PEDIATRIC DENTAL JOURNAL 17(2): 167–172, 2007

Case Report

A case of supernumerary primary and permanent canines

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Abstract A case of supernumerary primary and permanent canines is presented. A 9Y4M-old boy was referred to our clinic for consultation regarding a maxillary supernumerary primary canine. An oral examination showed 2 primary canines with a similar morphology between the maxillary left lateral incisor and first primary molar. The primary canine in the opposite quadrant had the appearance of a fused-tooth, with composite resin restoration seen in the border. Orthopantomography revealed that permanent successors were present for each primary tooth in the maxillary left region, whereas only a single permanent canine was developing in the opposite quadrant. The 2 primary canines in the maxillary left region were extracted at 9Y4M. The mesially located permanent canine emerged into the oral cavity at 10Y1M and was extracted at 10Y9M. At 12Y2M, the other permanent canine located in the distal position had nearly reached the occlusal plane and the maxillary right permanent canine had arrived at the occlusal plane. Dental age was evaluated by assessing the tooth formation stages in 4 orthopantomographs taken between 8Y5M and 12Y2M, and found to be nearly the same as chronological age. However, the dental ages of the maxillary left permanent canine that had erupted earlier than the one located distally and of the left permanent canine were approximately 1 year behind chronological age. In addition, the dental age of the left permanent canine located distally was 2.5 years behind until the patient reached the age of 10Y9M, after which tooth development was accelerated following extraction of the mesially located permanent tooth.

Key words
Chronological age,
Dental age,
Primary canine,
Supernumerary tooth,
Tooth extraction

Introduction

Supernumerary teeth or hyperdontia is a term used to describe an excess in tooth number, which can occur in both primary and permanent dentitions[1]. The occurrence of supernumerary teeth in primary dentition is extremely rare, though it is most often seen in the premaxilla region[2,3]. A study held in Japan analyzed the prevalence of supernumerary teeth in 2,733 Japanese children aged 3 years old and reported it to be 0.07%[4], while more recently the preference in 8,122 Japanese children aged 3–6 years was found to be 0.05%[5].

Supernumerary teeth are classified morphologically as either the supplemental type or rudimentary type. The former features a duplication of the typical anatomy of anterior or posterior teeth, and the latter is characterized by a dysmorphic shape with a conical or tuberculate form[6]. The rudimentary type has been shown to be involved with a variety of complications, such as extraction difficulties, impaction, and ectopic eruption[1].

We encountered a patient with 2 primary canine-like teeth in the maxillary left region. Herein, descriptions of the primary and permanent dentition as well as the clinical approach used for this case are presented.

