



FULL MOUTH REHABILITATION IN DISPARATE SCENARIOS: A CASE SERIES

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Abstract:

A successful administration of full mouth rehabilitation demands a multi-disciplinary approach for its endurance. The current case series is intended to provide an insight into the use of diverse treatment modalities to achieve a balanced, efficient and biomechanically successful prosthodontic treatment with acceptable aesthetics. The use of implants, porcelain fused to metal crowns and cast partial denture substantially in this series has provided a birds eye view for all the clinicians into managing multitude case scenarios. The implementation of telescopic double crown system in combination with conventional cast partial denture has also broadened the horizons for the practicing prosthodontists.

Keywords: Full mouth rehabilitation, Turner and Missirlian classification, Pankey Mann Schuyler, Marburg double crown, telescopic crown.

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INTRODUCTION-

Fabrication of a pleasing smile and delivering prosthesis with superior aesthetics along with desirable functional efficiency is extremely rewarding for any clinician. Simultaneously, it is extremely important to strike a balance between both the realistic and unrealistic expectations of patient along with rendering an appropriate as well as patient specific treatment plan.¹

A successful mouth rehabilitation requires a multidisciplinary approach for its long-time success. Dental implants play a pivotal role in oral reconstruction of partially as well as completely edentulous cases as it not only act as adjunct but also meet the high aesthetic demand and improve the prognosis of the treatment.²

In cases where the edentulous spaces are minimal, there is generalised attrition, grossly decayed teeth, collapsed bite cases. The Pankey Mann Schuyler (PMS) philosophy is commonly used organized approach for oral rehabilitation. The principles of PMS are based on the spherical theory of Monson and functionally generated path technique (FGPT).³ According to an article by Saafi J et al. it was not imperative to use FGPT in all the cases of full mouth reconstruction. Alternatively, the occlusion can be directly verified during the trial stages to reduce treatment time.⁴

In patients with financial limitation the concept of combining the removable partial denture with remaining abutment teeth has been there since a long time. One such measure to retain the RPD involves the use of double crowns, as elaborated by Yalisove et.al. there are different types of double crown systems like dual crowns with clearance fit, inner crowns with conical coping, dual crowns with parallel milled surfaces. These embrace the RPD providing better support, stability, reduced flexure and helps to transfer the force from the soft tissue part of the prosthesis to the long axis of the abutment tooth thus leading to creation of maximum area of tension with least amount of compression in periradicular space.⁵

The following case series demonstrates the use of dental implants, tooth supported fixed dental prostheses, Marburg double crowns, removable

dental prosthesis to restore the patient's aesthetics, function as well as confidence.

CASE REPORTS-**CASE 1- FMR WITH IMPLANTS AND CROWNS**

In our first case a moderately built 61year old patient reported to the Department of Prosthodontics with a chief complaint of multiple missing teeth in both maxillary and mandibular arches.

On intraoral examination, the patient had missing 13,14,22,31,32,36,41,42,46 with 11,12,21 grossly decayed. According to Turner and Missirlain classification of worn dentition he was diagnosed with category I: excessive wear with loss of vertical dimension of occlusion.

On radiographic examination, there was adequate bone in region 11,12,21. On assessment of the clinical situation and patient's desire full mouth rehabilitation with implants and fixed partial dentures was planned, the centric relation and facebow transfer was done and the patient was given an occlusal splint for 4 weeks and was directed to wear it the whole day except eating, to restore the lost vertical dimension, the broadrick's analysis was done and the wax mockup was done according to the analysis. After 4 weeks, the implants were placed with respect to 13,14,22,24 and left to osseointegrate for 3 months. During these 3 months the remaining teeth were endodontically treated and then prepared for receiving PFM crowns. Fixed partial denture was given with respect to 14,15,16,17,25,26,27,41,42, 43,44,45,46,47,31,32,33,34,35 with a cantilevered crown wrt 36. The occlusal scheme selected was canine guided occlusion. The maxillary anterior region was later rehabilitated with cement retained fixed partial denture once the implants were osseointegrated. Final bique trial was performed before cementing all the crowns and after finishing and polishing all the crowns were cemented with glass ionomer cements. A nightguard was fabricated for the patient to minimize risk of porcelain chipping and fracture.

