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CLINICO-STATISTICAL STUDIES REGARDING THE FREQUENCY OF SUPERNUMERARY TEETH IN A GROUP OF CHILDREN IN TG. MURES

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ABSTRACT

Supernumerary teeth represent a maxillarry dental anomaly of number, registered in the 1st Angle class. The goal of the authors was to analyze the frequency and the pattern of these anomalies in number in a group of patients who presented for an orthodontic treatment at the Clinic of Orthodontics and Pediatric Dentistry of the Faculty of Dentistry, UMFST Tg. Mures between the years 2015 and 2018 and to establish correlations between this anomaly and other pathologies belonging to the orthodontic field. The analyzed variables included age, gender, health condition, constitution, origin, and the statistical analysis was focused on the following parameters: the affected dentition and arch sector, number of supernumerary teeth and their location, association with other anomalies, onset of complications.

Keywords: orthodontic treatment, supernumerary teeth, maxillarry dental anomaly

INTRODUCTION

Supernumerary teeth represent a maxillarry dental anomaly of number, registered in the 1st Angle class, which can be singular, or associated with other pathological entities: inclusion, aplasia, or ectopy. The supernumerary tooth is the tooth which appears as a super-addition to the normal denture and can be positioned in any part of the dental arch. Supernumerary teeth have a complex etiopathogenesis (local-regional and general factors), being characterized by polymorphism and requiring a mixed orthodontic-surgical therapy. Of particular importance in orthodontics is the pathology of the complications associated with the presence of supernumerary teeth (5).

The terminology comprises differentiated aspects, thus the term "supplementary teeth" refers to extra teeth, but which present morphological aspects that are similar to the teeth of the normal series, while the term "supernumerary teeth" is used with reference to the teeth with a morphology that is completely different from the normal series (12). There are also other terms, such as hyperdontia, hyper-odontogeny, hyperplasia of the dentition, polyodontia, pleiodontia, or dental polygenesis (11).

Supernumerary teeth can be observed radiologically during an imagistic examination required by the inclusion of a permanent tooth, most frequently a central incisor, or they can be detected clinically, intraorally, after a spontaneous eruption. The clinical manifestations and the therapeutic decision depend on the type, position, and the dimension of the supernumerary tooth, as well as on the relation/consequences for the adjacent teeth in the entire dental-alveolar arch (14).

PURPOSE OF STUDY

The goal of the authors was to analyze the frequency and the pattern of these anomalies in number in a group of patients who presented for an or-

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thodontic treatment at the Clinic of Orthodontics and Pediatric Dentistry of the Faculty of Dentistry, UMFST Tg. Mures between the years 2015 and 2018 and to establish correlations between this anomaly and other pathologies belonging to the orthodontic field.

MATERIALS AND METHOD

The study was a retrospective one, carried out on a group of 145 patients with various maxillary dental anomalies who came for an orthodontic treatment at the Orthodontics Clinic during the period 2015-2018, with ages between 6 and 23 years. The analyzed variables included age, gender, health condition, constitution, origin, and the statistical analysis was focused on the following parameters:

- the affected dentition and arch sector
- number of supernumerary teeth and their location
- association with other anomalies
- onset of complications

After obtaining their consent for being included in the study (directly or from those with parental responsibility), the patients were examined clinically and benefited from a series of paraclinical investigations: study models (intraoral and extraoral photographs), radiological investigations (orthopantomogram, retroalveolar radiography, profile teleradiography, CT scan).

The processing of the collected data was carried out with the help of medical statistical analysis software, SPSS 22.0 for Windows.

RESULTS

The number of girls included in the lot is almost double (62.20%) than that of boys (37.80%), probably because of the higher addressability and availability for orthodontic treatment which can be encountered among patients of the female gender. The prevalence of the latter is consistent at most ages (with the exception of the group of 10 year-olds, in which case an almost equal number of girls and boys presented to the consultation). We noticed that, in the case of the 9 year-olds group, the lowest number of male patients came to the consultation, while among patients of ages older than 18 years, the overwhelming majority were female patients (Fig. 1).

