THEORETICAL AND PRACTICAL ASPECTS IN THE THERAPY OF DENTO-MAXILLARY SYSTEM MORPHOFUNCTIONAL IMBALANCES IN THE AGE OF 6-12 YEARS. PRELIMINARY STUDY

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Abstract: *The most important stage in the growth rate of individuals occurs at the age of 6-12 years. The importance of this step is represented by the transition from primary dentition to permanent dentition but also the overlapping over the morphological changes in the dental arches of an increased decay index in the area of canine and temporary molars. We have tried through this material to evaluate the attitude of practitioners towards the maintenance of teeth in the support area for patients aged 6-12 years.*

INTRODUCTION

Generally, in growth and development period of any individual, a multitude of deviations from the function and morphology of the dento-maxillary system may occur at a lower or higher frequency. Thus, in the growth rate of the individuals of our society, we notice 4 distinct stages, as follows:(1-5)

1. First period: age immediately after birth;
2. Second period: pre-school age (up to 6 years);
3. Third period: ages 6-12 years, which represents the changing stage of primary dentition with permanent dentition;
4. Fourth period: the age after 12 years.

Specifically, in this study we will approach a multitude of issues both theoretical and practical, issues related to the age range of 6-12 years, the changing stage of primary dentition with permanent dentition and which is actually the third period in the growth rate of the individuals of our society.(1-5)

The third period is the most important stage in the morphophysiology of the dento-maxillary system and represents the phase of changing the primary dentition with the permanent dentition, the period of mixed dentition between the ages of 6-12 years.(1-5) Generally, changes occurring in this age range (6-12 years) in dento-maxillary system (DMS) are clearly outlined and can be grouped into 2 distinct periods:(1-5)

- In the age range of 6-9 years, we notice a stage of changes in the front arch;
- In the age range of 9-12 years, we distinguish the stage of changes in lateral arches, these being influenced by the eruption of the permanent second molar, also known as the 12-year-old molar. Practically, any deviation from the normal morphology produced by this molar will influence its eruption.

The anthropological incongruities between the jaws and teeth, as well as the two maxillary jaws, can lead to relationship changes that exceed the limits of the modelling capacity of the osteogenic centers.(1-5) The phylogenetic shortening of the dental arch appear, particularly evident at the meeting between the front arch and the side arches, leading to the canine ectopia, with a higher frequency in the upper jaw area.(1-5)

But what characterizes this age stage, along with the phenomena inherent to the evolution (temporary tooth exfoliation, eruption of permanent teeth) is the carious morphology, with a very high intensity index, which contributes to the installation of some functional and development deficiencies of the dento-maxillary system (DMS).(1-5) The highest decay index, based on age, is given by teeth from the frontal-lateral areas but more lateral (canine - primary molars), in the 6 to 9 year age range.(1-5)

In the distal teeth eruption, there is always a tendency for mesialization, which can affect the implantation of the permanent canine, especially the maxillary, which is one of the most important permanent teeth that erupts in this timeframe: 6-12 years.(1-5) Thus, the morphological changes from the primary dentition in the lateral areas will in fact favour the mesialization the lateral teeth.(1-5)

However, in order to better understand these extremely important aspects in the formation and development of the dento-maxillary system in the age range of 6-12 years, the third period and also the age which constitutes the changing stage of primary dentition with permanent dentition, what follows is a brief explanation of the notions that characterize this important stage of the growth rate of the individuals of our society, which must be known by all dental practitioners, regardless of their specialty, and which is in fact the purpose this report.

Starting from the information presented above, namely correct preservation of the teeth in the support area, we can say with precision that these principles are the basis of dental follow up for patients between 6-12 years of age, which aims to ensure the development of dento-maxillary system.(6-15) The dentist, in the treatment of complicated dental injuries diagnosed in patients aged 6-12 years, will take into account the general

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condition of their body and will in no case retain a septic outbreak where there is a danger of a malady disease.(6-15). In fact, the dentist will choose tooth extraction when indicated, but will ensure the evolution of the normal dental arches relationship using the space keepers that will keep the space on the arch and the antagonist relationships (6-15).

