

Radiographic findings in the jaws of clinically edentulous old people living at home in Helsinki, Finland

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In the present survey the radiographic findings in the jaws of 124 clinically edentulous old people living at home in Helsinki, Finland, were studied, using panoramic radiography supplemented by intraoral radiographs. Only 9% of the subjects had root remains. Impacted teeth were found in 4%, radiolucent lesions in 3%, and radiopaque findings in 13%. Deviations from normal condylar structure were found in 17% and mucosal thickenings in the maxillary sinuses in 7%. The mental foramen was situated at the top of the residual ridge in 42% of the subjects. Topically situated mental foramen and condylar changes were commoner in women. The radiographic oral health status of the population studied was good. □ *Aged; edentulism; gerodontolgy; temporomandibular joint*

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During the past two decades (1970–1990) the number of persons aged 75 years and more has tripled in Finland, from about 100,000 to 300,000 (1). This trend is forecast to continue until 2030 (1, 2). Although the oral health status of the elderly has improved and the edentulous population is gradually diminishing (2, 3), there will still be a substantial number of edentulous subjects for several decades. An important part of their treatment is radiographic screening for pathologic findings that might interfere with their general health or planned prosthetic constructions. Panoramic radiography, supplemented by additional intraoral radiographs, is the method of choice in screening both edentulous and dentate patients (4). Numerous radiographic studies of pathologic findings in the jaws of edentulous patients have been performed in several countries. The prevalences of the various findings in different populations and subgroups have been quite similar (5–12).

However, only a few studies have been made of the oral health status or treatment needs of the non-institutionalized elderly in Finland, and these have mainly focused on the need for prosthetic treatment (13–15). So far no detailed epidemiologic studies have been made of the oral health status of old people living at home in Finland.

The aim of the present study was to perform the radiographic part of an extensive and detailed clinical oral health survey of clinically edentulous elderly subjects living at home in Helsinki (16).

Materials and methods

This investigation forms part of a large medical survey of a random sample of subjects (total, 8035) born in 1904, 1909, and 1914 and living in Helsinki in January 1989 (17). The response rate for the medical survey from the invited sample of 795 old people

Table 1. Numbers and percentages of clinically edentulous subjects and their sex distribution in the three age groups

	Age group			
	76 years	81 years	86 years	Total
Female	41 (33%)	25 (20%)	26 (21%)	92 (74%)
Male	15 (12%)	13 (11%)	4 (3%)	32 (26%)
Total	56 (45%)	38 (31%)	30 (24%)	124 (100%)

was 81.8% ($n = 651$) (17). Between 1989 and 1990, 651 subjects participated in the medical examination. Before 31 May 1990, the mortality among the participants in the medical survey was 8.0% ($n = 51$). In 1990–1991, 600 subjects who were still alive were invited to the Institute of Dentistry for a comprehensive dental examination. A total of 133 persons were interviewed by phone or by mail, and no dental data were available for 103 subjects. Altogether 364 subjects, of whom 28% were male and 72% female, were examined. The response rate was 60.7%. The participation rates were 69% for men and 58% for women.

Of the 364 subjects, 293 attended the Institute of Dentistry and were clinically and radiographically examined. Seventy-one subjects were examined clinically only at their homes or institutions.

The total radiography series consisted of 293 subjects. Of these, 124 (32 male and 92 female) were clinically edentulous and formed the series of the present investigation (Table 1). Patients were judged to be edentulous if they had no clinically visible teeth or roots in the mouth. The dentate subjects formed another series, which will be reported separately (18).

All patients were examined by means of panoramic radiography, supplemented by intraoral radiographs of any areas that were poorly visible in the panoramic pictures. (One periapical and six occlusal radiographs were taken.) The following radiographic findings were recorded: roots, impacted teeth, radiolucent lesions, local radiopaque findings, condylar changes, findings in the maxillary sinuses, location of the mental for-

amen at the top of the residual ridge, and sialoliths.

A radiolucent lesion was interpreted as a cyst when it was more than 1 cm in diameter and had well-defined roundish opaque margins.

