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POSTURAL FACE HEIGHT IN FULL DENTURE WEARERS

A LONGITUDINAL X-RAY CEPHALOMETRIC STUDY

by

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INTRODUCTION

The rest position or — as we prefer to call it — the postural position of the mandible, was formerly considered to be constant throughout life (*Niswonger,* 1934; *Brodie,* 1941; *Thompson,* 1946), but more recently a number of studies have shown that it is dependent on a number of factors, including age, body and head posture, breathing, mental and neuromuscular tension, changes in the dentition due to abrasion, loss of teeth, and denture treatment (*Olsen,* 1951; *Atwood,* 1956; *Tallgren,* 1957; *Duncan & Williams,* 1960; *Posselt,* 1962; *Fish,* 1964; *Swerdlow,* 1964; *Preiskel,* 1965).

In an earlier study (*Carlsson & Ericson,* 1965), referred to below as *Part I,* we have examined the alterations in the face height in edentulous subjects on changeover to new dentures and in the subsequent 2-year period. Apart from significant changes in the morphologic face height indicative of progressive resorption in

the denture-bearing tissues, variations in postural rest face height were observed — measured without dentures — that were ascribed to adaptation of the postural position of the mandible to changes in the morphologic face height. No approach was made in *Part I*, however, to the problems of the rate at which this adaptation takes place and the factors on which it may be dependent.

To examine the changes in postural face height that occur at, and just after, the sudden change in the morphologic face height usually attending replacement of old full dentures with new, and to elucidate the effect of various factors on the variations, the following study was carried out.

MATERIAL AND METHOD

The study was conducted on 29 patients (19 women, 10 men), who were furnished with full dentures at the School of Dentistry, Umeå, during the autumn session, 1964. The age range for the women was 44—77 years, mean 59.2, and for the men 42—69, mean 58.5.

This group constituted all the full-denture patients to fulfil the following requirements: (*i*) They should have worn both upper and lower full dentures for at least 5 years, and should still be wearing them; (*ii*) the state of the denture-bearing tissues should be such that the insertion of dentures would not call for any surgical measures; and (*iii*) there should be no major dysfunction of the temporomandibular joint.

The prosthetic treatment was carried out by students under supervision of the teachers, and in accordance with the principles taught in demonstrations and lectures at the Department of Prosthetics, (cf *Bergman et al.*, 1964). The vertical dimension was determined, account being taken of aesthetic factors and comfort; the free-way space was made as near as possible 3 mm.

Before insertion all the new dentures were ground in articulators to balanced occlusion and articulation. The only measure then required was trimming of the denture margins. Owing to dissatisfaction with the aesthetic results of the denture treatment

the dentures were re-made for 2 patients in the latter part of the follow-up period. These 2 patients were therefore excluded from the last examination.

A series of profile radiographs was taken on 3 occasions, namely, when the new dentures were fitted, 10—12 days and 3 months afterwards.

Each radiograph was taken by the same technique as in *Part I*, with the aid of a cephalostat (*Thörne*'s modification, 1951) with ear rods, and forehead and head rests. The central ray was directed through the porus acusticus externus perpendicular to the sagittal and film planes, with a film-focus distance of 155 cm and a constant distance of 14 cm between the median plane of the head and the film. The reported measurements have not been corrected for the enlargement of about 10 per cent.

The exposures were made with the dentures in habitual occlusion and with the mandible in the postural position, with and without dentures inserted. Two methods were used for getting the patient to assume the postural position of the mandible.

Relaxation method (*r* in the tables). — The patient was instructed to sit as relaxed as possible and not to bite together (see *Coulombe*, 1954, "no command" and *Tallgren*, 1957, "relaxation").

Phonetic method (*m* in the tables). — The patient was instructed to sound the letter *m* slowly, and the exposure was made 2—5 seconds afterwards (see *Swerdlow*, 1964).

At the first examination (I) 8 profile radiographs were taken of each patient.

