

REGULA SCHMUCKLI  
CLAUDIA LIPOWSKY  
TIMO PELTOMÄKI

Department of Orthodontics  
and Pediatric Dentistry  
University of Zurich

**Corresponding author**

Dr. Regula Schmuckli  
ZZMK, Abteilung für Kieferorthopädie  
und Kinderzahnmedizin  
Plattenstrasse 11, 8032 Zürich  
Tel. +41-(0)44-634-32-22  
Fax +41-(0)44-634-43-04  
E-mail: regula.schmuckli@gmail.com  
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# Prevalence and Morphology of Supernumerary Teeth in the population of a Swiss Community

## Short communication

**Key words:** prevalence, supernumerary teeth, mesiodens, tooth morphology, orthopantomogram

**Summary** The objective of the study was to determine the current prevalence of supernumerary teeth (PST) in the population of a Swiss community.

3,004 orthopantomograms (OPTs) routinely produced during the annual school dental examinations in the Winterthur municipality from 1990 to 2005 served as the study basis (average age 9.45 years, 1391 girls, 1613 boys, age range 6–15 years).

The study found 44 supernumerary teeth, which yields a prevalence of 1.5%. The prevalence among boys was higher than among girls, with 1.1% and 0.4%, respectively. The greatest proportion of supernumerary teeth was found in the maxillary anterior region

(38 of 44 teeth, 86%). Based on their position, 33 of these were classified as mesiodens. Five supernumerary teeth had the same shape as a maxillary lateral incisor. In the mandibular anterior region, five supernumerary teeth were shaped the same as the permanent mandibular incisors. 70% of the supernumerary teeth were conical.

The prevalence of supernumerary teeth is low (1.5%) and comparable to similar studies in the literature. The majority (86%) of supernumerary teeth are located in the maxillary anterior region. Thus, in the case of retention or delayed eruption, dentists should bear in mind that supernumerary teeth may be the cause.

## Introduction

Supernumerary teeth are defined as teeth additional to the normal dentition (RAJAB & HAMDAN 2002, PROFF ET AL. 2006). They can occur singly or in multiples, uni- or bilaterally, in both jaws, and associated with a syndrome or disease. Supernumerary teeth can erupt normally or be impacted; both cases can result in clinical problems. Most of the problems arise in connection with tooth eruption and development of the dentition (ORHAN & ÖZER 2006). Clinically, supernumerary teeth are usually coincidentally diagnosed, either during intraoral examination or on a radiograph. In certain cases, supernumerary teeth can cause malocclusion. They can be responsible for the following complications: crowding, disturbed eruption or

retention of teeth, delayed or abnormal root formation in permanent teeth, and cysts (PROFF ET AL. 2006). Supernumerary teeth can occur in both the permanent and the primary dentition, but the prevalence in the primary dentition is five times lower (GRAHNEN 1961, SEDANO & GORLIN 1969, SYKARAS 1975). Supernumerary teeth can occur in almost all regions of the dental arch. However, most are found in the anterior maxilla, either as mesiodens or supernumerary lateral incisors (ROBERTS ET AL. 2005). The distribution of supernumerary teeth appears to differ by gender; various authors have found the ratio of men to women with supernumeraries to be 2.2:1 or 2:1 (RAJAB & HAMDAN 2002, HOGSTROM & ANDERSON 1987, BROOK 1974). In contrast, a different study found the distribution to be 1.3:1 (LUTEN 1967).

The etiology of supernumerary teeth has yet to be unambiguously clarified. The most widely recognized theory ascribes the cause to hyperactivity of the lateral dental lamina, in which residual epithelium proliferates (PRIMOSCH 1981, GARVEY ET AL. 1999, RAJAB & HAMDAN 2002). In addition, supernumeraries can occur in the case of DNA mutations, cleft lip/jaw/palate, cleidocranial dysplasia (CCD), and Gardner Syndrome, among others. It would appear that the etiology of supernumerary teeth is a multifactorial process which does not simply unfold according to Mendelian laws, but instead is subject to a combination of genetic factors and environmental influences (RAO & CHIDZONGA 2001).

