

REBUILDING SMILES: A JOURNEY TO FULL-MOUTH RESTORATION (CASE REPORT)

Dr. T. Ritushree¹, Dr. Sunil Dhaded^{2*}

¹Post-graduate student, Department of Prosthodontics Crown Bridge and Implantology, AME's Dental College and Hospital, Raichur.

²Professor and Head of Department, Department of Prosthodontics, Crown Bridge and Implantology, AME's Dental College and Hospital, Raichur.

*Corresponding Author

Dr. Sunil Dhaded

Professor and Head of Department, Department of Prosthodontics, Crown Bridge and Implantology, AME's Dental College and Hospital, Raichur

Email: sunildhaded2000@gmail.com

Abstract-

Full-mouth rehabilitation encompasses a comprehensive and detailed series of restorative procedures aimed at modifying the occlusal plane and achieving proper balance. The Broadrick flag is a traditional tool used to replicate tooth morphology in harmony with the curve of Spee. This case report illustrates the development and use of a custom-designed Broadrick occlusal plane analyzer (BOPA) on a semi-adjustable articulator (Whipmix) to precisely establish the optimal orientation of the occlusal plane during full-mouth rehabilitation (FMR).

Conclusion: Full-mouth rehabilitation was pivotal in the treatment strategy for this case. A customized occlusal plane analyzer was developed and utilized to restore the damaged occlusal plane, ensuring its compatibility with the stomatognathic system. **Keywords:** Full-mouth rehabilitation, Anterior survey point, Posterior survey point, Curve of Spee, Occlusal plane.

Introduction:

Traditionally, individuals with severe dental challenges were treated with full-mouth extractions followed by complete denture placement. However, advancements in dental

materials, techniques, and technology have revolutionized Prosthodontics, making it more efficient to restore compromised mouths. Full-mouth rehabilitation entails a comprehensive approach that includes occlusal plane adjustments to achieve functional and balanced results. The occlusal plane plays a key role in these procedures. Tools such as the Broadrick occlusal plane analyzer are instrumental in recreating tooth contours that follow the curve of Spee, thus avoiding protrusive interferences. However, the Broadrick occlusal plane analyzer (BOPA) is a high-cost tool with limited compatibility, as it is designed for specific articulator systems. To make it more accessible, a custom-made version was developed for semi-adjustable articulators, allowing for broader use with minimal modifications.

This case report details the construction and application of a customized Broadrick occlusal plane analyzer, showcasing its effectiveness in diverse full-mouth rehabilitation cases.

Case report:

A 48-year-old female patient visited the Department of Prosthodontics at AME's Dental College and Hospital, Raichur, Karnataka, with a primary concern of multiple missing and decayed teeth. Her dental history revealed cases

of caries and periodontal disease, which led to the extraction of several teeth. An intraoral examination showed a partially edentulous maxillary and mandibular arch. The missing teeth included 12, 22, and 23 in the maxilla and 46, 47 in the mandible, along with root stumps in 14, 16, 18, and 37, and decay in 38. The vertical dimension remained intact, necessitating only adjustments to the occlusal plane.

The treatment involved extracting root stumps and performing root canal therapy on decayed teeth. A Broadrick Occlusal Plane Analyzer (BOPA) was employed to evaluate and refine the occlusal plane orientation. The maxillary cast was detached from the articulator, and a custom-made flag was attached to its upper member. The anterior survey point (ASP) was set at the midpoint of the disto-incisal edges of the mandibular canines bilaterally. Using a 4-inch radius, a long arc was drawn from the ASP on the flag. The posterior survey point (PSP) was identified at the anterior border of the articulator's condylar element, and a short arc was drawn, intersecting the ASP arc. The intersection point served as the pivot for drawing a 4-inch radius line along the buccal surfaces of the mandibular teeth. The process was repeated on both sides, and a putty index with polyvinyl siloxane material was created along these lines to aid in plane reduction.

Afterwards, an arbitrary facebow transfer was performed, and centric and lateral bite records were captured for mounting on a Whipmix articulator. Preparations were completed for teeth 11–14, 21–26 in the maxilla, and 34, 35, 44–47 in the mandible. Implants were placed at 36 and 37 for rehabilitation. Temporary restorations were provided, and the final restorations were temporarily cemented for a week. Following necessary adjustments during a recall visit, final cementation was performed.



Discussion:

As an essential component of the stomatognathic system, the mouth's functionality can be compromised by any disruption within its structures. Full-mouth rehabilitation is necessary to restore these components, ensuring proper function. The goal is to convert destructive forces exerted on

the teeth into positive forces that support periodontal health and promote normal function. This process involves comprehensive procedures to establish a healthy, aesthetic, and self-sustaining stomatognathic system.

Dr. Broadrick introduced an instrument in 1963 to determine the optimal position and orientation of the occlusal plane posteriorly. This device allows for the reconstruction of the Curve of Spee, ensuring alignment with incisal and condylar guidance. For cases involving a Dentatus semi-adjustable articulator, where no such apparatus was available, a custom Broadrick Occlusal Plane Analyzer (BOPA) was developed.

Over two months of weekly follow-ups, no signs of occlusal imbalance or tooth damage were observed. The patient exhibited maximum intercuspation in centric occlusion without interferences during jaw movements. Additionally, the patient reported significant improvements in chewing ability with the prosthetic solution.

Conclusion:

Full-mouth rehabilitation was a cornerstone of the treatment protocol in this case, addressing the multifaceted needs of the patient's compromised masticatory system. This comprehensive approach involved a series of restorative and rehabilitative procedures aimed at creating a healthy, functional, aesthetic, and self-maintaining mechanism. By focusing on the intricate relationship between the occlusal plane and the stomatognathic system, the treatment sought to restore harmony and functionality.

A custom-designed occlusal plane analyzer was meticulously fabricated to re-establish the severely disrupted occlusal plane. This device enabled precise adjustments, ensuring alignment with the stomatognathic system to support optimal function and comfort. Each step of the rehabilitation process was tailored to

address the patient's specific needs, incorporating careful planning, advanced techniques, and high-quality materials.

The culmination of this thorough treatment protocol resulted in a significant transformation for the patient. The restoration not only improved oral functionality but also enhanced aesthetics, boosting the patient's confidence and overall satisfaction with the outcome. The case highlights the importance of integrating innovative tools like a custom occlusal plane analyzer in achieving comprehensive and sustainable rehabilitation outcomes.

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