I *A* Old dentures, in occlusion
I *Ar* Old dentures, postural position, relaxation method
I *Am* Old dentures, postural position, phonetic method
I *Po* New dentures, in occlusion
I *Pr* New dentures, postural position, relaxation method
I *Pm* New dentures, postural position, phonetic method
I *r* No dentures, postural position, relaxation method
I *m* No dentures, postural position, phonetic method

At the second (II) and third (III) examinations 5 radiographs were taken as follows:

II *Po*, III *Po*	New dentures, in occlusion
II *Po*, III *Pr*	New dentures, postural position, relaxation method
II *Pm* III *Pm*	New dentures, postural position, phonetic method
II *r*, III *r*	No dentures, postural position, relaxation method
II *m*, III *m*	No dentures, postural position, phonetic method

Because of technical mishaps a few radiographs from examinations I and II had to be discarded. The exact number of radiographs analysed are therefore given in the tables.

The following definitions were used:

morphologic face height: distance nasion—gnathion (*N*—*Gn*) with dentures in occlusion.

postural face height: N—Gn with mandible in postural position.

free-way space: difference between the postural face height and the morphologic face height.

The nasion and gnathion are defined as follows:

nasion, N: the most anterior point on the nasofrontal suture.

gnathion, Gn: the most inferior point on the mandibular symphysis.

The distance *N—Gn* was measured directly on the radiographs with calipers calibrated in tenths of a millimetre. The results of the study of the method presented in *Part I* may be considered to apply also to the present study, since the same X-ray cephalometric method was used in both studies.

The usual statistical methods were used. The levels of significance (according to the *t* test) observed were as follows:

$P < 0.001$	+++	highly significant
$0.001 < P < 0.01$	++	significant
$0.01 < P < 0.05$	+	almost significant
$P > 0.05$	..	not significant

The error of the method was calculated in *Part I* by means of duplicate radiographs exposed on 35 patients. The standard deviation for a single measurement was calculated from the expression

$$s = \sqrt{\Sigma d^2/2n}$$

where d is the difference between the measurements on the two radiographs and n is the number of patients. s for N—Gn with dentures in occlusion was 0.24 mm, and with the mandible in the postural position, 1.45.

RESULTS

The mean morphologic face height and postural face height at the various examinations are reported in Table I and Figure 1.

The morphologic face height (N—Gn with the dentures in occlusion) increased by a mean of 4.5 mm when the old dentures

Table I

Morphologic face height and postural face height (N — Gn) at the three examinations. Mean ($\bar{x}$) and standard deviation (s) (milimetres). n denotes the number of patients

				Women			Men			Total		
	Dentures	Registration	Symbol	n	$\bar{x}$	s	n	$\bar{x}$	s	n	$\bar{x}$	s
Examination I												
On fitting	Old	Occlusion	I *Ao*	19	116.4	6.2	10	122.3	12.6	29	118.4	9.1
	„	Relaxation	I *Ar*	19	121.1	6.2	10	130.0	9.8	29	124.2	8.6
	„	Sounding *m*	I *Am*	19	122.3	5.7	10	130.5	10.8	29	125.1	8.6
	New	Occlusion	I *Fo*	19	120.2	5.6	9	128.7	10.7	28	122.9	8.5
	„	Relaxation	I *Pr*	19	122.3	5.6	10	131.6	9.9	29	125.4	8.5
	„	Sounding *m*	I *Pm*	19	124.2	5.8	10	132.9	10.1	29	127.2	8.5
	None	Relaxation	I *r*	19	119.7	6.4	10	130.4	9.4	29	123.4	9.0
	„	Sounding *m*	I *m*	19	121.0	6.0	10	130.0	10.0	29	124.1	8.6
Examination II												
10—12 days	New	Occlusion	II *Po*	16	120.5	5.6	9	132.0	4.9	25	124.6	7.6
after	„	Relaxation	II *Pr*	18	123.5	5.9	10	132.2	9.6	28	126.6	8.4
fitting	„	Sounding *m*	II *Pm*	19	124.8	5.7	10	133.8	9.7	29	127.9	8.4
	None	Relaxation	II *r*	19	121.2	5.9	10	130.3	9.6	29	124.4	8.4
	„	Sounding *m*	II *m*	19	122.3	6.4	10	131.6	10.6	29	125.5	9.1
Examination III												
3 months	New	Occlusion	III *Po*	18	119.4	5.2	9	127.4	10.3	27	122.1	8.0
after	„	Relaxation	III *Pr*	18	122.2	5.9	9	130.9	9.7	27	125.1	8.3
fitting	„	Sounding *m*	III *Pm*	18	123.9	5.7	9	132.6	10.1	27	126.8	8.4
	None	Relaxation	III *r*	18	120.5	6.4	9	129.6	9.3	27	123.5	8.5
	„	Sounding *m*	III *m*	18	121.8	5.9	9	130.2	9.5	27	124.6	8.2

