

Fundamentals Of Fixed Partial Denture (Fpd) Preparation With Soft Splint

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Cite this paper as: Prithiksha N, Dr. Vijay Anand (2024) Fundamentals Of Fixed Partial Denture (Fpd) Preparation With Soft Splint..*Frontiers in Health Informatics*, Vol.13, No.8, 8247-8250

ABSTRACT:

Fixed partial dentures (FPDs) remain one of the most predictable treatment options for replacing missing teeth. The success of FPD therapy is closely linked to meticulous tooth preparation that fulfills mechanical, biological, and esthetic principles. Improper preparation can lead to restoration failure, pulpal damage, periodontal complications, and patient discomfort. Soft splints, used as occlusal appliances, play a significant adjunctive role during FPD treatment by protecting prepared abutment teeth, minimizing occlusal overload, and managing parafunctional habits. This review article discusses the fundamental principles of FPD tooth preparation in detail and highlights the clinical relevance, indications, and benefits of soft splint therapy in fixed prosthodontics

Keywords: Fixed partial denture, Tooth preparation principles, Soft splint, Occlusal appliance, Prosthodontic rehabilitation

INTRODUCTION

Fixed partial dentures are prosthetic restorations that replace one or more missing teeth by anchoring artificial teeth to prepared natural abutments or implants. Despite advancements in implant dentistry, FPDs continue to be widely practiced due to their reliability, affordability, and favorable long-term outcomes.

Tooth preparation is a critical step that directly influences retention, resistance, marginal adaptation, esthetics, and biological response of supporting tissues. The preparation process, however, exposes teeth to occlusal stress, thermal sensitivity, and parafunctional forces. Soft splints are frequently used as protective devices during the treatment phase to safeguard prepared teeth and provisional restorations. This review aims to consolidate existing knowledge on FPD preparation principles and the adjunctive role of soft splints.

2. Objectives of Fixed Partial Denture Tooth Preparation

The primary objectives of FPD preparation include:

1. Achieving adequate retention and resistance form
2. Providing sufficient space for restorative materials
3. Preserving maximum tooth structure
4. Protecting pulpal and periodontal health
5. Ensuring proper esthetics and occlusal harmony

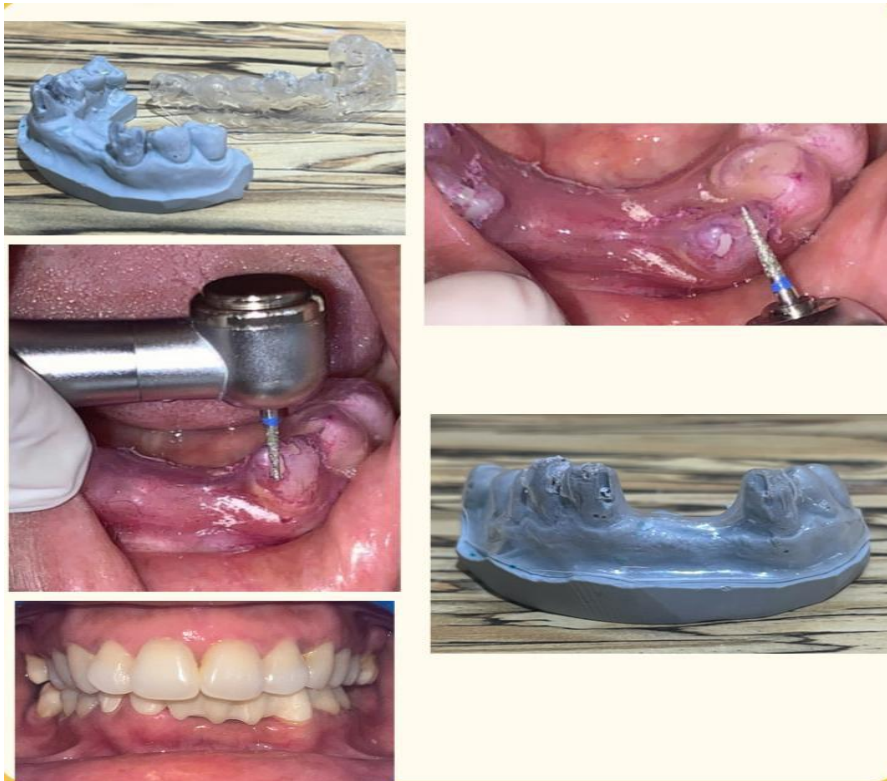
Meeting these objectives requires a careful balance between mechanical demands and biological limitations.

3. Fundamental Principles of FPD Tooth Preparation

3.1 Preservation of Tooth Structure

Conservation of tooth structure is a fundamental principle in fixed prosthodontics. Excessive tooth reduction can weaken the abutment, increase the risk of pulpal exposure, and compromise tooth longevity. Minimal yet adequate

reduction ensures structural integrity while providing space for restorative materials.



3.2 Retention Form

Retention refers to the ability of a prepared tooth to resist removal of the prosthesis along its path of insertion.

