Amelogenesis Imperfecta: Report and Review of a Rare Case

Suryakanti Nayak, Aprna Gupta, Lipsa Bhuyan, Saratkumar Nayak

ABSTRACT

Context: Amelogenesis imperfecta (AI) is a hereditary ectodermal disorder, which is characterized by developmental alterations in the structure of enamel in the absence of any other systemic manifestations. It is transmitted through either an autosomal dominant, autosomal recessive, or X-linked mode of inheritance.

Aims: This study aims to report a case of AI and presents a review of the literature, to highlight the current knowledge about this condition.

Settings and design: A detailed case history was taken before clinical examination of general, extraoral, and intraoral features. Intraoral periapical and panoramic radiographs were taken.

Conclusion: Based on the patient's family history, and changes in the enamel structure as revealed by clinical examination and radiographs, the patient was diagnosed with amelogenesis AI.

Keywords: Amelogenesis imperfecta, Multiple impacted teeth, Pulp calcification, Teeth exfoliation.

INTRODUCTION

Amelogenesis imperfecta (AI) encompasses conditions characterized by quantitative or qualitative developmental abnormalities affecting the structure of tooth enamel, without any identifiable known systemic manifestations. Crown malformation and abnormal enamel density are typical manifestations.

Both the primary and permanent dentitions may be involved. It is a purely ectodermal defect, which does not affect mesodermal/ectomesenchymal structures; hence, dentin and root development will be normal. Interestingly, the affected teeth are more resistant to dental caries. No racial predilections of AI have been reported. Amelogenesis imperfecta has been classified based on clinical, radiographic, and histologic appearance of the enamel defect and the mode of inheritance of the trait. Amelogenesis imperfecta has been categorized as hypoplastic (autosomal dominant/autosomal recessive and X-linked dominant), hypocalcified [autosomal dominant (AD)/autosomal recessive (AR)], hypomaturity (AR/X-linked recessive/AD), and hypoplastic–hypomaturation types.

Hypoplastic AI represents 60 to 73% of all cases, hypomaturation AI represents 20 to 40%, and hypocalcification AI represents 7%.

CASE REPORT

A 20-year-old male reported to the Department of Oral Pathology and Microbiology, SCB Dental College and Hospital, Cuttack, Odisha with the complaint of pain and pus discharge from posterior teeth of both sides of lower jaw for 20 days. The patient reported frequent extractions from upper and lower arch following complaints of pain and pus discharge. The patient's father had got all his teeth extracted due to the same problem, but mother was not reported to be affected. The patient has one sister who also reported to have no problems. Medical history did not reveal anything relevant. The patient was of normally built; hair, skin, and nails appeared normal. There was no systemic problem.

Extraoral examination showed apparent mandibular prognathism and sparse facial hair. Intraoral examination revealed a narrow, high-arched palate, and reverse overjet with deep bite. Tongue was normal in size and shape. Gingiva was normal in color and consistency. Many teeth were missing in the right and left lower posterior region and upper arch as well. Most teeth were small in size, with open contact areas and a yellow brown hue. Severe attrition of teeth was present (Figs 1 and 2).

Right side intraoral periapical (IOPA) radiograph showed a tooth with short root, periapical radiolucency, and exposed pulp horn due to attrition (Fig. 3). Left side IOPA showed a tooth with attrition, short root, and

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periapical radiolucency (Fig. 4). Panoramic radiograph showed many teeth with stunted roots and malformed crown, multiple impacted permanent teeth, and congenitally missing teeth. Few teeth with pulp calcifications were also present. No peripheral enamel overlying the dentin could be appreciated in the radiographs, as the normal enamel–dentin contrast was absent. Multiple periapical radiolucencies were also seen, in relation to many attrited teeth (Fig. 5).

Based on the above clinical and radiological features, a diagnosis of AI was arrived at.

DISCUSSION

Amelogenesis imperfecta is a developmental, often-inherited disorder, affecting enamel. It occurs in the absence of systemic features and comprises diverse phenotypic entities. At the clinical level, AI can be subdivided, depending on the type of defect and stage at which enamel formation is disturbed, into hypoplastic, hypomineralized, or hypomaturation type (Table 1).6

The prevalence of the condition has varied among studies conducted in different populations and has

![Fig. 1: Many missing teeth, small in size with open contacts and yellow brown hue](image)

![Fig. 2: Severe teeth attrition present](image)

![Fig. 3: Right side IOPA showing tooth with short root, periapical radiolucency and exposed pulp horn due to attrition](image)

![Fig. 4: Left side IOPA showed attrited tooth with short root and periapical radiolucency](image)

**Table 1:** Classification of amelogenesis imperfecta (Witkop 19886)

<table>
<thead>
<tr>
<th>Type I Hypoplastic</th>
<th>Type II Hypomaturation</th>
<th>Type III Hypocalcification</th>
<th>Type IV Hypomaturation–hypoplastic with taurodontism</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA – Hypoplastic, pitted autosomal dominant</td>
<td>II A – Hypomaturation, pigmented autosomal recessive</td>
<td>III A – Autosomal dominant</td>
<td>IVA – Hypomaturation–hypoplastic with taurodontism, autosomal dominant</td>
</tr>
<tr>
<td>IB – Hypoplastic, local autosomal dominant</td>
<td>II B – Hypomaturation</td>
<td>III B – Autosomal recessive</td>
<td>IVB – Hypoplastic–hypomaturation with taurodontism, autosomal dominant</td>
</tr>
<tr>
<td>IC – Hypoplastic, local autosomal recessive</td>
<td>II C – Snow-capped teeth, X-linked</td>
<td></td>
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</tr>
<tr>
<td>ID – Hypoplastic, smooth autosomal dominant</td>
<td>II D – Autosomal dominant?</td>
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Amelogenesis imperfecta represents a group of developmental conditions, genomic in origin, which affects the structure and clinical appearance of enamel of all or nearly all the teeth. Amelogenesis imperfecta is a serious problem that can result in reduced oral health-related quality of life. Amelogenesis imperfecta affects the psychology of the patient negatively due to esthetic concerns. It should be promptly identified and treated and the existing dentition should be protected so that teeth can be conserved as much as possible. From this point of view, people with AI need extensive treatment. While planning for the treatment, the age, socioeconomic status of the patient, and type and severity of the disorder should be taken into consideration. Multidisciplinary approach is important for the success of the treatment if accompanied by other dental anomalies. Patients should be counseled and motivated to maintain good oral hygiene.

REFERENCES