Received on March 12, 2007
Accepted on August 23, 2007

Case Report

A boy aged 9Y4M was referred to the Pedodontic

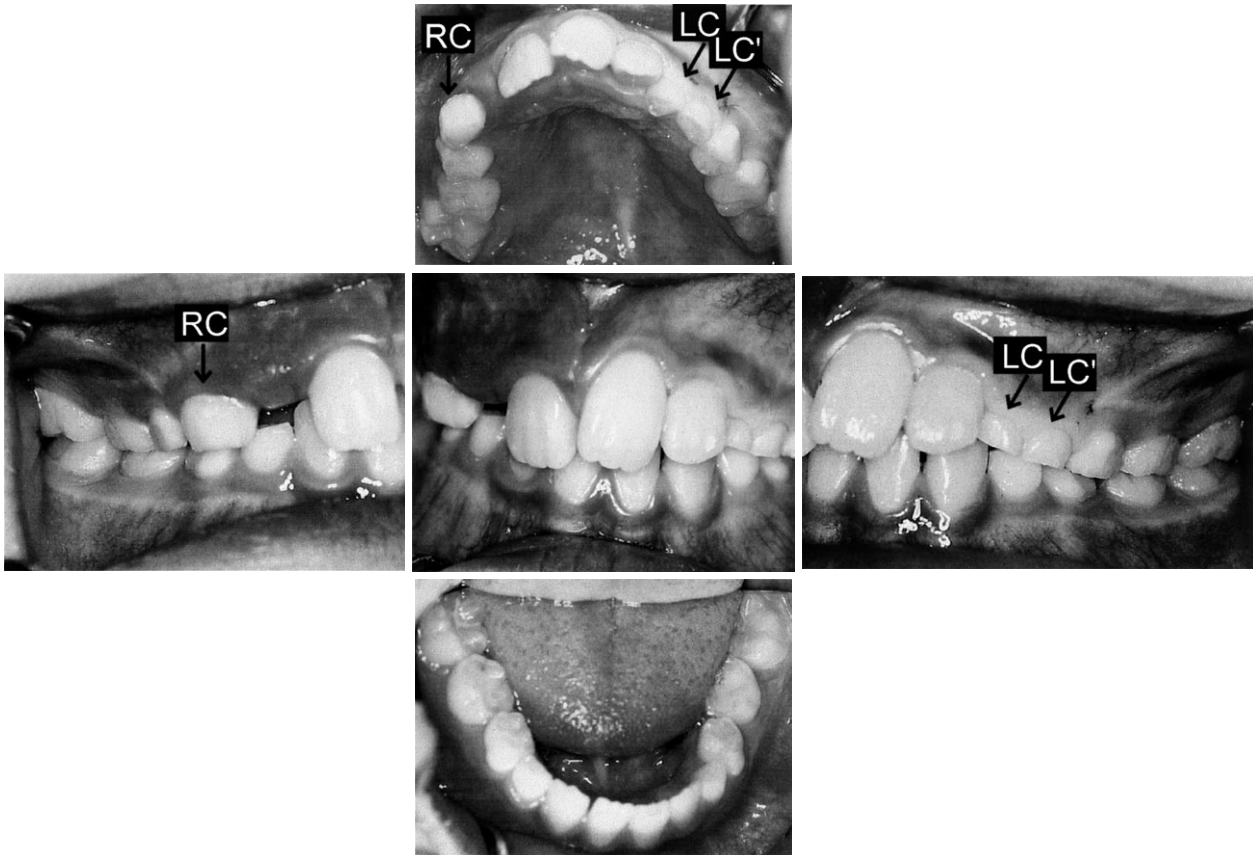

Fig. 1 Oral photograph taken at initial visit at 9Y4M
RC: maxillary right primary canine, LC: maxillary left primary canine,
LC': supernumerary primary tooth located in position distal from LC

Clinic of Osaka University Dental Hospital for consultation regarding supernumerary teeth. Figure 1 shows an intraoral photograph taken at the first visit to our clinic. Two teeth shaped like primary canines were identified in the maxillary right region (LC and LC' in Fig. 1), while a tooth with the appearance of a fused-tooth restored with composite resin at their border was identified in the opposite quadrant (RC). The boy and his parents were informed of the supernumerary teeth at the age of 8Y5M following an examination at another dental clinic and the orthopantomographs taken at that time were brought to us for reference. Orthopantomographs taken at our hospital at the age of 9Y4M showed that the morphologies of the teeth was similar and 2 permanent successors could be identified independently (L3 and L3' in Fig. 2A and B), which was the same as in the images taken at 8Y5M. The patient had no specific medical disorders and none of his family members was reported to be complicated with supernumerary teeth.

We decided to extract both primary canines to induce emergence of their permanent successors into the oral cavity. Extraction was performed under infiltration anesthesia and the extracted specimens showed only slight differences in their morphologies (Fig. 3). At 10Y1M, the cusp of one of the permanent canines appeared in the oral cavity and two-thirds of the tooth crown was visible at 10Y9M (L3 in Fig. 4), at which time we extracted the tooth under infiltration anesthesia. At a follow-up examination at 11Y9M, the permanent canine distal of L3 had nearly erupted (L3' in Fig. 5) and the morphology of the crown was quite similar to that of the opposite tooth (R3 in Fig. 5). The mesiodistal width of L3' was 8.1 mm, which was nearly the same as that of R3 and within the normal range for Japanese children[7].

The dental ages of the whole dentition and affected regions were evaluated at 4 different chronological ages using orthopantomographs (Fig. 2).

