



ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2021; 7(3): 29-33
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www.oraljournal.com
Received: 16-05-2021
Accepted: 18-06-2021

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Stepwise approach for full mouth rehabilitation of worn dentition: A case report

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DOI: <https://doi.org/10.22271/oral.2021.v7.i3a.1276>

Abstract

Severely worn teeth can affect the aesthetics and functions adversely. Rehabilitation in such cases not only restores functional and physiological harmony but also provides psychological contentment to the patient. Wearing of teeth is very common phenomenon and can occur due to mechanical or biochemical reasons. This case report describes treatment protocol for a 62-year-old female with severely worn-out dentition, partial edentulism and lost anterior guidance. A fixed permanent restoration of the occlusion was planned with appropriate planning and analysis. Pankey Mann Schuyler philosophy was used to rehabilitate occlusion. First anterior rehabilitation was carried out, later the posterior plane analysis and rehabilitation was done. This report presents how worn-out dentition can be rehabilitated to improve aesthetics and function leading to improved quality of life.

Keywords: full mouth rehabilitation, incisal guidance, vertical dimension, Pankey Mann philosophy

Introduction

Depending on cause tooth, wearing can be classified as abrasion, erosion and attrition [1]. Excessive wearing of dentition can however result in mutilated aesthetics, pulpal pathology, occlusal disfigurements and impaired function over time [2]. Wearing out of teeth causes loss of anterior guidance and loss of vertical dimension [3]. Rehabilitation of such cases need utmost care and comprehensive planning employing various diagnostic, therapeutic and restorative play of action. Prosthodontic considerations like analysis of the existing occlusion and occlusal plane, availability of freeway space, size and location of edentulous areas, number, position and condition of the existing teeth in each arch, the need for altering the vertical dimensions are needed to achieve favourable results [4].

Management of worn dentition with partial edentulism using fixed or removable prostheses is complex [3] but articulated diagnostic casts and diagnostic wax-up can provide important information. Provisional prosthesis and meticulous clinical evaluation can help gain an in-depth knowledge of reaction of stomatognathic system to altered vertical dimension in such cases [5].

This clinical report describes the treatment protocol followed to rehabilitate occlusion of a 62 years old female patient who reported to the clinic with a chief complaint of difficulty in chewing due to worn-out dentition. Complete rehabilitation was done using fixed prosthesis with restoration of anterior guidance and rehabilitation of occlusal plane. Pankey Mann philosophy was used wherein occlusal rehabilitation is completed into 4 stages [6].

Case report

A 62 years old female patient reported to Department of Prosthodontics with chief complaint of difficulty in chewing food due to worn out dentition. Patient had hypothyroidism and was under medication for the same for ten years. She had normal gait and built. On extra oral examination, face was symmetric with convex facial profile and decreased lower facial height. TMJ had no clicking sound and showed no deviation from normal movement. Lymph nodes appeared normal on palpation.

On intra oral examination, it was observed that patient had fair oral hygiene. Teeth present were 11, 12, 13, 14, 15, 16, 21,22, 23, 25, 26, 27, 31, 32,33, 34,35,38, 41, 42, 43, 44, 45 and 48. (Figure 1 and 2) Most of the teeth were root canal treated with nearly half of tooth structure lost due to either attrition or caries. (Figure 3) 16 was not root canal treated but was restored due to caries and showed gingival recession. Teeth loss especially in mandibular posterior region was gradual due to periodontal and carious reasons over the period of 8-10 years. The remaining teeth had physiologic mobility with good periodontal support. She has been undergoing oral prophyllaxis once in two year.

This was a diagnosed case of wear with Turner’s category I of occlusal wear [2], loss of incisal guidance and vertical dimension with deficient freeway space to restore them and Kennedy’s class II modification 1 partial edentulism associated with mandibular arch and Kennedy’s class III modification 1 partial edentulism associated maxillary arch [7].

Various treatment options like full coverage porcelain veneered crown or full coverage zirconia for anteriors and full coverage metal, PFM or zirconia for posterior was informed to patient. Considering the edentulous areas, treatment options like removable partial denture, cast partial denture, implant supported removable prosthesis and implant supported fixed prosthesis were discussed with patient. Patient opted for Full coverage veneer crowns with fibre post in maxillary anteriors, full coverage PFM with lower anteriors, and PFM bridge with lower posterior edentulous areas.



Fig 4: CLP planned for both arches.



Fig 5: Increased crown height after CLP.



Fig 1: Pre-operative intra-oral picture



Fig 2: Recording the face-bow orientation.



Fig 3: Diagnostic mounting and wax mock-up.



Fig 6: Teeth preparation



Fig 7: Provisionalisation



Fig 8: Metal tri-in for anteriors.



Fig 9: Final prosthesis for anteriors.



Fig 11: Re-mock up for posteriors according to new plane established.



Fig 10: Posterior plane analysis using Broadrick's occlusal plane analyser.



Fig 12: Final posterior crowns.



Fig 13: Completed posterior rehabilitation right and left. (centric)



Fig 13: Occlusion of eccentric movements. (Right and Left)



Fig 14: Posterior disocclusion on anterior protrusion.