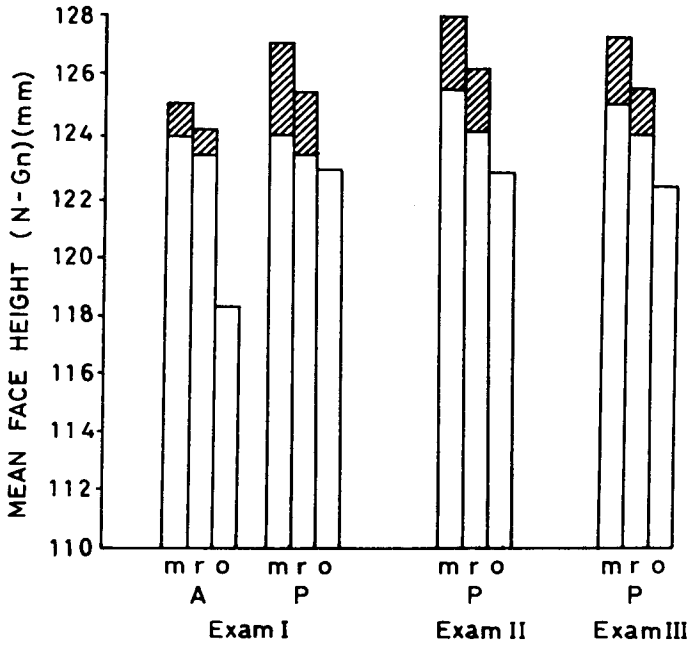

Fig. 1. Face height (*N—Gn*) measured under various conditions at the three examinations.

The lined areas show the mean differences in postural face height with and without dentures inserted.

A, Old dentures; *P*, new dentures; *m*, sounding *m;* r, relaxation; *o*, occlusion; I, II, III The examinations.

were exchanged for new. During the next 3 months there was a reduction of 0.5 mm. During the first 12 days there was no significant change (Table II).

The various measurements of *N—Gn* with the mandible in the postural position show that the postural face height was not constant but varied according to the conditions (Fig. 2). The mean

Table II

Change in morphologic face height between examinations

Comparison	No. of patients	Mean difference	Level of significance
I *Po*—I *Ao*	28	4.5	+++
II *Po*—I *Po*	24	0.1	..
III *Po*—I *Po*	26	—0,5	++

