Similarly impacted second and third maxillary and mandibular molars in a pair of monozygotic twins

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Disturbances of eruption of second and third permanent molars in a monozygotic twin pair are reported. Similarly impacted teeth occurred bilaterally in the maxilla and mandible, with only minor differences between twins. The findings suggest the possibility of a genetic influence.

Keywords: Molar; molar, third; genetics; twins, monozygotic

Similarity in tooth formation and timing of tooth development in monozygotic twins suggests a degree of genetic control\(^1\)-\(^4\). The formation of mandibular posterior teeth, in particular, has been found to show greater similarities compared with dizygotic twins\(^2\). Coincident ectopic eruption of the first molars in monozygotic twins has been reported by Ashley-Montague\(^5\) and by Järvinen and Väätäjä\(^6\). There are very few observations in the literature relating to twins exhibiting abnormalities in the eruption of permanent teeth\(^7\). The following case report records similar dentitions and impacted second and third molars in a monozygotic twin pair.

Case report

Male monozygotic twins (P.A. and P.E.), aged 16 years and 4 months, were referred for examination because of delayed eruption of their second permanent molars. Oral examination revealed good dental hygiene and no sign of gingivitis. The anterior occlusal surface of the left second lower molar was partly erupted in P.A.

Panoramic radiographs (Figures 1, 2) showed almost identical unerupted and impacted second and third molars on both sides of the upper and lower jaws. More detailed comparisons were based on stereoradiographs and the corresponding findings during third molar surgery.

In one of the twins (P.A.), a supernumerary tooth germ was found distal to wisdom tooth 28. There were slight dissimilarities in the locations of teeth 37 and 48. The stereoradiographs showed that tooth 47 in both twins and tooth 37 in P.A. were displaced lingually in the alveolar crest. The findings are summarized in Table I.

Histopathological examination of the third molar follicles revealed no cystic or other pathological changes. Ten months postoperatively the disimpacted second molars were erupting at the same rate in both
Table I: Similarities (+) and dissimilarities (−) in the positions and development of impacted second and third molars in 16-year-old monozygotic twins (P.A. and P.E.)

<table>
<thead>
<tr>
<th>Impacted tooth</th>
<th>18</th>
<th>17</th>
<th>27</th>
<th>28</th>
<th>37</th>
<th>38</th>
<th>47</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inferosuperior position</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Anteroposterior position</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>−</td>
<td>+</td>
<td>−</td>
<td>+</td>
</tr>
<tr>
<td>Angular position</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>−</td>
<td>+</td>
<td>−</td>
<td>+</td>
<td>−</td>
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<tr>
<td>Buccolingual position</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Root development stage</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Root form</td>
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<td>+</td>
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<td>+</td>
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</tbody>
</table>

Twin P.E.: panaromic radiograph

Discussion

Previous investigations have indicated the significance of genetic factors in the diagnosis and treatment of dental patients. It has been assumed that monozygotic twins have similar occlusions, as manifested by similar Angle molar classifications, tooth size, crowding patterns and arch shapes and sizes, but individual rotations, overjet and overbite do not reflect a comparable level of similarity.

Lobb compared the occlusions of monozygotic twin pairs. Identical molar relationship and arch form were found in all these twin pairs while Helpin and Duncan reported almost similar dentitions and ankylosis in monozygotic twins. The similarities in the disturbance in tooth eruption we report here are consistent with a hereditary influence. The inclinations and inferosuperior positions of teeth 18, 17, 27 and 47 were fairly symmetrical in the twins. On the other hand, the supernumerary tooth germ in the upper left maxilla in one twin and some minor differences in angulation of the right mandibular wisdom tooth show that potential for expression of environmental influences also exists. Our findings supplement those of Efstratiadis et al., who noticed that third molar inclination in two pairs of identical twins exhibited remarkable parallelism in relation to progressive changes in angulation, with close agreement within twin pairs at each stage. Occasionally, values in both the sagittal and frontal planes were identical, suggesting a genetic influence on the normal course of mandibular third molar development. It is hoped that this report will act as a stimulus to further objective and quantitative studies of several monozygotic and dizygotic twin pairs in order to confirm this hypothesis.

References


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