

# Effect of Agenesis on the Crown-Size Profile Pattern

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Agenesis and hypodontia are associated with crown-size reduction in the remaining teeth (S. M. GARN ET AL, *J Dent Res* 41:717, 1962, *Nature* 200:488-489, 1963; *J Dent Res* 42:1344-1363, 1963; H. J. KEENE, *Amer J Orth* 50:445-451, 1964; and K. HANIHARA ET AL, *J Anthrop Soc Nippon* 73:72-81, 1965). The question arises as to whether crown-size reduction associated with tooth number reduction is uniform throughout the remaining teeth or whether there is differential reduction in tooth material that results in a distinctly different crown-size profile pattern.

In order to answer this question we measured the mesiodistal crown diameters of 658 subjects, including 82 with third molar agenesis and 19 with radiographically verified agenesis of multiple teeth. The original measurements were converted into sex-specific *t*-scores using a computer program (C. R. BLACK, *Ann NY Acad Sci* 134:538-540, 1966). The crown-size profile patterns were then compared using the statistic  $r_T$  as previously described (S. M. GARN ET AL, *J Dent Res* 47:1190, 1968; *Arch Oral Biol* 13:1235-1242, 1968; *Amer Anthropol* 71:79-84, 1969).

As shown in the table, the crown-size profile pattern of individuals lacking one or more mandibular third molars is distinctly different from that of the total group ( $r = -0.34$ ). Sim-

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TABLE  
CROWN-SIZE PROFILE PATTERN SIMILARITIES ( $r_T$ )  
OF SUBJECTS WITH VARYING  
DEGREES OF HYPODONTIA

Comparison	$r_T^*$
Third molar agenesis vs total sample	-0.340
Multiple agenesis vs total sample	-0.381
Third molar agenesis vs multiple agenesis	+0.712

\* Based on 14 pairs of teeth, calculated from mean value of *T*, see references.

ilarly the crown-size profile pattern of individuals with multiple agenesis differs from that of the total group ( $r = -0.38$ ). However the crown-size profile patterns of the two agenesis groups strongly resemble each other ( $r = +0.71$ ). Accordingly, agenesis is associated with differential crown reduction and is characterized by a distinctly different crown-size profile pattern.

Under these circumstances it is of interest to measure changes in the crown-size profile pattern in Down's syndrome (trisomy G) and other chromosomal abnormalities such as ring D, and in deletions and reduplications of the sex chromosomes. Further, alterations in the crown-size profile patterns in relatives of subjects with cleft palate would help to identify genetic carriers of this complex developmental abnormality.