With regard to the 6 year old molar (or the first permanent molar on the dental arch), whether it is with maxillary or mandibular localization, it has to be in the dentist's attention since its eruption. The correct treatment of the 6-year-old molar (the permanent first molar) must follow known treatment principles starting from the ones outlined by the great G.V. Black and choose the optimal form of functional restoration through periodontal perspective.(2-7) The treatment should restore dynamic relationship in the articular area; therefore the completion of an occlusal and/or occluso-proximal restoration must be reported to the antagonist teeth not only in static occlusion but also in dynamic occlusion, while observing in the same time the modifications produced in the antagonist dental arch.(6-15)

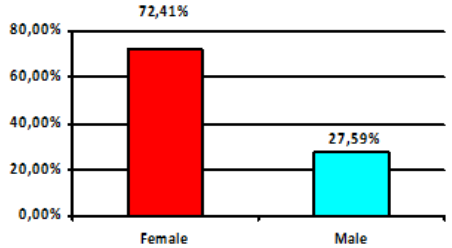
Over the age of 9 years, the future relationships of the dento-maxillary arches are actually sketched out. Thus, orthodontic specialists consider optimal the introduction of orthodontic therapy at this age, which will act on bone growth.(1-5) Until this age, the action taken is more a preventive one, by procedures that avoid the occurrence of anomalies. However, from this age the curative orthodontic intervention is necessary because, both in the maxillary and in the mandible, the growth zones are in full osteogenetic evolution.(1-7)

The age limit for the ending of mixed dentition period is quite relative, approximately 12-13 years, and ends with the eruption of 12-year-old molar (the permanent second molar). In the mandible, the tooth with the biggest eruption delay is the 12-year-old molar, which hardly finds its place on the arch because due to frequent missing of the 6-year-old molar, it has a tendency to mesial migration or tipping.

MATERIALS AND METHODS

Starting from these above-mentioned aspects, and for a thorough study, we made a questionnaire consisting of 6 items, applied to 87 dental practitioners (simple dentists, resident doctors, specialists in related dentistry specialties: general dentistry, dental prosthetics, orthodontics and dentofacial orthopedics, pedodontics, endodontics, dento-alveolar surgery, periodontics, oro-maxilo-facial surgery). Subjects were aged 28-68, were from Bucharest and showed the following gender distribution: 63 of the subjects were females (representing 72.41%), while the remaining 24 subjects were males (representing 27.59%) (figure no. 1). The study was conducted between 1 June and 15 July 2018.

Figure no. 1. Gender distribution of subjects involved in the study.



Next, we will present the questionnaire applied to the 87 subjects:

Questionnaire

1. At what age range of the third period of growth of the individuals of our society, we notice the highest decays index in the fronto-lateral areas (canines - temporary molars): a. 6-8 years; b. 6-9 years; c. 9-11 years; d. 9-12 years?

Correct answer: b.

2. How do you asses, in ages between 6-12 years, the morphological changes from the primary denture in the lateral areas? a. Will favour mesial migrations of the lateral teeth; b. Will favour distal migrations of frontal teeth; c. Will favour distal migration of lateral teeth.

Correct answer: a.

3. How do you asses that complicated dental lesions should be treated in patients aged 6-12 years? a. The dentist will take into account the general condition of the patient's body and will not, in any case, retain a septic outbreak where there is a danger of an illness outbreak. b. The dentist will choose extraction when indicated, but will ensure the evolution of normal relationship of dental arch by using space keepers that will keep the space on the arch and the antagonist relationship. c. It does not matter the existence of a septic outbreak, the dentist will keep the tooth at all cost as a space maintainer, and restore coronary integrity with composite restorative materials.

Correct answers: a, b.

