

Prosthodontic rehabilitation of dentinogenesis imperfecta

ANIL GOUD, SAAE DESHPANDE¹

Abstract

Dentinogenesis imperfecta and its prosthodontic management is a challenging task. Treatment protocol varies according to clinical case. Although various reports in the literature suggest general guidelines for treatment planning, the present case report describes a full mouth rehabilitation of a young patient with dentinogenesis imperfecta treated by maxillary fixed partial dentures and mandibular fiber reinforced overdenture with metal occlusal surfaces.

Keywords: Dentinogenesis imperfect, overdenture, pre-peg

Introduction

Dentinogenesis imperfecta is inherited as an autosomal dominant trait and in fact it is the one of the most common dominantly inherited disorder in humans. The scalloping at the dentino-enamel junction which is thought to help the mechanical interlocking, the two hard tissues together are defective in these conditions which leads to enamel fracture easily from the defective dentin. The exposed dentin may then undergo severe and rapid attrition. Early diagnosis and proper treatment is mandatory in these conditions. Delay in the treatment can cause partial or complete loss of clinical crowns with healthy roots.^[1-6]

Case Report

A 35-year-old male patient came to our department with a chief complaint of occasional chipping of teeth while eating and dislodged fixed partial denture. Patient had experienced abnormal dentition since childhood [Figure 1]. He had undergone extraction of some primary teeth due to caries. The color of primary dentition was yellowish. He had experienced continuous chipping of tooth structure while masticating especially lower dentition. Six-year back his lower left molars were extracted due to fracture and attrition. He had gone for extraction of 16, 27, 46 and 47 last year and

nickel-chrome fixed partial denture was fabricated on 14, 15, 16, 17, 18, 33, 34, 35, 43, 44, 45, 46, 47, 48.

These fixed partial dentures frequently come out during eating. The patient was keeping cotton below these fixed partial dentures for retention while eating. He keeps them out of mouth for the rest of the time. No history of any major illness or hospitalization was there. His grandfather has got opalescent brown, worn-out dentition.

Radiographic examination

OPG full mouth and IOPA X-rays revealed total obliteration of pulp chambers with 33,34,35,43,44,45,48. Partial obliteration of pulp chambers with rest of the teeth with abnormal pulpal morphology. No evidence of any periapical pathology with any tooth was revealed. Posterior to anterior (PA) chest and PA skull were normal [Figure 2].

Pathological investigations

Maxillary badly destructed second molar was sent to lab for histological examination. It was revealed that there was normal enamel rods, irregular calcified dentinal tubules, and almost completely obliterated pulp chamber.

Diagnosis

After correlating clinical pathological and radiographic findings, diagnosis of dentinogenesis imperfecta (Type-II) was made and osteogenesis imperfecta was ruled out from the differential diagnosis.

Treatment plan

Ideal treatment plan for this patient should be placement of endosseous implants for missing teeth followed by full mouth rehabilitation.^[7] Due to economical factors under the circumstances, full crowns and fixed partial dentures were planned for maxillary teeth. Ideally, single complete denture is not indicated in mandible.^[8] As the denture base coverage area is very less so there are chances of midline fracture in mandibular single complete dentures due to flexural fatigue and impact force.^[9] To avoid this complication in this case denture base was reinforced the with glass fibers

Department of Prosthodontics, Aditya Dental College and Hospital, Beed, ¹VSPMDCRC, Nagpur, Maharashtra, India

Correspondence: Dr. Anil Goud, Department of Prosthodontics, Kamineni Institute of Dental Sciences, Hyderabad, India.
E-mail: goudanil@rediffmail.com

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Figure 1: Pretreatment intraoral views



Figure 2: Orthopantomographs



Figure 3: Centric record



Figure 4: Teeth preparation for metal copings



Figure 5: Cementation of metal copings



Figure 6: Sectioning of acrylic occlusal surfaces and addition of retentive loops

which is supposed to be one of the best choice for denture reinforcement.^[10]

Treatment procedure

Diagnostic impressions were made and diagnostic wax-up was done [Figure 3]. 17 was extracted and send to the oral

pathology lab for investigations. Amalgam restorations were done with 18, 48. Scaling and polishing was done. Crown lengthening was carried out with 11, 12, 13, 14, 15, 16. 33, 34, 35, 43, 44, 45 were prepared to receive nickel-chrome overdenture copings [Figure 4] and overdenture copings were cemented on 33, 34, 35, 43, 44, 45 [Figure 5]. Special tray was fabricated for lower overdenture. Border molding

