

NON-INVASIVE TREATMENT OF MULTIPLE ENAMEL HYPOPLASIA: A CASE REPORT

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НЕИНВАЗИВНИ ТРЕТМАН МУЛТИПЛЕ ХИПОПЛАЗИЈЕ ГЛЕЂИ: ПРИКАЗ СЛУЧАЈА

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ABSTRACT

Objective. Enamel hypoplasia is a quantitative disorder of enamel deposition during the secretory phase and is characterised by a deficiency of the enamel, while hypomineralization is a qualitative disorder caused by incomplete mineralization and maturation of the enamel, followed by the porosity of the solid dental tissues and the opalescent tooth colour. Clinically, hypoplasia is a risk for caries, tooth sensitivity, erosion, and affects the aesthetic appearance of a patient with a psychological connotation. The aim of the paper is to present the case report, the possibility of preventive measures and restorative treatments with minimally invasive requirements in these patients.

Methods. At the Faculty of Medical Sciences, University of Kragujevac, in March 2018, a thirteen-year-old boy was diagnosed with isolated hypoplastic enamel defects on teeth 24, 25, 26, 33 and 34.

Results. Enamel hypoplasia was diagnosed by anamnesis, clinical and radiological examination. Preventive measures and conservative interventions were used to prevent progressive abrasion and early tooth loss due to caries and its complications.

Conclusion. Early diagnosis, timely preventive methods and minimally invasive restorative treatment can correct anomalies and prevent possible complications.

Key words: esthetics, dental; growth and development; dental enamel hypoplasia.

INTRODUCTION

Congenital abnormalities involving the development or mineralization pathways of the enamel are described as deviations from the normal appearance of the teeth, which occur most often due to negative influences on the enamel organ. If the activity of ameloblasts is disturbed or stopped during tooth development, shorter enamel prisms are left behind, which is observed as enamel hypoplasia. If the hypoplasia is localized on one tooth, the probable cause is a local inflammatory process or trauma. When it affects

САЖЕТАК

Циљ. Хипоплазија глеђи је квантитативни поремећај у таложењу глеђи током секреторне фазе и карактерише се недостатком глеђи који прате порозност чврстих зубних ткива и опалесцентна боја зуба. Клинички, хипоплазија представљају ризик за настанак каријеса, осетљивост зуба, ерозију и утичу на естетски изглед пацијента са психолошком конотацијом. Циљ рада је да се приказом случаја уоче могућности превентивних мера и ресторативних третмана минимално инвазивним захватима код ових пацијената.

Метод. На Факултету медицинских наука Универзитета у Крагујевцу, марта 2018. године, прегледан је тринаестогодишњи дечак, коме су клиничким прегледом установљени унилатерални изоловани дефекти глеђи на зубима 24, 25, 26, 33 и 34. Прегледом је утврђено да су зуби перкуторно и палпаторно неосетљиви а да је тест виталитета позитиван.

Резултати. Анамнестички, клиничким прегледом и радиолошки дијагностиковали смо хипоплазију глеђи наведених зуба. Очекује се да ће се применом превентивних мера и конзервативних захвата спречити прогресивне абразије и рани губитак зуба услед каријеса и његових компликација.

Закључак. Раном дијагнозом, правовременим превентивним методама и пратећим минимално инвазивним ресторативним третманом могу се санирати аномалије и спречити могуће компликације.

Кључне речи: естетика, зуба; раст и развој; хипопластична зубна глеђ.

teeth from the same group, they show a symmetrical appearance and are assumed to be a consequence of metabolic disorders. Hereditary ones usually affect a larger number or all the teeth and depending on the type of inheritance, they can occur in a different number of family members (1, 2).

From our clinical practice, structural and morphological anomalies of teeth are increasingly noticeable. According to the latest data, a study done in Iowa (USA) shows that enamel hypoplasia occurs in 6% of children aged 4-5 years, while isolated enamel

opalescence was found in 27% of children of the same age. The most commonly affected teeth were the mandibular and maxillary second molars (3). On the territory of Serbia, there are no data on the frequency of observed dental anomalies, so it would be important to document and fill in dental records in order to timely monitor these anomalies in our population. Developmental defects of enamel occur more frequently in permanent dentition, most often on the maxillary central incisors and the first permanent molars (4). Clinically, enamel is deficient in amount, in the form of a pit or groove, or it can be a complete lack of enamel on some teeth. Thus, hypoplasia poses a high risk of caries, tooth sensitivity, non-cariou damage to the teeth and affects the aesthetic appearance of the patient with psychological connotation (5).

CASE REPORT

A thirteen-year-old boy applied for the first examination at the Faculty of Medical Sciences, University of Kragujevac (Department of Dentistry). During anamnestic data collection, the patient complained that he suffered from teeth sensitivity to cold and discomfort when brushing teeth. According to the data taken from the mother, the boy was healthy, without the presence of systemic diseases, allergies and other diseases. Clinical examination revealed unilateral isolated enamel defects on teeth 24, 25, 26, 27, 33, and 34 (shown in Figure 1). The hypoplastic regions were brownish-yellow in colour, covered with dental plaque and calculus. The enamel of the affected teeth was thinned and present in traces. The almost complete absence of enamel on the maxillary premolars and molars on the left side was confirmed (shown in Figure 2), while on the mandibular left canine, which is rarely affected by this anomaly, and the first premolar, the enamel hypoplasia was present on the vestibular surface. Teeth were percussion and palpation insensitive. Pulp vitality test was positive on all examined teeth. The patient maintained oral hygiene well, and the remaining teeth were healthy or rehabilitated.

