THE IMPORTANCE OF ORTOPANTOMOGRAPHY IN THE MANAGEMENT OF EARLY LOSS OF TEMPORARY MOLARS

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Abstract

The early loss of temporary molars represents a potential risk factor related to the integrity of the dento-alveolar arch, having a tridimensional impact: dental, dento-alveolar, maxillary.

Aim: this study aims at assessing the relevance of ortopantomographic examination in identifying the dento-dental and dento-alveolar consequences resulting from the early loss of temporary molars.

Materials and method: the ortopantomographs of 43 patients aged between 6 and 11 were examined. The patients presented at the Clinic of Pediatric Dentistry in Iasi with an early loss of temporary teeth. The results showed modifications on the level of the dento-alveolar arches with tippings, rotations and body displacements of the teeth adjacent to the breach, egression of the antagonistic teeth, narrowing of the space for premolar eruption especially on mezio tipping or dispalcement of permanent molar I, a poor alveolar development in the area, secondary dento-alveolar incongruence due to lack of space.

Conclusion: in this context, ortopantomograph is justified for choosing the correct therapeutical, preventive and curative treatment for temporary molars.

Key words: ortopantomograph, temporary molars, early loss

Introduction

The specialist in pedodontics is mainly concerned with a harmonious eruption and growing of temporary and permanent teeth. This supervision should have in view the correct growth of permanent teeth, with a harmonious, functional and aesthetic occlusion. It is important to recognize, differentiate and assume a behavioral and therapeutical management adequate to the disorders which occur in dental development (1,2). One should be aware of the fact that whenever an early loss of a temporary tooth occurs, there are modifications in the arch integrity with migration of temporary and/or permanent teeth, while the available space could be significantly diminished to create a certain degree of overcrowding of the permanent teeth.

The early loss of temporary molars may require the use of a space maintainer to prevent the occurrence of such a clinical entity. The aim of this device is to prevent any loss of integrity in the circumference and length of the arch by maintaining the relative position of the existing teeth.

Materials and Method

The present paper is a retrospective study regarding various consequences, visible ortopantomographically, of the early loss of temporary molars.

We selected our subjects from the patients who came to the Clinic of Pediatric Dentistry in Iasi, and examined 43 children aged between 6 and 11. Each patient was subjected to careful anamnesis and clinical examination and was recommended to have a pantomograph taken. On evaluating this paraclinical examination, we had in view the implantation of the teeth adjacent to the breach, their relationship with the permanent teeth, the position of the permanent teeth inside the alveolar bone, the dimension of the transitory edentulous space in comparison with that on the other area quadrant of the arch. Cases with unilateral and bilateral loss of one molar, and with unilateral and bilateral loss of the two temporary molars were analyzed.
Results

There were different forms of early loss in our sample group, from the loss of one unilateral, unimaxillar, temporary molar, to the loss of two unilateral, unimaxillar or bimaxillar temporary molars.

This early loss had an impact upon the permanent teeth leading to modification of the integrity of the dento-alveolar arch, tipping of the temporary and permanent teeth adjacent to the breach, extrusion of the antagonistic teeth resulting in shortening of the arch for the permanent teeth, creating conditions for rotations, rendering a too small a space for the permanent teeth and influencing their eruption, having an impact on the interarch relation and on the mandibular dynamics, which is in agreement with the studies made by Eckles and Shulman (3).

The early loss of temporary molar II was accompanied by:
- mezio-tipping and rotation of the permanent molar I (fig.1)
- disto-tipping of the temporary molar I (fig. 2)
- mezio-tipping of the permanent molar I
- narrowing of the space for the eruption of premolar II, with its possible inclusion
- modification in the eruption of the permanent teeth

Fig. 1. Premature loss of 7.5, with mezio-tipping of 3.6 and inclusion of 3.5

The early loss of temporary molar I led to:
- mezio-versia of temporary molar II
- disto-versia of temporary canine (fig.3)
- inclusion of premolar I
- secondary dento-alveolar incongruence
- modification in the eruption of permanent teeth

Fig. 2. Premature loss of 5.5 with distal-tipping of 5.4

The early loss of temporary molars I and II lead to the same modifications as mentioned before, but they are more marked, and the area of development may be damaged, leading to an asymmetrical endoalveoly and, depending on the age at which extraction is made, unilateral cross-bite, palato-tipping of the upper teeth and lingua-tipping and supraposition of the lower teeth can occur (fig.4).

