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Amelogenesis Imperfecta- Restoring the Confidence Back: A Case Report of Complete Oral Rehabilitation

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Authors' contributions

This work was carried out in collaboration between all authors. Author MS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors APT and AC managed the analyses of the study. Author PV managed the literature searches. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Amelogenesis imperfecta is a term commonly used for a clinically and genetically heterogeneous group of conditions that affect the enamel formation and maturation. The biggest challenge in management of patients suffering with amelogenesis imperfecta is to restore esthetic, function and occlusal stability while conserving remaining tooth structure as much as possible. The goal of treatment should be to prolong the life of patient's tooth and to prevent or delay the extraction and prosthetic replacement. This article presents a case of amelogenesis imperfecta cosmetically rehabilitated by direct composite veneers.

Keywords: Amelogenesis imperfecta; direct composite veneers; esthetic.

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1. INTRODUCTION

Amelogenesis, process of enamel formation which occurs in two stage: secretory phase and mineralization phase. Initially a protein rich matrix is laid down which is replaced by hydroxyapatite crystals in second stage resulting in a highly mineralized enamel structure. Amelogenesis imperfecta is a hereditary condition that affects either the formation of enamel matrix or its mineralization or both affecting deciduous and permanent dentition. Amelogenesis imperfecta may show inheritance pattern of either autosomal dominant, autosomal recessive, sex-linked or sporadic and its prevalence is found to vary from 1:700 to 1:16,000 depending on the population studied and diagnostic criteria [1,2].

Most common classification used for amelogenesis imperfecta is mainly based on phenotype [3]. Four major categories include hypoplastic, hypomatured, hypocalcified and hypomatured – hypoplastic with taurodontism. A diagnosis of Amelogenesis imperfecta can be established by asking four questions given in Table 1 [1]. Based on the mode of inheritance these four phenotypes are further divided in to 15 categories. Most of the patient suffering with amelogenesis imperfecta reports to the dentist for esthetic problem due to staining or sensitive teeth depending on severity. If loss of tooth structure is severe then loss of vertical height and masticatory disturbances are also present which needs careful management. This article describes management of a male patient suffering from moderate form of amelogenesis imperfecta.

In management of the patient with AI preservation of tooth structure is very important and minimal invasive treatment should be considered whenever possible. Treatment options available to restore patients with amelogenesis imperfecta may and depends on several factors such as age of the patient, patient motivation, periodontal health, endodontic status, remaining tooth structure, severity of disorder, associated medical conditions, socioeconomic status and most importantly the patient's availability for treatment and cooperation [4,5].

1.1 Aim

The aim of this case report was to present complete oral rehabilitation of patient suffering from amelogenesis imperfecta with simple and noninvasive technique.

2. PRESENTATION OF CASE

A male patient of 22 years of age reported in Department of Conservative and Endodontics, Faculty of Dental Sciences, Lucknow, with the chief complaint of unaesthetic appearance of all teeth. Detailed history revealed that patient one sibling is also suffering from the same problem and deciduous dentition was also affected. Clinical examination showed moderate form of amelogenesis imperfecta with brown discoloration of all teeth (Fig. 1). Left side canine was impacted causing midline shift. Loss of enamel was not very severe and patient did not have sensitive teeth. Teeth were non carious, vital and non tender to percussion. Panoramic radiograph of upper and lower jaw was made to exclude presence of any periapical pathology (Fig. 2).

