

CHANGES IN THE ANTERIOR NASAL SPINE AND THE  
ALVEOLAR PROCESS OF THE MAXILLARY BONE  
IN LEPROSY<sup>1</sup>

J. MICHMAN, D.M.D.  
AND F. SAGHER, M.D.

*From the Prosthetic Department, School of Dentistry  
and the Department of Dermatology and Venereology,  
The Hebrew University-Hadassah Medical School  
and the affiliated Hospital for Hansen's Disease  
Jerusalem, Israel*

It is a rare occurrence that a new clinical sign of a disease is found as a result of the examination of bodies exhumed from old graveyards. Møller-Christensen (1, 2, 3), on investigating skeletons from the cemetery of a leprosarium in use during the Middle Ages at Naestved in Denmark, found, besides the known leprosy bone changes, also atrophy of the anterior nasal spine and of the maxillary alveolar process in the area of the upper central incisors—changes which were called the Bergen syndrome. That they were not due to concomitant diseases was demonstrated by Waaler (4), who in autopsies of 7 leprosy cases found complete loss of the anterior nasal spine in 5 and corresponding alveolar atrophy in 3. Melsom (5), on clinical and radiologic examination of 9 patients in the leprosy hospital in Bergen, found considerable atrophy of the maxillary alveolar process in all cases and complete or partial atrophy of the anterior nasal spine in 6.

Since these signs are readily found on clinical and x-ray examination, it seemed important to determine whether or not they can be detected in early leprosy. This question could not be answered from the studies mentioned, which dealt only with advanced cases or autopsy material. We therefore undertook a systematic examination for these signs in a number of early and advanced cases of different types of leprosy undergoing treatment in the leprosy hospital here in Jerusalem.

MATERIAL AND METHODS

Forty-four patients undergoing sulfone or thiosemicarbazone treatment were examined. Of these, 21 were males and 23 females, their ages ranging from 6 to 62 years with averages of 32.8 and 32.7 years, respectively. The duration of the disease was from 1 to 38 years (mean: 10.4 years). In 2 cases the duration was unknown.

The type distribution, determined according to clinical, bacteriological, immunological and histological findings, was as follows:

Lepromatous .....	30
Indeterminate .....	10
Tuberculoid .....	4

<sup>1</sup> This work was aided by a grant from the Ministry of Health.

Certain data of these cases are given in Table 1.<sup>2</sup>

The following procedures were followed in the examination for the special features under investigation:

1. Digital examination of the anterior nasal spine.
2. Oral and dental examinations.
3. Lateral x-ray examination of the anterior nasal spine.
4. Intra-oral x-ray examination of the anterior maxillary alveolar process.
5. Tests for superficial sensitivity in the corresponding areas of skin and mucosa.

TABLE 1.—Data on age and on duration and type of the disease in 44 leprosy patients studied with respect to changes of the anterior nasal spine and the anterior maxillary alveolar process.

Group <sup>a</sup>	Cases			Age (years)		Duration (years)		Type of disease		
	No.	M	F	Range	Av.	Range	Av.	L	I	T
1. Lacking	11	5	6	26-62	44.4	6-36	17.1	10	1	0
2. Atrophic	13	8	5	14-59	33.7	3-23	9.6	10	2	1
3. Normal	20	8	12	6-62	25.3	1-38 <sup>b</sup>	6.6	10	7	3

<sup>a</sup> The designation of these groups here given refers to the anterior nasal spine; see text for details.

<sup>b</sup> The duration in one of these cases was 38 years, and in another it was 20 years; the upper limit in the other 18 cases was 10 years.

Softer x-rays were used than is usual in routine bone examination, it being found that they revealed the anterior nasal spine more clearly. The harder rays may in some cases not show the nasal spine at all.

The oral and dental examinations, both clinical and radiologic, were especially directed to the general hygienic and periodontal condition, and to demonstrating caries, occlusal trauma, and the vitality of the teeth. These examinations seemed necessary to exclude disease of the teeth and their surrounding tissues as the cause of a secondary atrophy of the maxillary alveolar process.