Regarding the patients' origin, we can state that the vast majority are from urban areas, while 20% come from rural ones (Fig. 2). The differences among age groups are not statistically significant ($p > 0.05$, chi-square test), but the highest percentages of patients from rural areas are encountered at the age of 10 years (3.40% of the total number of patients) and 14 years (2.20% of the total number of patients). We can, therefore, conclude that the addressability of patients from rural areas is higher during the development age (7-11 years), reaching a peak at the age of 10 years, after which the number of patients from these areas decreases, reaching a high level again at the age of 14 years. This evolution of the data is similar to the percentages of the presence of patients from urban areas, except for the group of 18 year-olds, where the addressability of the patients from urban areas is higher.

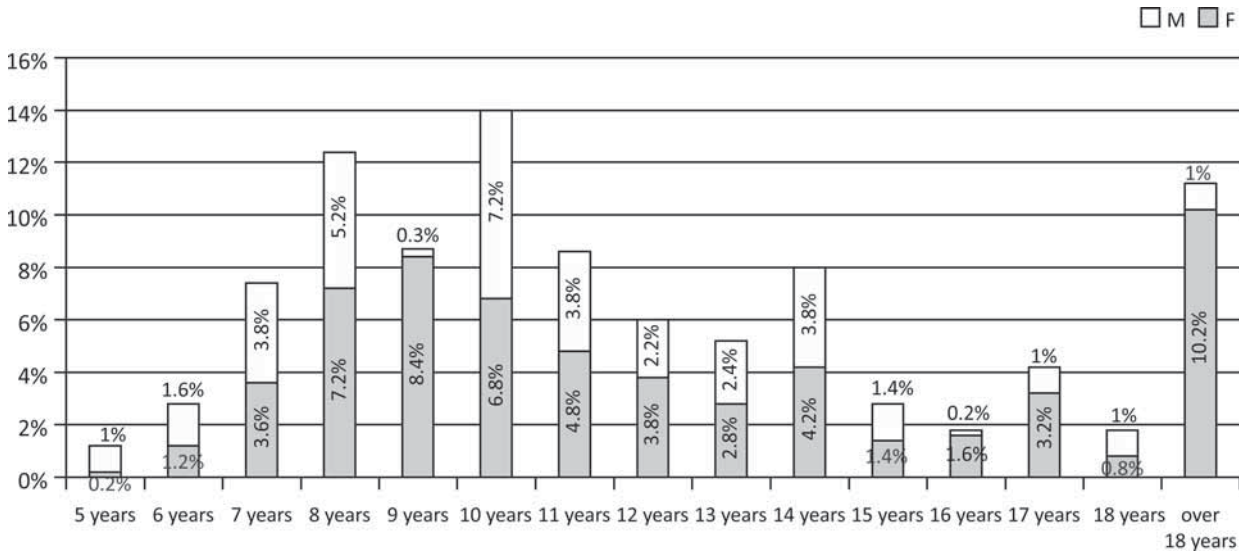

FIGURE 1. *Distribution of patients based on gender and age; M – male, F – female: $p < 0.01$*