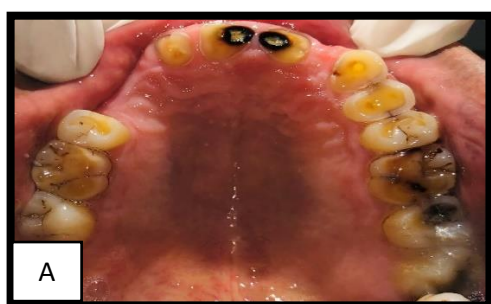


Figure 1- Pre-op intraoral views of maxilla(A) and mandible (B) of the patient



Figure 2- Pre-op intraoral view of the patient (frontal)



Figure 3- CBCT of the patient

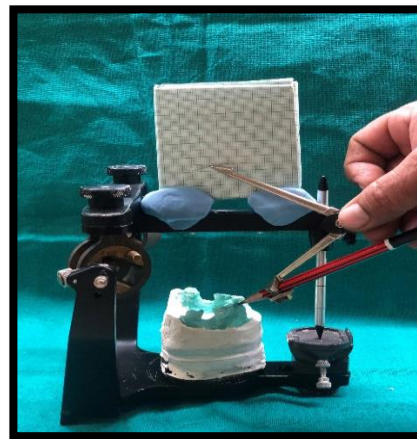


Figure 4- Broadrick's evaluation

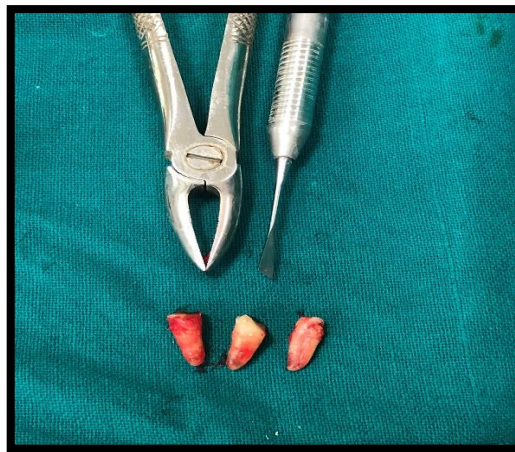


Figure 5- Extracted teeth

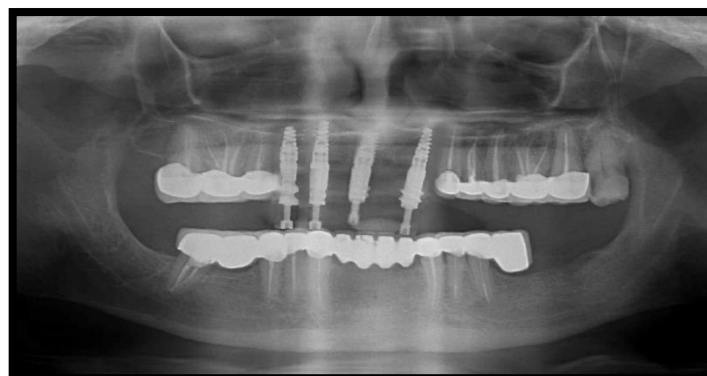


Figure 6- Jig Verification

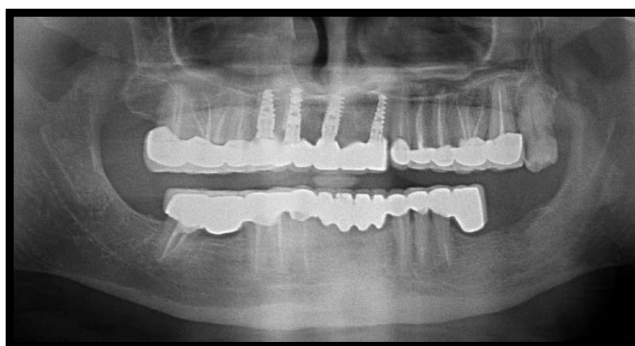


Figure 7- Post-op OPG of the patient



Figure 8- Post-op intraoral view of the patient (frontal)