### Classification

Supernumerary teeth are classified according to their morphology and location (Figs. 1 and 2). In the permanent dentition,

there are four different morphological types: conical, tuberculate, supplemental, and odontoma (GARVEY ET AL. 1999).

The purpose of this study was to determine the current prevalence and morphology of supernumerary teeth in the population of a Swiss community, as the last data from Switzerland were collected in 1974 (STÖCKLI & BEN ZUR 1994).

### Materials and Methods

3,004 orthopantomograms (OPTs) routinely produced during the annual school dental examinations in the Winterthur municipality from 1990 to 2005 served as the study basis (average age 9.45 years, 1,391 girls, 1,613 boys, age range 6–15 years). The OPTs were retrospectively examined by two dentists. 300 OPTs were evaluated by both dentists, who subsequently discussed the positive findings. The rest of the OPTs were divided between the two dentists. There was no danger of assessing two

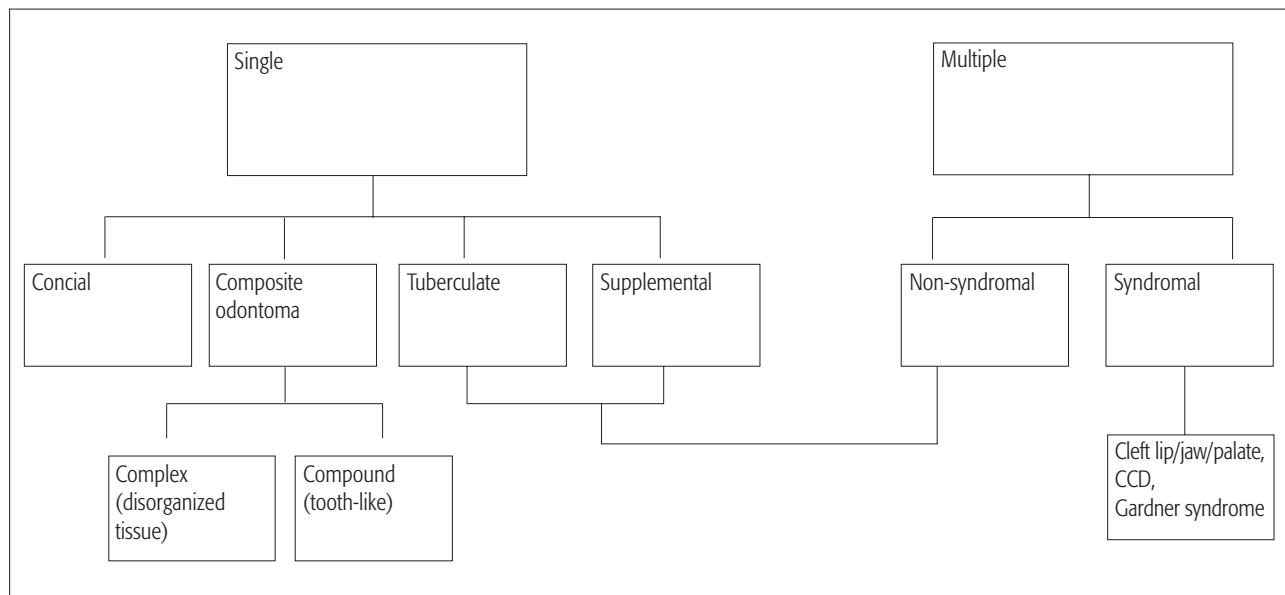


Fig. 1 Classification of supernumerary teeth according to GARVEY et al. 1999.