4. How do you think the treatment of the 6-year old molar (first permanent molar) should be done? a. Since it is the first permanent tooth that appear on the dental arch, so with the longest life, its morpho-functional recovery must be durable, stable and to provide strength over time; b. This tooth must be extracted regardless of the type of coronary destruction it has; c. The choice indication for the treatment of the 6 year old molar is extraction?

Correct answer: a.

5. How do you assess the need for orthodontic therapy after the age of 9 years? a. It is not up to date, it unnecessarily complicates the existence of children; b. The introduction of orthodontic therapy at this age is optimal because it will act on bone growth. c. From this age, the curative orthodontic intervention is necessary since, both in maxillary and mandible, the growth areas are in full osteogenic evolution.

Correct answers: b, c.

6. When does the third period of growth of the individuals of our society end? a. Exactly at 12 years; b. With the eruption of last 12 years molar (second permanent molar) on the dental arch; c. Always after the age of 14.

Correct answer: b.

RESULTS AND DISCUSSIONS

After studying the answers to the 6 questions, the following results were obtained:

For the first question, regarding the period with the highest decay index in the fronto-lateral area (canines - temporary molars) 62 subjects (representing 71.27%) responded correctly (answer *b*) while 15 subjects (representing 17.24 %) chose the answer *a* and 10 subjects (representing 11.49%) chose the answer *c* (figure no. 2).

Regarding the assessment of morphological changes from the primary dentition in the lateral areas in the 6-12 months age group, 75 of the subjects (representing 86.21%) responded correctly (variant *a*), while 7 subjects (representing 8.04 %) chose variant *b* and 5 subjects (representing 5.75%) chose variant *c* (figure no. 3).

For the third question all subjects included in the study provided the correct answers from the three variants.

Figure no. 2. Assessment of the age range with the highest decay index in the fronto-lateral area (canine - temporary molars)

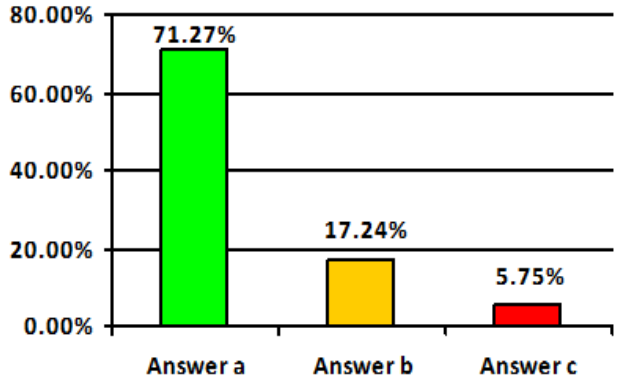
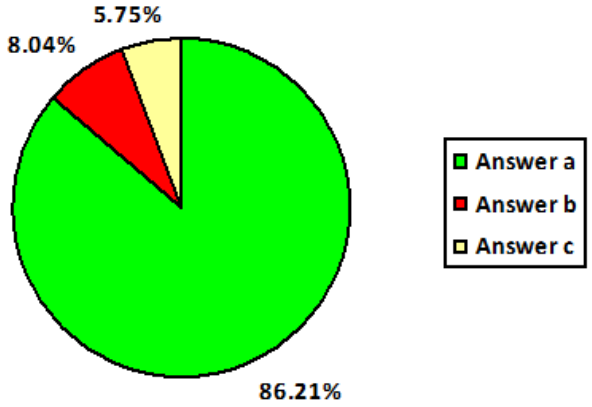
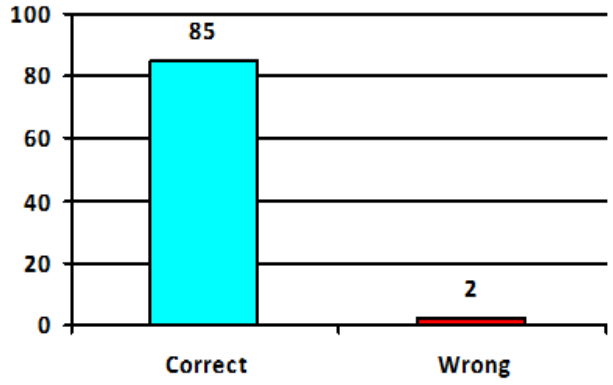


Figure no. 3. Morphological changes in primary dentition in lateral areas



With regard to the treatment to be given for affected 6-year-old molar, the majority of dentists included in the study (85 practitioners representing 97.70%) responded correctly (variant *a*) while only 2 practitioners (representing 2.30%) responded *c* (figure no. 4).