CASE 2- FMR WITH CROWNS USING MODIFIED PMS TECHNIQUE

In our second case a 31year old Female patient reported to the Department of Prosthodontics complaining of loss of tooth structure and unpleasant appearance since 3 years. She had difficulty in eating hard and chewy food, she was also concerned about the mottled appearance of his teeth since the same time. According to her medical history she had gangrene and her dental condition deteriorated after her first pregnancy. On intraoral examination patient had grossly carious 11,12,17,21,22,23,24,26,27,31,32,36,37,41,42,43, 44,46,47. Carious 14,15 and missing 16. She was diagnosed according to Turner and Missirlain classification of worn dentition into category I: excessive wear with loss of vertical dimension of occlusion. On assessment of the whole situation

full mouth rehabilitation was proposed and the patient agreed to the treatment plan, the diagnostic impressions, facebow transfer was done in the first appointment, all the teeth were planned to be endodontically treated. In the second appointment an occlusal splint was given to the patient, she was instructed to wear it for 4 weeks. Broadrick’s analysis was done and wax mockup was prepared and shown to the patient in the following appointment, on her consent and approval the tooth preparation was started. The modified Pankey Mann Schuyler technique with was followed for the whole rehabilitation and the patient was successfully rehabilitated with full mouth Porcelain fused to metal crowns and bridges. A nightguard was fabricated for the patient to minimize risk of porcelain chipping and fracture.

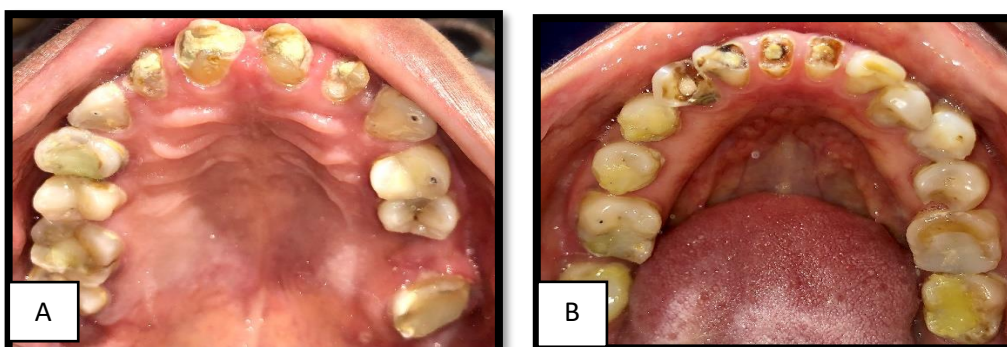


Figure 9- Pre-op intraoral views of maxilla(A) and mandible (B) of the patient



Figure 10- Pre-op intraoral view of the patient (frontal)

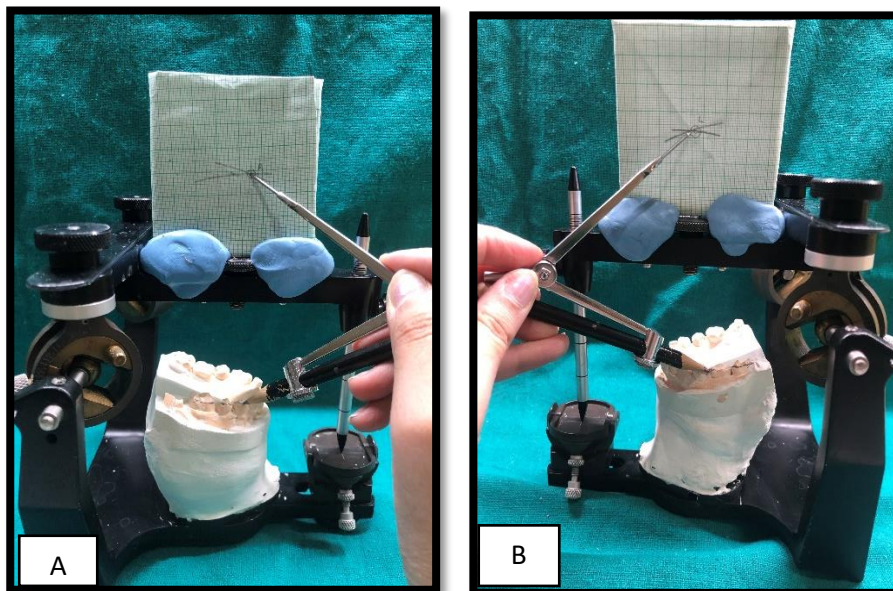


Figure 11- Broadrick's evaluation right(A) left(B) side



Figure 12- Full mouth wax mockup



Figure 13- Post-op intraoral view of the patient (frontal)

CASE 3- FMR WITH CROWNS AND RPD WITH MARBURG DOUBLE CROWNS SYSTEM

In our third case a female aged 63 years reported to the Department of Prosthodontics complaining of multiple missing teeth with unaesthetic appearance of remaining teeth.

