Association between maxillary anterior supernumerary teeth and impacted incisors in mixed dentition

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ABSTRACT

Background. Few researchers have investigated the relationship between supernumerary teeth (ST) and impacted incisors. The authors investigated the relationship between ST and impacted incisors in the maxillary anterior area in the mixed dentition.

Methods. Using cone-beam computed tomography, the authors diagnosed 417 ST among 294 patients (age range, 6-12 years; 220 boys and 74 girls). The number, morphology, growth orientation, and position of ST were recorded along with the presence of impacted incisors.

Results. The authors reported that 23.1% of patients having ST (n = 68; mean [standard deviation] age 8.5 [1.6] years) also had impacted incisors. Morphology (molariform and odontomelike), growth orientation (normal and no orientation), and position (coronal) of the ST were significantly associated with impacted incisors ($P < .05$ for all). An increase of 1 year in age was associated with a decreased risk of having ST accompanied by impacted incisors (odds ratio, 0.76; 95% confidence interval, 0.63 to 0.92). An increase of 1 ST more than doubled the risk of having an impacted incisor (odds ratio, 2.39; 95% confidence interval, 1.44 to 3.96).

Conclusions. In this population, the number, morphology, growth orientation, and position of ST as well as the patient's age were associated with impacted incisors in the maxillary anterior area during the mixed dentition.

Practical Implications. The presence and morphology of ST should alert the clinician to the increased likelihood of having impacted incisors and the need for early diagnosis and appropriate treatment.

Key Words. Supernumerary teeth; impacted incisors; mixed dentition.

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Supernumerary teeth (ST), which are defined as any teeth or odontogenic structures that are formed from a tooth germ in excess of the normal number for any given region of the dental arches, are developmental abnormalities that are usually encountered in the clinical practices of pediatric dentists and oral surgeons.[1] The prevalence of ST is 0.3% to 0.8% in primary dentition and 1.5% to 3.5% in permanent dentition.[2-4] The distribution of ST can be single, multiple, unilateral, or bilateral. Multiple ST are rare and mostly related to syndromes such as Gardner syndrome, cleidocranial dysplasia, and cleft lip and palate.[5,6]

Although ST can present in all areas of the dental arches, they have been found to be more prevalent in the maxillary anterior area.[7] The presence of ST in the maxillary anterior area causes esthetic and functional problems, significantly impacting the patient's quality of life.[8] In addition, ST can also affect the eruption of maxillary permanent incisors and lead to the impaction of these incisors.[9,10] Therefore, maxillary anterior ST have been considered to be 1 of the most important risks for the impaction of maxillary permanent incisors, and impacted incisors caused by ST have been reported.[8,9] However, few researchers have investigated the relationship between the characteristics of ST and the impaction of maxillary incisors.

Our aim in conducting this study was to investigate the relationship between the characteristics of maxillary