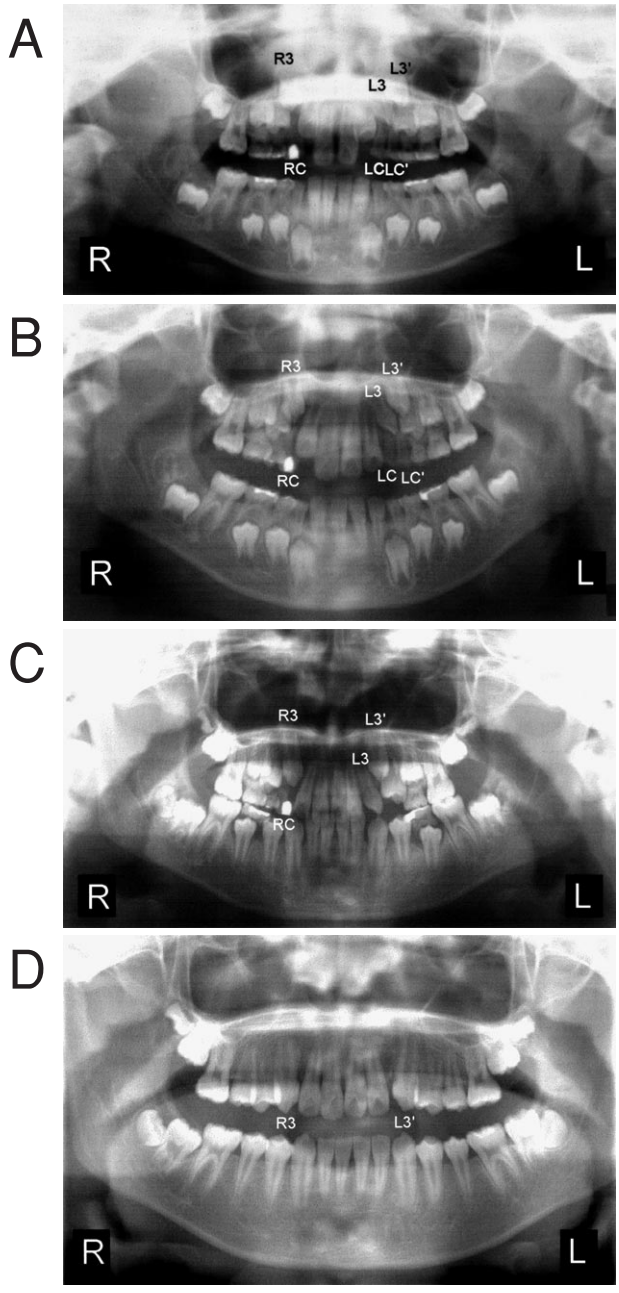

Fig. 2 Orthopantomographs taken at 8Y5M (A), 9Y4M (B), 10Y9M (C), and 12Y2M (D)

RC: maxillary right primary canine, R3: maxillary right permanent canine, L3: maxillary left permanent canine, L3': supernumerary permanent tooth located in position distal from L3, LC: maxillary left primary canine, LC': supernumerary primary tooth located in position distal from LC

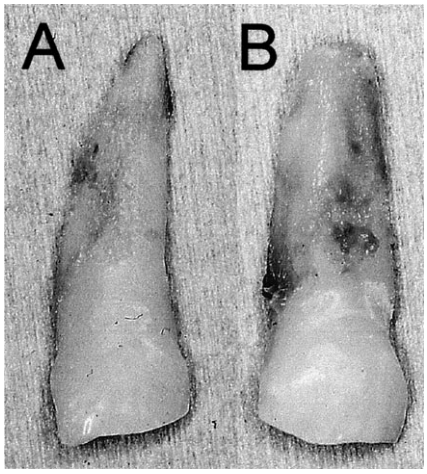

Fig. 3 Extracted maxillary right primary canine (A) and tooth located in distal position (B)

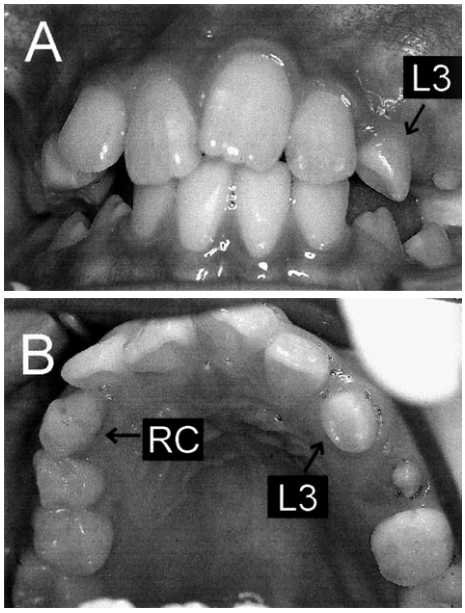

Fig. 4 Oral photograph taken at 10Y9M

RC: maxillary right primary canine,
L3: maxillary left permanent canine

Dental age calculations were performed using the method of Haavikko[8], which was proven to be valid for Japanese subjects in our previous study[9]. The dental ages of the present patient were very similar to the chronological ages at all 4 evaluations (Table 1). Further, the tooth formation stages of both of R3 and L3 were very similar, while that of L3' was behind by approximately 1.4 to 2.5 years.

