



DIRECT PULP CAPPING IN TREATMENT OF REVERSIBLE PULPITIS IN PRIMARY TEETH-CLINICAL PROTOCOL

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SUMMARY

The pulp of primary teeth is identical morphologically and physiologically to that of permanent teeth and it is capable to answer to pathological stimuli by producing tertiary dentin. When the inflammation of the pulp is in its reversible stage vital methods of treatment are indicated in order to stimulate the healing processes in it and protect its vitality. In Bulgaria the most popular method of treatment of inflammation diseases of the pulp in primary dentition is the mortal amputation. The biological way of treatment is not very common even in cases where there are indications for it.

Purpose: The aim of this paper is to present the approved by us protocol for application of direct pulp capping for treatment of reversible pulpitis in primary teeth.

Material and methods: On the base of world experience and our contemporary meta-analysis of the researches published in the last 15 years concerning the problems of diagnostics. We determined clinical and radiographic diagnostic criteria for reversible pulpitis in primary teeth and indications for application of direct pulp capping as a method of treatment. We give clinical steps for application of the method and summarized the clinical and radiographic criteria for success after treatment.

Results/conclusion: We gather all the information for applying direct pulp capping for treatment of reversible pulpitis in primary dentition. We offer the method of direct pulp capping as a clinical protocol "step by step" and illustrated by scheme which can be useful for students and dentists in their everyday practice.

Key words: direct pulp capping, primary teeth, reversible pulpitis, vital methods

Direct pulp capping is a method of treatment of inflammation diseases of the pulp in their reversible stage. The aim is to preserve the life of the pulp by stimulating healing processes in it. [1, 2, 3, 4]. Contemporary guidelines of pediatric dentistry [3, 4, 5, 6] and high number of scientists working in this sphere describe the method as applicable for traumatically opened pulp of temporary and permanent teeth or incidentally opened pulp during cav-

ity preparation [1, 6, 7, 8]. The method is not recommended for caries pulp exposure and the most common reason for that is the rapid progression of the developed inflammation [9 - 12]. An analysis of the specialized literature unravels also the fact that some unsuccessful results of this method are probably due to the absence of consensus on the exact technique of application [13]. Some authors recommend the treatment method only in cases of expected physiological exfoliation of the treated primary tooth in the next one to two years [2, 14,]. National association of pediatric dentists in Bulgaria in its consent comment that the direct pulp capping is not suitable for carious opened pulp with reversible pulpitis but recommend more investigations in this direction which could change the current opinion [8].

A lot of specialist in the last 15 years work and publish interesting result for successful application of direct pulp capping in primary dentition. The success rate is between 80% and 100% and this gives reason for more studies in this scientific direction [7, 15 - 27].

The aim of this paper is to present the approved by us protocol for application of direct pulp capping for treatment of reversible pulpitis in primary teeth.

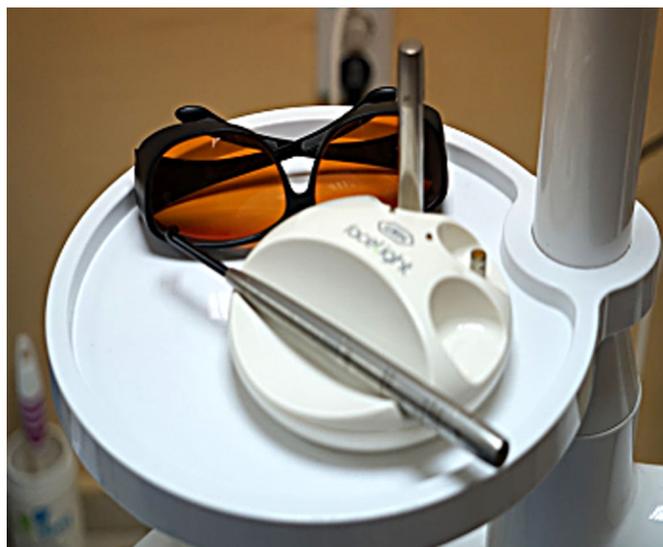
Presence of clinical protocol:

All clinical and radiographic criteria in the protocol are summarized from information obtained on the base of contemporary meta-analysis of clinical and radiographic criteria which specialists are using to diagnose reversible pulp inflammation in primary teeth and which are defined as criteria for choosing direct pulp capping as a treatment option [15].