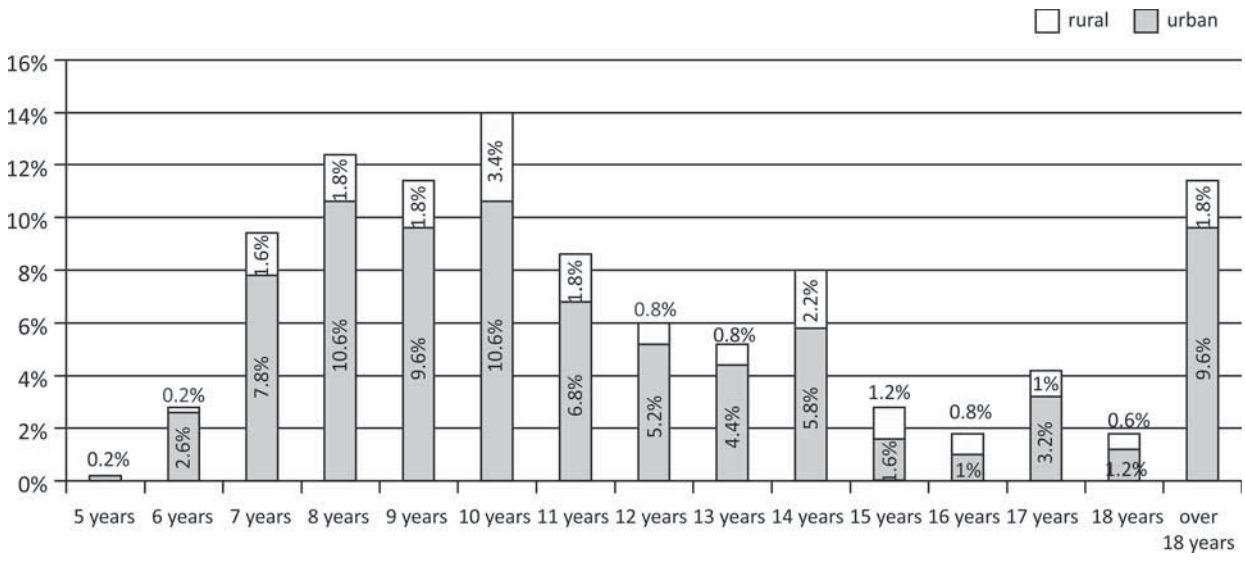

FIGURE 2. *Distribution of patients based on age and origin*

After analyzing the patients with supernumerary teeth, we found a number of 36 cases, with ages between 6 years-4 months and 23 years. The highest percentage was encountered in the group of 7 year-olds, for the female gender, and 10 year-olds for the male gender, respectively. Their distribution according to age groups and gender is illustrated in Fig. 3.

Relative to the total number of patients comprising the investigated lot, we can appreciate the prevalence of various types of supernumerary teeth, the prevailing ones being those of the mesiodens type and the supernumerary formations detected in the area of the lateral incisor (2.4% of the entire lot). These data are inserted in Table 1 below.

As the patients' age gets older, the frequency with which types of included supernumerary teeth (odontoma, developing tooth bud) are identified increases as well. The group of patients with the age of over 18 years, diagnosed with supernumerary teeth, represents **23.21% of the total number of patients** with this dental anomaly. The differences regarding the typology of detected supernumerary teeth registered among the age groups are statistically significant.

Regarding the type of supernumerary tooth, the statistical analysis showed the following:

– **58.3%** of the patients with multiple supernumerary teeth presented the same type of supernumerary tooth;
– **16.6%** of the patients with supernumerary teeth had geminated-type teeth; 8.3% me-

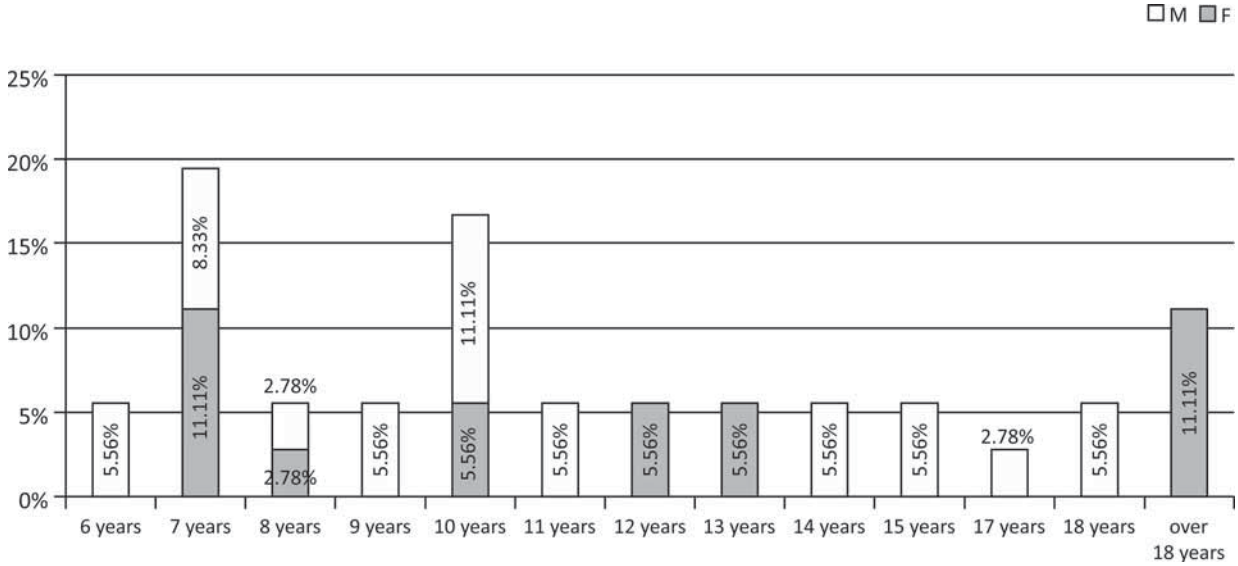

FIGURE 3. *Percentual distribution of patients with supernumerary teeth, based on gender and age*