#### FINDINGS

The forty-four patients examined could be separated into three groups, from the findings in these examinations, as follows:

Group 1. Patients in whom the nasal spine was lacking and the alveolar process clearly atrophied (11 cases).

Group 2. Patients with partial atrophy of the nasal spine and a normal or partly atrophied alveolar process (13 cases).

Group 3. Patients with normal nasal spines, and with normal maxillary alveolar processes except in cases of absent upper incisors (20 cases).

*Group 1.*—In this group of 11 patients in whom the anterior nasal spine was entirely lacking, there was complete resorption of the frontal maxillary alveolar process in 5 instances, and marked resorption in the 6

<sup>2</sup> The manuscript of this article was accompanied by other tables which gave many details of each case, but consideration of space prohibited using them.—EDITOR

others. The 4 upper anterior teeth were lacking in the first 5 cases, but were present (except that one patient had only teeth) in the 6 in which resorption was incomplete.

Dental and oral examinations showed marked chronic inflammation of the free margin of the gingiva with pocket formation which, although affecting all of the teeth, was much the most pronounced around the upper central incisors. Roentgenologic examination showed varying degrees of vertical resorption of the crest of the alveolar bone, more pronounced around the upper central incisors, but with very little caries and no occlusal trauma in this area. In 6 patients no migration or looseness of the teeth could be detected.

Four patients had a full complement of natural teeth, but with marked resorption around the upper central incisors. One patient had the 4 upper front teeth present with all the others partially missing, and one patient had only 3 front teeth present and all the others partially missing. Four patients had no upper natural teeth at all, and one had the 4 upper front teeth missing with most of the others in place.

Changes and deformations in other bones of the nose, producing saddle nose, were present in 10 patients. Six of them had neural bone lesions in both hands and feet and 2 in the hands only.

The average age of this group of 5 males and 6 females was 44.4 years. The average duration of the disease was 17.1 years.

*Group 2.*—The anterior nasal spine was clinically smaller than normal in the 13 patients of this group, and the x-ray pictures revealed no well-defined bony structure. There was a rather marked gingivitis with vertical resorption of the alveolar bone affecting more or less all the teeth in 8 patients, in one of whom there was occlusal trauma. The maxillary alveolar process was normal in 3 cases, showed slight resorption in 6, marked in 3, and complete in 1. Two patients had no natural upper front teeth.

The other bones of the nose were not affected in any patient of this group; i.e., none had the saddle nose appearance. Nerve and bone changes were present in the hands of 2 patients, in the feet of 4, and in both hands and feet in 3.

The average age of this group of 8 males and 5 females was 33.7 years. The average duration of the disease for 12 of the patients was 9.6 years; in one the duration was unknown.

*Group 3.*—The anterior nasal spine was without pathologic change in these 20 patients. Fourteen of them showed normal frontal maxillary alveolar processes; but, on the other hand, there was complete resorption in 4, marked in 1, and slight in 1. Four patients had no natural upper incisors. Some resorption of the alveolar crest, affecting more or less all the teeth, was found in 2 patients. Gingivitis or periodontitis was present in 6 patients.

The other bones of the nose were not affected. Nerve and bone changes

in the hands and feet were present in 2 patients, and in the hands only in 3.

The average age of this group of 8 males and 12 females was 25.3 years. The average duration of the disease in 19 patients was 6.6 years; in 1 the duration was unknown.

#### DISCUSSION

An analysis of the duration of the disease in these patients revealed that the average duration in the first group was 17.1 years, in the second group 9.6 years, and in the third group 6.6 years (Table 1). The bony changes under discussion were found most frequently in those patients whose disease was present for many years, and only rarely in patients suffering for a relatively short period.

It happened that the 30 lepromatous cases among those examined fell in equal numbers in the three groups, 10 in each (Table 1). Of the 4 tuberculoid cases, only 1 showed any such bone changes, and they of slight to moderate degree.

