

RESEARCH ARTICLE

A Retrospective Longitudinal Study Regarding the Dental Anomalies of Position with Eruptive Etiology

(Nagy-Bota) Muica Monica-Cristina¹, Păcurar Mariana², (Chibelean) Cireș-Marginean Manuela¹, Jurcă Anamaria², (Coșarcă) Lup Adina Simona¹, Tudor A³

¹ PhD candidate, University of Medicine and Pharmacy, Tîrgu Mureș, Romania

² Department of Pedodontics and Orthodontics, University of Medicine and Pharmacy, Tîrgu Mureș, Romania

³ Department of Anatomy and Embriology, University of Medicine and Pharmacy, Tîrgu Mureș, Romania

Objective: Given the high frequency of dental anomalies of position and the lack of preventive measures of surveillance and monitoring of the eruption of permanent teeth, the aim of this study is to evaluate the frequency of dental anomalies of position in children.

Material and methods: We conducted a retrospective longitudinal study in the 2006–2012 period. Data were collected from the medical records and orthopantomography x-rays of 408 patients (230 female and 178 male) who presented to the Pedodontics-Orthodontics Clinic in Tîrgu Mureș. After applying the exclusion criteria, 77 patients remained in the study.

Results: From the 77 patients, 57 had dental inclusions, 15 presented ectopic teeth, dental rotations have been observed in 2 patients, and midline diastema in 5 patients. Regarding sex distribution, there was a higher frequency of dental inclusions in women (39) than men (38). The frequency of dental inclusions, regarding dental groups, in a descending order was: maxillary canine, mandibular second premolar, mandibular canine, maxillary second premolar, mandibular first premolar, maxillary first premolar, maxillary lateral incisor, maxillary central incisor and maxillary and mandibular first molars. The frequency of dental inclusions in the dental support area had the highest rate in the 12–14 years age group.

Conclusions: From all the studied dental anomalies, dental inclusions presented the highest frequency. Regarding the dental support area, most cases of dental inclusion were observed in the 12–14 years age group.

Keywords: dental inclusion, ectopic tooth, dental support area

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Introduction

Dental anomalies of position are characterized by the fact that the dominant change belongs to the dental system and the bone damage is more discrete, sometimes barely perceptible.

Due to the complexity of the development of the dento-maxillary apparatus, a dentist may encounter different situations and the bone involvement may vary from case to case. The dental anomaly can be either primary or secondary, as a consequence of other dento-maxillary anomalies [1].

The order and chronology of the eruption of the temporary dentition, but especially of the permanent teeth, underwent some changes in recent decades due to intensive refining process of food, fiber removal, and food habits of the younger generation, a fan of fast food diets which does not include fresh fruit and vegetables, causing a physiological attrition of enamel, favoring physiologic root resorption.

Early eruption of permanent teeth on the underdeveloped arches will cause a disturbance in the space balance and the last teeth to erupt on the arcade around the age of 11 years (maxillary canine and mandibular second premolar) will erupt ectopic, rotate, requiring orthodontic treatment.

Given the high frequency of dental anomalies of position and the lack of preventive measures of surveillance and monitoring of the eruption of permanent teeth, the aim of this study is to evaluate the frequency of dental anomalies of position in children.

Material and method

We conducted a retrospective longitudinal study in the 2006–2012 period. Data were collected from the medical records and orthopantomography x-rays of 408 patients (230 female and 178 male) who presented to the Pedodontics-Orthodontics Clinic, in Tîrgu Mureș,

Inclusion criteria:

- Patients with permanent dentition, aged 12–18 years;
- Good quality orthopantomography x-rays;
- Etiologic diagnosis certifying the cause of the dental anomalies of position;
- No history of orthodontic treatment.

Exclusion criteria:

- Patients with craniofacial syndromes and labio-maxillo-palatine clefts;
- Maxillary and mandibular third molar inclusion;
- Dentoalveolar trauma;
- Maxillary bone fractures.

After applying the exclusion criteria, 77 patients remained in the study.

Table I. The frequency of dental anomalies of position

	No. of patients	%	95% CI
Dental inclusions	57	74%	62.8–83.4%
Ectopic teeth	15	19.5%	11.3–30.1%
Dental rotations	2	2.6%	0.3–9.1%
Midline diastema	5	6.5%	2.1–14.5%

Results

The frequency of dental anomalies of position is presented in Table I.

Given the high rate of dental inclusion among all patients with dental anomalies of position, we studied in detail this condition. The results are presented in Table II.

In this study we also wanted to evaluate dental inclusion of the teeth in the dental support area (canine-first premolar-second premolar) with respect to the patients' age. Thus, we chose three age groups: 12–14 years, 15–17 years, over 17 years. Results for the three age groups are presented in Table III.