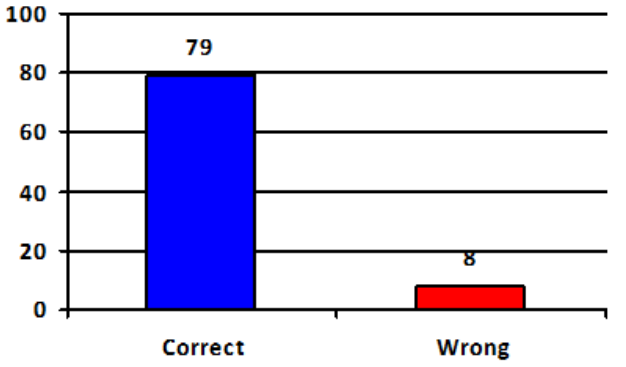
Figure no. 4. How to achieve treatment of 6-year-old molar



Regarding orthodontic therapy at the age of 9 all the practitioners in the study answered correctly, namely variants *b* and *c*.

The last question used in the study related to the end of the third period of the growth rate of individuals 79 subjects (representing 90.80%) provided the correct answer variant *b*, while 8 practitioners (representing 9.20 %) responded to *c* (figure no. 5).

Figure no. 5. The end of the third period of the growth rate of individuals



CONCLUSIONS

Following the evaluation of the answers to the six points of the questionnaire, we can conclude on several aspects, some extremely important, as follows:

1. Changes in form and relationship of decays in frontal areas (canine - temporary molars) in the age range of 6-9 years are of the greatest importance in directing relationship between evolving dental arches. Thus, complicated dental lesions, which require a great effort to preserve these teeth, even if they are temporary, require a correct, time-resistant morpho-functional recovery, extremely important in the development of the dento-maxillary system (DMS).

2. Starting from the fact that the morphological changes from the temporary dentition in the lateral areas will favor the mesial migration of the lateral teeth, it should be said that this observation lies at the basis of the instructions for treating and preserving as far as possible the temporary dentition from these areas to maintain space in order to stop the mesial migrations.

3. The fast changes which occur during the development dento-maxillary system (DMS) over the age range of 6-12 years, obliges dentists to follow a strict and continuous follow-up of patients entering treatment. The dental therapy of temporary teeth viewed only from the point of view of the odontological pathology itself may lead to easier extraction of the teeth in time, but also to the implementation of easier methods of preservation.

4. Given that the 6 year old molar (or the permanent first molar) is the first permanent tooth that appear in the dental arch, and therefore has the longest life, its morpho-functional recovery must be durable, stable, and to provide strength over time. Therefore, the dentist should use the most demanding forms of restoration, starting from simple coronary filling and ending, in case of severe coronary destruction, with the approach of some convenient prosthetic solutions.

5. Orthodontic therapy should be imposed from the age of 9 years. This therapy should be varied and adapted to each case.

6. From a prophylactic point of view, the role of the dentist with pediatric training and/or specialization is to look forward to the dento-maxillary system (DMS) and to ensure its normal development in the future. At this age, any intervention in both the front arch and the side arches must be reported to 12-year molars, whether they are or not on dental arches. In fact, the same dentist should perform the prophylaxis of dento-maxillary anomalies to ensure the normal development of the relationships between the constituent elements of the dento-maxillary system both through proper odontal and effective orthodontic therapy, thus ensuring its functions.

7. Coronary destruction or early tooth missing of 6-year molar is an important factor of imbalance, influencing the 12-year-old molar eruption, causing the coronary mesial migration and/or tipping.

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