Since loss of the anterior nasal spine might be assumed to have the same etiology as bony changes in other parts of the body, the co-existence of such findings was ascertained. There was a loss of other bony structures in the nose in 10 cases in the first group, but no such bony alteration in the other groups. (Conversely, in all cases in which a saddle-nose or other bony change was present the anterior nasal spine was lacking and the frontal maxillary alveolar process was atrophied.)

Bone resorption of hands, or feet, or both was found in 8 out of 11 cases in the first group, 9 out of 13 cases in the second group, but only 5 out of 20 cases in the third group. It therefore appears that the loss of the anterior nasal spine is a further symptom of the bone resorption common in leprosy patients.

The same reasoning might apply for the atrophy of the alveolar process of the maxillary bone, but atrophy of this area may also be caused by the dental condition of the patient, such as the presence of chronic periodontal disease. In cases of complex periodontitis and localized periodontosis, vertical bone resorption of single teeth or of a group of teeth is regularly found.

It was nevertheless striking to find a certain repetition of the same pattern, namely, that in some cases the atrophy of the maxillary alveolar process left about one-half of the roots of the upper central incisors uncovered by bone, whereas all the other teeth showed much less bone resorption. The loss was most pronounced between the upper central incisors, being triangular in form, with the apex between the central incisors and gradually diminishing toward the laterals. There was no occlusal traumatism and no signs of migration, loss of vitality or looseness of the upper central incisors in spite of the loss of bone.

Furthermore, a complete dental and oral examination with full mouth x-ray, undertaken in a number of patients with the most pronounced disturbances, revealed this characteristic form of resorption as a constant finding. A loss of this type and regularity is unknown to us in other periodontal diseases. Because this atrophy corresponds to the area of distribution of the nervus spheno-palatinus, neurological examinations of the mucous membrane in this area was carried out, but no disturbance of sensitivity could be detected.

It should be mentioned that syphilis played no role in these cases. All examinations, including that of the spinal fluid, did not reveal syphilis in any of them.

#### SUMMARY

Forty-four patients with various forms and stages of leprosy were examined for changes in the anterior nasal spine and the anterior maxillary process.

Clinical and roentgenologic changes could be found in both areas. These signs, first described by Møller-Christensen, seem to be characteristic of leprosy.

The loss of these bone structures was, in general, observed most frequently and in most marked degree in patients in whom leprosy had been present for many years. In patients who had had the disease for relatively shorter periods no typical, or only questionable, changes were found. A certain correlation was present with other leprosy bone changes of the nose, hands and feet.

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#### RESUMEN

Cuarenta y cuatro enfermos con varias formas y períodos de lepra fueron examinados en busca de alteraciones en la espina nasal anterior y la apófisis maxilar anterior.

En ambas zonas pudieron observarse alteraciones clínicas y roentgenológicas. Estos signos, descritos por primera vez por Muller-Christensen, parecen ser típicos de la lepra.

La pérdida de estos elementos óseos fué observada, en general, más frecuentemente y en forma más acentuada en los enfermos en quienes la lepra había existido muchos años. En los que habían tenido la enfermedad durante períodos relativamente cortos, no se encontraron alteraciones típicas, o éstas eran a lo más dudosas. Había cierta correlación con otras alteraciones leprosas en los huesos de la nariz, las manos y los pies.

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#### DESCRIPTION OF PLATES

##### PLATE (13)

FIG 1. X-ray photograph demonstrating the presence of a well-defined anterior nasal spine.

FIG. 2. Demonstrating the complete lack of the anterior nasal spine.