On intraoral examination patient had rotated 11,12,21,22,31,32,33,41,42,43 she had missing 14,25 36,37,46,47 and restoration wrt 15,17,24,26,34,38,44,45,48. There was no loss of vertical dimension and overall the teeth had yellowish discoloration. On thorough assessment and considering all treatment options full mouth rehabilitation was proposed with multiple implants in regions 36,37,46,47 however patient denied implants due to financial constraints and then was given the option for cast partial denture retained with Marburg double crowns in lower arch, the patient agreed to the treatment plan, the diagnostic impressions, facebow transfer was done in the first appointment. All the teeth were endodontically treated before proceeding for the full mouth rehabilitation.

The primary cast was surveyed for cast partial denture (CPD) planning, the broadrick's analysis, wax mockup was done during the planning phase.

The CPD was planned with occlusal rests on distal surface of 35 and 36, indirect occlusal rest on mesial of 34,44, the depth of the sulcus was not adequate so lingual bar was planned anteriorly. The secondary copings of 38 and 48 were included in the CPD framework.

In the consecutive appointments tooth prep was done in all the teeth, in the next appointment metal trial was done and thereafter the crowns and bridges were cemented using Glass ionomer cement. After cementation of all the crowns and bridges, the impression of the lower arch with edentulous spaces wrt 36,37,46,47 and primary copings wrt 38 and 48 was done using elastomeric impression material (putty and light body), the wax pattern for CPD was made, the casting was done and in the next appointment the framework was tried in patients mouth. Once the correct fit was achieved, the pickup impression of the framework was done and the cast was poured with die stone, according to this the final adjustment of framework was done. The occlusal bite was made on the CPD framework and jaw relation was recorded followed by try in for the acrylic teeth and later the final acrylisation of the CPD framework with denture teeth was done, composite facing crowns were given wrt 38,48 secondary copings.

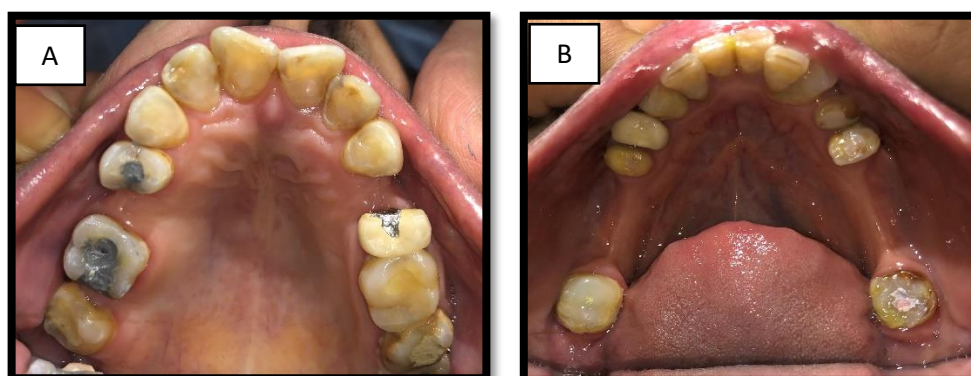


Figure 14- Pre-op intraoral views of maxilla(A) and mandible (B) of the patient



Figure 15- Pre-op intraoral view of the patient (frontal)