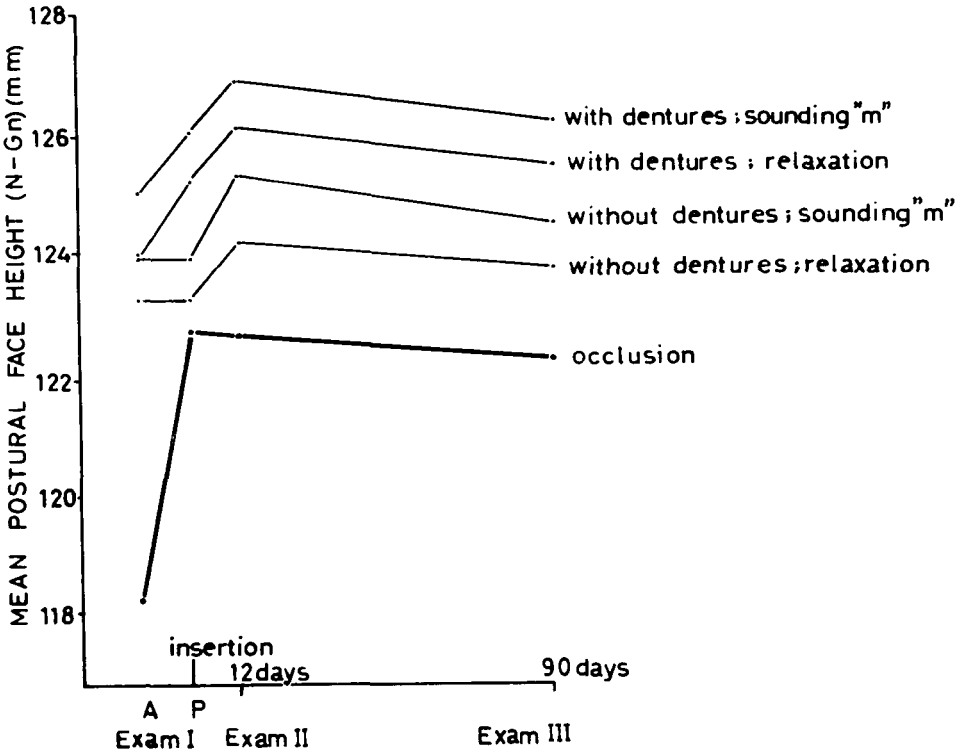

Fig. 2. Change in face height (*N—Gn*) during the follow-up period. *A*, Old dentures; *P*, New dentures.

postural face height was greater with the dentures inserted than without (Fig. 2); this applies to both the methods of achieving the rest position (Table III, *A*).

The mean postural height of the face was greater with the new higher dentures in place than with the old (Table III, *B*).

During the first 12 days after supplying the new dentures the mean postural height increased, both with and without the dentures inserted, and for both methods of assuming the postural position (Table III, *C*). There was then some reduction up to the 3-month follow-up. For the whole follow-up period there was a mean increase in the postural height only for the registrations without dentures.

The postural face height differed with the method used to get the mandible to assume the postural position (Table III, *D*). The

phonetic method (sounding m) gave consistently larger means than the relaxation method. The mean difference for all comparisons was 1.3 mm (highly significant).

Table III

Postural face height measured under different conditions

Comparison	No. of patients	Mean difference	Level of significance
A, With versus without dentures			
I *Ar* — I *r*	29	0.8	+
I *Pr* — I *r*	29	2.1	+++
II *Pr* — II *r*	28	2.0	+++
III *Pr* — III *r*	27	1.6	+++
I *Am* — I *m*	29	1.1	+
I *Pm* — I *m*	29	3.0	+++
II *Pm* — II m	29	2.4	+++
III *Pm* — III *m*	27	2.2	+++
B, New versus old dentures			
I *Pr* — I *Ar*	29	1.3	+++
I *Pm* — I *Am*	29	2.0	+++
II *Pr* — I *Ar*	28	2.2	+++
II *Pm* — I *Am*	29	2.8	+++
III *Pr* — I *Ar*	27	1.4	+++
III *Pm* — I *Am*	27	2.2	+++
C, Different examinations			
II *Pr* — I *Pr*	28	0.9	++
II *Pm* — I *Pm*	29	0.8	++
II *r* — I *r*	29	1.0	++
II *m* — I *m*	29	1.4	+++
III *Pr* — II *Pr*	26	—0.7	++
III *Pm* — II *Pm*	27	—0.6	..
III *r* — II *r*	27	—0.5	..
III *m* — II *m*	27	—0.8	+
III *Pr* — I *Pr*	27	0.3	..
III *Pm* — I *Pm*	27	0.2	..
III *r* — I *r*	27	0.6	+
III *m* — I *m*	27	0.9	+++
D, Different methods of obtaining postural position			
I *Am* — I *Ar*	29	1.0	++
I *Pm* — I *Pr*	29	1.7	+++
I *m* — I *r*	29	0.7	+
II *Pm* — II *Pr*	28	1.6	+++
II *m* — II *r*	29	1.2	+++
III *Pm* — III *Pr*	27	1.7	+++
III *m* — III *r*	27	1.1	+++

The free-way space, that is the difference between the face height measured with the mandible in the postural position and occlusion, varied according to the conditions (Table IV). It was on average larger with the old dentures than the new, but the difference was not so great as the increase in the morphologic face height on changing over to the new dentures. The mean free-way space, which with the old dentures inserted was on average 6 and 7 mm with the two methods for assuming the postural position, diminished to 2 and 4 mm, respectively, with the new dentures. During the follow-up period there was then an increase in the free-way space of about 1 mm (Fig. 3).