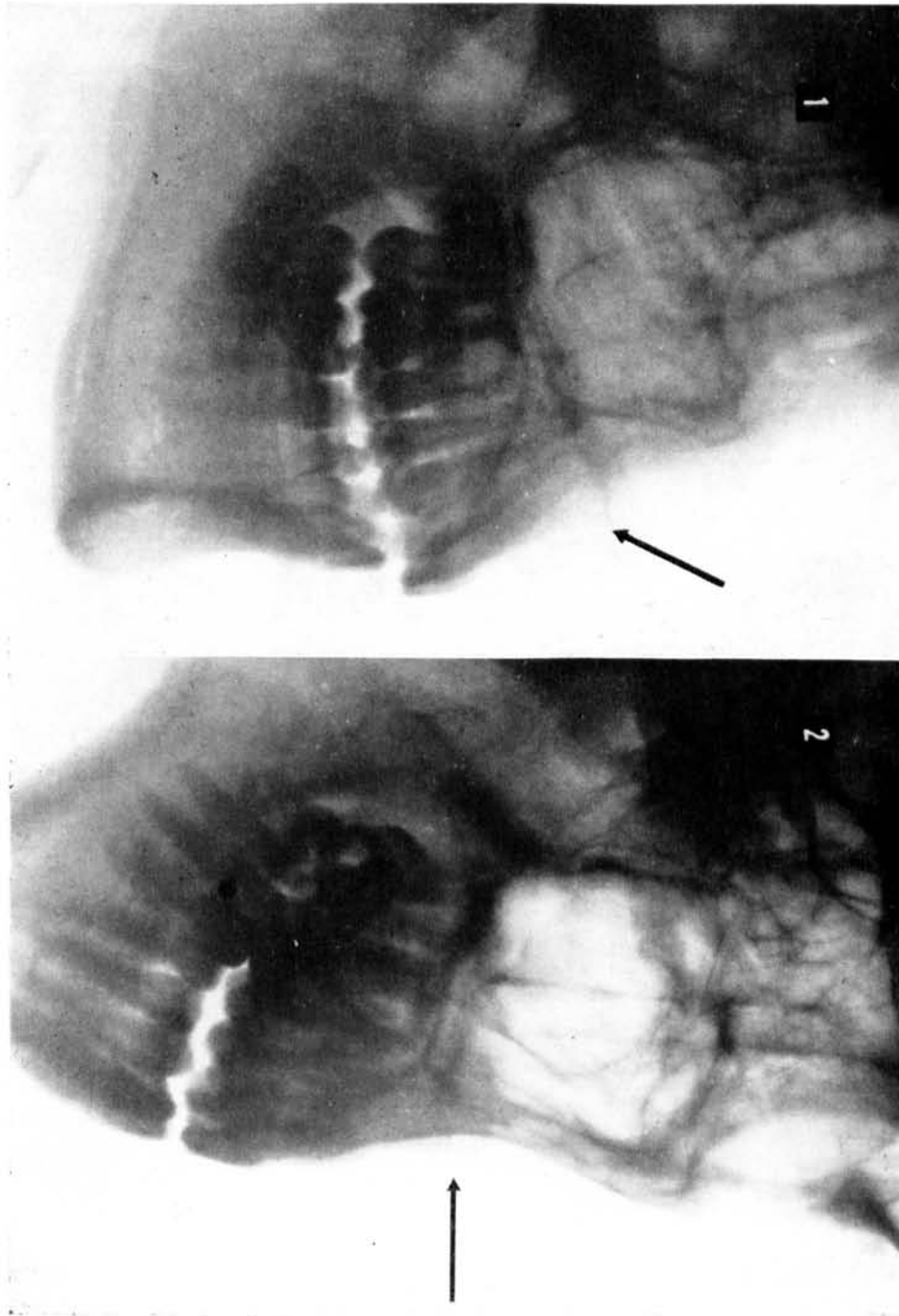


PLATE 13

PLATE (14)

FIG. 3. Patient in whom the anterior nasal spine is lacking and a saddle nose is present.

FIG. 4. Atrophy of the anterior maxillary process, with one-half of the roots of the upper central incisors uncovered. Same patient as in Fig. 3.

FIG. 5. The atrophy of the anterior maxillary process gradually diminishes toward the lateral incisors. Same patient as in Figs. 3 and 4.

FIG. 6. X-ray photograph demonstrating the excessive loss of bone of the anterior maxillary process, especially between the central incisors. Same patient as in the preceding figures.