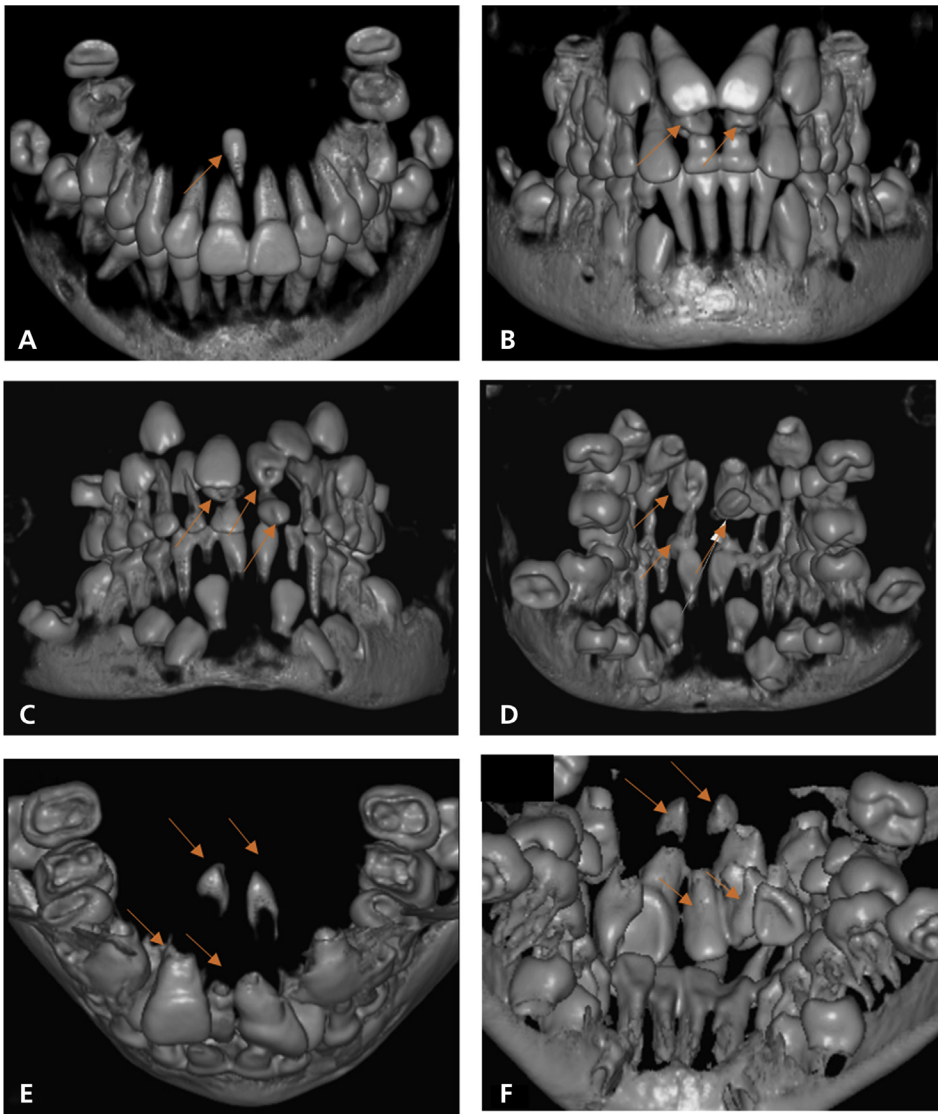

Figure 1. Cone-beam computed tomographic images showing the number of maxillary anterior supernumerary teeth (ST) (arrows). **A.** One ST. **B.** Two ST. **C, D.** Three ST. **E, F.** Four ST.

anterior ST and maxillary impacted incisors by using cone-beam computed tomography (CBCT). These characteristics of maxillary anterior ST included their number, morphology, growth orientation, and position.

METHODS

We included in this study a total of 294 patients from the Nanjing Stomatological Hospital, Medical School of Nanjing University, Nanjing, China. All CBCT (VG, NewTom) records in the hospital database were screened and assessed for eligibility. We contacted patients who had at least 1 ST present in their CBCT record and obtained informed consent to use their data in our research. The exclusion criteria were syndromes or systemic diseases that predisposed patients to having ST, history of oral cavity trauma, and tumors in the oral cavity. The study was approved by the Ethical Standards Committee of Nanjing Stomatological Hospital.

We imported the CBCT imaging records and Digital Imaging and Communications in Medicine files into Dolphin Imaging Version 11.0 (Dolphin Imaging & Management Solutions) and the picture archives and communication system for the measurements and analysis.

Two dental investigators (D.H., L.M.) independently measured and recorded information about the ST: the number, morphology, growth orientation, and position relative to incisors. The investigators classified the number of the ST as 1, 2, 3, and 4 (Figure 1); described the morphology of the ST as conoid, tuberculated, incisiviform, molariform, and odontomelike (Figure 2); categorized the growth orientation of the ST as normal, inverted, transverse, labial palatal, inclined, and no orientation (odontomelike ST) (Figure 3); and classified the position of ST relative to incisors as palatal, labial, coronal, apical, mesial, and distal (Figure 4). We diagnosed the impacted incisors according to the normal eruption times and sequences, combined with the CBCT images showing that the incisor root had developed more than two-thirds,[11] and took into account the delayed eruption of the incisors that had been considered as temporary

ABBREVIATION KEY. CBCT: Cone-beam computed tomography. **ST:** Supernumerary teeth.