

Dental anomalies in familial adenomatous polyposis coli

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Forty-seven Danish and 50 Finnish patients with familial adenomatous polyposis coli (FPC) were studied by panoramic tomography (PTG) of the mandible, which showed dental abnormalities in 17% of the cases. Eleven patients (11%) had supernumerary teeth and/or compound osteomas, and nine patients (9%) had impacted permanent teeth. The frequency of the dental anomalies was statistically significantly higher in FPC patients than in the normal population; it is therefore concluded that this dental abnormality should be included in the list of extracolonic manifestations that may occur in any FPC patient. The frequency of dental anomalies was higher in Finnish than in Danish patients, probably owing to a higher frequency of extracolonic manifestations in the Finnish series. □ *Compound osteomas; cysts; impacted teeth; odontomas; polyposis coli familiaris; supernumerary teeth*

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An increased incidence of supernumerary and impacted permanent teeth in patients with familial adenomatous polyposis coli (FPC) has been reported (1-3). These conditions have primarily been found in patients with clinically detectable extracolonic manifestations (osteomas, epidermoid cysts, and desmoid tumors), and it has therefore been proposed that dental abnormalities should be considered a 'fourth feature' of Gardner's syndrome (1). However, because of the high frequency of extracolonic manifestations in FPC patients many authors no longer consider Gardner's syndrome a separate clinical entity (4, 5). On this basis we have found it of interest to study the frequency of dental anomalies in FPC patients with and without extracolonic manifestations.

Patients and methods

The series consisted of 97 patients with FPC, including 47 Danish and 50 Finnish patients. The diagnostic criteria for FPC were the presence of at least 100 colorectal polyps, verified as being adenomas at histologic examination.

The age of the patients ranged from 9 to 71 years (median, 29 years); there were 51 males and 46 females. The patients belonged to 40 unrelated families. Twenty-two (23%) of the patients had clinically detectable extracolonic manifestations (Table 1).

All patients were studied by panoramic tomography (PTG) of the mandible. Impacted teeth, excluding wisdom teeth, supernumerary teeth, and compound osteomas were diagnosed from the radiographs by two specialists in dental radiology (I. N. Witt and J. Wolf) and by a dental surgeon (G. Tetens). Since a differential diagnosis between supernumerary teeth and odontomas was difficult, these were not separated in the results.

The chi-square test was used in the statistical evaluation, and a significance level of 5% was adopted.

Results

Dental abnormalities were found in 17 patients (17%). Eleven patients (11%) had supernumerary teeth and/or odontomas, and nine patients (9%) had impacted per-

Table 1. Extracolonic manifestations in FPC patients*

	Epidermoid cysts	Desmoid tumors	Gast/duo. polyps	Osteomas	Supern. teeth	Impacted teeth
Positive	16 (15F, 1D)	12 (12F, 0D)	48 (35F, 13D)	77 (41F, 36D)	11 (10F, 1D)	9 (8F, 1D)
Negative	81 (35F, 46D)	85 (38F, 47D)	14 (8F, 6D)	20 (9F, 11D)	86 (40F, 46D)	88 (42F, 46D)
Examined, <i>n</i>	97	97	62	97	97	97

* F = Finnish; D = Danish.

manent teeth. Three patients had supernumerary teeth, odontomas, and impacted permanent teeth (Fig. 1).

A significant relation was found between the presence of dental abnormalities and epidermoid cysts (7 of 17 patients with cysts, versus 6 of 80 patients without cysts; $P < 0.01$) and desmoid tumors (7 of 12 patients with desmoid tumors versus 8 of 85 patients without desmoids; $P < 0.01$). No significant relation was found among the presence of osteomas, gastroduodenal polyps, age, or sex (Table 1).

The frequency of epidermoid cysts and desmoid tumors was significantly higher in the Finnish series (15 of 50 and 12 of 50, respectively) than in the Danish series (1 of 47 and 0 of 47, respectively). The frequency of osteomas and gastroduodenal polyps was equal in the two series (Table 1).

The Finnish series showed significantly

more dental anomalies (15 of 50) than the Danish series (2 of 47) ($P < 0.01$); supernumerary teeth were detected in 10 of 50 Finnish versus in 1 of 47 Danish patients and impacted teeth in 8 of 50 Finnish and in 1 of 47 Danish patients.

Discussion

The pathogenesis of supernumerary teeth has been explained on the basis of dichotomy of the tooth germs or local hyperactivity of the dental lamina. The condition is associated with congenital defects (cleft palate, cleidocranial dysostosis, orodigitofacial dysostosis, and Hallermann-Streiff syndrome) (6). In two large studies, with 2589 and 48,550 individuals, respectively, a frequency of 1.0–1.5% was found for supernumerary teeth in the normal population (7, 8).