As in *Part I,* the material was divided into two groups according to (*i*) the magnitude of increase in the vertical dimension on changing over to the new dentures, the limit being put at the mean 4.25 mm for the comparison I *Po*—I *Ao* and (*ii*) the degree of resorption of the mandible, the grouping being performed from inspection of the symphysis region; to group 2 were assigned 16 patients with a resorption of the whole of the alveolar process in at least the anterior segment, that is to say, the bone margin

Table IV

Free-way space at the three examinations and for different methods of obtaining the postural position

Comparison		No. of subjects	Mean diff.	Levels of significance
(a) New *versus* old dentures	(I *Ar* — I *Ao*) — (I *Pr* — I *Po*)	28	3.2	+++
(b) Between examinations; new dentures; relaxation	(II *Pr* — II *Po*) — (I *Pr* — I *Po*)	23	0.4	..
	(III *Pr* — III *Po*) — (I *Pr* — I *Po*)	26	0.8	+
	(III *Pr* — III *Po*) — (II *Pr* — II *Po*)	22	0.1	..
(c) New *versus* old dentures	(I *Am* — I *Ao*) — (I *Pm* — I *Po*)	28	2.4	+++
(d) Between examinations; new dentures; phonetic method	(II *Pm* — II *Po*) — (I *Pm* — I *Po*)	24	0.5	..
	(III *Pm* — III *Po*) — (I *Pm* — I *Po*)	26	0.7	+
	(III *Pm* — III *Po*) — (II *Pm* — II *Po*)	23	0.2	..
(e) Between examinations; relaxation	(II *r* — II *Po*) — (I *r* — I *Po*)	24	0.7	..
	(III *r* — III *Po*) — (I *r* — I *Po*)	26	1.1	+++
	(III *r* — III *Po*) — (II *r* — II *Po*)	23	0.2	..
(f) Between examinations; phonetic method	(II *m* — II *Po*) — (I *m* — I *Po*)	24	1.1	+
	(III *m* — III *Po*) — (I *m* — I *Po*)	26	1.2	+++
	(III *m* — III *Po*) — (II *m* — II *Po*)	23	0.1	..

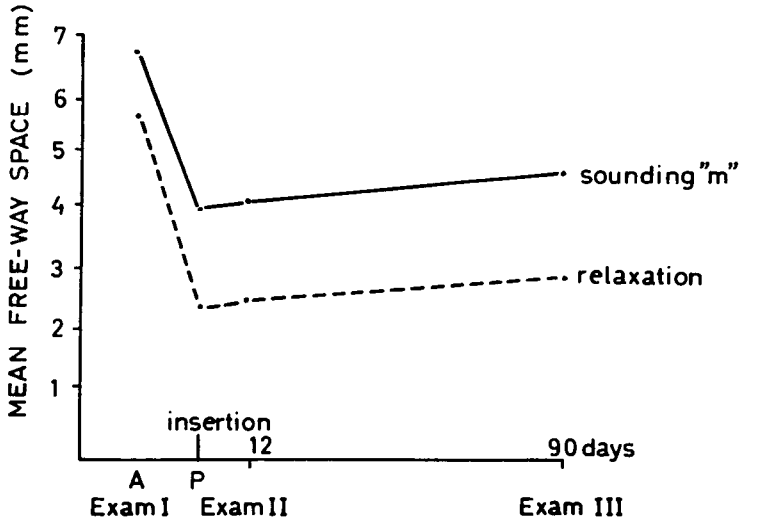

Fig. 3. Change in free-way space during the follow-up period. The postural face height was recorded with the dentures inserted.
A, Old dentures; *P*, New dentures.

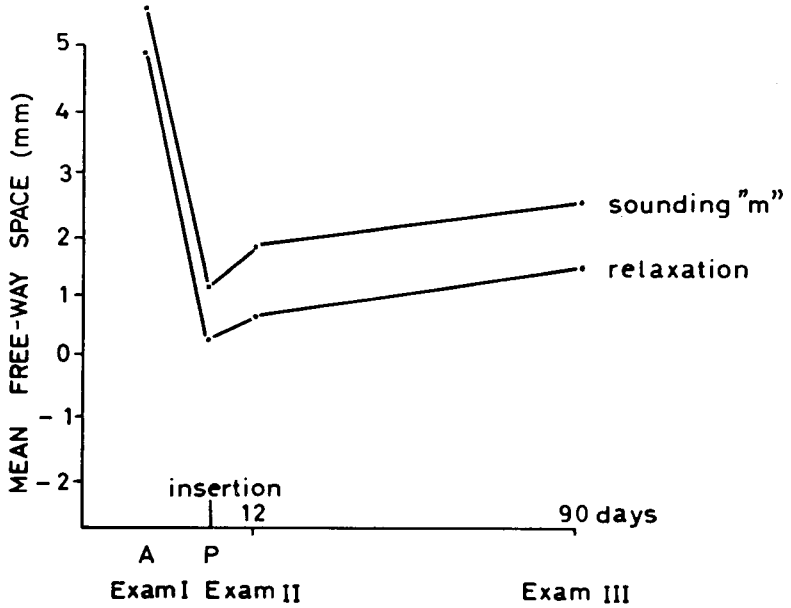

Fig. 4. Change in "free-way space" during the follow-up period (postural face height recorded without the dentures. cf Fig. 2 in *Part I*).