Fig 15: Completed rehabilitation with a satisfied patient.

Treatment plan was formulated with a multidisciplinary approach in various phases as follows:

1. Phase I – Oral prophylaxis and oral hygiene instructions.
2. Phase II – Restorations
3. Phase III – Diagnostic mounting and complete mock wax-up at increased vertical dimension. Crown lengthening. Delivery of provisional restorations for stomatognathic system to adjust to increased vertical dimension.
4. Phase IV – Prosthetic phase – Full mouth rehabilitation using Pankey Mann Schuyler philosophy.

After completion of phase I and phase II, Pankey Mann philosophy was employed for the prosthetic phase. According to this, treatment is divided into 4 stages. (6)

Step 1: Examination, diagnosis, treatment planning and prognosis.

Step 2: Harmonization of anterior guidance for the best possible esthetics, function and comfort.

Step 3: Selection of acceptable occlusal plane and restoration of lower posterior occlusion in harmony with

anterior guidance in a manner that will not interfere with condylar guidance.

Step 4: Restoration of upper posterior occlusion in harmony with anterior guidance and condylar guidance.

A preliminary impression was made and casts were fabricated. Maxillary cast was mounted on semi adjustable arcon articulator (Hanau wide vue) via face-bow transfer. (Figure 4) A tentative jaw relation was recorded with established vertical dimension in centric relation (figure 5) and mandibular cast was mounted on articulator in accordance to maxillary cast with the help of inter-occlusal records. Diagnostic mock-up was done using mock-up (MAARC Mock Up Wax) wax. Crown lengthening procedure was planned for complete maxillary and mandibular arch. Silicon putty index (Zhermack Zetaplus C Silicone) was prepared on wax mock-up.

Full mouth tooth preparation was carried out for receiving full coverage porcelain fused to metal crown. Temporaries were transferred and adjusted to achieve anterior guidance in harmony with condylar guidance. The assessment of appropriate height and angulation of anteriors was done observing the aesthetics and phonetics especially with “f” and “v” sounds.

After 20 days of temporaries, both maxillary and mandibular impression were made with temporaries over which index was fabricated and which acts as a guide for final crowns. After temporaries were removed and final impression were made followed by mounting on articulator. Metal copings were fabricated and metal try-in was carried out for evaluation of fit and clearance for porcelain layering. After that bisque trial was done to check for occlusion and interferences, followed by final glazing and cementation of maxillary and mandibular anteriors.

In third part of treatment wherein came the occlusal plane analysis, Broadrick occlusal plane analyser was used. A point was selected on pre-molar, wherein needle point of caliper was placed with a 4 inch radius an arc was scribed on flag, marking the anterior survey line. Then, the needle point of caliper was held against the condyle ball of articulator and another arc was scribed on the flag. Now, keeping the needle point at the intersection of first two lines, a line was scribed from molar to canine, marking the acceptable occlusal plane for lower posteriors. After obtaining this plane, wax mock-up was repeated for the posterior teeth. New temporaries were fabricated and transferred to the patient. These temporaries were kept for two week for the stomatognathic system of the patient to adjust with it.

Next maxillary and mandibular impressions were made with temporaries which will act as a guide for final crown. Final impressions were made after refining the preparation. Sectional bite was recorded on either side of arch by placing the temporaries on the contralateral side. Casts were mounted on articulator by using the bite and metal copings were fabricated and tried intraorally. Next bisque trial was done and occlusion was adjusted and restorations were glazed. Final prosthesis was cemented in group function occlusion.

Discussion

One of the aim of full mouth rehabilitation treatment is to convert unfavourable forces on the teeth into favourable ones permitting normal function and thereby resulting in healthy conditions. (8) In this case, due to gastric erosion a gradual continuous wearing off of the tooth structure had occurred. Surgical repositioning of soft tissue helped gain better aesthetic outcomes. Also the transitional prosthesis that was

fabricated on the proposed vertical dimension provided a room for neuromuscular adjustment thereby allowing validation of VDO and functional occlusion prior to initiation of definitive treatment^[9]. Patient was kept on continuous follow-up and reported no problems thereafter. There are many philosophies to follow for an occlusal rehabilitation, most important among them is Hobo's philosophy and Pankey Mann Schuyler philosophy. Pankey Mann Schylur philosophy is a well-organized logical procedure that progresses smoothly with less wear and tear on the patient operator and technique^[6]. Optimum oral health should be prime objective of the rehabilitation procedures, because the ultimate goal will always be to restore the mouth to health and preserve this status throughout life of a patient^[10]. Instrument for occlusal plane analysis was introduced by Pankey and Mann, but here we used a simplified version of the same i.e. customized Broad rick flag analyzer. This assists in the reproduction of tooth morphology that is commensurate with the curve of Spee when posterior restorations are designed^[11].

Conclusion

Proper implication of interdisciplinary concepts is a key to successful case of full mouth rehabilitation. A combination of proper diagnosis and treatment planning help achieve the desired results of harmonious occlusion, aesthetics and function. A properly executed case of full mouth rehab not only improves function but also provides psychological gratification to the patient.

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