Fig. 3. Premature loss of 8.4 with distal-tipping of 8.3
Fig. 4. Premature loss of the temporary molar teeth in Quadrant 1, 3 and 4, with mezio-tipping of the prime permanent molar teeth, inclusion of premolars and significant reduction of the Leeway-space-ului, which leads to secondary dental-alveolar incongruence.

Mezio-tipping of permanent molar I creates a retentive site for the plaque on the mezial surface and, in time, dental or parodontal caries may occur (at first, as papillitis, which can turn into a septus syndrome) (fig.5)(4).

Fig. 5. Premature loss of the temporary molar teeth in quadrant 4, with mezio-tipping of the prime permanent molar tooth, leading to retention of the bacterial plaque and formation of caries on its mezial side.

If the early loss of temporary molar II occurs before the eruption of the permanent molar I, the latter can be subjected to corporeal mesial drift and premolar II may be included. It was noticed that the most severe diminishing of the Leeway-space at the level of the mandible was associated with the loss of temporary molar II, while the loss of molar I or II at the level of the maxilla resulted in a similar diminishing of the space, which agrees with the published studies in the field (5).

Discussions

Most researchers consider that the early loss of temporary molars is an important factor in the etiology of malocclusions, while some others (Seipel) reject this assertion. The decrease in the leeway/Leeway??-space was noticed in most situations. Kronfeld found out that 51% of the early lost temporary molars I and 70% of the early lost temporary molars II resulted in a loss of space, in a statistically significant rise in the frequency of malocclusion and an increased need for treatment. (6).

The size of the lost space depends on the lost tooth, patient’s age, eruption of the adjacent permanent teeth, the extent of the overcrowded space for some teeth and of the larger spaces among the rest of the teeth, the rhythm of dental eruption, etc. The loss of temporary molars II accelerates the reduction of the respective space, as compared with the situation of temporary molars I. Ronnerman7 found out that children who had lost temporary molars before the age of 7 years and a half had a smaller space than those without such a loss, while loss after this age had a less significant impact on this space.

The largest loss, as far as space was concerned, was noticed 6 months after tooth exfoliation (8). The necessity of using a space maintainer soon after the extraction of the temporary molars was largely accepted.

Many authors dealing with the lost space do not mention the possibility of a distal movement of the anterior teeth, considering the resulting space the consequence of a mezial movement of the teeth placed in distal position in the transitory edentulous space. Pringle3 is among those who demonstrated that: "in cases in which the arch displays normal anteroposterior relations, the early extraction of the upper temporary molars or of canines allow the crowns of the
lateral teeth to assume a distal position, and the central teeth have the tendency to follow the same movement.”

When the design of the space maintainer is considered, the manner in which the space is closed is of utmost importance. The main role of the maxillary space maintainer is to prevent the mesial migration of the distal teeth adjacent to the area of extraction. On the other hand, the distal migration of the teeth in a mesial position to the space is a movement which must be approached bimaxillary or mainly on the level of the mandible. In this way, distal displacement of canines is prevented, while the incisive teeth must be supported from the oral side, to avoid their oral collapse (9,10).

Conclusions

The early loss of temporary molars represents a potential risk factor for the integrity of the dento-alveolar arch. In this context, it is of utmost importance to identify the dental movement involved in the diminishing of the Leeway-space, so that to achieve a dental- and dental-alveolar congruence for the permanent teeth which will subsequently grow.

A careful examination of the space and assessment of the consequences are extremely important in establishing the clinical factors which will grant the success of the treatment. In this way, the ortopantomograph is justified for a correct identification of the possible local and local-regional short- medium- or long-term consequences, which might have psychosomatic and psycho-social implications.

References