FIG. 7. X-ray photograph of the same area in an individual with normal relationships of bone and teeth.



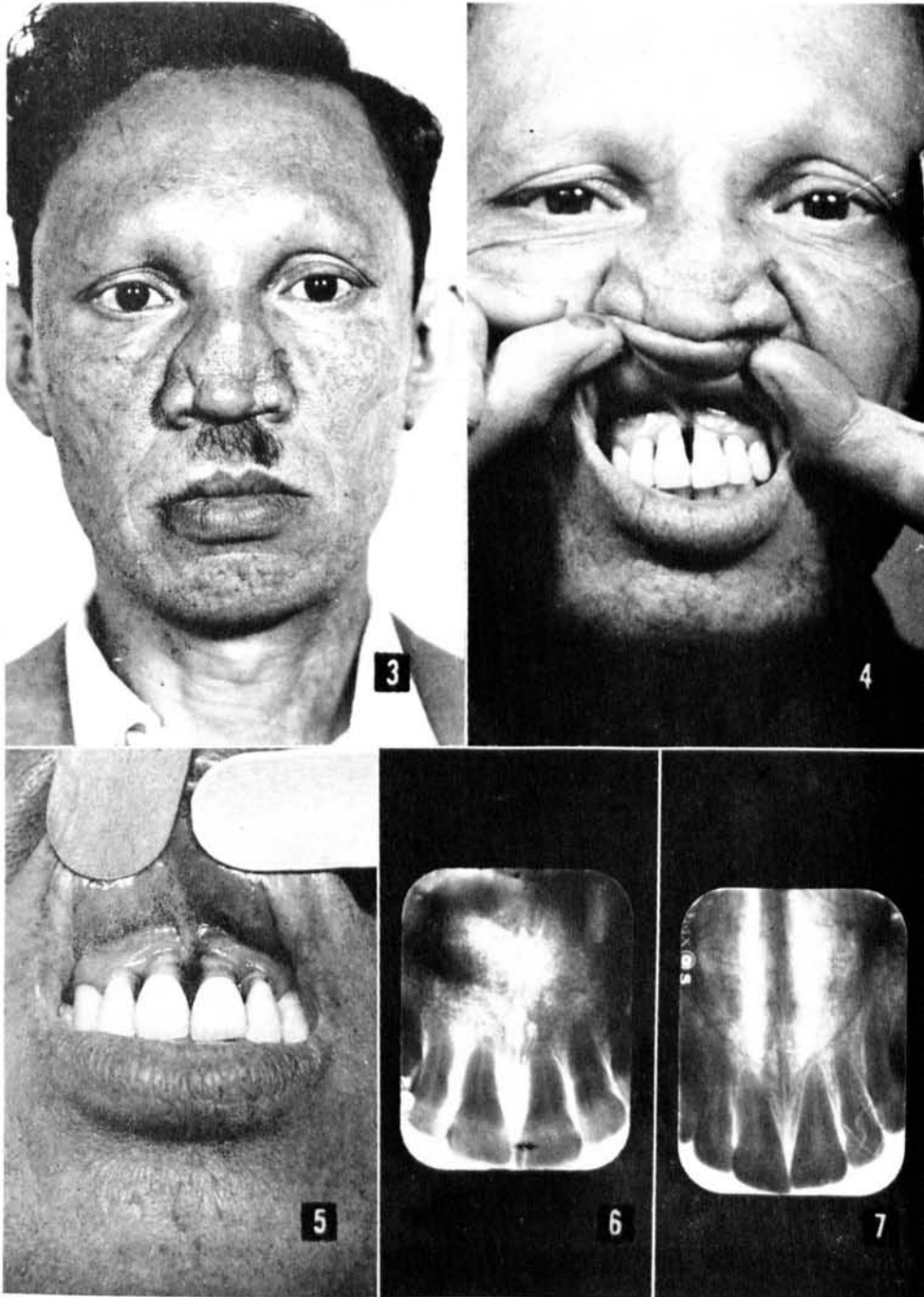


PLATE 14