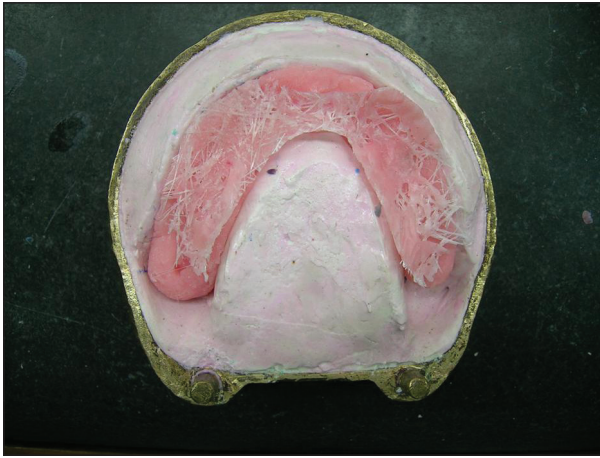


Figure 7: Pre-peg embedded in resin dough



Figure 8: Processed denture intraoral view



Figure 9: Maxillary core buildups and teeth preparations



Figure 10: Matrix impression

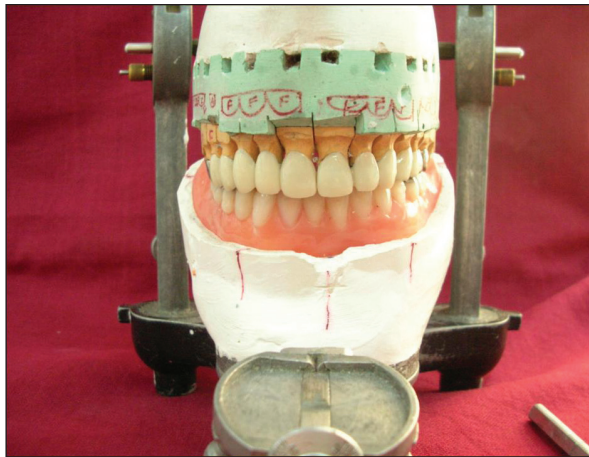


Figure 11: Mounting of die cast as opposed to mandibular denture and final restorations

was carried out with low fusing impression compound (DPI Pinnacle Tracing Sticks, DPI, India). Wash impression was made in medium body PVS impression material (Aquasil, Dentsply Caulk, USA). Final cast was prepared, blocked out,



Figure 12: Post-treatment intraoral view

and duplicated. On the working cast, temporary denture base was fabricated. Wax rim was prepared and height was adjusted posteriorly up to a level 2/3 of retromolar pad and anteriorly up to the level of lower lip. The vertical dimension was recorded according to esthetics and phonetics. Centric relation was recorded in bite registration wax (Alminax,

UK) [Figure 5]. Teeth arrangement was done according to anatomical landmarks, phonetics, and esthetics.

Preparation of metal occlusal surfaces

Lower overdenture was flaked and dewaxed. After dewaxing, posterior teeth were removed from their indentations and they sectioned horizontally from occlusal one third. Wax loops were placed at the back of sectioned teeth for anchorage. These sectioned occlusal surfaces with loops were casted in nickel-chrome. These metal occlusal surfaces with the help of loops were kept into their remaining part of respective indentations and luted [Figures 6 and 7].

Reinforcement of the denture base

Glass fibers were impregnated with silane (Heliobond, Ivoclar) and pre-peg was prepared. This pre-peg was then sandwiched in dough of heat cure acrylic and packed (compression molding technique). Curing was done. Finished lower overdenture was evaluated intraorally [Figures 8 and 9].

Fabrication of maxillary restorations

Worn out tooth structure was build with core buildup composite [Figure 10] (Lumiglass, Dentsply Caulk, USA) reinforced with titanium pins (Amalgam pins, DPI, India) for each cusp. Upper teeth were prepared according to the occlusal surface of lower overdenture teeth. Provisionals were fabricated and delivered along with lower over denture. The increased vertical dimension was evaluated up to 4 weeks. After the final adjustment of the provisionals, interocclusal records were made and articulator (Hanau H2, USA) was programmed accordingly. Final preparation of the upper teeth was done. Gingival retraction was done with retraction cord (Ultrapack, Dentsply, USA) impregnated with haemostatic agent (AlCl₃ MP Sai, India). To prevent relapse of marginal gingiva before loading of impression material and to have uniform space for impression material, impression was made with the matrix impression technique using bite registration material (Exa Bite, GC, Japan) and Light body PVS and Putty PVS (Aquasil Dentsply Caulk, USA) [Figure 11]. After the final setting the tray was removed in toto and poured in type IV die stone (Kalrock, Kalabhai, India). Thus master cast fabricated and transferred to the articulator according to the lower denture [Figures 10-12].

Centric relation was recorded along with final overdenture and relation transferred to the articulator [Figure 12]. Upper nickel-chrome FPDS and full crowns with acrylic

facing were fabricated. Upper FPD's full crowns were luted with temporary non-euzenol cement (Temposil, Coltene Whaledent, Switzerland) and lower overdenture delivered. Patient was recalled after 15 days for final luting. Final cementation (GC 1, Gold label, Japan) was done.

Conclusion

One of the greatest challenges for the prosthodontist is to provide adequate treatment to achieve functional and esthetic restoration in cases of diseases like dentinogenesis imperfecta. Early diagnosis and treatment are essential for obtaining a favorable prognosis. Preservation of the existing tissues and rehabilitation of the function and esthetics with a multidisciplinary approach is of paramount importance. Prosthodontic rehabilitation of this kind greatly improves function, esthetics and proves to be great psychological boost to the patient's well-being.

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