Local radiopaque findings were diagnosed as cementomas when there was a radiolucent capsule but no root canal. Enostoses included local thickenings in bony structure without apparent cause. Sialoliths were diagnosed from supplementary occlusal radiographs (submandibular gland) and the one parotid sialolith from a panoramic radiograph.

Changes in temporomandibular joints were recorded from the condyles. The changes recorded were osteoarthritis (flattening, cortical sclerosis, osteophytes, subchondral cysts and erosion) and other pathologic findings or abnormalities.

Findings of increased opacity in the maxillary sinuses were recorded and divided into two categories: mucosal cysts—that is, well-defined opacities with a round outline rising from the floor or walls of the sinus—and mucosal thickenings, representing a more diffuse opacity along the margins of the sinus without a well-defined round outline.

The data were analyzed using the chi-square test.

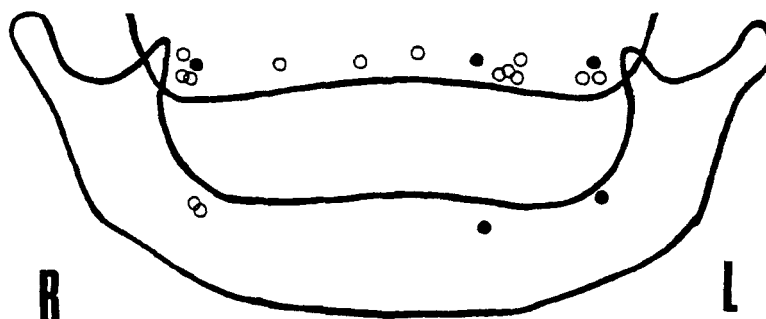
Results

The radiographic findings and their sex distributions are summarized in Table 2.

Table 2. Radiographic findings in 124 edentulous subjects, expressed as number and percentage of patients

Finding	Men		Women		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Retained roots	4	13	7	8	11	9
Impacted teeth	0	0	5	5	5	4
Radiolucencies	3	9	1	1	4	3
Local opaque findings	3	9	13	14	16	13
Sialoliths	0	0	3	3	3	2
Condylar findings	4	13	17	19	21	17
Maxillary sinus findings	3	9	5	5	8	7
Mental foramen on crest	4	13	48	52	52	42

Fig. 1. Location of retained roots (○) and impacted teeth (●).



Eleven subjects (4 men and 7 women) had altogether 14 submucosal or intrabony root remains, 12 of which were located in the maxilla (Fig. 1).

Impacted teeth were found in five women but in no men. Two of the impacted teeth were maxillary third molars, one was a maxillary canine, one a mandibular molar, and one a mandibular premolar.

Five radiolucent findings were observed in four patients (3%). Two of these were diagnosed radiographically as residual cysts and one as a nasopalatine cyst. One male patient had two lesions at the apex of submucosal roots.

Local opaque findings were recorded in 16 subjects (13%). The maximum number of opacities per subject was two. Radiopaque findings indicating enostoses were noted in 13 subjects (11%). Two findings (2%) were diagnosed as cementomas and one (1%) as condensing osteitis.

Three suspected sialoliths were found in three women: one in the duct of the right parotid gland and the others in the duct of the left submandibular gland.

Deviations from normal condylar structure were found in 21 subjects (17%). Findings indicating osteoarthritis were made in 20 persons (16%). Seventeen of them were women and three men ($p < 0.05$). One male subject had condylar deformity and malposition of the condylar head, probably due to an old fracture or condylotomy.

Opaque findings in the maxillary sinuses were recorded in eight subjects (6%). In four

of these (3%) the findings were classified as mucous cysts. More diffuse mucosal thickenings were found in the other four cases.

More than half of the women (52%) but only 13% of the men had the mental foramen or the mandibular canal situated at the top of the residual ridge (altogether 52 subjects, 42% of all subjects examined). No statistically significant differences were found between the age groups, however.