Presented clinical protocol "step by step" is a result of our clinical experience and long term studies which are published and still followed-up [7, 15, 23, 25, 26, 27].

We used caries detector in our clinical studies for differentiate infected (cariou) from affected (demineralized) dentin (fig. 1). Infected dentin lights up in bright red (intensive red) after use of the detector but the affected dentin lights up in light red and the healthy dentin – in green color.

Fig. 1. Caries Detector Facelight (W&H)



As a pulp capping material we used mineral trioxide aggregate (MTA) which is recommended and applied in many newly published scientific studies. The success rate registered by us was 82,5% after period of two years follow-up [1, 15, 23 - 29].

Clinical Protocol:

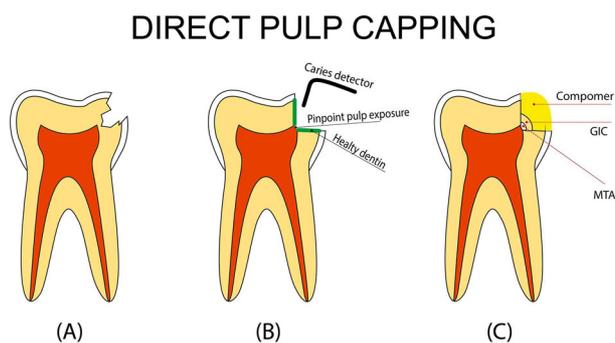
1. *Indications:* reversible pulpitis

2. *Diagnostic criteria:*

- Subjective:
 - Primary tooth with large carious lesion;
 - No history of past or present spontaneous/night pain;
 - Possible provoked pain by chewing which goes away after removal of the irritant.
- Objective:
 - Visually a primary tooth with large carious lesion (criteria determined by consent of National association of pediatric dentists in Bulgaria (8);
 - No visually observed communication with the pulp (fig.2 –A);
 - No pathological mobility or pain by percussion;
 - No swallow, redness, sinus tract or abscess in the surrounding soft tissues.
- Radiographic criteria: periapical or bitewing X-ray
 - Deep Carious lesion close to the pulp horn, or it may seem that there is no dentin barrier;
 - Lack of pathological resorption in fur cal and apical regions;
 - Lack of pathological external or internal root resorption;
 - Physiological resorption no more than 1/3 of the normal root length.

3. *Direct pulp capping “step by step”(Fig.2):*

Fig. 2. Scheme of the technique of direct pulp capping “step by step”



- Local anaesthesia;
- Isolation (cofferdam or cotton rolls);
- Excavation of the infected/carious dentin from the cavity walls, especially dentin-enamel junction with round bur/spoon excavator till reaching healthy dentin-it lights up in green with caries detector (fig.2-B); when cleaning the pulp wall before reaching the moment to control the excavation process with caries detector the pulp is opened; the anaesthesia allows us to have a good control on cleaning the infected dentin which is obligatory for applying direct pulp capping method.
 - Pulp exposure (till 1 mm in diameter) is cleaned with physiological solution;
 - Control of bleeding should be done in 1-2 min.;
 - Pulp exposure is covered with MTA (fig. 2-C);
 - The pulp capping material (MTA) is covered with glassionomer cement (fig. 2-C);
 - The cavity is finished with aesthetic restoration (fig. 2-C).
- 4. *Follow up period:*
 - Control check-ups are scheduled for 6 mounts, 1 year and 2 years after treatment.
 - *Clinical criteria for success:*
 - Lack of pain;
 - Lack of fractures of the obturation or secondary caries around the edges;
 - Lack of swallow, redness, fistula or abscess of the surrounding soft tissues;
 - Lack of pathological mobility of the tooth.
 - *Radiographic criteria for success:*
 - Presence of formed reparative dentin (calcifying fibrous bridge) on the side of the communication with the pulp (if there is no evidence for formed tertiary dentin the case is not classified as a failure);
 - Normally continuing physiological root resorption;
 - Lack of pathological external or internal root resorption;
 - Lack of pathological changes in furcal or periapical regions.

CONCLUSION:

Clinical protocol for method of direct pulp capping aims to present the technique "step by step" and in this way to encourage its application in everyday dental practice. Proper diagnose and strictly implementation of the clinical steps, illustrated on the proposed by us scheme, are extremely important for the final success. We recommend the method of direct pulp capping as an alternative in treatment of reversible pulpitis in primary dentition. The clinical protocol may be used successfully by students of dental medicine and dentists in their regular practice.

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