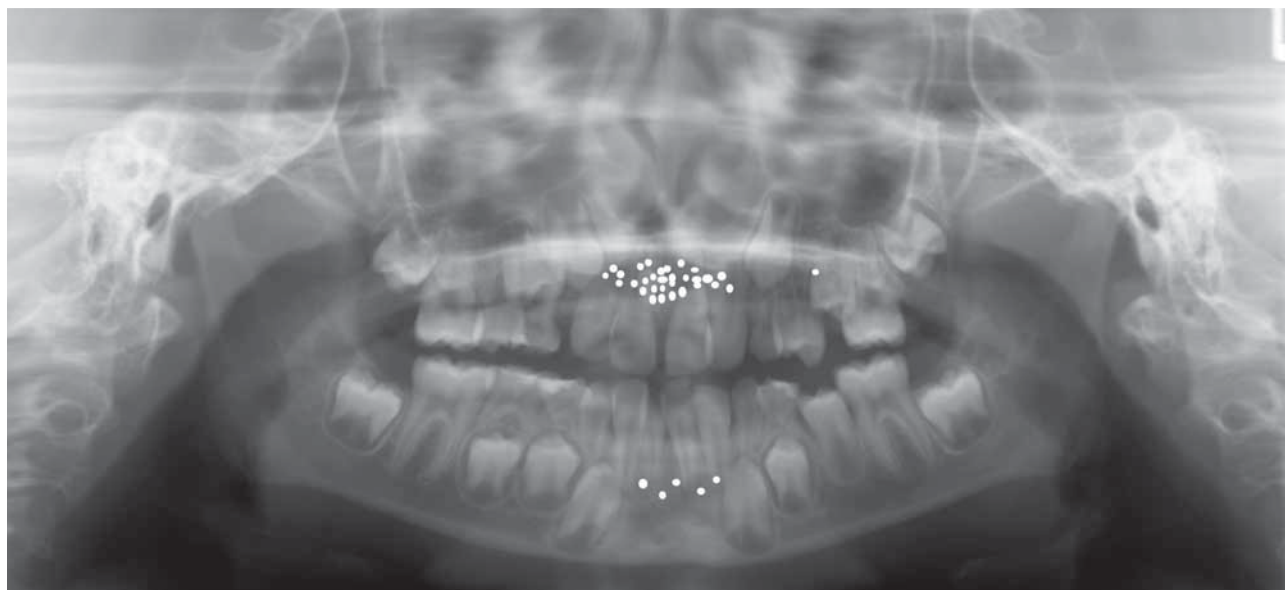


Fig. 2 Distribution of the 44 supernumeraries superimposed on an orthopantomogram.

OPTs from the same patient, since the radiographs were kept in the same dossier to facilitate recognition of identical images. The number of supernumeraries was recorded and their morphology determined.

## Statistics

Statistical evaluation was performed with the Windows XP-Excel Statistical Package and SPSS 15.01 for Windows (SPSS Inc., Chicago, Illinois, USA). The statistical analysis was descriptive.

## Results

Forty-four supernumerary teeth were found in this study. This yields a total prevalence of 1.5%; among boys the prevalence was 1.1% and among girls 0.4%. Table I presents an overview of the results and Figure 2 illustrates the distribution of supernumeraries within the dentition.

The most frequent location of supernumerary teeth is the maxillary anterior region, where 38 supernumerary teeth were found in this study, chiefly as mesiodens (a total of 33 teeth). Five supernumeraries were discovered in the mandibular anterior region, and one supernumerary premolar was observed in the premolar region.

The conical supernumerary was the most frequent type, comprising 70%, followed by the supplemental (25%) and the tuberculate (5%) morphological types.

## Discussion

With a prevalence of 1.5%, the results of this study are comparable to those from similar publications in the literature. A prevalence of supernumerary teeth from 1% to 3% is usually found among Caucasians, while in east Asian countries and in patients with cleft lip/jaw/palate or cleidocranial dysplasia, prevalences are higher (BROOK 1974, TAY ET AL. 1984, LIU 1995, MASON ET AL. 2000, SALCIDO-GARCIA ET AL. 2004, BADRA ET AL. 2005, DE OLIVEIRA GOMES ET AL. 2008).

In terms of location, most supernumerary teeth occur in the maxillary anterior region (DE OLIVEIRA GOMES ET AL. 2008). The present study was in agreement with this, as 86% were found in the anterior maxilla.

