## COMMENTARY

## A MULTIDISCIPLINARY APPROACH TO THE FUNCTIONAL AND ESTHETIC REHABILITATION OF AMELOGENESIS IMPERFECTA AND OPEN BITE DEFORMITY: A CASE REPORT Greggory A. Kinzer, DDS, MSD\*

Ameloginesis imperfecta (AI) is used to describe a clinically and genetically heterogenous group of conditions that affect enamel formation and hence affect the structure and clinical appearane of enamel. Primarily based on phenotype, AI can be catagorized into four main groups: (1) hypoplasia, (2) hypocalcification, (3) hypomaturation, and (4) hypomaturation-hypoplasia. However, at least 14 subtypes exist when phenotype and mode of inheritance are considered.

Given its rarity, our knowledge of AI from the literature is mainly based on case reports as large study groups are difficult to obtain. Diagnosis of AI involves evaluating for familial history to establish a likely inheritance pattern, exclusion of extrinsic environmental or other factors, recognition of phenotype, and correlation with the dates of tooth formation to exclude a chronological developmental disturbance. Numerous dental anomalies can be associated with AI including, but not limited to, enamel deficiencies, tooth sensitivity, missing or impacted teeth, taurodontism, altered dental esthetics, and anterior open bite.<sup>1–3</sup> In addition to the aforementioned anomalies, patients with AI often report difficulty with mastication and a perceived negative psycho-social impact.<sup>4</sup>

In this case report, Drs. Vanessa Gisler, Norbert Enkling, Jürgen Zix, Klara Kim, Nadja-Marina Kellerhoff, Regina Mericske-Stern do an excellent job of illustrating the many complexities of managing a patient with AI and an anterior open bite. The treatment rendered was very thorough as can clearly be seen with the case documentation and the wonderful final result. As was clearly explained, it is imperative that an interdisciplinary approach be utilized at each step in the process (evaluation, diagnosis, and treatment) in order to manage the esthetic, structural, and functional issues that arise with a case of this nature. One of the biggest challenges with this clinical situation, aside from managing the AI itself, is addressing the anterior open bite and the significant posterior tooth wear. With such a clinical situation the inevitable treatment planning questions arise: How do we close the anterior open bite?; How do we get room to restore the posterior teeth?; How is the treatment sequenced?

In this specific situation, a one-piece Lefort I osteotomy was used to close the anterior open bite and reduce the gummy smile. Treatment began with the author using direct composite to build up the individual teeth in order to help restore the anatomy of the teeth as well as reduce the dentin sensitivity. This extremely difficult clinical situation was very well managed and was maintained in the mouth for 2 to 3 years. The difficulty when treating patients with a combined orthodontic-orthognathic surgery/restorative approach is correctly positioning the maxilla to accommodate the future structural and esthetic requirements. This case was managed by utilizing direct composite to build up the teeth. However, with the composite being in function for a significant period of time prior to surgery, the restorative material continued to wear, thereby leading to a decrease in the clinical crown height of the posterior teeth. As a result, the authors noted that the vertical dimension had to be increased postorthognathic surgery in order to create enough space for the restorative reconstruction. Although the esthetics of the completed case are very nice, one could argue that the alteration in the vertical dimension to gain restorative room in the posterior may have resulted in the lower anteriors having to be made too long.

An alternative way to help communicate to the surgeon as to where to place the maxilla would be to place provisional restorations, as can be seen in the following case example (Figure 1a,b—photos courtesy of Dr. Frank Spear). Prior to the actual orthognathic surgery, the interdisciplinary team performs surgery on the mounted models to advance and rotate the maxilla (Figure 2). Following the model surgery, a diagnostic wax-up is performed to act as a blueprint for the provisional restorations (Figure 3). The teeth are prepared clinically and provisionals are placed

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Figure 1. Initial presentation of a patient with an anterior open bite (A) and posterior tooth wear (B).



Figure 2. Model surgery done on the diagnostic models to advance and rotate the maxilla.



Figure 3. Diagnostic wax-up postmodel surgery.



Figure 4. A, Provisionals placed prior to surgery. B, Provisional and occlusion after orthognathic surgery.



Figure 5. Definitive restorations.

using the diagnostic wax-up. Because the wax-up was performed on the diagnostic models that had model surgery, the provisionals in the mouth have an unusual occlusal relationship and caused a significant increase in the anterior open bite (Figure 4). The orthodontic brackets are then repositioned and the patient is sent for orthognathic surgery where the occlusion from the provisionals help guide the surgeon (Figure 5a,b). Following the appropriate retention period, the definitive treatment can be completed (Figure 5).

In summary, this article shows the important role of interdisciplinary treatment in managing a patient with AI and an anterior open bite. The authors should be commended on successfully restoring the patient both functionally and esthetically, utilizing a well thought-out treatment plan and sequence.

## REFERENCES

- 1. Alfred MJ, Crawford PJ. Variable expression in amelogenesis imprefecta with taurodontism. J Oral Pathol 1988;17:327-33.
- 2. Yip HK, Smales RJ. Oral rehabilitation of young adults with amelogenesis imperfecta. Int J Prosthodont 2003;16:345-9.
- Collins MA, Mauriello SM, Tyndall DA, Wright JT. Dental anomalies associated with amelogenesis imperfecta: a radiographic assessment. Oral Surg Oral Med Oral Pathol Endod 1999;88:358–64.
- 4. Coffield KD, Phillips C, Brady M, et al. The psychosocial impact of developmental dental defects in people with hereditary amelogenesis imperfecta. J Am Dent Assoc 2005;136:620–30.

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