Correlations of Hypodontia In Children with Isolated Cleft Palate

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A total of 251 children with isolated cleft palate were examined. Orthopantomograms, taken at the age of 6–12 years, were used in the detection of hypodontia of the permanent teeth, excluding the third molars. The findings were: 1. Familial history of clefting has no pronounced effect on the prevalence of hypodontia; 2. The prevalence of hypodontia was significantly higher in children with conical elevation of the lower lip than in those without it (40% to 25%), and increased with increasing extension of the cleft; 3. Cleft palate was associated with conical elevation and/or hypodontia in 56% of the subjects. The same etiological factor or factors seems to be responsible for the formation of the cleft, for conical elevation, and for hypodontia.

Hypodontia has been shown to occur more frequently in children affected with cleft lip and palate (Böhn 1963, Ranta 1972). The frequency of hypodontia in the permanent dentition of 841 children, excluding the third molars and the upper lateral incisor in the region of alveolar cleft, increases from 9.3% to 68.4% with increasing severity of the cleft (Ranta, in press). Furthermore, hypodontia is a very common dental anomaly in children with Van der Woude syndrome (Schneider 1973, Ranta and Rintala 1982) and cleft palate children with conical elevation of the lower lip, which at least in certain cases represent a microform of the Van der Woude syndrome (Ranta and Rintala, 1983). The aim of the present study was to compare the prevalence of hypodontia in the following groups of isolated cleft palate: 1. with and without familial occurrence of clefts, 2. with and without conical elevation of the lower lip and 3. subgroups of submucous, partial and complete cleft palate.

Material

A total of 397 children were seen in 1980 at the Department of Dentistry of the Finnish Red Cross Cleft Center in Helsinki. The appropriate X-ray pictures were available in 323 cases. When the children with Pierre Robin anomalad (31), Van der Woude syndrome (9) and those with concomitant visceral anomalies (32) were omitted, the final material comprised 88 boys and 163 girls, totalling 251 children with a cleft palate. Orthopantomograms of the dentition, taken at the age of 6–12 years, were used in the detection of hypodontia of the permanent teeth, excluding the third molars. The material was described in an earlier paper (Ranta and Rintala, 1983).

Findings

1. Hypodontia was present in 79 of 251 children (31.5% Table 1). In the subgroups with and without familial occurrence of clefts

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TABLE 1. Distribution of Subjects According to Extension of Cleft Palate and Sex*

Extension of cleft palate	*Boys*	*Girls*	*Total*	*Percentage*
Submucous	20	14	34	14
Partial	59	107	166	66
Complete	9	42	51	20
Total	88	163	251	100

* The subjects with Pierre-Robin syndrome (27), the lower lip sinus syndrome (9), and those with other concomitant visceral anomalies (36) were eliminated.

(FOC) the corresponding figures were 32.8 percent and 31.1 percent, respectively. (Table 2). The occurrence of congenitally missing teeth was 2.3 percent in both subgroups. Significantly more congenitally missing teeth were diagnosed in the upper (3.3 percent) than in the lower jaw (1.4 percent). The most frequently missing teeth were the maxillary lateral incisors, the second premolars in both arches.

2. The incidence of conical elevation of the lower lip (CE) was 49.2 percent in the group with FOC, 38.4 percent in the group without FOC, and combined 41.4 percent. The difference was not statistically significant ($\chi^2 = 2.22$, $p < 0.05$). Hypodontia was present in 40.0 percent of children with both CE and FOC, in 41.1 percent with CE without FOC, in 25.8 percent without CE but with FOC, and in 24.8 percent without CE or FOC.

3. A clear tendency to increased hypodontia was observed in children with increased extention of the cleft. Hypodontia was present in 26.5 percent of children with submucous cleft palate, in 29.5 percent with partial cleft palate and in 41.2 percent with complete cleft palate.

Discussion

Among 323 children with cleft palate, there were 72 children with a syndrome or additional malformations (22.3%). That is well in accord with some earlier findings in Finnish children with cleft palate; e.g. for 298 children with cleft palate, born in 1967–71, the corresponding figure was 66 (22%) (Saxén 1974). In our selected group of 251 children with cleft palate, whose only anomaly was conical elevation of the lower lip and/or hypodontia, there were 163 girls (64.9%). This figure, too, is well in accord with the study of Gylling and Soivio (1962), where, on the basis of hospital records, 64.8% of 1117 children with isolated cleft palate, born in 1949–60 were girls. The review of the records for 1967–71 in the Finnish Register of Congenital Malformations prove the percentage representing girls in familial cases to be 71% and in nonfamilial cases 56% (Saxén 1974). The number of children with submucous cleft palate was 34 of 251 children (13.6%). This figure is also well in accord with the corresponding incidence (13.8%) among the Finnish children with cleft palate, born in 1948–75 (Rintala and Stegars 1982). The Finnish cleft population seems to be exceptional when compared to populations in other countries. However, according to these comparisons of our sample and the findings reviewed earlier, the present selected sample is well representative of this Finnish population. Moreover, the prevalence of hypodontia (31.5%) is well in accord with the findings of Böhn (1963) in 31 Danish and Norwegian children with isolated cleft palate (32.3%), and with the findings of Ranta (in press) in a random sample of 416 Finnish children with isolated cleft palate (32.7%).

It is well agreed that heredity is an important factor in the etiology of facial clefts, probably the most important. Moreover, hypodontia is genetically conditioned and the substantial increase in hypodontia in children with cleft palate is likely to be due to factors similar to those causing the cleft itself (Jordan et al. 1966, Adams and Niswander 1967, Bailit et al. 1968, Suarez and Spencer 1974). However, the familial occurrence of clefts appeared to have no significant impact on the prevalence of hypodontia. Nevertheless, hypodontia was more common in children with

TABLE 2. Hypodontia in Isolated Cleft Palate. Congenital Absence in Teeth Occurred in 2.3% of Cases

	n	*% Hypodontia*
Total Sample	251	31.5
Positive familial occurrence	61	32.8
Negative familial occurrence	190	31.1
Positive FO, Positive CE	30	40.0
Negative FO, Positive CE	73	41.1
Positive FO, Negative CE	31	25.8
Negative FO, Negative CE	117	24.8
Submucous cleft	34	26.5
Incomplete cleft	166	29.5
Complete cleft	51	41.2

cleft palate with CE (40%) than without CE (25%). Furthermore, the prevalence of hypodontia in 9 children with Van der Woude syndrome associated with cleft palate was 78% (Ranta and Rintala, 1983), but only 8 percent in normal Finnish children (Haavikko 1971).

The extension of the cleft had no significant effect on the familial occurrence of clefts and on the prevalence of CE, but a clear tendency to increased hypodontia was observed in subjects with increased extension of the cleft. This may be evidence of a lowered threshold in the more severe clefts.

Our observations led to the following conclusions:

1. Familial occurrence of clefts has no superficial effect on the prevalence of hypodontia, on the extension of the cleft or on the prevalence of conical elevation of the lower lip (CE).

2. The prevalence of hypodontia is significantly higher in children with CE (40%) than without CE (25%) and increases with increasing extension of cleft.

3. Cleft palate is a widespread developmental anomaly, because it was associated with CE and/or hypodontia in 55.8 percent of the subjects.

4. The same etiological factor or factors seem to be responsible for the formation of the cleft and the occurrence of CE and for hypodontia in children with and without familial occurrence of clefts.

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