TABLE 1. *Correlation between number anomaly and the patients' age*

Age at diagnosis	Type of the supernumerary tooth						Total		
Normal morphology	Conical tooth	Tuberculate tooth	Dens in dente	Geminated / fused		Odontom	Developing tooth bud	Atypical	
6 yrs	0	1.79%	0	0	0	0	1.79%	0	3.57%
7 yrs	7.14%	8.93%	0	0	1.79%	0	0	0	17.86%
8 yrs	0	3.57%	0	0	0	0	0	0	3.57%
9 yrs	0	1.79%	0	0	3.57%	0	0	0	5.36%
10 yrs	5.36%	0	0	0	1.79%	5.36%	0	0	12.50%
11 yrs	0	0	0	0	8.93%	0	0	0	8.93%
12 yrs	0	0	0	0	0	0	3.57%	1.79%	5.36%
13 yrs	0	0	0	1.79%	0	1.79%	3.57%	0	7.14%
14 yrs	0	0	0	1.79%	0	0	0	0	1.79%
15 yrs	0	0	0	0	0	1.79%	1.79%	0	3.57%
16 yrs	1.79%	0	0	0	0	0	0	0	1.79%
17 yrs	0	0	1.79%	0	0	0	3.57%	0	5.36%
Over 18 yrs	3.57%	0	0	0	0	10.71%	3.57%	0	23.21%
Total	17.86%	16.07%	1.79%	3.57%	21.43%	19.64%	17.86%	1.79%	100%

siodens-type teeth, fused, conical, supplementary, odontoma, while the rest presented combinations of various typologies of supernumerary teeth;

- **33.3%** presented association of the supplementary tooth with another type of supernumerary tooth: 16.6% with odontoma, 8.3% with mesiodens, and 8.3% with geminated tooth (Fig. 4);
- in **8.3%** of the cases, geminated-type teeth and odontoma were detected (Fig. 5).

After the statistical analysis of the data regarding the location of supernumerary teeth, we noticed that they were detected on both maxillae, especially on the upper one, where we found 71.43% of the supernumerary teeth (Fig. 6). The differences related to the localization of the teeth on the maxillae and on arch sectors are statistically significant, the majority of supernumerary teeth (57.14%) being diagnosed in the frontal maxillary area.

As regards the presence of supernumerary teeth on each arch, and their inclusion, respectively, we noticed that 50% of them remain included, and 50% erupt in various areas, the most affected one being the frontal area, and the sector of the central incisor (mesiodens), respectively.

The results of the study show that **mesiodens is the most frequent supernumerary** tooth (46.9%), followed by supernumerary premolars (24.1%) and distomolars (18%) (Fig. 7).

Of the erupted teeth, a percentage of 5.36% were in vestibular location, and 7.14% had an oral location. According to our data, the right hemiarch is relatively more affected by the occurrence of su-