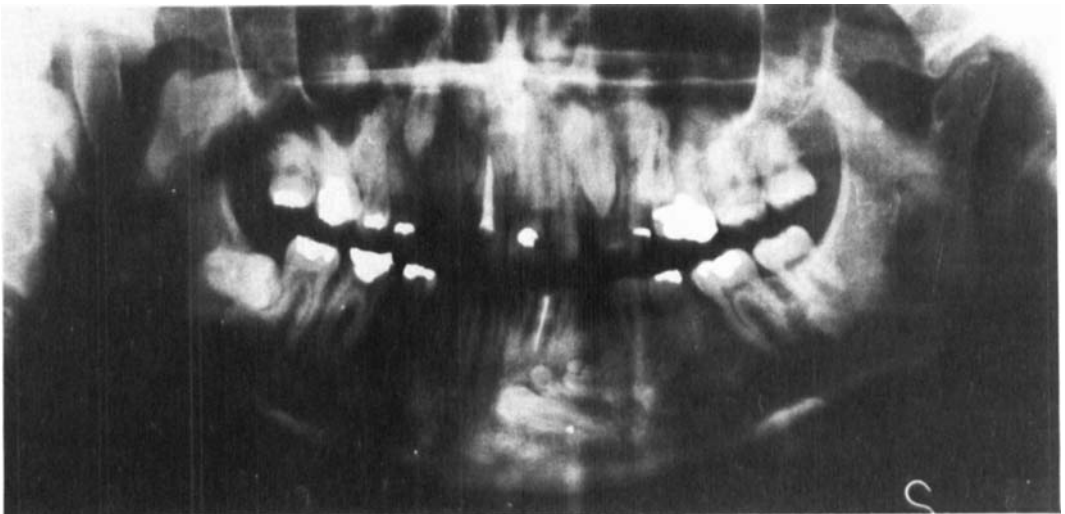


Fig. 1. Panoramic tomogram showing supernumerary teeth, impacted teeth, and odontomas in a 25-year-old man.

Impaction of permanent teeth may be caused by local factors, since an abnormal position of the tooth germ, abnormal size of the crown, arrested tooth formation, dental ankylosis, supernumerary teeth, cysts, and tumors (6) and impacted teeth are also seen in patients with congenital defects such as cleidocranial dysostosis (6). In a series of 1685 individuals impacted teeth were found in 28, thus indicating a frequency of 1.7% in the normal population (9).

Fader et al. (1) have stated that the presence of supernumerary and impacted permanent teeth may be another feature of the disease FPC. In a later study of 52 FPC patients Ida et al. (3) found supernumerary teeth in 10 (19%) and impacted teeth in 12 (23%). The supernumerary teeth were all located in the region from the incisors to the third molar. In 'unaffected relatives' they found supernumerary teeth in 3 of 33 individuals, but unfortunately, it was not clearly stated whether these individuals were first-degree relatives, with a 50% risk of future FPC development, or more distant relatives (3). It is not known whether mandibular osteomas may cause teeth abnormalities.

The present study of FPC patients showed an 11% frequency of supernumerary teeth, which is lower than the frequency reported from Japan (3) but significantly higher than the frequency in the normal population. The present frequency of 9% impacted permanent teeth is lower than that found in Japanese FPC patients (3) and is not significantly higher than the frequency in the normal population (9). We have no plausible explanation of the higher frequency of dental anomalies in the Finnish than in the Danish patients except for mere statistical coincidence, since the diagnostic criterion of FPC was the same in both countries.

The higher frequency of epidermoid cysts and desmoid tumors in the Finnish patients than in the Danish patients is probably explained by the fact that the latter have not been systematically examined with regard to these extracolonic lesions. An equal frequency of osteomas and gastroduodenal polyps was found among those Danish and

Finnish FPC patients who have been examined for these manifestations, thus indicating that no differences exist between FPC patients from the two countries.

In conclusion, the frequency of supernumerary teeth is greater in FPC patients than in the normal population, and, consequently, it is correct to include this dental abnormality in the list of extracolonic manifestations that may occur in any FPC patient (1). Like other extracolonic manifestations, the detection of supernumerary teeth can probably be used as an early sign of the future development of polyposis in first-degree relatives without colonic polyposis at present.

Since the frequency of dental anomalies was much greater in patients with desmoid tumors and epidermoid cysts than in those without these lesions, dental anomalies may not be totally independent of the presence of other extracolonic manifestations, but no separate clinical entities can be differentiated on the basis of this study.

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