Treatment objective were to improve esthetic appearance of teeth, improvement in gingival health and maintenance of oral hygiene to prevent caries in future. Patient was not ready for midline shift correction by orthodontic intervention. Patient's demand for less chair side time and due to cost factor, consent form was obtained and treatment plan was established to improve esthetic by direct composite veneers. After assessing the smile zone decision was made to do direct veneering up to second premolar in upper and lower arch. Oral prophylaxis done and patient was instructed to maintain oral hygiene to improve gingival health for one week. Treatment was started with maxillary teeth, as there was no need to change occlusal table, only window preparation was done during reduction on labial side of tooth. Nano hybrid restorative resin (NT Premium, Coltène Whaledent, Germany) was used. After separating adjacent tooth with Teflon tape surface was etched with 35 % phosphoric acid for 15 seconds. Care was taken to rinse the etchant gel completely by rinsing the surface for atleast 20 seconds, surface was blot dried and bonding agent was applied and cured with curing unit for 20 seconds. Opaque layer was applied first to mask the brown discoloration and then body and enamel composite were used to build up and final curing was done for 40 seconds. Finishing and polishing was done with SwissFlex polishing kit (Coltene Diatech SwissFlex Polishing Kit, Coltène Whaledent, Germany). Mandibular teeth were also restored and polished in the similar manner (Fig. 3).

Table 1. Questions to aid diagnosis of AI as described by Crawford et al. [1]

1. Has anyone else in the family had anything like this?
2. Has there been anything in the patient's medical history which might have caused sufficient metabolic disturbance to affect enamel formation?
3. Are all the teeth affected in a similar manner?
4. Is there a chronological distribution to the appearance to the defect?



Fig. 1. Preoperative view



Fig. 2. Orthopantomogram showing impacted right canine and absence of periapical pathology



Fig. 3. Post operative view

The patient was instructed to maintain the oral hygiene and advised to use fluoridated toothpaste. Follow up has been done after 6 months and still continued, patient was evaluated for any discoloration, gingival erythema and sensitivity. On follow up visit patient was completely symptom free.

3. DISCUSSION

Rehabilitation of the patients suffering from amelogenesis imperfecta requires careful treatment with preservation of remaining tooth structure while considering most important factors age and cooperation of patient. The restorative treatment in adolescence and onwards should aim to restore aesthetics, health and functional requirements of the patient's own teeth and prevent or delay the need for extraction and prosthetic management [6].

Non-invasive and reversible treatment options such as composite resin (with or without the use of microabrasion and bleaching) should be considered before the more destructive treatment options. The use of composite resins in such cases allows restoration of aesthetics, which is most important concern for the patient while preserving tooth tissue [7]. These advantages of composite restorations make them a cost effective both biologically and economically when compared with other more expensive and invasive restorations. Therefore composite resins should be considered as the initial restorative material of choice for all patients suffering from AI, especially when the patient is in their late teens and early twenties. When direct composite veneers fail repeatedly or the maintenance burden becomes too difficult the treatment could progress to more invasive techniques. Other options involve adhesive porcelain veneers, dentine bonded crowns, full coverage gold, porcelain bonded to metal or all ceramic crowns. If these treatment can be delayed until later in the patient's life when the pulps have receded and gingival levels have stabilized, this will be beneficial to the patient as it will limit the biological insult of treatment on the dentition.

There are evidences suggesting that teeth affected with amelogenesis imperfecta do not show typical etching pattern and this can lead to reduced bond strength between enamel and composite resin [8]. However, continuous development of adhesive bonding system has increased the use of composite to restore esthetic and function in such patients [9].

Although composite resins are esthetic and easy to manipulate, they have undesirable properties of staining, plaque accumulation, low abrasion resistance and microleakage. So they are more appropriate if the lesion is limited in enamel. Drinking habits such as coffee and alcohol may cause rapid discoloration and should be considered in treatment plan [10]. Nano hybrid composite was used in this case as they have good mechanical resistance and can be polished well.

In this case patient presented with unaesthetic tooth due to inherited abnormal enamel development. The poor appearance was due to brown discoloration of all teeth. There was minimal loss of tooth structure. Considering patient age, cost factor and remaining tooth structure conservative and non-invasive treatment option for direct composite veneer was established.

4. CONCLUSION

The cosmetic rehabilitation of patient with amelogenesis imperfecta by direct composite veneer has been described. However, initial results with composite resins are promising further research is required to evaluate the longevity of composite restorations in AI affected teeth. Despite the lack of good evidence, due to its reversible and minimally invasive nature, rehabilitation with composite resins should be considered as the first line of treatment for patients with AI.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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