FIGURE 4. *Mesiodens associated with paramolar*

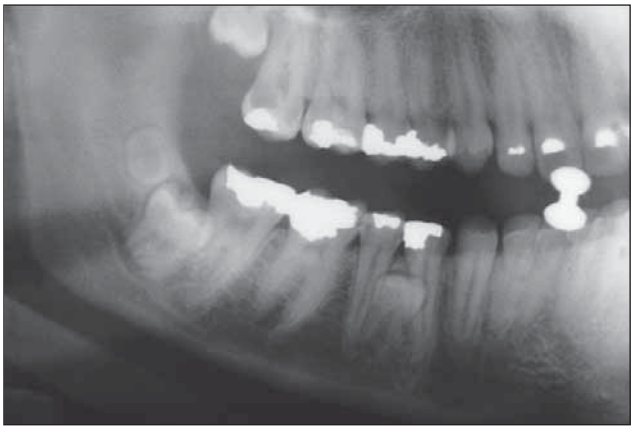

FIGURE *5. Odontoma*

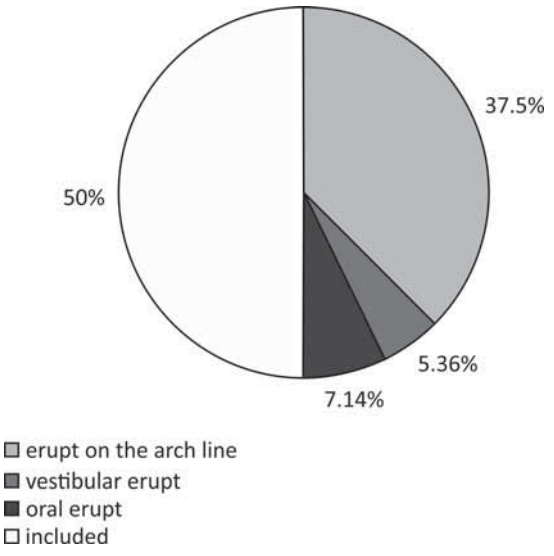

FIGURE 6. *The eruptive stage of supernumerary teeth diagnosed in the investigated lot*

FIGURE 7. *Conical shaped mesiodens erupted in a palatinal location of 1.1*

pernumerary formations (58.93% of the total number of supernumerary teeth). Of the erupted supernumerary teeth, 89.29% were localized at maxillary level, while in the case of included supernumerary formations, the distribution on maxillae was almost equal (53.57% detected at the level of the maxilla) (Fig. 8).

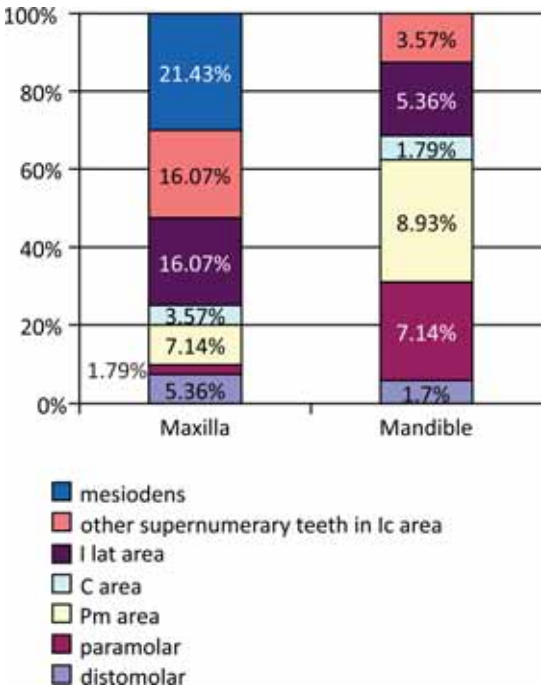

FIGURE 8. *Localization of supernumerary teeth, based on the affected maxilla/arch sector*

In the case of the included supernumerary teeth, the predominance of right hemiarches is maintained in the case of erupted supernumerary teeth (60.7% being in quadrants 1 and 4); as far as the distribution on upper maxillae is concerned, the situation appears more balanced than that at the level of the entire lot (a little more than half, namely 53.57%, are localized on the maxilla, compared with 89.29% in the case of erupted supernumerary teeth – Fig. 9).

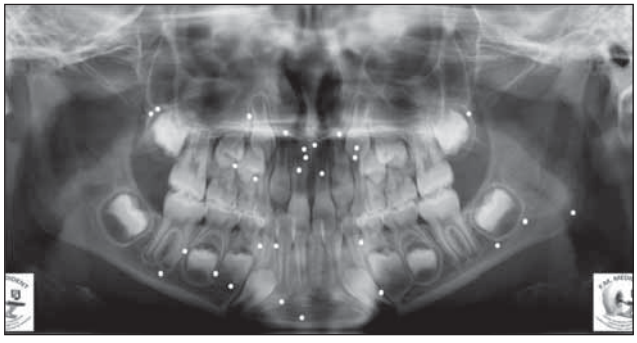

FIGURE 9. *Illustration of the localization of included supernumerary teeth, OPT detected*

DISCUSSIONS

Today, many authors agree that the etiology of supernumerary teeth is a multifactorial process which does not simply develop according to Mendelian rules, but is subject to the combined influence of genetic and environmental factors, hyperdontia being a multifactorial inherited condition, which occurs because of the hyperactivity of dental lamina.

