



## Prosthetic Rehabilitation in Dentinogenesis Imperfecta: A Conservative Approach

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### Abstract

This case report deals with the multidisciplinary approach of a 21 year old female patient with Dentinogenesis imperfecta. The patient reported with a chief complaint of worn out teeth, unsatisfactory esthetics and pain in several teeth. On clinical assessment, severe loss of vertical dimension was noted along with attrition of anterior teeth and tenderness in several posterior teeth. Treatment plan was fabricated with a conservative approach to preserve as much tooth structure, restore the vertical dimension, and improve esthetics and function. It involved prosthodontic, surgical and periodontic interventions. The lost vertical height was regained in stages by insertion of full coverage non preparation temporary crowns for all the teeth. Systematic multidisciplinary treatment approach ensured patient's esthetic and functional needs were met with. A two year follow up showed no further loss of tooth structure as well as functional and aesthetic harmony.

**Keywords:** Rehabilitation; Dentinogenesis; Teeth; Crowns

### Introduction

Dentinogenesis imperfecta is a genetic disease characterized by disturbance of dentin formation resulting from abnormalities of dental papilla. Teeth of both dentition are affected [1]. Clinical signs include opalescent, amber like teeth which darkens with age and pronounced attrition of incisal and occlusal edges. Radiographically, teeth are characterized by bulbous crowns, marked cervical constrictions and short, thin roots. The pulp chambers and root canals show increased odontoblast activity that eventually obliterates the lumen of the ductules. This feature of the root is typical and consistent sign of the anomaly as also periapical radiolucent areas in absence of any other bone anomaly or visible dental caries. The characteristic scalloping at the dentinoenamel junction is decreased or missing resulting in loss of enamel from the tooth surface [2,3].

### Case Report

A 21 year old female reported with chief complaint of unaesthetic appearance due to missing and discoloured teeth. Medical history revealed patient was under treatment for rheumatoid arthritis three years back. Patient gave history of repeated chipping of teeth and subsequent extraction of lower front teeth and posterior

teeth three months back. On clinical examination, 16, 26, 31, 32, 33, 36, 41, 42, 43, 46, 47 were missing while the remaining teeth showed amber coloured discoloration. Patient was currently using a treatment partial denture for the mandibular arch. 48, 18, 28 were impacted. Maxillary anterior teeth showed attrition while 17, 18 were carious, tender on percussion. Periodontal examination revealed bleeding on probing and severe gingivitis.

Radiographically, root canals were obliterated and multiple teeth showed periapical radiolucencies characteristic of dentinogenesis imperfecta. Correlating the clinical and radiographic findings, the patient was diagnosed with dentinogenesis imperfecta.

After clinical examination and diagnosis it was recommended that the patient should undergo a full mouth rehabilitation [4]. A treatment plan involving extraction, periodontal, prosthetic and aesthetic therapy was charted out. The initial phase consisted of extraction of impacted 48 and carious 17, 18 which could not be endodontically treated due to obliteration of the pulp canals [5]. Periodontal therapy involved scaling, root planing and irrigation with regular follow ups.

The next stage of treatment was the prosthetic phase. Missing lower anteriors, 33 to 43, were planned to be replaced by cast partial denture with OT strategy attachments on 44, 34 while the remaining teeth were planned for porcelain fused to metal crowns. It was decided to not replace 16,17 since the opposing teeth were also missing in the mandibular arch following the concept of shortened dental arch. Vertical dimension was planned to be raised by 5mm since the patient had reduced facial height in lower third of the face and zero visibility of maxillary anterior teeth both at rest and function. Non preparation temporaries were given to increase the vertical dimension of occlusion for a period of 3 months to facilitate the planned raise of vertical dimension in fixed partial denture. After regular follow ups and confirmation of vertical dimension, tooth preparation was done sequentially beginning with maxillary anterior teeth and these were then temporised. This was followed by preparation of posterior teeth on left side, the other side with non-preparation temporaries acted as vertical stops and temporization done. Finally, the posterior teeth of right side were prepared and temporised. Final upper and lower arch impressions were made in addition silicone, face bow transfer was done and interocclusal records made. After metal trial and bisque trial, impression was made for the cast partial denture framework fabrication. After framework trial, jaw relation was recorded and cast partial denture trial was evaluated for aesthetics, phonetics and occlusion. Final cementation of the porcelain fused to metal crowns was done using resin modified glass ionomer cement.



**Figure 1:** Bisque Trial; OT Strategy attachment.

## Discussion

Treating patients with Dentinogenesis imperfecta demands a multidisciplinary approach with emphasis on occlusal rehabilitation [1]. Aesthetic consideration becomes paramount in such cases since most patients reporting are young. The aim of restorative treatment should be protecting the remaining tooth structure from caries, attrition, abrasion, erosion and retaining as much tooth structure as possible [4].

In this patient, ideal treatment plan would be placement of implants for missing 31, 32, 33, 41, 42, 43, 16 but it was not feasible due to economical constraints. Another treatment option was over denture for the mandibular arch, it was ruled out since the patient was young and preparation of teeth for over denture copings would lead to unnecessary loss of tooth structure, besides a removable prosthesis was detrimental to patient's self-confidence [6]. Hence, a cast partial denture with attachment was planned which would provide improved retention as well as preserve the remaining tooth structure since minimal preparation would be required for porcelain fused to metal crowns as compared to over denture copings [7].

Severe attrition, early loss of teeth lead to reduced vertical height and improper occlusion which was corrected before commencing prosthetic phase of treatment. Complete coverage crowns were preferred since such restorations protect the dental tissues from further destruction [8]. Shortened dental arch concept was adopted instead of giving cantilevers to avoid additional forces on already compromised dentition [9].

The patient was recalled after a week, one month, one year and two years interval. There was complete aesthetic and functional harmony with no further loss of tooth structure. At the two year recall, the female component (OT Strategy caps) were changed due to reduced retention with no other reported issues or significant clinical findings.

## Conclusion

Rehabilitation of patients with dentinogenesis imperfecta continues to be a challenge to the prosthodontist. Decision and treatment plan need to be drafted case to case basis while applying a multidisciplinary approach. Functional as well as aesthetic considerations should be given due importance.



Figure 2

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