SEVEN CASES OF DWARFED LOWER INCISORS

EVIDENCE OF A MISSING LINK IN EVOLUTIONARY MORPHOLOGY

BY

Tatsuo Fukuhara *

The dwarfed or peg-shaped upper lateral incisor frequently noted in human dentitions has been accepted as a manifestation of evolutionary phenomena as well as the diminished teeth often found in the third molars and the second premolars without correlation to jaw and quadrant. On the contrary, some uncertainty still exists concerning the phylogenetical behavior of the lower anterior teeth since only a few cases have been reported concerning their dwarfism. It is noted in the reports of many authors that the lower central incisors are more frequently diminished in their shape and size than the laterals. This supposition, however, is acceptable in the light of two facts: first, the width of the crown of the central incisors usually is smaller than that of the laterals and, second, central incisors are more frequently congenitally absent than laterals. Thus, the lower central incisor forms an exception to the general theory of dental phylogeny in which it is widely accepted that teeth are reduced in size and shape mostly from the distal aspect of each tooth group, namely, the third molars and the second premolars and upper laterals. If evidence exists of many dwarfed or peg-shaped teeth particularly in the location of the lower incisor, we could term them a “missing link” which fills up the gap between normal variation of the morphology and congenital absence. It would be informative that the lower incisor is an exception to the general rule of teeth reduction. The following report of seven cases of the lower dwarfed incisors may help to elucidate the problem.

Case Reports

CASE-1: Dwarfed lower right lateral incisor found in a girl aged 9 years (Figs. 1, 2 and 3).

The following is the present dental formula.

\[
\begin{array}{cccc|c|c|c|c|c}
6 & 5 & 4 & III & 2 & 1 & 1 & IV & V & 6 \\
6 & 5 & III & 2 & I & 1 & 2 & III & V & 6
\end{array}
\]

* 福原達郎: Dept. of Orthodontics (Chief: Prof. F. MIURA) School of Dentistry. 
Received for Publication, Oct. 5, 1962.
X-ray examination reveals that the five deciduous teeth have their successors, and other permanent teeth are still in the alveolar bone. The problem tooth, the lower right lateral incisor, is peg-shaped with almost the same length of the crown as the central incisor and shows no evidence of abrasion. The upper first permanent molars of both sides are non-hypoconus type which suggests that these two molars are also reductive. Four months later, surprisingly, this peg-shaped incisor was staled by the ectopic eruption of an approximated canine. Therefore, this might be
Fig. 6.

Fig. 6 and 7. An irregularly reduced lower right central incisor and congenital absence of the left central incisor as found in a girl 11 years of age. (Case 2)

Fig. 7.

Fig. 9.

Fig. 8., 10. and 11.

Fig. 8, 9, 10, 11 and 12. Case 3. Dwarfed lower left central incisor found in a boy 8 years of age.

Fig. 8. Shows a labial view of the tooth.

Fig. 9. Shows a lingual surface of the tooth, a small supernumerary cusp is present.

Fig. 10 and Fig. 11 were taken after a period of two years. (Fig. 12: Radiograph)
thought as of a deciduous dentition. Family history indicates that only a sister who is 13 years of age has a lower left lateral incisor which is congenitally missing (Figs. 4 and 5). Details of their parents' dentition are unknown.

CASE-2: An irregularly reduced lower right central incisor and congenital absence of the lower left central incisor as found in a girl 11 years of age (Figs. 6 and 7). The dental formula is as follows,

$$
\begin{array}{|c|c|c|c|}
\hline
& V & 3 & 2 & 1 \\
\hline
6 & 5 & 4 & 3 & 2 & 1 \\
\hline
1 & 2 & 3 & 5 & 6 \\
\hline
2 & 3 & 4 & 5 & 6 \\
\hline
\end{array}
$$

The upper first premolars of both sides were extracted prior to orthodontic treatment.

Radiographs show the absence of the left permanent central incisor and consequent late retention of the deciduous tooth. The irregularly formed permanent tooth shows no evidence of abrasion.

CASE-3: Dwarfed lower left central incisor found in a boy 8 years of age (Figs. 8, 9, 10, 11 and 12). Fig. 8 shows a labial view of the lower left central incisor with a typical peg-shaped crown. On the lingual surface, a small supernumerary cusp is present as shown in Figs. 9 and 12. Figs. 10 and 11 were taken after a period of two years.

CASE-4: Bilaterally dwarfed lower lateral incisors in a girl 6 years of age. These two irregular teeth were studied for two years before they

![Fig. 13.](image1)

![Fig. 14.](image2)

![Fig. 15.](image3)

![Fig. 16.](image4)

Fig. 13, 14, 15 and 16. Case 4. Bilaterally dwarfed lower lateral incisors in a girl of 6 years of age. Those two irregular teeth were studied for two years before they were lost.
were lost (Figs. 13, 14, 15 and 16).