Discussions

This study shows a high frequency of dental inclusions, so an early diagnosis of these anomalies is necessary, a very important role is represented by orthopantomography x-rays. Similar results were also shown in other studies over the years.

Boboc [1] made a statistical analysis regarding the frequency of dental anomalies of number and position. Her results showed dental rotation in 0.33% of the cases, dental transposition in 0.87% of cases, dental inclusion (including dental reinclusion) in 2.73% of the cases, ectopic canine in 16.36% of the cases and midline diastema in 2.73% of the cases.

Litsas and Acar [2] in their study show a much higher frequency of the maxillary canine inclusions in comparison

Table II. Dental inclusion frequency regarding teeth groups

	No. of patients	%	95% CI
Maxillary central incisor inclusion	1	1.3%	0.0–7.0%
Maxillary lateral incisor inclusion	5	6.5%	2.1–14.5%
Mandibular canine	11	14.3%	7.4–24.1%
Maxillary canine	24	31.2%	21.1–42.7%
Mandibular first premolar inclusion	5	6.5%	2.1–14.5%
Maxillary first premolar inclusion	2	2.6%	0.3–9.1%
Mandibular second premolar inclusion	12	15.6%	8.3–25.6%
Maxillary second premolar inclusion	10	13.0%	6.4–22.6%
Mandibular first molar inclusion	1	1.3%	0.0–7.0%
Maxillary first molar inclusion	1	1.3%	0.0–7.0%

with mandibular canine inclusions, and a study carried out in Hungary showed a higher incidence of dental inclusions in girls, similarly to the present study.

A study carried out in Pakistan [4] studied the canine inclusions, observing a rate of 3.3%, much lower compared to the results shown in this study.

A study conducted in Turkey [5] assessed the sex distribution of dental inclusions, and the authors found a male:female ratio of 1:1.4, with a percentage of 71.5% for the maxillary canine. Another study [6], also carried out in Turkey, regarding premolars inclusion, showed a much higher percentage of patients with second premolar inclusion, similarly to the results of our study.

Similar results were shown in a study performed in Saudi Arabia, regarding the incidence of dental anomalies of position [7]. The authors revealed the presence of dental inclusions in 21.1% of the cases and the most common dental inclusion was represented by the canine inclusion.

The incidence of dental anomalies was also studied in Iran. In their study [8] the authors noticed a higher percentage (5.15%) of ectopic teeth in comparison with dental inclusions (2.6%), unlike the results obtained in the present which showed a higher frequency of dental inclusion.

In a study conducted in Korea [9], regarding the prevalence of dental anomalies, the authors noticed that the most common anomalies were represented by anodontia and dental inclusions.

A study from Malta [10], regarding incisors inclusions revealed that the number of the included incisors is greater in males compared with females (2.7:1); similar results were obtained in this study also, where were noticed 6 cases in males and 1 case in females.

Conclusions

In the limits of this study, from all the dental anomalies studied, dental inclusion presented the highest frequency, followed by ectopic teeth, midline diastema, and dental rotation.

Of all dental inclusions, maxillary canine inclusion obtained the highest percentage, followed by mandibular second premolar inclusion, maxillary second premolar inclusion, maxillary and mandibular first premolar inclu-

Table II. Frequency of dental inclusion by age groups

	No. of patients	%	95% CI
12–14 years			
Mandibular canine inclusion	9	15.8%	7.5–27.9%
Maxillary canine inclusion	18	31.6%	19.9–45.2%
Mandibular first premolar inclusion	4	7.0%	1.9–17.0%
Maxillary first premolar inclusion	2	3.5%	0.4–12.1%
Mandibular second premolar inclusion	9	15.8%	7.5–27.9%
Maxillary second premolar inclusion	9	15.8%	7.5–27.9%
15–17 years			
Mandibular canine inclusion	1	7.7%	0.2–36.0%
Maxillary canine inclusion	4	30.8%	9.1–61.4%
Mandibular first premolar inclusion	1	7.7%	0.2–36.0%
Mandibular second premolar inclusion	3	23.1%	5.0–53.8%
Over 17 years			
Mandibular canine inclusion	1	14.3%	0.4–57.9%
Maxillary canine inclusion	2	28.6%	3.7–71.0%
Maxillary second premolar inclusion	1	14.3%	0.4–57.9%

sion, lateral and central incisors inclusion and first molar inclusion. Dental inclusion was more frequent in females than males.

The central incisors, lateral incisors and the maxillary canines inclusions were more frequent in the upper jaw than in the lower jaw.

Regarding the dental support area, most cases of dental inclusion were observed in the 12–14 years age group.

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