

Case Report

Filling paste extruded from primary root canal remains for extended period: Two case reports

Kazuhiko Nakano, Noriko Shimizu, Serina Umemura, Kaori Nishio and Takashi Ooshima

Department of Pediatric Dentistry, Osaka University Graduate School of Dentistry
1-8 Yamada-oka, Suita, Osaka 565-0871, JAPAN

Abstract We examined 2 patients with filling material extruded from root canals of their primary teeth that remained for a long time. In Case 1, 3 separate small radiopaque masses were initially identified below the mandibular right second primary molar at the age of 7 years 6 months old and the patient was followed for approximately 7 years. The permanent successor was congenitally absent and the radiodensity of the masses decreased as the patient matured, though they were still apparent 7 years later. In Case 2, a large radiopaque mass was detected in the crown region of the permanent central incisor of a patient aged 5 years 2 months old, which had come from the root canal of the corresponding primary tooth that had been filled with iodoform calcium hydroxide paste. The radiopaque filling material in the root canal and the large mass seen superimposed on the crown of the permanent successor had apparently become separated. The mass became smaller and nearly disappeared 1 year 6 months later. In both cases, the root canal filling materials were speculated to have been extruded from the root apex. Differences in features of the radiopaque masses are discussed in this report.

Key words

Primary teeth,
Radiopaque mass,
Root canal filling

Introduction

Root canal filling is usually performed to preserve teeth that are heavily decayed by dental caries or fractured by a traumatic injury, and selection of filling materials for primary and permanent teeth varies based on developmental, anatomic, and physiological differences¹. Material used for primary teeth should be easily absorbed as the primary root become absorbed. In addition, filling materials must be harmless to periapical tissues and tooth germs, and be readily absorbed if overflowing occurs beyond the apex.

Zinc oxide-eugenol (ZOE) paste is the most commonly used root canal filling material in the United States^{1,2}, while calcium hydroxide/iodoform paste (Vitapex[®]) is widely used in Japan. ZOE paste has several disadvantages, including a mild foreign

body reaction when overfilling occurs beyond the root apex, because of its slow rate of absorption³. On the other hand, Vitapex[®] is regarded as a nearly ideal filling material for primary teeth. This paste has been shown to be absorbed at a similar speed as the absorption of primary teeth and any excess is generally absorbed within 1 week to 2 months².

In this report, we present 2 cases that showed unusually long periods of absorption of canal filling paste. In the first case, a radiopaque mass was found located below the mandibular second primary molar, for which the permanent successor was congenitally absent, that remained for a period of 7 years, while in other case, overfilled Vitapex[®] required a period of 1 year 6 months to become absorbed.

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Case 1

A girl was referred to the Pediatric Dental Clinic of Osaka University Dental Hospital by her general

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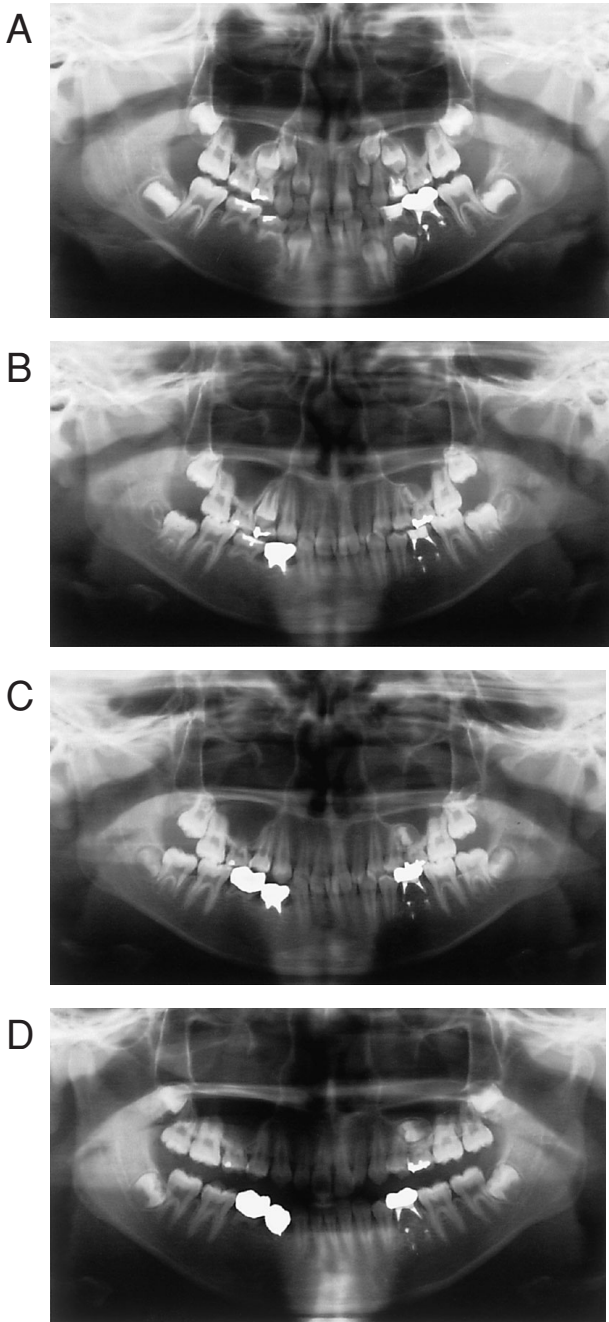


