AN ALGORITHM FOR TREATMENT OF CHILDREN UNDER GENERAL ANESTHESIA

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ABSTRACT

INTRODUCTION: Children indicated for general anesthesia are those with early childhood caries; with a high degree of anxiety from dental treatment, and those with special needs.

AIM: The aim of this article is to create an algorithm for the complex treatment of children under general anesthesia.

MATERIALS AND METHODS: The object of observation were 992 teeth in 124 children with primary dentition, treated under general anesthesia. The treated teeth were separated into two groups with 496 teeth each, depending on the way of treatment. Observation units: count and relative share of tooth-related complications in relation to the used treatment methods.

RESULTS AND DISCUSSION: In the first examined group all the teeth diagnosed with periodontitis were extracted. The teeth diagnosed with pulpitis, which had a developed apex and no x-ray data of root resorption, were treated with extirpation and filling of the root canals with metapex, followed by obturation with glass ionomer cement (GIC). Only 1.2% (n=3) of them had complications.

CONCLUSION: In order to prevent retreatment, a more radical therapy approach is mandatory. A basic principle in the treatment of these children is that it is consistent with a more severe differential diagnosis, in order to avoid complications.

Keywords: *general anesthesia, retreatment, radical approach*

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INTRODUCTION

Behavioral management has a main role in pediatric dentistry. A big part of children accept dental treatment with the help of techniques of behavioral management in dental clinics, with or without local anesthesia (1,2,3,4).

However, there are cases, where children do not accept routine dental treatment and the use of gen-

eral anesthesia (GA) is the only alternative to ensure dental treatment for children in a safe and effective way (5,6,7).

Dental treatment in childhood, accompanied by pain and unpleasant psychological and forceful experiences may result in fear, anxiety and evading of treatment, including in adult age. This inevitably leads to seeking new opportunities of behavior and pain control during dental treatment in children. The treatment of children, which includes physical force is unacceptable, especially if there are ways to evade it, using general anesthesia (8,9,10,11).

AIM

The aim of this article is to create an algorithm for the complex treatment of children under general anesthesia.

MATERIALS AND METHODS

The object of observation were 992 teeth in 124 children with primary dentition, treated under general anesthesia. The treated teeth were separated in two groups with 496 teeth each, depending on the way of treatment. Half of them were diagnosed with periodontitis chr. granulomatosa diffusa cum/sine fistule, and the other half - with pulpitis chr. fibrosa (248 each). In the first group the teeth with periodontitis were extracted, and the ones diagnosed with pulpitis were treated with extirpation, for teeth with completed root development and no physiolog-

ical resorption. In the second group all teeth diagnosed with pulpitis, not depending on the root development or resorption, were treated with amputation using the formalin-resorcinol method. Half of the periodontitis teeth, which had underdeveloped roots or were in a stage of root resorption (124) were treated with amputation using the formalin-resorcinol method. The other half (124), which had a completed root development and no root resorption had undergone mechanical and chemical treatment of the root canals, followed by filling.

Observation units:

Count and relative share of tooth-related complications in relation to the used treatment methods.

RESULTS AND DISCUSSION

In the first examined group, all the teeth diagnosed with periodontitis were extracted. The teeth diagnosed with pulpitis, which had a developed apex and no x-ray data of root resorption were treated with extirpation and filling of the root canals with metapex, followed by obturation with glass ionomer cement (GIC). Only 1.2% (n=3) of them had complications, for example periodontitis (Table 1).

Out of the 124 teeth diagnosed with periodontitis, treated with amputation in the second group, 80 (64.5%) had exacerbated. From the 124 teeth with mechanical and chemical treatment of the root canals, 32 (25.8%) have had complications. A total of 27 (10.9%) from the treated teeth, diagnosed with pul-

Table 1. A relative share of the complications after using different materials and methods while conducting a treatment under general anesthesia

Group	Diagnosis	Treatment Method	Complications
Research group (1)	Periodontitis chr. granulomatosa diffusa cum/sine fistule	Extraction	n=0 0%
	Pulpitis chr.fibrosa	Extirpation (used with developed roots and no root resorption)	Periodontitis n=3 1.2 %
Research group (2)	Periodontitis chr. granulomatosa diffusa cum/sine fistule	Amputation - Formalin-resorcinol method	Exacerbated n=80 64.5%
		Mechanical-chemical treatment of the root canals and filling (Developed root and no resorption)	Exacerbated n=32 25.8%
	Pulpitis chr. fibrosa	Amputation - Formalin-resorcinol method	Periodontitis n=27 10.9%

Fig. 1. Algorithm for treating children under general anesthesia

pitis chr. fibrosa have had complications as well. The complicated pulpitis teeth have undergone a treatment with amputation following the formalin- resorcin method.