The gender-specific distribution of supernumeraries in this study showed that the prevalence was much higher among boys (1.1%) than among girls (0.4%), i. e., a ratio of 2.75:1, which corresponded to ratios of 2:1 to 6:1 reported in the literature (LUTEN 1967, RAVN 1971, BROOK 1974, TAY ET AL. 1984, DAVIS 1987, DE OLIVEIRA GOMES ET AL. 2008).

Tab. I Distribution of supernumerary teeth

	n
Mesiodens, conical	31
Mesiodens, tuberculate	2
Supernumerary incisors (maxilla, anterior)	5
Supernumerary premolars (maxilla, buccal)	1
Supernumerary incisors (mandible, anterior)	5
Total supernumerary teeth	44
Number of patients examined	3,004
Prevalence (percent boys)	1.5% (1.1%)
Location (maxilla, anterior)	38

The frequencies of the different morphological types of supernumeraries (70% conical, 25% supplemental, 5% tuberculate) found in this study also largely agree with those of the current literature, where the prevalence of the conical type ranges from 31% to 75% and that of the supplemental form from 4% to 33% (KOCH ET AL. 1986, ZILBERMANN ET AL. 1992, HATTAB ET AL. 1994, LIU 1995, PRIMO & WILHELM 1997, RAJAB & HAMDAN 2002, UMWENI & OSUBOR 2002, KIM & LEE 2003, DE OLIVEIRA GOMES ET AL. 2008). Only the prevalence of the tuberculate tooth form (5%) deviated from that documented in the literature (between 12% and 28%). There is no objective reason for this discrepancy; neither the methodology employed nor the age groups of the patients can explain this difference.

The treatment of supernumerary teeth differs from case to case. According to Kuroi (KUROI 2006), mesiodens may be left in situ if they cause no clinical complications. His observations show that pathological phenomena such as resorptions of permanent teeth or cystic alterations are extremely rare. Kuroi is confident that they will spontaneously resorb or even erupt, thus making their extraction a simple matter. However, most authors share the opinion that once a supernumerary is discovered, it should be surgically removed (PRIMOSCH 1981, KOCH ET AL. 1986, ZILBERMANN ET AL. 1992, PRIMO & WILHELM 1997, RAO & CHIDZONGA 2001, ERSIN ET AL. 2004, SOLARES & ROMERO 2004, DE OLIVEIRA GOMES ET AL. 2008). In the cases examined in this study, supernumerary teeth were always removed surgically.

## Conclusion

The prevalence of supernumerary teeth in the population of a Swiss community is low (1.5%) and comparable to similar previous studies. Most supernumeraries are located in the anterior maxilla and are classified as mesiodens due to their position. In most cases, these teeth are conical. If retentions or delayed eruptions arise in this region, the dentist should consider that supernumerary teeth may be the cause.

## Résumé

Le but de cette étude était d'examiner la prévalence de dents surnuméraires (PDS) dans la population d'une commune suisse.

3004 orthopantomogrammes (OPTs) des contrôles scolaires annuels, entre 1990 et 2005 dans la ville de Winterthur, Suisse, ont servi de base (âge moyen 9,45 années, 1391 filles et 1613 garçons).

44 dents surnuméraires ont été trouvées. Ceci représente une prévalence de 1,5%. La PDS chez les garçons (1,1%) était plus grande que parmi les filles (0,4%). La plupart des dents surnuméraires étaient localisées dans le bloc incisif supérieur (38 sur 44, 86%). Parmi ces dernières 33 dents surnuméraires ont été désignées comme «mésiodentes». Dix individus ont présenté des dents surnuméraires de taille et de forme normale; cinq au bloc incisif supérieur et cinq au bloc incisif inférieur.

70% des dents surnuméraires présentaient une forme conoïdale et, de ce fait, représentaient l'anomalie morphologique la plus fréquente.

L'étude montre que la PDS est basse (1,5%) et comparable avec les résultats trouvés dans d'autres études. Etant donné que la plupart des dents surnuméraires sont localisées dans la région incisive supérieure (86%), le fait d'avoir un délai d'éruption des incisives permanentes devrait faire penser le médecin-dentiste à la présence éventuelle d'une dent surnuméraire.

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