Hyun HK, Lee SJ et al. carried out a study (11) on a group of Caucasian people and reported that the group that presented supernumerary canines and supernumerary lateral incisors had a lower frequency (2.8%), a fact which is consistent with the data obtained from previous studies, and 75% of the lateral incisors localized on both maxillae did not present any symptom. Two thirds of the supernumerary teeth were found in the upper maxilla, in 46.9% of the cases in palatinal position.

In the study carried out by Fardi A et al. (7), the prevalence of supernumerary teeth was of 1.45%, a percentage which can be justified by the specificities of the investigated populations and by the detection method (confirmation of the presence of the supernumerary through CT scan investigations). In the above mentioned study, a number of 15,357 patients were examined, and a study group was selected, which consisted of 223 patients with supernumerary teeth (68 women and 155 men), localized in different areas of the dental arches. The age of the patients was between 12 and 25 years. The prevalence of supernumerary teeth proved to be of 1.45% of the studied group. Men were more affected by this anomaly, in a proportion of 2.3:1, compared with women.

In this study, 153 patients, with the average age of 14.57±2.22 (14.30 years ±1.92 in the case of men and 14.81 years ±2.44 in the case of women), with ages between 12 and 25 years, were observed in order to determine the presence, gender, location and the relation between the eruption rate and the shape of supernumerary teeth. The number of female patients was 3,211 (46.96%), and that of the male patients was 4,146 (53.04%). Most frequently, the supernumerary teeth were localized in the maxilla (86.2%) and the mandible (10.1% of the supernumerary teeth) and on both upper maxillae (3.7% of the supernumerary teeth). The differences related to the location on the maxilla of the supernumerary teeth, according to the patient's gender, were not statistically significant.

The relative frequency as regards large population groups shows us a constantly higher frequency of supernumerary teeth in populations with better developed maxillae (black or Australian people). According to the literature and to the studies carried out on various population groups, there seems to be a racial variation as regards the incidence of supernumerary teeth, which is higher among people belonging to the Mongoloid race (13) and among black people. Batra P, Duggal R and Parkash H (3) found an incidence of supernumerary teeth in temporary dentition of 0.3-0.8%, and in permanent dentition 1.5-3.5% (4,8,10).

The low prevalence in temporary dentition can be explained by several mechanisms: supernumerary teeth are much less noticed and reported during this type of dentition, because supernumerary teeth most often have the shape and dimension which are similar to the teeth of the normal decidual series, they erupt normally and are aligned, due to physiological diastema (2). According to studies of Gündüz K, Celenk P et al. (9), supernumerary formations can sometimes be mistaken for dental gemination or fused teeth. No significant distribution of the prevalence of this anomaly in temporary dentition is known. Nevertheless, it has been noticed, in the case of permanent dentition, that the male gender seems to be more affected than the female one, and this fact has been evidenced in studies carried out both on Romanian population and on other international population groups (6).

CONCLUSIONS

1. The frequency of supernumerary teeth among orthodontic patients is relatively small, 7.2%, with a higher prevalence among men.

2. In patients of young age, we mostly detected supernumerary teeth with normal morphology (at the age of 7 years). As the patients advance in age, the frequency with which types of included supernumerary teeth can be identified increases as well (odontoma, developing tooth bud).

3. In patients coming from rural areas, supernumerary teeth in the canine area are more frequent (almost twice as frequent), and the same observa-

tion applies to the paramolars as well, the results being statistically significant (p = 0.03).

4. Two thirds of the investigated patients (66.6%) were diagnosed with a supernumerary tooth, the rest representing multiple supernumerary teeth, most frequently localized on the maxillae, on the right hemiarch.

5. From a morphological point of view, we noticed that a percentage of 35.72% of the supernumerary teeth presented a coronary morphology similar to the teeth from the normal series of the arch sector where they formed, 21.43% presented various forms of dental gemination, and 16.06% presented chronic morphology.

6. Half of the supernumerary teeth present on the arches or intraosseously produced one or more modifications at the level of the stomatognathic system – most frequently, malposition of adjacent teeth.

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