Factors influencing retention include:

- 1) Taper of axial walls
- 2) Surface area of the preparation
- 3) Length and height of the abutment
- 4) Surface texture

Ideally, a total occlusal convergence angle between 6° and 12° enhances retention while facilitating prosthesis placement.

3.3 Resistance Form

Resistance form prevents dislodgement of the prosthesis due to oblique or horizontal forces. Adequate axial wall height, proper preparation geometry, and incorporation of auxiliary features such as grooves or boxes improve resistance, especially in short clinical crowns.

3.4 Structural Durability

Structural durability ensures the prosthesis can withstand masticatory forces without deformation or fracture. This requires sufficient occlusal and axial reduction to accommodate the selected restorative material. Inadequate reduction can lead to over-contoured restorations or compromised strength.

3.5 Marginal Integrity and Finish Lines

Finish lines play a crucial role in marginal adaptation and periodontal health. Common finish line designs include: ● Chamfer

- Heavy chamfer
- Shoulder
- Shoulder with bevel

The choice depends on the restorative material and esthetic demands. Smooth, continuous margins reduce plaque accumulation and improve the longevity of the prosthesis.

3.6 Biological Considerations

Biological preservation involves protecting the pulp and periodontal tissues. Overheating during preparation, excessive reduction, and subgingival margins may lead to pulpal inflammation and gingival irritation. Whenever possible, supragingival margins are preferred to facilitate oral hygiene and periodontal health.

4. Provisionalization and Occlusal Considerations

Provisional restorations play a vital role in maintaining tooth position, occlusion, and esthetics during the interim period. However, provisional restorations alone may not sufficiently protect abutment teeth in patients with bruxism or heavy occlusal forces, necessitating the use of occlusal splints.

5. Soft Splint Therapy in FPD Treatment

5.1 Definition of Soft Splint

A soft splint is a removable occlusal appliance fabricated from resilient thermoplastic materials. It covers the occlusal surfaces of teeth and provides a cushioning effect during function.

5.2 Indications for Soft Splint Use

Soft splints are indicated in:

- Patients with bruxism or clenching habits
- Recently prepared abutment teeth ●
- Cases with occlusal instability
- Protection of provisional restorations
- Management of muscle-related discomfort

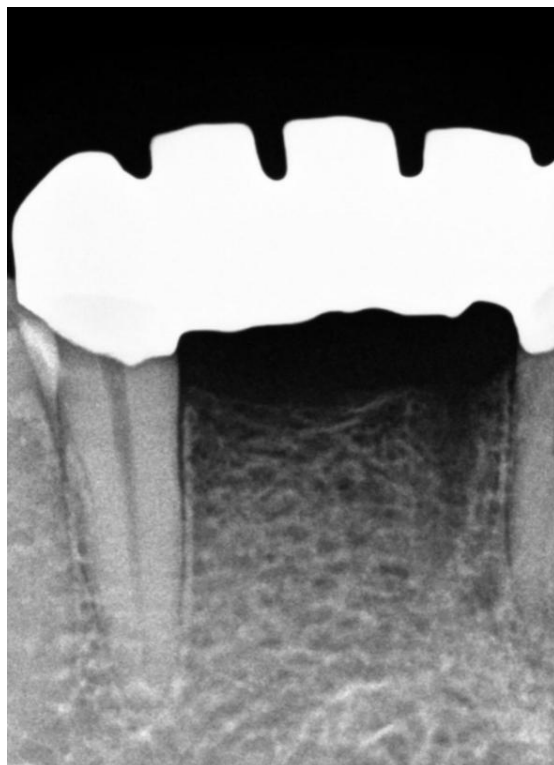
5.3 Role of Soft Splints After FPD Preparation

Following tooth preparation, abutments are susceptible to occlusal trauma and sensitivity. Soft splints help distribute occlusal forces evenly, reduce stress concentration, and prevent damage to prepared tooth surfaces. They also limit parafunctional activity that may compromise provisional or definitive restorations.

5.4 Advantages of Soft Splints

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Improved patient comfort
Easy fabrication and adjustment
Reduced occlusal



5.5 Limitations of Soft Splints

Despite their benefits, soft splints may wear rapidly, alter occlusion if used long-term, and require frequent monitoring. They should be considered an adjunctive therapy rather than a replacement for proper occlusal design.

6. Clinical Considerations and Maintenance

Proper case selection and regular follow-up are essential when using soft splints. Splints should be periodically evaluated for fit, occlusal contacts, and hygiene. Patient education regarding splint use and maintenance is critical for optimal outcomes.

7. FUTURE PERSPECTIVES

With advances in digital dentistry, CAD/CAM-fabricated splints and customized occlusal appliances offer improved precision and patient comfort. Further clinical studies are required to establish standardized protocols for splint use in FPD therapy.

8. CONCLUSION

The success of fixed partial denture therapy relies on adherence to fundamental tooth preparation principles that balance mechanical stability and biological preservation. Soft splint therapy serves as a valuable adjunct during FPD treatment by protecting prepared teeth, minimizing occlusal stress, and enhancing patient comfort. When used judiciously, soft splints contribute significantly to the long-term success of fixed prosthodontic restorations

REFERENCES

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