

Short Communication

## Heredity may be one of the etiologies of supernumerary teeth

Asuka Kawashima\*<sup>1</sup>, Yoshiaki Nomura\*<sup>2</sup>, Yoko Aoyagi\*<sup>1</sup> and Yoshinobu Asada\*<sup>1</sup>

\*<sup>1</sup> Department of Pediatric Dentistry,

\*<sup>2</sup> Department of Preventive Dentistry and Public Health,  
Tsurumi University School of Dental Medicine  
2-1-3 Tsurumi, Tsurumi-ku, Yokohama 230-8501, JAPAN

**Abstract** Supernumerary teeth are often seen in daily clinical practice in pediatric dentistry. To investigate the role of genetics, we carried out a case control study. The study population consisted of 103 males and 184 females and their mean ages were  $8.31 \pm 3.03$  (age range: 3 to 18). The patients with supernumerary teeth were diagnosed by radiography. For the control groups, the absence of supernumerary teeth was confirmed by panorama radiographs and interviews with the patients' parents about past treatment of the supernumerary teeth in other dental clinics. The presence or absence of supernumerary teeth in other family members was also investigated by the questioners. A total of 287 patients were analyzed. If supernumerary teeth existed in either of the parents, the odds ratio was 5.989. This result indicated that genetics may play some role in the occurrence of supernumerary teeth.

**Key words**

Heredity,  
Supernumerary teeth

Supernumerary teeth are often seen in daily clinical practice in pediatric dentistry. Their prevalence had previously been reported to be 0.8% in deciduous teeth and 2.1% in permanent teeth<sup>1)</sup>. In Japan, prevalence had been reported to be 0.3% to 5.0%<sup>2)</sup>. The maxillary region has the highest frequency of occurrence<sup>3)</sup>. Ninety to 98% of supernumerary teeth occur in the maxilla, and permanent dentition is more frequently affected than primary dentition. The most common supernumerary tooth is the mesiodens, which occurs in the palatal midline and can assume a number of shapes and positions relative to the adjacent teeth. It can also affect the eruption or location of permanent teeth. In addition, sometimes it causes defective formation of the tooth root. Many reports exist on the prevalence or treatment of supernumerary teeth, however the etiology of the condition is still unknown. The role of genetics had been reported, however the sample size of the study population was not sufficient. Thus,

we conducted a case control study to investigate the role of genetics in supernumerary teeth.

The study population was obtained from patients who attended the pediatric dental clinic in the Dental Hospital of Tsurumi University from August 2002 to October 2004. The study population consisted of 103 males and 184 females, and their mean ages were  $8.31 \pm 3.03$  (age range: 3 to 18). The patients with supernumerary teeth were diagnosed using radiography and the control groups were also obtained from patients who attended the pediatric clinic of the Dental Hospital of Tsurumi University. For the control groups, the absence of supernumerary teeth was confirmed by panorama radiographs and interviews with their parents about the past treatment of the supernumerary teeth in other dental clinics. The presence or absence of supernumerary teeth in other family members was also investigated by the questioners. Informed consent was obtained from the parent of the patients and this study was approved by the ethical committee of the Tsurumi University (Approval number was 2002-008). A total of 287 patients were analyzed. One hundred

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Table 1 Odds ratios for a questionnaire about supernumerary teeth

		Supernumerary teeth			P-value	Odds ratio
		-	+	Missing		
Father	-	140	130	8	0.002	—
	+	0	9			
Mother	-	137	134	5	0.217	2.726
	+	3	8			
Any siblings	-	140	95	41	<0.001	—
	+	0	13			
In either parent	-	137	122	9	0.002	5.989
	+	3	16			

For any siblings, missing value included the patients without any siblings.  
If 0 values were existed in any cells, odds ratio could not calculated.

forty-three patients had supernumerary teeth and 154 were normal. Cross tabulations were performed and *P*-values were calculated by Fisher's exact test. If supernumerary teeth existed in either of the parents, the odds ratio was 5.989 (Table 1).

A variety of dental anomalies are associated with defects in tooth development precipitated by heredity, systemic, traumatic, or local factors. Identification of anomalies of odontogenesis is important in evaluating etiological factors, dental and medical histories, present states of oral health, and control and management. Supernumerary teeth may be single or multiple, unilateral or bilateral, malformed morphologically or normal in size and shape, and erupted or impacted<sup>4-8</sup>). The etiologies of supernumerary teeth were suggested to be abnormalities in the division of the tooth germ, hyperplasia of the normal tooth bud or tissue derivation, however, there is still no established theory<sup>9</sup>). In contrast, many clinical case reports have shown that supernumerary teeth may be the heredofamilial dental anomaly<sup>7,10</sup>) and it appeared in the same location in the monozygotic twins<sup>9,11</sup>). The available data confirmed that supernumerary traits have a strong hereditary component, but do not appear to conform to a simple Mendelian pattern. Environmental factors may also play a part.

In this study, by surveying patients whose supernumerary teeth had been extracted, we discovered that the odds ratio of having supernumerary teeth in either parent was 5.989. Even though this survey was carried out by the questioners, it was suggested

that heredity factors might be involved in the etiology of supernumerary teeth. The supernumerary teeth, impacted or erupted, may remain in position for many years without clinical manifestations, either pathologic or orthodontic conditions. Many complications can be associated with supernumeraries, including impaction, delayed eruption, or ectopic eruption of adjacent teeth, crowding, development of a median diastema, eruption into the floor of the nasal cavity, formation of primordial or follicular cysts with significant bone destruction, and root resorption of adjacent teeth<sup>5,6,12,13</sup>). Early diagnosis of supernumeraries is crucial even if these complications are to be avoided or minimized. The mode of inheritance for supernumerary teeth is still unknown, however the information obtained in this study is essential. In this study, we obtained the information that the presence of supernumerary teeth in the patient's parents can be an important aid in diagnosis.

The results of this study indicated that heredity may be involved in the etiology of supernumerary teeth.

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