Discussion

The population in the present study differs somewhat from most populations studied earlier in Finland (5, 13–15, 19–22). The subjects were older than in general population studies and were living at home.

Studies involving similar age groups have usually been carried out on institutionalized subjects with a poorer general health status than their non-institutionalized counterparts. Accordingly, their oral health status has usually been poorer and edentulousness more prevalent than in non-institutionalized subjects (15, 19–22).

As the patients were clinically edentulous, all retained roots were either submucosal or intrabony. Most of the retained roots were found in the maxilla (12:4), as in earlier studies (6, 11, 23). In most previous studies the prevalence of root remains has been greater than in the present study, but the number of unerupted teeth does not seem to differ from earlier studies (Table 3). In

Table 3. Some publications on radiographic findings in edentulous jaws (number and percentage of subjects)

Study	Country	No. of subjects	Age, years	Retained roots	Impacted teeth	Radiolucencies	Radiopacities	Findings in maxillary sinuses	Condylar findings
Wolf, 1969 (5)	Finland	142	19-76	43 (25.0%)	11 (6.4%)	3 (1.7%)	—	—	—
Barclay & Donaldson, 1970 (6)	New Zealand	100	18-79	40 (40.0%)	4 (4%)	3 (3.0%)	5 (5.0%)	—	—
Perretlet et al., 1977 (7)	Switzerland	287	—	43 (15.0%)	17 (5.9%)	33 (11.5%)	—	—	—
Tronje et al., 1980 (8)	Sweden	178	30-80	41 (23.0%)	16 (9.0%)	9 (5.1%)	16 (9.0%)	37 (20%)	—
Jones et al., 1985 (9)	USA	114	—	14 (12.3%)	1 (0.9%)	2 (1.8%)	12 (10.5%)	—	—
Keur et al., 1987 (10)	Australia	1135	18-91	379 (33.4%)	46 (4.1%)	12 (1.1%)	80 (7.0%)	30 (2.6%)	28 (2.5%)
Axelsson, 1988 (11)	Iceland	225	—	25 (11.1%)	11 (4.9%)	6 (2.6%)	8 (3.5%)	—	—
Dias et al., 1988 (12)	Malaysia	488	—	47 (9.6%)	5 (1.0%)	14 (2.7%)	28 (5.7%)	—	—
Present study, 1991	Finland	124	76,81,86	11 (8.9%)	5 (4.0%)	4 (3.2%)	16 (12.9%)	8 (6.5%)	21 (16.9%)

Finland the Social Insurance Institution has subsidized panoramic radiographs of the jaws since 1972. Thus it has become customary to take a panoramic radiograph before the provision of dentures, and more residual roots may have been surgically removed as a result of the increased use of radiography.

The incidence of intraosseous radiolucent and radiopaque findings did not differ greatly from earlier studies. Intraosseous radiopaque findings were observed slightly more often than in previous studies (Tables 2 and 3).

Condylar changes were found more often in women than in men (19%:13%), and nearly all of them were interpreted as arthrotic because of their often grossly deformed and flattened condylar heads. Similar findings have been reported in an earlier study (19).

In the present material the prevalence of mucosal cysts and thickenings was 6.5%. In earlier studies figures ranging from 2.6% to 20% have been reported in edentulous subjects (8, 10).

In studies of round shadows in maxillary sinuses found in both dentate and edentulous subjects, figures ranging from 2% to 10% have been reported (23-26). According to Mattila (24), the prevalence of mucosal cysts is not age-dependent.

In women the mental foramen was situated at the top of the residual ridge more often than in men (53%:13%). This is in accordance with an earlier study (19) and is caused by the more advanced alveolar atrophy of the mandible in women in the subjects studied ($p < 0.001$).

Compared with the dentate group of the same population (18), there were fewer mucosal changes in the maxillary sinuses (6%:18%; $p < 0.05$) and fewer condylar changes (17%:25%; $p < 0.01$).

The radiographic oral health status of these old edentulous people was good, and the pathologic findings requiring treatment were few.

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