

# Direct pulp capping in primary molars: Report of two cases

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## ABSTRACT

Pulpotomy has been the preferred therapy for carious pulpal exposure in primary teeth. Direct pulp capping (DPC) is considered controversial on these types of cases due to the belief that the pulp may be compromised due to the bacterial invasion with subsequent treatment failure. This case report describes two cases of primary molars effectively treated with DPC after small pulpal exposures during caries excavation.

**Key words:** Calcium hydroxide, Dental pulp exposure, Direct pulp capping

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## INTRODUCTION

The goal of vital pulp therapy is to treat reversible pulpal damage in primary and permanent teeth in order to conserve the pulp vitality and function.<sup>[1]</sup> Vital pulp therapy includes the following approaches: Indirect pulp therapy (IPT), direct pulp capping (DPC), and pulpotomy. The use of DPC in primary teeth after carious pulpal exposure has been considered controversial, and this therapy is not advocated by the American Academy of Pediatric Dentistry.<sup>[2]</sup> DPC has been performed infrequently because the carious exposure may restrict the potential for recovery due to bacterial invasion and infection, which can jeopardize the host system's defense reaction.<sup>[3]</sup> Treatment failure may result in internal root resorption or dentoalveolar abscess.<sup>[4]</sup> The use of DPC, which consists of applying a dressing on the exposed pulp to promote healing and repair has been reported as a successful therapy;<sup>[5]</sup> therefore, it may be favorable to consider the pulp as a tissue that has considerably more regenerative capacity than commonly believed.<sup>[6]</sup>

This case report describes two cases of primary molars effectively treated with DPC after small pulpal exposures

during caries excavation in which calcium hydroxide (CH) was used a pulp capping medicament.

## CASE REPORTS

### Case report 1

#### History

A 4-year-old healthy female was presented for restorative treatment. There was no history of pain. Clinical examination revealed no signs of infection. Caries were noted on tooth L (occlusal-lingual) and tooth K (occlusal). Radiographic evaluation showed deep caries on teeth L and K without pulpal involvement or periradicular pathology.

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### Treatment

After a local anesthetic, rubber dam isolation was used. During caries excavation on tooth K, a pinpoint pulpal exposure occurred. CH (Dycal<sup>®</sup>, Dentsply Caulk, York, PA, USA) was placed on the exposure site followed by a resin-modified glass ionomer (RMGI) (Vitrebond<sup>™</sup>, 3M ESPE, St. Paul, MN, USA) liner. The preparation was etched, bonding agent (All-Bond 3<sup>®</sup> Universal Dental Adhesive System, Bisco, Inc., Schaumburg, IL, USA) applied and a composite restoration (Filtek<sup>™</sup> Supreme Ultra Universal Restorative, 3M ESPE, St. Paul, MN, USA) inserted. During caries excavation on tooth L, a pulpal exposure of approximately 2.0 mm was detected and a ferric sulfate (Astringent<sup>®</sup>, Ultradent, South Jordan, UT, USA) pulpotomy followed by a stainless steel crown (Hu-Friedy, Chicago, IL, USA) were performed. The patient was examined every 6 months for 24 months. During each appointment, mobility, percussion, and palpation sensitivity tests were performed on both teeth. After 24 months, no evidence of clinical or radiographic pathology was detected on tooth K. On the other hand, tooth L showed radiographic evidence of external root resorption and furcal radiolucency [Figure 1]. As a result, tooth L was extracted, and a space maintainer placed.

### Case report 2

#### History

A 6-year-old Caucasian male presented for restorative treatment. Clinical and radiographic examination revealed an asymptomatic tooth I with deep caries on the distal surface.

#### Treatment

Following local anesthetic and rubber dam isolation, a disto-occlusal cavity preparation was performed on tooth I. During caries excavation, a pinpoint pulp exposure was detected. The pulp was covered with CH (Dycal<sup>®</sup>) followed by an RMGI (Vitrebond<sup>™</sup>) liner. Tooth I was restored with the same technique as explained previously. The patient was examined at 6 and 12 months. At every exam, tests were performed to rule out mobility, pain to percussion or palpation. No evidence of clinical or

radiographic pathology was detected [Figure 2]. This patient is due for a 6 months follow-up visit, but since the family moved to another state it has not been performed. The plan is for the patient to have a follow-up evaluation with a pediatric dentist at their hometown.

### DISCUSSION

During the follow-up visits of case 1, tooth L treated with a pulpotomy showed signs of internal and subsequently external root resorption. This pulp therapy failed even though tooth L had appropriate preoperative clinical and radiographic findings. In contrast, on tooth K a more conservative approach was performed, and this therapy appears to have a successful outcome. The DPC on the tooth I (case 2) demonstrates to be an effective treatment as well.

Although DPC has not yet been viewed as an acceptable treatment for either primary or young permanent teeth after carious pulpal exposure, it may be favorable to consider the pulp as a tissue with regenerative capability.<sup>[6]</sup> The dental pulp has the ability to develop a dentin-like matrix (tertiary dentin) as part of the healing in the dentin-pulp organ.<sup>[7]</sup> When a pulpal exposure occurs, the amputated pulp can be restored by itself or by the use of capping materials.<sup>[8-10]</sup>

A previous clinical study reported that DPC on a carious pulpal exposure can be a treatment with successful outcomes<sup>[5]</sup> and the findings from this case report support the use of this pulp therapy on asymptomatic primary teeth.

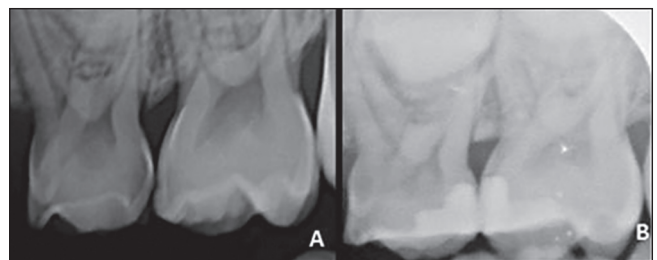
It is important to mention that for both cases an IPT could have been a feasible option as well, given the history of the absence of symptoms and appropriate clinical and radiographic findings.<sup>[11]</sup>

### CONCLUSION

The findings from this case report support the use of DPC when a small pulpal exposure occurs during caries excavation on asymptomatic primary teeth.



**Figure 1:** Radiographs of tooth K - preoperative (a) and at 24 months follow-up (b)



**Figure 2:** Radiographs of tooth I - preoperative (a) and at 12 months follow-up (b)

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## Conflicts of interest

There are no conflicts of interest.

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