Rare Molariform Supernumerary Teeth: Why are They Bilateral?

Abstract
Anterior supernumerary teeth in the permanent dentition may be supplemental or rudimentary. Rudimentary types are further classified as conical, tuberculate, and molariform. The molariform type has been only rarely reported. We report a rare variety of anterior supernumerary teeth - the molariform type, occurring bilaterally and in association with a midline supernumerary tooth. We also suggest a hypothesis for the bilateral occurrence of supernumerary teeth.

Keywords: Anterior supernumerary teeth, bilateral, molariform type

Introduction
Supernumerary teeth are defined as an excess number of teeth when compared with the normal dental formula. Their reported prevalence ranges between 0.3% and 0.8% in the primary dentition and 0.5% and 3.8% in the permanent dentition.[1] Cases involving one or two supernumerary teeth occur in the maxilla 8.2–10 times more frequently than mandible, and as most commonly affect the premaxillary region.[1] Cases involving multiple supernumeraries (more than five) have a predilection for the mandibular premolar region.[2]

Primosch[3] classified anterior supernumerary teeth into two types (according to their shape):
1. Supplemental - Eumorphic teeth of normal shape and size; also termed as incisiform. They appear most commonly as extra maxillary and mandibular lateral incisors in the permanent dentition and maxillary central incisors in the primary dentition
2. Rudimentary - Dysmorphic teeth of abnormal shape and smaller size; includes conical, tuberculate, and molariform types.

Conical-shaped supernumerary teeth are the most common and occur as single, midline (mesiodens), or bilateral (mesiodentes) structures. The tuberculate type has a barrel-shaped appearance (width is equal to its length), a crown anatomy consisting of multiple tubercules, and either incomplete (stunted) or total absence of root formation.[3] Finally, the molariform type[5] has derived its name because the crown closely resembles the morphology of a premolar. It is unique in that it appears to occur in pairs in the central incisor area and unlike the tuberculate type shows complete root formation. On literature search, there is abundant data on the prevalence of supplemental, conical, and tuberculate types of anterior supernumerary teeth; however, we could find only two studies[5,6] where the prevalence of molariform type has also been included. The prevalence ranges from 1.9% to 13.7%.

We report a case of a rare type of supernumerary teeth - the molariform type, occurring bilaterally and in association with a midline supernumerary tooth. We found no such case of concurrent occurrence of molariform teeth with other types of supernumerary teeth reported till date. We also suggest a hypothesis for the bilateral occurrence of supernumerary teeth.

Case Report
A 13-year-old female presented to our department with a chief complaint of forwardly placed anterior teeth. Medical and family histories were noncontributory.

On intraoral examination [Figure 1], three supernumerary teeth were noticed in the anterior maxillary region. One was a midline supernumerary tooth resembling an incisor. The other two were seen bilaterally. Both of them showed the presence of multiple lobes or tubercles

How to cite this article: Jain P, Kaul R, Saha S. Rare molariform supernumerary teeth: Why are they bilateral?. Indian J Dent Res 2017;28:702-5.
with well-formed developmental grooves on the occlusal surface. Central incisors were displaced. Maxillary occlusal radiograph [Figure 2] revealed completely formed root of the midline supernumerary tooth. The maturity of bilateral supernumeraries was assessed by Cvek’s classification[7] [Table 1] and recorded as Cvek’s stage 4 for left supernumerary and stage 3 for right supernumerary teeth.

Based on the clinical and radiographic examinations, the bilateral supernumerary teeth were diagnosed as the rare molariform type.

A comprehensive treatment plan was formulated. All the three supernumeraries were extracted [Figures 3 and 4], and the patient referred for fixed orthodontic treatment.

**Discussion**

The etiology of supernumerary teeth is not completely understood. Several theories such as atavism theory, dichotomy theory, and dental lamina hyperactivity theory have been suggested to explain the development of supernumerary teeth. All these theories are hypothetical because of the inability to obtain sufficient embryologic material on the origin of hyperdontia.[3]

Atavism theory[3] proposed that supernumerary teeth were the result of phylogenetic reversion to extinct primates with three pairs of incisors. Dichotomy theory[2] proposed that the tooth bud splits into two equal or different-sized parts, resulting in the formation of two teeth of equal size, or one normal and one dysmorphic tooth, respectively. Both atavism and dichotomy theories have been largely discounted.