Discussion

The prevalence of supernumerary primary teeth in Japanese subjects (0.05%) is considered to be significantly lower than those in other countries,

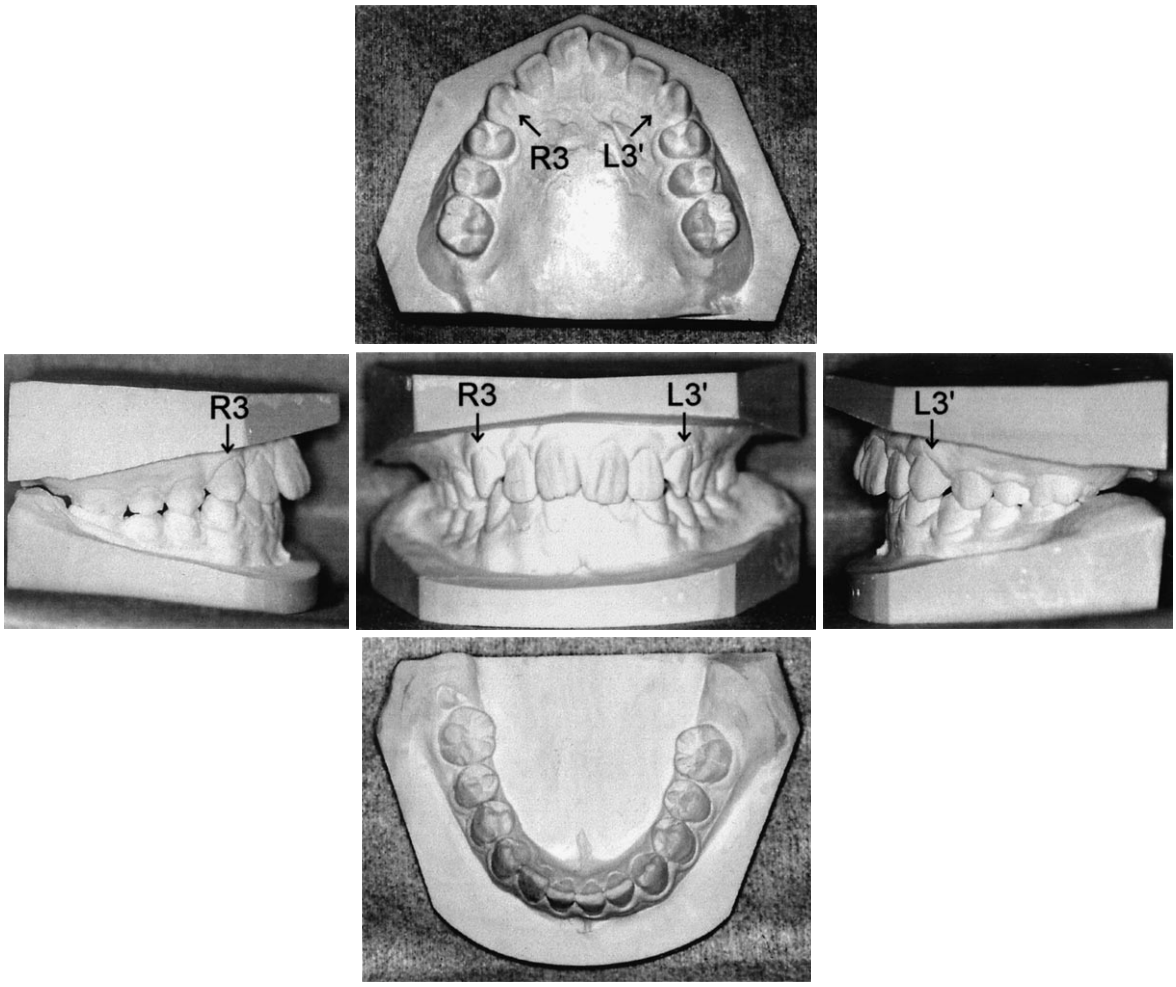

Fig. 5 Study cast taken at 12Y2M
R3: maxillary right permanent canine, L3': supernumerary permanent tooth located in position distal from L3