Figure 16- Surveying of the cast

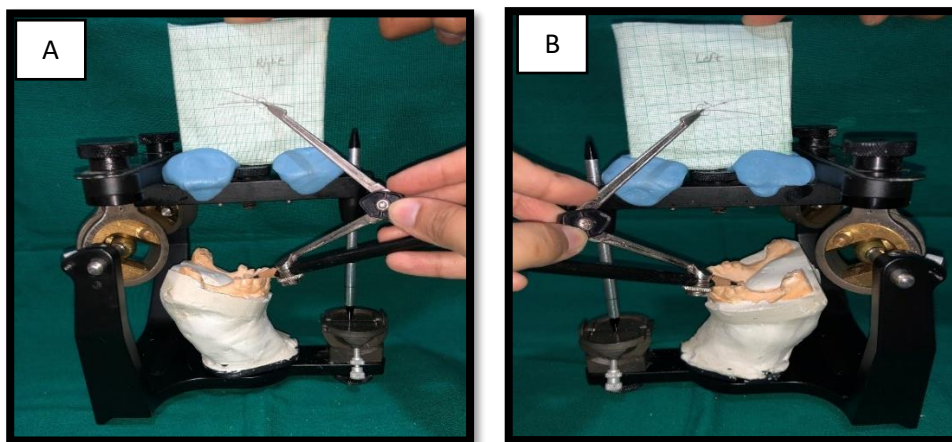


Figure 17- Broadrick's evaluation right(A) left(B) side



Figure 18- Full mouth wax mockup

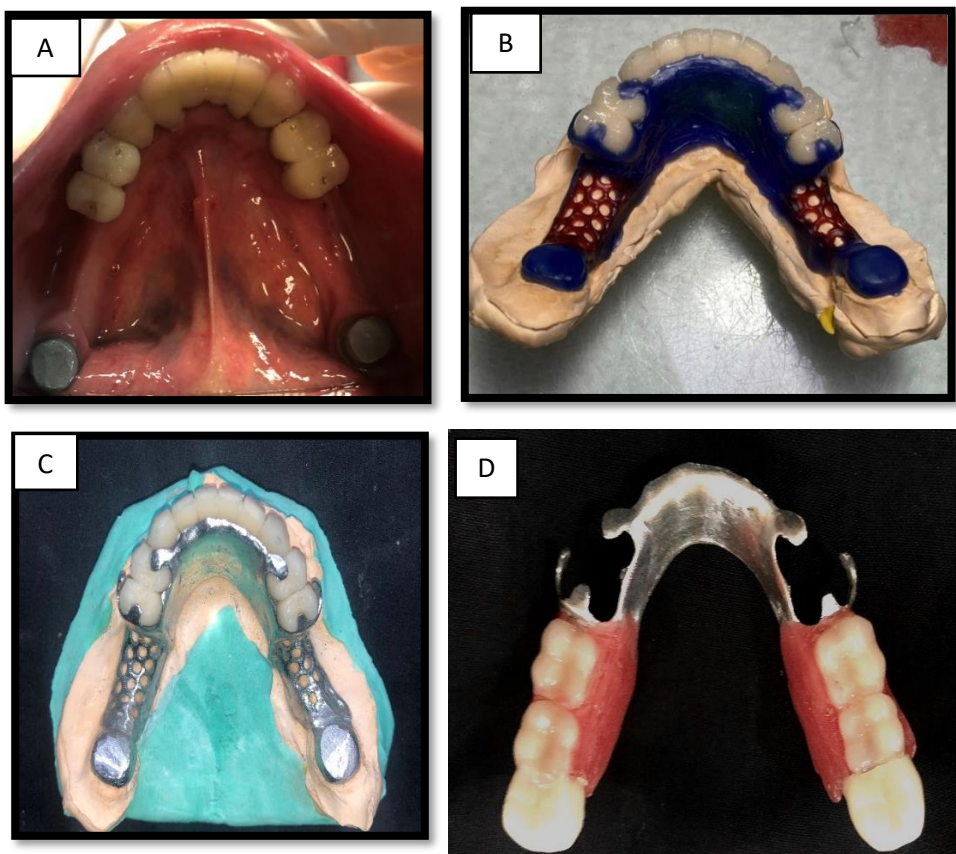


Figure 19- Cementation of final Porcelain fused to metal crowns of 31,32,33,34,35,41,42,43,44,45 and final cementation of primary copings of 38 and 48 having heavy chamfer finish line(A), Wax up for cast partial denture(B), Metal framework of cast partial denture(C), Wax trial of cast partial denture with acrylic teeth 35,36,45,46 and composite facing 38,48(D)

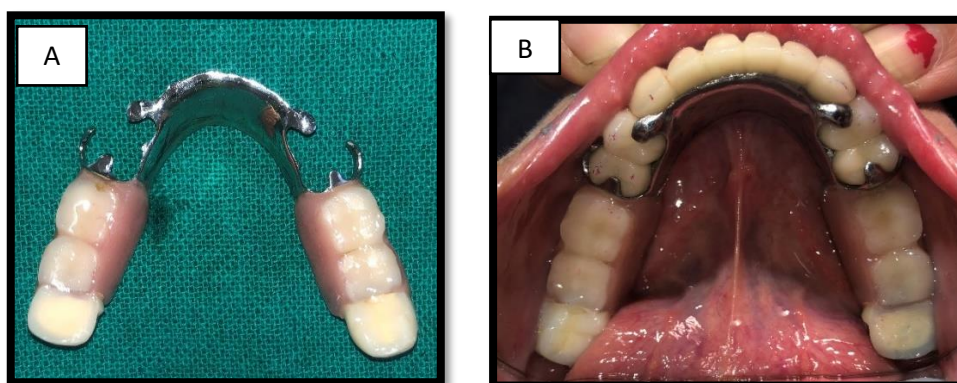


Figure 20- Final cast partial denture prosthesis



Figure 21- Post-op intraoral view of the patient (frontal)