Most of the literature support the dental lamina hyperactivity theory.[3] This involves localized, independent, conditioned hyperactivity of the dental lamina. According to this theory, a supplemental form would develop from the lingual extension of an accessory tooth bud, whereas a rudimentary form would develop from the proliferation of epithelial remnants of the dental lamina.

Another theory is the genetic theory; evidence of which lies in the reports of mesiodens in twins, siblings, and sequential

| Stage | Description |
|-------|-------------|
| Stage 1 | Teeth with wide divergent apical opening, and a root length estimated to less than half of the final root length |
| Stage 2 | Teeth with wide divergent apical opening, and a root length estimated to half of the final root length |
| Stage 3 | Teeth with wide divergent apical opening and a root length estimated to 2/3rd of the final root length |
| Stage 4 | Teeth with wide open apical foramen and nearly completed root length |
| Stage 5 | Teeth with closed apical foramen and completed root length |

![Figure 1: Intraoral view showing three supernumerary teeth with displaced maxillary anteriors](image1)

![Figure 2: Maxillary occlusal radiograph showing stage of root formation of the supernumerary teeth](image2)

![Figure 3: Extracted supernumerary teeth showing presence of multiple lobes or tubercles with well-formed developmental grooves on the occlusal surface of the bilateral molariform teeth](image3)

![Figure 4: Post-extraction intraoral view](image4)
generations of a single family. Multiple supernumerary teeth can either be syndromic or nonsyndromic. When nonsyndromic, they may have a genetic component and are sometimes thought to represent a partial third dentition in humans.\(^8\)

Shapira and Lieberman\(^4\) first reported the molariform type of supernumerary teeth as abnormally-shaped supernumerary maxillary incisors. Cases of molariform supernumerary teeth reported till date along with the hypothesis suggested by the authors have been tabulated in Table 2.

Study of organ morphogenesis reveals that the early primordia of most organs start in a symmetrical left-right position, but then asymmetries are superimposed in different ways - bending and rotation movements, asymmetric regression/persistence, and differential growth.\(^9\)

The entire primary dentition is initiated between the 6th and 8th weeks of embryonic development; and the successional permanent teeth are initiated between the 20th week in utero and the 10th month after birth.\(^10\)

| Authors                   | Clinical and radiographic finding                                                                 | Hypothesis                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Shapira and Lieberman\(^6\) | Two fully erupted molariform supernumerary teeth between maxillary central incisors              | Fusion of two or more supernumerary teeth, during the stage of crown formation |
| Marya and Kumar\(^11\)     | Mesiodentes in two siblings, one of whom exhibited an unusual molariform mesiodens                | Familial occurrence                                                        |
| Shashikiran et al.\(^12\)  | Molariform teeth in upper canine region                                                           | -                                                                          |
| Sharma\(^13\)              | Palatally erupted molariform mesiodens in daughter and a conical mesiodens in father             | Genetics                                                                  |
| Srivatsan and Aravindha Babu\(^14\) | Erupted molariform mesiodens and ten impacted supernumerary teeth in a nonsyndromic patient | Lack of fusion of the lobes during development                             |
| Aneugundi et al.\(^15\)    | Molariform teeth associated with double dens invaginatus                                          | -                                                                          |
| Mangalekar et al.\(^16\)   | Molariform mesiodens in primary dentition                                                         | -                                                                          |
| Indira et al.\(^17\)       | Molariform mesiodens in primary dentition                                                         | -                                                                          |
| Özden et al.\(^18\)        | Two cases of bilateral molariform supernumerary teeth in anterior maxilla                         | -                                                                          |

It is probable that bilateral supernumerary teeth, especially the molariform type of supernumerary teeth arise not due to proliferation from dental lamina remnants at a later stage but rather as lingual extensions during the time when the molecular signals for the bilateral distribution of successional permanent tooth buds are active. They then develop concurrently with the natural permanent teeth and have complete root formation.

The midline supernumerary tooth reported in this case was perhaps because of fusion of two separately proliferating lingual extensions in the midline because of close approximation.

Differential expression of patterning genes is perhaps responsible for the difference in morphology of the supernumerary teeth. Further embryological investigations are required to know about the initiation time and patterning of different types of supernumerary teeth.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

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