Table 1 Dental age of maxillary canines and supernumerary tooth in the maxillary canine region

Chronological age (years)	Dental age of the subject	Dental age of the teeth		
		R3*	L3*	L3'*
8.42	8.18 ± 0.84	7.0 (R1/4)	7.0 (R1/4)	4.6 (Crc)
9.33	9.50 ± 0.82	8.4 (R1/2)	8.4 (R1/2)	7.0 (R1/4)
10.75	10.87 ± 1.05	9.8 (R3/4)	9.8 (R3/4)	8.4 (R1/2)
12.17	12.21 ± 0.70	12.3 (Rc)	extracted	12.3 (Rc)

*: R3, L3 and L3' are indicated in Fig. 2.

such as the United States (0.23%), Sweden (0.26%), Canada (0.64%), Denmark (0.57%), Finland (0.40%) and China (0.44%)[5]. In addition, supernumerary teeth in the canine region are extremely rare clinical findings[10], and there have been only a limited number of case reports that presented details of clinical findings in cases of supernumerary canines. Türkkahraman *et al.*[11] reported severe esthetic and functional disturbances in a case of bilateral supernumerary maxillary permanent canines. In contrast,

we recently presented a case of bilateral supernumerary permanent canines in the maxilla, which had no complications due to their locations in the palatal side and not in the dental arch[12]. In the present case, simultaneous extraction of the 2 primary teeth followed by that of the permanent tooth successfully led to the supernumerary canine becoming located in the ideal position within the dental arch. These results indicate that the position of a supernumerary canine can influence clinical problems and treatment modalities.

The medial line of the maxillary dentition was displaced to the right at 9Y4M (Fig. 1), which was possibly caused by the presence of the 2 primary teeth in the unilateral dental arch between the lateral incisor and first primary molar. It has been reported that 35–60% of cases of primary supernumerary teeth are later complicated by the presence of supernumerary permanent teeth[13]. In the present case, a supernumerary canine was identified in the maxillary left quadrant, while no supernumerary teeth were detected in the opposite quadrant, in which the primary canine appeared to be a fused-tooth. It was fortunate that the morphologies of the permanent (L3) and supernumerary (L3') canines were similar, judging from the orthopantomograph taken at 9Y4M. In fact, the mesiodistal sizes of these 2 teeth were nearly the same (8.1 mm) when measured from a study cast made at 12Y2M. Based on results of a survey conducted in Japan, the mesiodistal width of the maxillary canine was reported to be 8.24 ± 0.49 mm (mean $\pm$ standard deviations)[7], indicating that these 2 teeth in the present patient were within the normal range.

The supernumerary canines in the present case were the supplemental type, according to the classification of Primosch[6], for which there are generally few clinical complications. We made a treatment plan for extraction of both primary canines (LC and LC'), followed by extraction of the permanent canine mesially located (L3) to induce the other permanent canine located distally (L3') to move into position between the maxillary left lateral incisor and first primary molar. At 12Y2M, the treatment was completed with no unexpected complications, and the patient and his parents were satisfied with the outcome.

Previously, we reported a case of external root resorption of the distal root of a mandibular second permanent molar caused by the adjacent third molar, for which the second molar with severe root resorption was extracted[14]. Surprisingly, the third molar became positioned in the space left by the extracted tooth as if it was a second molar, indicating that a tooth may be ideally positioned by moving into the space vacated by an extracted tooth if a suitable timing for extraction is selected.

The dental ages of supernumerary canines reported previously[12] and those in the present case were quite different and it is interesting to compare the orthopantomographs taken at 12Y2M in both. The dental ages of the supernumerary canines in the previous case were extremely late (behind by 7 years), while those in the present were nearly the same as the chronological age of the patient. The main difference between these patients was the location of the supernumerary teeth, as those in the previous case were located in the palatal side, while those in the present were located distally. In our patient, the dental age of L3' was behind by 4.6 years at 8Y5M, however, the speed of tooth development became rapidly elevated after extraction of the primary teeth as well as the permanent canine located mesially. Thereafter, L3' moved into the extracted tooth position and began to develop at an accelerated pace, indicating that the timing of extraction is important when planning treatment.

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