There is a notable difference between the complications, related to using different methods of treatment in the two research groups. In the first research group where the diagnose is periodontitis chr. granulomatosa diffusa, mechanical and chemical treatment of the canals is and filling them with metapex is preferred and when the diagnose is pulpitis chr. fibrosa and the teeth have fully developed roots and no data of root resorption the complications are noticeably less.

Based on the research we have conducted an algorithm for treating children under general anesthesia (Fig. 1).

Clinical cases, treated following the steps of the algorithm:

CLINICAL CASE 1

Boy at the age of 2 years and 1 month, diagnosed with early childhood caries (Fig. 2). Uncooperative due to his young age, treated using the algorithm for treatment under general anesthesia.

1. Professional oral hygiene
2. Treatment of teeth 51,52 and 61, diagnosed with pulpitis chronica fibrosa, using extirpation (Fig. 3), mechanical and chemical treatment with so-

Fig. 2. Early childhood caries – before treatment

Fig. 4. Treatment of the root canals with sodium hypochlorite 2.5%

Fig. 5. A. Filling of the root canals with metapex and lining with GIC. B. X-ray of the filled root canals with metapex of teeth 51,52,61

Fig. 3. Pulp extirpation of teeth 51 and 61

- dium hypochloride 2.5% (Fig. 4) and filling the canals with metapex (Fig. 5a and 5b)
3. Tooth 62 had a D3 caries lesion, treated with amputation. Obturated with composite (Fig. 6).
4. Teeth 53 and 63 – D1 caries lesions, treated with fluoride varnish.
5. The parents received a written individual prophylactic program, with recommendations for

- a balanced food regime and strict oral hygiene with a toothpaste, containing F- 500 ppm.
6. A routine checkup was scheduled after 1 week.

CLINICAL CASE 2

Girl at the age of 3 years and 1 month, diagnosed with ECC (Fig. 7). Uncooperative due to her young age, treated using the algorithm for treatment under GA.

Fig. 6. Restoration of the four incisors with composite and celluloid crowns

Fig. 7. Early childhood caries before treatment

1. Professional oral hygiene
2. Teeth 51,61,52,62 have D2 caries lesions, which were treated and obturated with composite.
3. Teeth 84 and 85 were diagnosed with pulpitis chronica fibrosa and were treated using extirpation (Fig. 8). Tooth 85 was restored using a zirconium crown (Fig. 9 and Fig. 10).
4. The parents received a written individual prophylactic program, with recommendations for a balanced food regimen and strict oral hygiene with a toothpaste, containing F- 500 ppm
5. A routine checkup was scheduled after 1 week

CLINICAL CASE 3

Boy at the age of 8 with multiple carious lesions and a delayed eruption of tooth 21 (Fig. 11 and Fig. 12) treated, using the algorithm of treatment under general anesthesia.

Fig. 8. Treatment of teeth 84 and 85 using extirpation

Fig. 9. Placement of zirconium crown on tooth 85

Fig. 10. Child with ECC after treatment

After a tomography, a supernumerary tooth was discovered, located orally, which was the reason for the delayed eruption (Fig. 13). The area was disinfected, after which the tooth was extracted surgically (Fig. 14 and Fig. 15).

CONCLUSION

Based on the four-year experience in treating children under general anesthesia and their follow-up, we analyzed the different methods of treatment and we came to the conclusion that after di-

Fig. 11. A child with a delayed eruption of tooth 21 and multiple carious lesions (upper jaw)

Fig. 12. A child with a delayed eruption of tooth 21 and multiple carious lesions (lower jaw)

Fig. 13. Computer tomography of the orally located supernumerary tooth

agnosing pulpitis chr. fibrosa the treatment with extirpation and filling of the root canals with metapex when they are fully developed and have no root resorption is preferable over amputation and using the formalin-resorcinol method. The need for retreatment is higher in teeth, diagnosed with periodontitis chr. granulomatosa diffusa cum/sine fistule and

Fig. 14. Extracted supernumerary tooth

Fig. 15. After sanitization of the oral cavity

treated using amputation or mechanical and chemical treatment of the root canals, followed by filling. This proves that it is better to use the more radical method of extraction and using space maintainers where they are needed.

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