Fig. 1 Orthopantomographs images taken at 7Y6M (A), 10Y3M (B), 11Y1M (C) and 14Y4M (D) in Case 1

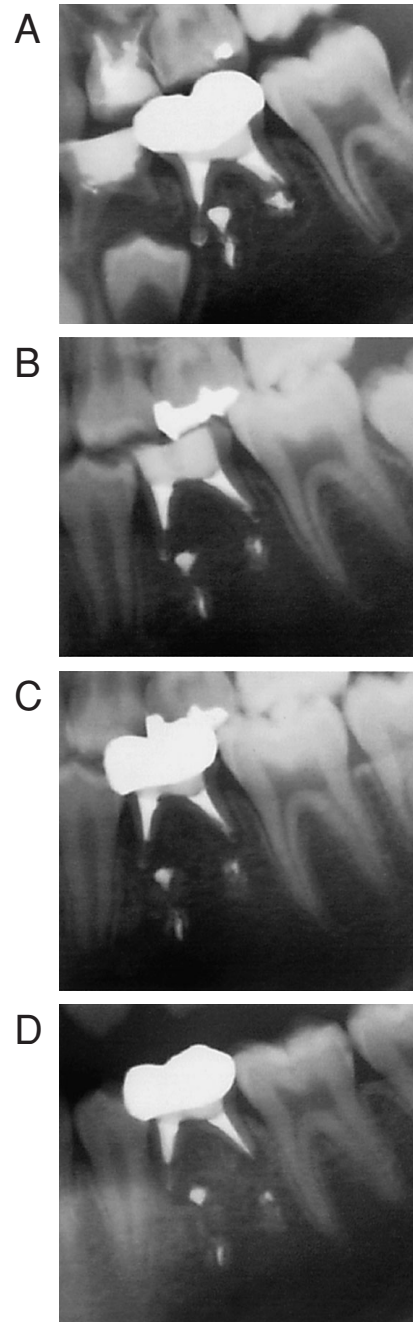


Fig. 2 Magnification of the mandibular primary molar area of the orthopantomographs images taken at 7Y6M (A), 10Y3M (B), 11Y1M (C) and 14Y4M (D) in Case 1

practitioner for management of multiple congenitally absent teeth at the age of 7 years 6 months. There were no special mention matter in disorders or unusual family history. Panoramic radiograph examination revealed that there were no tooth germs for any of the second premolars or mandibular right first premolar (Fig. 1A, 1B). The mandibular

right first primary molar was submerged below the occlusal plane. Three radiopaque masses were found below the root apex of the mandibular left second primary molar (Fig. 2A), however, there was no information available regarding past treatment of that tooth. We were able to identify the tooth germs of the maxillary left second premolar, and the

