary arch (coping, after endodontic treatment) and a multiple fixed partial denture and individual crowns in the mandibular arch. Overdenture was fabricated first against a diagnostic wax up which was an exact replica of the final restorations. A canine guided occlusion with group function on working side was established in the new occlusal scheme. After cementation of fixed prosthesis and delivery of overdenture, patient exclaimed her satisfaction with both prosthesis.

Key words: porcelain, acrylic, overdenture, implant, endodontic, precision attachment

I. INTRODUCTION:

Rehabilitation of the oral cavity is restoring the form and function of the masticatory apparatus to normal and is mostly that of the complex form. Strangely, GPT (glossary of Prosthodontic terms) does not define the term full mouth rehabilitation [1], but rather the term complete mouth rehabilitation is used for referring such cases. Complete oral rehabilitation (COR) may or may not involve implant prosthesis and its range may include other Prosthodontic areas like fixed partial denture, removable partial denture or a maxillofacial prosthesis [2]. In reality, it is basically restoring an existing dentition which is why complete denture does not qualify to be although tooth supported overdentures can be a part of COR. It has been reported as a treatment option in developmental conditions like amelogenesis imperfecta [3], localized and generalized attrition [4], [5], psychological influences (occupationally stressed) [6]. Among systemic influences it has been reported to have been done in cases of rheumatoid arthritis [7], scleroderma [8] and regular cases of controlled hypertension or type 2 diabetes. It has been reported to accompany extensive build up of foundation restorations (post core) [9], with or without occlusal plane correction [10], anterior guidance curation [11], partially edentulous situations [12] and completely edentulous situation with implant supported rehabilitations. While most of the cases are mostly associated with severe attrition of natural teeth, there are few reports that have mentioned the use of overdenture along with fixed partial denture treatment.

A tooth supported overdentures on the other hand is a very significant branch of preventive Prosthodontics, that emphasizes the importance of any procedure that can delay or eliminate future Prosthodontic problems [13].
Different treatment options for partial edentulism must maintain the same Prosthodontic principle of the preservation of what is presently given by DeVan [14]. Preparing a denture over existing natural teeth has been reported not to adversely affect tooth condition [15] while at the same time improving masticatory efficiency when compared with a complete denture [16].

This article in the form of a case report is an attempt to present a rare variant of COR, in which the maxillary arch was restored by the tooth supported overdenture and the mandibular arch was restored using multiple fixed partial dentures and single crowns.

CASE REPORT

A 49 year old female patient was referred to the Department of Prosthodontics with a chief complaint of difficulty in mastication and impaired esthetics. Medical, social and drug history were irrelevant to the oral status. Dental history disclosed the duration of partial edentulousness since last 7 to 8 years. Extra oral examination revealed a very long maxillary lip, deep and prominent naso labial sulcus, collapsed lower third of the face and a thick mandibular lip. Intra oral examination showed the presence of maxillary few remaining natural teeth out of which the first premolar and first molar on the left side were mobile and having carious lesions (Fig.1 A,B). Attrition was seen with respect to tooth number (FDI system) 31,32,33,41,42,43 and 46. Since the vertical stops were treated, the method to detect the amount of functional interocclusal space was done by a clinical method mentioned in the literature [17]. Clinical evaluation of the abutment teeth for overdenture were performed using a multidisciplinary approach and the final decision regarding retaining or extracting a tooth was decided by a periodontist rather than a prosthodontist [18].

Fig 1: (A) and (B) Intra oral view of remaining natural teeth (C) Orthopantomograph showing the condition of teeth
Fig 2: (A) Copings cemented on maxillary natural teeth (B) Mandibular teeth prepared to receive fixed partial denture (C) Establishing anterior guidance after maxillary overdenture teeth arrangement and mandibular diagnostic waxup

Fig 3: (A) Cast frameworks of all mandibular fixed partial denture (B) porcelain fused to metal restorations (C) Completed prosthesis on articulator
A radiographic examination was conducted that included an orthopantomogram (Fig.1 C) and various intra oral periapical views of the abutment teeth. A diagnostic impression was made following which the diagnostic casts were mounted on a semiajustable articulator using facebow, interocclusal records and check records. After a detailed analysis the treatment options presented to the patient included a surgical approach that comprised of various implant supported prosthesis and a non surgical approach that included a tooth supported overdenture for maxillary arch and multiple fixed partial denture for the mandibular arch. The treatment plan that was consented by the patient was the one that was considered as ideal for this case.