At the first examination, a hard deposit of mineralized substance adhering to crowns of hypoplastic teeth was mechanically removed. The treatment plan details were presented to the patient, and he was properly trained and instructed to maintain satisfactory oral hygiene. An orthopantomographic image was taken for evaluation. During the following week, a highly concentrated gel with fluoride was applied for local application (Fluorogal forte, Galenika, Belgrade, Serbia) NaF 18.5 mg (8400 ppmF), FH 6.2 mg (2600 ppmF), FH 6.82 mg (2600 ppmF) three times a week (according to the application protocol), (Figure 3). At the follow-up examination, the patient stated that the discomfort had decreased. Teeth 33, 34, 24, 25, and 26 were repaired in the next session, they were not

treated mechanically, except for machine brushing. A 35% orthophosphoric acid was applied for 30 s, and then rinsed with water for another 30 s and dried with air. An adhesive was applied, and the air was expelled with a puster in order to suppress the adhesive. To achieve satisfactory aesthetics with the minimally invasive treatment of hypoplastic enamel an enamel composite (Evetric - Ivoclar Vivadent, EA2) was placed (Figure 4). On the teeth 24, 25, and 26, glass-ionomer cement (GC Fuji II LC, light-cured, resin-reinforced restorative) were set as a base (Figure 5), using the following technique: first 10% polyacrylic acid was applied for 10 s, then it was rinsed with water for the same duration and then the teeth were dried with a dry air. After the complete rehabilitation, the patient was scheduled for regular check-ups for six months.

DISCUSSION

Enamel hypoplasia is more likely to occur in patients with hypoparathyroidism, rickets, neonatal tetany or due to vitamin D deficiency and a wide range of perinatal diseases. It has been observed that enamel hypoplasias are more common in underdeveloped countries, where calcium and phosphate deficiency have had a major impact on the development of this disease (6). Enamel defects can occur as a mutation in genes encoding enamel proteins, or as a hereditary familial anomaly when manifestations of the disease are observed in other tissues and organs (7). Also, ameloblasts, enamel-producing cells can be damaged in many metabolic conditions and infections as well as trauma, radiation, drug and chemical exposure (8, 9).

Enamel damage can often be more difficult to detect because it is masked by viscous saliva, plaque and inadequate lighting. Differential diagnosis may suggest caries, damage and traumatic loss of tooth structure. Even in milk dentition, a milder clinical picture can lead to differential diagnostic dilemmas. Linear hypoplasia of the front teeth can be mistakenly considered for early childhood caries in children, primarily because of its localization, but also because hypoplastic surface irregularities can be more susceptible to trapping plaque and bacteria and more prone to caries, which quickly leads to tooth decay and a very similar clinical picture (7).

The clinical approach depends on the degree of hypomineralization or lack of enamel. If the changes on the teeth are barely noticeable and the patient has no symptoms, it can be enough to educate the patient on how to properly maintain oral hygiene and to monitor the following condition at the scheduled controls (10, 11). If symptoms are present and the patient complains of tooth sensitivity (as in our case), the hypoplastic surface should be protected, and this can effectively be done with glass



Figure 1. Unilateral enamel defects in permanent dentition.



Figure 3. Local application of a highly concentrated gel with fluoride according to the application protocol.



Figure 2. Enamel hypoplasia with almost complete absence of enamel on the maxillary premolars and molars.



Figure 4. A clinical view before and after the restorative procedures.



Figure 5. Initial and postrestorative clinical aspect of the maxillary premolars and molars.

ionomer cement (12). The non-invasive approach with the application of fluoride varnishes has proven, as in our case, as the treatment of choice in reducing symptoms when it comes to mild and moderate forms of the disease (13). As one of the most effective anti-caries agents for teeth affected by developmental defect of enamel, topical fluoride can be given as neutral sodium fluoride gels or fluoride varnishes applied professionally in 3 or 6-month intervals or used as daily or weekly rinses in children who are able to expectorate after rinsing (14). Resin modified glass-ionomer types of cement and polyacid modified composite resins are a better option when it comes to more severe for sealing and restoring developmental defect of enamel (15). Non-chemically bonded restorative material such as amalgams, are not recommended, due to the breakdown of structurally weak enamel which can lead to marginal leakage, secondary caries and pulp pathology (16). As a restoration of choice of primary dentition affected by severe enamel hypoplasia, stainless steel crowns and pre-fabricated crowns have the longest duration and best protection against depletion of dental substance (17, 18), but they are not a therapy of choice for permanent dentition.

In conclusion, early diagnosis, timely preventive methods and restorative treatment can correct enamel anomalies and prevent possible complications. As enamel hypoplasia is increasing in the population, it is necessary to find an adequate personal approach for their treatment.

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