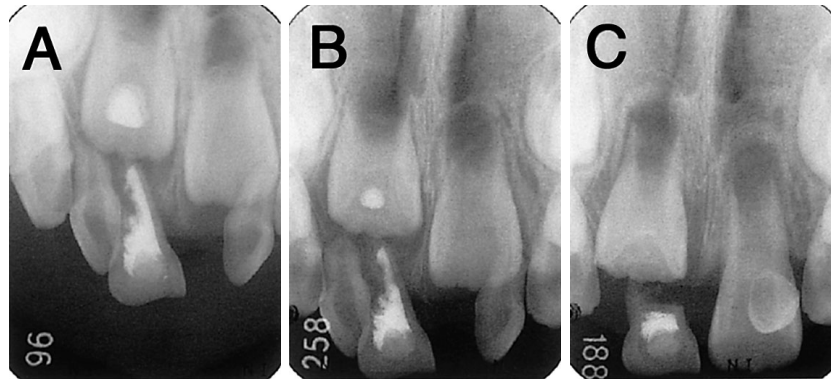


Fig. 3 Periapical radiograph taken at 5Y2M (A), 5Y6M (B) and 6Y8M (C) in Case 2

bilateral third molars. At the age of 10 years 3 months, the radiolucency from the root apex had disappeared and the positions of the 3 radiopaque masses were lower than at the examination at 7 years 6 months of age (Fig. 2B). In addition, calcified deposition was initiated to be identified in one of the masses located close to the distal apex. At 11 years 1 month, the tooth germ of the maxillary left third molar was identified, and the development of the maxillary second molar was observed (Fig. 1C). Further, the radiopaque masses were slightly smaller (Fig. 2C). At 14 years 4 months of age, all of the tooth germs of the third molars were detected and tooth formation of the maxillary second premolar had progressed (Fig. 1D). At that time, the radiopaque masses were smaller, but remained detectable in the radiographic images (Fig. 2D).

Case 2

A 5-year-2-month-old boy was referred to the Pediatric Dental Clinic of Osaka University Dental Hospital by his general practitioner for evaluation of the prognosis of a traumatic tooth. According to the dental records, a root canal treatment was performed for the maxillary right primary incisor, after which Vitapex® (calcium hydroxide/iodoform paste) was used to fill with the root canal (Fig. 3A). A periapical radiograph taken at the first visit (5 years 2 months of age) revealed irregular absorption on the distal side of the root and a radiopaque mass superimposed on its permanent successor. The radiopaque area in the root canal and the mass superimposed on the tooth were apparently separated. The mass became smaller at an examination conducted 5 years 6 months of age (Fig. 3B). At 6 years 8 months, the edge of the maxillary right central incisor had nearly

reached the alveolar bone crest and the radiopaque mass on the permanent successor had disappeared (Fig. 3C). The patient moved to another area and periodical follow-up examinations of the traumatized area were recommended to the new dentist.

Discussion

ZOE paste is the most popular root canal filling material for primary teeth in the United States, whereas absorbable iodoform paste is commonly used in Japan. There is no information available regarding what type of canal filling material was used in Case 1. However, the results of our 7 years of follow-up examinations led us to conclude that ZOE paste was likely used, and the 3 separate radiopaque masses may have been caused by overfilling, which caused a foreign body reaction. As for Case 2, calcium hydroxide/iodoform paste was the filling material used for the primary right central incisor. Although the time of the root canal filling is unclear, a certain amount of time had passed before the first visit to our clinic, because the filling material and radiopaque mass below the primary tooth were not continuous and clearly separated.

In general, a small amount of excess iodoform paste extruded from the apex is absorbed within 1 week, while up to 2 months may be required for a larger amount^{2,4)}. However, in the present Case 2, more than 4 months were needed for the radiopaque mass to be absorbed, which we considered to be uncommon. It is possible that the mass was extremely large as compared to the amount of overflowing material usually seen. Another possible reason might be that leakage of a large amount of filling material occurred because of widely irregular

absorption in the area on the distal side of the root.

Root canal filling materials for primary and permanent teeth have different criteria, and the major characteristics for the primary teeth should be absorbable ability⁵⁾. In Case 1, unlike general cases, the permanent successor was congenitally absent, indicating that the filling material used for that primary tooth was likely not absorbable. It is unclear what material was used for canal filling in this patient, however, several types including those used for permanent teeth are possible. Judging from the shape and location of the 3 radiopaque pieces, we speculated that it was ZOE paste.

Vitapex[®] has been reported to be superior to ZOE as a filling material following a pulpectomy in necrotic non-vital primary teeth⁶⁾. On the other hand, there have been some reports of possible complications caused by the extruded calcium hydroxide paste. A recent study reported occurrence of inferior nerve paraesthesia due to a necrotic effect caused by displaced calcium hydroxide paste, utilized as a temporary dressing material in a root canal that filled the mandibular second premolar⁷⁾. In the present Case 1, there were no signs or symptoms around the mass and the distribution of extruded paste was smaller than in that case of paraesthesia. In addition, the radiodensity of the lesion became gradually reduced over a period of 7 years.

As for the maxilla, the close proximity between the roots of the maxillary posterior teeth and the floor of the maxillary sinus may be a predisposing condition for establishment of an oroantral passage. Further, a case of an antrolith thought to be formed by extruded calcium hydroxide paste during endodontic therapy was very recently reported⁸⁾. A large amount of calcium hydroxide paste located on the surface of the palatal side of the permanent successor was identified in Case 2 (Fig. 3A).

Although it required a longer time than normal for the paste to be absorbed, there were no clinical signs or symptoms at any time. It is impossible for us to continue follow-up examinations after the normal eruption of the permanent central incisor, since the patient moved to another area. Nevertheless, an adequate follow-up observation seems to be necessary for such cases.

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