The treatment plan was executed in 2 phases: pre- prosthetic phase and prosthetic phase. In pre prosthetic phase extraction of 27 was planned, followed by intentional root canal treatment of all remaining teeth in both arches. In prosthetic phase, the maxillary teeth were prepared first to receive an overdenture coping which was cemented on the abutment teeth (Fig 2 A). For the mandibular arch, natural teeth were prepared in segment wise (first three anterior teeth on one side, then on the other side, and posteriors also similarly) (Fig 2 B). This allowed to maintain vertical in the temporary restoration, which were fabricated in self cure. After recording the jaw relations and mounting the casts, the maxillary denture was arranged against a previously made diagnostic wax up (Fig 2 C). After anterior trial, posterior teeth were arranged in overdenture and the denture was fabricated in a conventional manner. A customized incisal guide table was fabricated which guided incorporation of an occlusal scheme for the occlusion in both prosthesis. For the mandibular arch, the cast framework for multiple individual crowns and fixed partial denture was tried in the same way as the temporary restorations were fabricated (Fig 3A). After the routine metal and porcelain trial, the fixed partial denture and individual crowns were corrected against the maxillary overdenture (Fig 3B, C). Once all the restorations were ready, the fixed partial denture and single crowns were cemented first (Fig 4A), which was followed by verifying of centric occlusion (Fig 4B) against maxillary overdenture. A clinical remount procedure was done to correct occlusal errors in overdenture (Fig 4C) followed by insertion and delivering instructions to the patient regarding oral hygiene maintenance and care. The patient was put on a follow up protocol and adapted well to the treatment. She exclaimed her happiness regarding the esthetic and functional outcome of the prosthesis (Fig 5).
the excess wax each time after each trial closure. A uniform layer of separating medium was then applied to the investing plaster surrounding the mould space (Fig 4 A, B). The two layers were separated by a layer

Fig 5: Complete denture inserted in the mouth

II. DISCUSSION

A case of complete oral rehabilitation using natural teeth for fixed partial denture that opposed a tooth supported overdenture has been presented in this article. It has been stated that a balance between functional stability and cosmetic appeal in dentures is essential [19]. Full mouth rehabilitation in most of the cases is a classic example of such balance. From patients’ point it is the esthetics while from the restore point it is the establishment of complete occlusion that is essential. Various principles and philosophies are present to accomplish COR [20], [21]. With the advents of implants, COR can be accomplished using implant supported overdentures which has also been one of the most common forms of implant treatment procedures [22], [23]. A tooth supported overdenture on the other hand is an established form of preventive Prosthodontics [24] because of its essential role in bone preservation. COR has been indicated for developmental tooth anomalies and acquired tooth deformities like severe attrition [3], [9]. One of the complex issues in such cases is the establishment of occlusion especially if the vertical dimensions are not maintained by any posterior tooth. In this case, occlusal vertical dimensions at rest were assessed by phonetics [25],[26] measurement of interocclusal space [27], and evaluation of the facial appearance using the maxillary incisal and occlusal plane. Placing the incisal edge in the esthetic favorable position establishes the incisal plane, which in turn develops the anterior guidance for the restorations. A customized incisal table was fabricated after overdenture trial was done with the patient. Minor adjustments in the anteriors were essential to accommodate the long maxillary lip of the patient. Although visibility of the incisal edges was kept to a minimum, it was still difficult to accomplish esthetic objectives in this case. Restoration of the patient was divided essentially into two different components that were the overdenture and the fixed partial denture. The choice of doing the overdenture first was based on the fact that the cast restoration would be easy to adjust to the opposing artificial teeth rather than vice versa [28]. Overall the occlusion was based on multiple philosophies that included mainly the Pankey many schulyers and the balanced occlusion philosophy. Treatment efforts were mainly focussed on transmission of maximum lateral forces to the anterior part of the mouth where they will cause less damage. Basic principles of gaining adequate support [29] from the compact bone of the maxillary arch and stability from balanced occlusion were incorporated and accomplished. The drawbacks and limitations of this case are the use of porcelain fused to metal teeth against opposing high impact nanoacrylic denture teeth. Impaired effects due to the such occlusal scheme were minimised by placing an occlusal contact with metal rather than porcelain.
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