CASE-5: A boy aged 8 years with slightly reduced lower right central incisor. From the labial view, the form of the crown appears to be almost normal. However, the lingual view reveals a reductive pattern of the mesial and distal marginal ridges (Figs. 17 and 18).

CASE-6: A girl aged 12 years with a slightly reduced lower left central incisor. This tooth is less a reductive type than peg-shaped. The lingual view, however, is a pattern of reduced morphology (Figs. 19 and 20).

CASE-7: A peg-shaped lower deciduous left lateral incisor noted in a girl 5 years of age (Figs. 21 and 22). Enamel hypoplasia was present in all lower anteriors. The problem tooth, the deciduous lateral, has the crown form of a canine due to its irregular shape. The successor tooth is not apparently present by X-ray as contrasted to the normal side.
CONSIDERATION

Congenital missing anterior teeth have long been thought of only an evidence of evolution, particularly in the lower anterior teeth since few cases of the dwarfism have been found. Due to this, Dr. Fujita has theorized that fused anterior teeth in the lower will play an important role in filling up the gap between the two characters: the normal variation in morphology and the congenital missing teeth. Following is a schematic illustration of his interpretation of the evolutionary manifestation in the lower anterior segment.

\[
\begin{align*}
\text{Norm or normal variation} & \\
\downarrow & \\
\text{Fused teeth} & \\
\downarrow & \\
\text{Congenital missing}
\end{align*}
\]

The writer also agrees with this concept of evolution because, statistically, there are many cases of congenital missing incisors and fused teeth in the lower anterior denture but few dwarfed incisors as compared to those found in the upper laterals. On the other hand, though, there are rare cases of fused permanent incisors and numerous examples of peg-shaped lateral incisors in the upper arch. Also it has been noted that the correlation between fused deciduous incisors and the frequency of their congenitally missing successors is quite high, with about 50% of their successors missing.

Dr. Fujita’s new theory, notwithstanding, the evidence of the presence of lower dwarfed incisors remains to be considered.

The question as to which lower incisor is primarily involved in evolutionary reduction is in the speculative stage. Dr. Moorrees writes as follows:—if the evolutionary hypothesis are correct, the dental formula of man ultimately become:

\[
I_1 \ C \ P_1 \ M_1 \ M_2 \\
I_2 \ C \ P_1 \ M_1 \ M_2
\]

From the same standpoint, Dr. A. A. Dahlberg nominates “stable” and “variable” teeth, which he states:

\[
\begin{align*}
\text{upper} & \\
I_1 & \ C \ P_{m1} \ P_{m2} \ M_1 \ M_2 \ M_3 \\
I_2 & \ C \ P_{m1} \ P_{m2} \ M_1 \ M_2 \ M_3
\end{align*}
\]

The “stable” teeth are the upper central incisor, the lower lateral
incisor, the canine, the first premolar and the first molar. The other teeth, which might be called the "variable" are the upper lateral incisor, the lower central incisor, the second premolar and the second and the third molars. The third molars are somewhat more variable than the seconds.

As above mentioned, the lower lateral incisor is more "stable" than the central. In other words, the lateral tooth is less frequently reduced in evolution than is the central in the lower arch.

Present case reports indicate, as pertaining to the permanent dentition, there is no evidence of the dwarfed lower lateral incisor if all these three cases (Cases 1, 4 and 7) are deciduous. Practically, however, it is not necessarily accurate to determine these cases as deciduous teeth, since there is limited evidence for the early shedding of the permanent normal and dwarfed incisors occurring in the case of ectopic eruption of canine\textsuperscript{3}). Admitting that the dwarfed lateral teeth belong to the deciduous denture, there is one more thing to consider: why are only lateral incisors reduced as dwarfed teeth in the deciduous dentition? Also the limited size of the sample must be taken into consideration.

**Summary**

1. The writer has presented 7 cases of dwarfed lower incisors. The details are as follows:

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Dwarfed tooth</th>
<th>Age</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>9</td>
<td>F</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>11</td>
<td>F</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>8</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>2 2</td>
<td>6</td>
<td>F</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>8</td>
<td>M</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>12</td>
<td>F</td>
</tr>
<tr>
<td>7</td>
<td>II</td>
<td>5</td>
<td>F</td>
</tr>
</tbody>
</table>

2. Peg-shaped lateral incisors as seen in Cases 1 and 4 have disappeared during the 4 months to 2 years period of observation, but this phenomenon does not necessarily mean that they were of the deciduous teeth, since in the instance of ectopic eruption of the canine some cases of lateral or central incisors with normal form are found to have evidence of root resorption. In the cases of the dwarfed lower lateral incisors, resorptions are most likely to occur.

3. Admitting that the teeth of Cases 1 and 4 belong to deciduous
dentition as well as Case 7, it is acceptable to assume that in the permanent dentition all the dwarfed or reduced teeth are the central incisors. This assumption coincides with the prevailing theory of phylogenetic changes in the lower anterior segment.

References

3) Idem: A personal communication.