

Comprehensive esthetic smile rehabilitation using diagnostic wax-up–guided full-mouth fixed prosthodontic management in a young adult with dental fluorosis: A case report.

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Abstract

Esthetic rehabilitation of patients with generalized fluorosis and malformed anterior teeth requires meticulous treatment planning to restore function, esthetics, and patient confidence. This clinical case report describes the multidisciplinary prosthodontic rehabilitation of a 22-year-old female patient presenting with generalized fluorosis, stained and ill-formed teeth, anterior crossbite, retained deciduous canine, and multiple endodontically treated teeth. A diagnostic wax-up was used as the primary esthetic planning tool to visualize the final outcome and guide tooth preparation. Following comprehensive clinical evaluation, tooth preparation of the maxillary and mandibular anterior and selected posterior teeth was performed, followed by definitive elastomeric impressions, provisional restorations, and fabrication of full-coverage porcelain-fused-to-metal (PFM) crowns. The treatment successfully restored dental esthetics, improved smile harmony, and enhanced patient satisfaction while preserving functional occlusion. The case emphasizes the value of diagnostic wax-up as an indispensable tool in smile rehabilitation where digital planning is not employed.

Keywords: Dental fluorosis, Diagnostic wax-up, Esthetic dentistry, Full mouth rehabilitation, Smile rehabilitation.

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Introduction

An attractive smile is one of the most important determinants of facial esthetics and significantly influences an individual's self-esteem and social interactions. Dental discoloration, developmental defects, fluorosis, malformed teeth, and malocclusion adversely affect smile attractiveness and often necessitate comprehensive prosthodontic rehabilitation. Smile design is a systematic approach aimed at harmonizing the relationship between teeth, gingiva, lips, and facial features.^[1] Proper diagnosis and treatment planning are fundamental to achieving predictable esthetic outcomes. Among the various planning methods, a diagnostic wax-up remains an invaluable

clinical tool, allowing visualization of the proposed restorations before initiating irreversible procedures.^[2] Dental fluorosis results from excessive fluoride exposure during enamel formation, producing intrinsic discoloration and varying degrees of enamel hypoplasia.^[3] In moderate-to-severe fluorosis, restorative intervention frequently becomes necessary because bleaching procedures alone cannot adequately mask the defects.^[4-6] Full-coverage restorations are often indicated when structural defects coexist with discoloration and previous endodontic treatment.^[7,8] This report describes the esthetic rehabilitation of a young female patient using diagnostic wax-up–guided full-coverage PFM

restorations to restore function and improve smile esthetics

Case Report

Patient Information

A 22-year-old female patient reported to the Department of Prosthodontics K.D Dental college & Hospital, Mathura with the chief complaint of stained and ill-formed upper and lower anterior teeth. The patient expressed dissatisfaction with her smile and desired an esthetic improvement.

Clinical Examination

Extraoral examination revealed no facial asymmetry or temporomandibular joint abnormalities.

Intraoral Findings

- Generalized dental fluorosis (Fig. 1)
- Ill-formed maxillary and mandibular anterior teeth.
- Anterior crossbite involving teeth 11, 21, 31, 41, and 42.
- Retained deciduous canine 63.
- Previously endodontically treated teeth were 11,12,17,21,24,26,35,37,46.

The existing occlusion was evaluated, and study casts were obtained for treatment planning.

Clinical Procedure

1. An orthopantomogram (OPG) was obtained to evaluate the status of the existing dentition, previously endodontically treated teeth, retained deciduous tooth, and the supporting alveolar bone before initiating prosthodontic treatment (Fig. 2).
2. Preliminary impressions of both arches were made, and diagnostic casts were prepared for treatment planning.
3. A diagnostic wax-up was performed on the study casts to establish ideal tooth

proportions, incisal edge position, current occlusal status, and overall esthetic outcome (Fig. 3).

4. The diagnostic wax-up served as a blueprint for the definitive restorations and facilitated communication with the patient regarding the anticipated treatment outcome.
5. The planned anterior and posterior teeth were prepared for full-coverage porcelain-fused-to-metal (PFM) crowns following standard biomechanical principles (Fig. 4).
6. Adequate axial and occlusal reduction were achieved while maintaining uniform finish lines and preserving sound tooth structure.
7. Gingival displacement was performed wherever necessary, and definitive impressions were made using elastomeric impression material to accurately record the prepared teeth and surrounding soft tissues.
8. Interim restorations were fabricated and temporarily cemented to maintain esthetics, function, periodontal health, and tooth position during laboratory fabrication of the definitive prostheses.
9. The definitive porcelain-fused-to-metal (PFM) crowns were fabricated based on the diagnostic wax-up and definitive casts.
10. During the clinical try-in, marginal adaptation, proximal contacts, occlusion, phonetics, and esthetics were evaluated, and necessary adjustments were made (Fig. 5).
11. The definitive restorations were permanently cemented, followed by final occlusal refinement (Fig. 6). The patient was provided with oral hygiene instructions and advised to attend periodic follow-up visits for evaluation and maintenance.

Discussion

Management of generalized fluorosis presents a restorative challenge because intrinsic

discoloration is often associated with enamel hypomineralization and altered surface morphology.^[3] The severity of fluorosis determines the treatment modality, ranging from microabrasion and bleaching to veneers and full-coverage crowns.^[4-6] In the present case, generalized fluorosis with malformed teeth, previous endodontic treatment, and esthetic concerns justified full-coverage restorations.^[8]

Diagnostic wax-up remains one of the most valuable methods for smile planning.^[2] It allows visualization of the proposed treatment, assessment of tooth dimensions, evaluation of esthetic parameters, and communication among the clinician, laboratory technician, and patient.^[1] It also serves as a guide for tooth preparation and provisional restoration fabrication.

PFM crowns continue to demonstrate excellent longevity, mechanical strength, marginal adaptation, and predictable esthetic outcomes, particularly in young patients requiring rehabilitation of multiple structurally compromised teeth.^[10] Although all-ceramic restorations have become increasingly popular, PFM restorations remain a reliable treatment option because of their favorable biomechanical properties and long-term clinical success.^[9]

Careful assessment of smile line, facial proportions, incisal display, gingival architecture, and occlusal relationships contributed to the successful esthetic rehabilitation achieved in this patient.

Conclusion

Comprehensive smile rehabilitation requires meticulous diagnosis, thorough treatment planning, and careful execution. Diagnostic wax-up serves as an effective tool for visualizing treatment outcomes and guiding restorative procedures. In patients presenting with generalized fluorosis, malformed teeth, and compromised esthetics, full-coverage

PFM restorations can successfully restore function, improve smile harmony, and enhance patient confidence when executed using sound prosthodontic principles.

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FIGURES



Figure 1



Figure 2



Figure 3



Figure 4

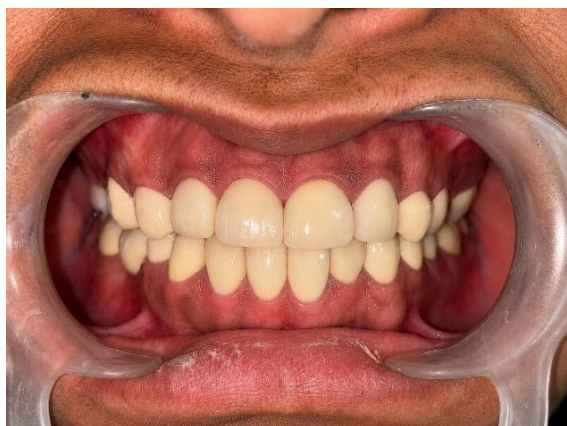


Figure 5



Figure 6