DISCUSSION-

Rebuilding and replacing multiple missing, highly attrited and mutilated dentition has been a challenge to a dentist's skill and capabilities. The concept of entire mouth rehabilitation is dependent upon three accepted and proved principles. These are- Existence of a physiological rest position of the mandible which is constant, the recognition of a variable vertical dimension of occlusion and the acceptance of a dynamic, functional centric occlusion.⁶ Occlusal rehabilitation seeks to convert all unfavourable forces on the teeth which inevitably induce pathologic conditions, into favourable forces which permit normal function and therefore induce healthy conditions.

Full arch implant-supported restorations are increasingly popular, but in this case the patient was not psychologically ready for the extractions and alveolectomy. The maxillary anterior region was rehabilitated with multiple immediate extractions and 4 dental fixtures, thus cautioning the fabrication of a long span bridge which is bound to fracture in near or late future. The full mouth rehabilitation was done with splinted crowns, and in mandible one cantilever crown was permissible. The use of cement-retained prosthesis has some advantages like a simpler construction technology, a compensation of placed implants absence of parallel axes, and a passive fitting of prosthesis due to cement space between construction and abutment.

Amongst several philosophies for an occlusal rehabilitation, the most important are Hobo's philosophy and Pankey Mann Schuyler philosophy (PMS). PMS philosophy is one of the most practical philosophies for occlusal rehabilitation as it is well organized logical procedure that progresses smoothly with less wear and tear on the patient operator and technique. Pankey and Mann introduced an instrument for occlusal plane analysis, here we used simplified version of the instrument i.e. customized broad rick flag analyzer⁹. This assists in the reproduction of tooth morphology that is commensurate with the curve of Spee when posterior restorations are designed. The PMS technique is a very flexible concept. According to Dawson the most impressive advantage of PMS is the latitude it permits.⁴ The advantages of this technique include incorporation of freedom from centric, no need to prepare or rebuilding all the teeth at a time, a well-organised procedure, all posterior occlusal contours are programmed in harmony with both condylar border movements and a perfected anterior guidance, and

thus eliminating any specific instrument like the one used in Hobo's technique.

The removable partial denture option is an essential prosthetic option in many oral conditions. Cobalt-chromium (Co Cr) alloy is the material of choice to construct removable partial denture frameworks because of its better corrosion resistance, lower cost, high micro hardness, good modulus of elasticity and low density. Fabrication of telescopic denture was made by using double crowns in the present case.⁷ The advantages of these telescopic crowns are (i) it provides superior retention as the double crowns exhibit constant friction between the parallel-sided surfaces of the crowns during the entire process of insertion and removal. The friction force, arising when the secondary part is moving against the primary part of the latch, is called the slide friction (Tomasz Dabrowa, 2011). (ii) assists the crowns or bridges to withstand the occlusal forces and therefore transmits less forces to underlying bone thus helps in reduced bone resorption and (iii) these system of telescopic denture looks similar to fixed partial denture which exhibit superior aesthetics. In previous studies these dual crown systems were used in fabrication of tooth supported telescopic denture, however in the present case both tooth and tissue supported hybrid telescopic denture were fabricated which resulted in better support, less transmission of forces to the supporting bone and therefore leading to diminished bone resorption.⁸

Patients who present with variable dental needs that require full mouth rehabilitation can make treatment planning difficult to plan and achieve. Many clinicians have a vision of the overall treatment that they would like to provide; however, deciding where to start the case and how to sequence interdisciplinary care proves challenging. This article discusses a series of cases that leveraged a systematic approach for the execution of a full mouth rehabilitation utilising almost all kind of prosthesis starting from implants, fixed partial dentures to removable dental prosthesis.

CONCLUSION-

This clinical case series has documented the aesthetic and functional rehabilitation of three patients with implant and tooth supported, tooth-removable partial denture along with Marburg double crown supported and tooth supported fixed partial denture prosthesis. The ultimate objective of full mouth rehabilitation is to fabricate a prosthesis that function for longer period of time keeping in mind the financial status, compliance, hygiene

status, and underlying systemic conditions of the patient.

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