

## Esthetic and Functional Rehabilitation in a Patient with Amelogenesis Imperfecta: A Case Report

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### Abstract

### Case Report

Amelogenesis imperfect (AI) is a hereditary disorder. It is a condition that expresses several issues that cause an alteration in the formation of enamel structure. This disorder has several adverse impacts on oral health and additionally hampers the standard of living of the individual inflicting physiological issues. The treatment of such patients would not be to solely upgrade their quality-of-life, but also will additionally be to improve their self-confidence. The correction of such severely exhausted dentition could need in depth restorative treatment to achieve the expected results. It is also vital to spot the factors that contribute to the excessive wear and loss of vertical dimension. The correction of the defects needs to be done without violating the biological or mechanical principles. Full mouth rehabilitation in such patients improves esthetics, operational capability and comfort. The subsequent case report presents a streamlined & structured approach in rehabilitating a case of AI hypoplastic, using full mouth porcelain metal restorations.

**Keywords:** Amelogenesis imperfect, disorder, dentition, esthetics.

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## INTRODUCTION

The face is the eye to the mind. The most important feature in a person's face is usually his smile. An esthetically pleasing smile always creates the most number of positive responses to any situation. There exists an array of medical conditions which compromises the esthetics of a patient. One such condition is Amelogenesis Imperfecta (AI), which is a disorder that affects the development of enamel [1]. It manifests itself as deep brow discoloration, which hampers the overall appearance of the patient [2]. One common problem patients affected with AI face is sensitivity, loss of vertical height, loss of esthetic appeal & dysfunction [3]. It is important to restore these defects in order to meet the esthetic expectation, functional & psychological demands of the patient. The

recent advancement in materials and clinical procedure has made it possible to fully restore in terms of functionability and esthetics even in case as this where the patient has such severely worn out dentition. The following report demonstrates an approach which is multidisciplinary in treating a patient who presented with AI.

## CASE REPORT

A 23-year-old male patient named Mohammad Ashraf reported to the Department of Prosthodontics complaining of discolored teeth, teeth chipping, and chewing difficulties. Extraoral examination of the patient's features revealed that he had a round face with a straight profile (Fig 1).



**Fig-1: Preoperative photograph**

He did not show any signs of neuromuscular incoordination. There were no abnormalities detected on inspection of the temporomandibular joint during movement. Also, the muscles of mastication did not show any signs of fatigue or pain on palpation. He was a patient with moderate expectations and responded well to instructions given.

Upon intraoral examination, unaesthetic appearance due to brownish discolouration, generalized attrition, sharp incisal edges, anterior edge to edge relation, root stump in the lower right posterior tooth region were revealed (Fig 2).



**Fig-2: Preoperative intraoral photograph**

Radiological examination also revealed generalized loss of enamel. The patient was diagnosed with AI hypoplastic type based on the above findings after observation. Root canal treatment was advised in

relation 36, and thereafter planned Pankey Mann Schyuler philosophy of full mouth rehabilitation for this patient. A Diagnostic cast was obtained, followed by the completion of a face-bow transfer (fig 3).



**Fig-3: Facebow record**

The centric relation position was recorded using aluwax and the casts were mounted on a semi-adjustable articulator. The vertical dimension was

maintained as there was no alteration. Diagnostic wax-up was completed maintaining the vertical dimension (fig 4).



**Fig-4: Mounted waxup**

The wax-up helped assess the outcome of the final prosthesis and in fabricating the temporary restorations. The maxillary and mandibular anterior teeth were prepared and restored with provisional restorations. The provisional restorations helped assess the esthetics and to establish the customized anterior guidance. Following this, the final restoration of the maxillary and mandibular anterior was fabricated and

luted in the patient's mouth. The next step was to restore the mandibular posterior teeth for which the occlusal plane was established using a Broadrick's occlusal plane analyzer. The Diagnostic wax pattern was fabricated (fig 5) for mandibular posteriors and verified using Broadrick's occlusal plane analyzer. After the fabrication of the patterns, a silicon putty index was made.



**Fig-5: Diagnostic waxup**

This acted as a guide in the ceramic build up. Once fabricated, the restorations were luted. The functionally generated path (FGP) technique was used

for the fabrication of the maxillary posteriors before which, the luting of the mandibular posteriors was done (fig 6).



**Fig-6: FGP done with Aluwax**

A master impression was made to obtain a maxillary master cast, after the preparation of the maxillary posterior teeth. A softened functional wax (inlay wax) was added onto the occlusal surface of the luted permanent lower restoration for recording the FGP, and the patient was asked to perform centric and eccentric movements. The FGP should be checked for any and all movements during excursions to ensure all pathways have been recorded in enough functional wax. After confirmation of the movements, the wax is chilled with ice water to make it firm, and a smooth creamy mix of fast setting stone was poured into the depressions of the functional wax. The fast setting stone must cover at least one unprepared tooth (restored canine) in front that served as a definite vertical stop

and a positive key to the master dies used in the laboratory.

The mandibular cast was then removed from the articulator, and the FGP base with the stone core was placed against the maxillary cast and mounted. The functional wax was then removed, the wax patterns were fabricated, and a cast was prepared. After the metal trial was verified the ceramic build-up was completed with the help of the stone core. The stone core acts as a guide in removing the centric and eccentric interferences. A bisque trial was done in the patient's mouth. After correcting the interferences, the restorations were glazed and luted (fig 7).



**Fig-7: Cemented final prosthesis**



**Fig-8: Group function occlusion**

A group function type of occlusal scheme was provided to the patient and regular follow-up with good oral hygiene maintenance was advised (fig 8).

## DISCUSSION

Each clinical presentation of AI varies with the type. The hypoplastic type shows well-mineralized enamel, but its amount is reduced as seen in the radiograph. In the present case, the patient presented with no obliteration of vertical dimension and a freeway space of 3 mm, hence it was decided not to increase the vertical dimension. As a severe wear of anterior teeth was not sighted in the patient, anterior guidance was not lost, which protects the posterior teeth from wear during excursive movements. The collapse of posterior dentition results in loss of the normal occlusal plane [4]. The choice of restoration in this case was porcelain fused to metal as this would double the mechanical durability, recover esthetics, and protect the residual dentin.

There are many philosophies to follow for an occlusal rehabilitation, most important among them is Hobo's philosophy and Pankey Mann Schuyler philosophy[5]. Pankey Mann Schylur philosophy is one of the most practical philosophies for occlusal rehabilitation. It is 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[7]. Pankey and Mann introduced an instrument for occlusal plane analysis, here we used simplified version of the instrument 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 [8].



**Fig-9: preoperative (A) and post-operative (B) intraoral photographs**

## CONCLUSION

Reasons for Severe tooth wear are multifactorial and vary according to different condition. The treatment of such cases involves a careful analysis of the relationship between natural teeth and the stomatognathic system.

## Clinical significance

The above case reflects the importance of the use of prosthodontic principles and strategic planning in addition to a multidisciplinary approach in managing a patient of AI.

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