Table V

Comparison between groups divided according to vertical dimension (I Po — I Ao)

Variable	I Po — I Ao	No. of patients	Mean difference	Level of significance
II *r* — I *r*	< 4.25	15	1.3	
	> 4.25	13	0.6	..
III *r* — I *r*	< 4.25	13	0.8	
	> 4.25	13	0.5	..
III *Po* — II *Po*	< 4.25	11	—0.3	
	> 4.25	11	—0.9	+
(III *Pr*—III *Po*) —	< 4.25	10	—0.2	
— (II *Pr*— II *Po*)	> 4.25	11	+0.3	..

Table VI

Changes in morphologic face height during the follow-up period, associated with different degrees of mandibular resorption

Variable	Degree of resorption	No. of patients	Mean difference	Level of significance
III *Po* — I *Po*	1 (little)	13	—0.6	
	2 (marked)	13	—0.3	..

was on a level with, or lower than, the spinal mentalis; the other 13 with less advanced bone loss were assigned to group 1 (see Figs. 4 and 5, *Part I*).

The comparisons are reported in Tables V and VI. Between the second and third follow-ups, the mean morphologic face height diminished, with a greater value for the group with the greater increase in vertical dimension (almost significant). For the other comparisons no mean differences were found.

DISCUSSION

Since the principles for the treatment, the criteria for the selection of the patients and the method for the X-ray cephalometric examination were identical to those used in the earlier study (*Part I*), it is permissible to make certain comparisons between the results.

The increase in the morphologic face height on changeover to the new dentures was of the same order in the two studies, namely, 5.0 and 4.5 mm. The large increase was considered to compensate for the reduction in the vertical dimension that occurred during the time the old dentures were being used.

The significant decrease of 0.5 mm in the morphologic face height during the short follow-up period of 3 months is in close agreement with the results obtained in *Part I* — that is, 1 mm for the first 6 months. The mean change during the first 12 days was 0.1 mm in both studies.

The rapid increase in the postural face height during the first 12 days after supplying the new dentures is remarkable; it was present both with and without the dentures in the mouth and both methodes of obtaining the postural position (Table III, *C*). This would suggest that the postural position of the mandible is rapidly adapted to changes in occlusal vertical dimension. That this is due not only to the direct action of the dentures on the intraoral structures is evident from the similarity of the changes in the postural face height with and without the dentures inserted. It is as if the masticatory apparatus rapidly retains an impression of the new occlusal and postural positions of the mandible, an impression that persists for a time after the occlusal contacts are lost on removal of the dentures.

Results indicative of parallelism in the development between the morphologic and postural face height have been presented by *Tallgren* (1957), *Swerdlow* (1964) and *Carlsson & Ericson* (1965).

That the postural face height in full-denture wearers differs according to whether the dentures are in the mouth or not has been reported by *Olsen* (1951), *Atwood* (1956) and *Swerdlow* (1964). The last of these authors intimates that the dentures can affect the postural position by changing the weight of the mandible or by pressure on the exteroceptors in the mucosa in the region bearing the dentures. According to *Fish* (1964), on removal of the dentures from the mouth there is not only an elevation of the mandible but also protraction of the soft palate and a shortening of the tongue. He proposes that the position of the mandible is determined by the demands of the tongue in per-

forming its respiratory function of completing the anterior wall of the pharyngeal part of the respiratory tract. Although this mechanism would seem to be reasonable, it is inconceivable that it can alone account for the rapid variations in the rest position of the mandible observed in studies in the postural face height.

The possibility that various methods of determining the postural position yield discrepant results has been discussed earlier. *Tallgren* (1957), for instance, found no significant difference between a fatiguing, a relaxation and a phonetic method, while *Swerdlow* (1964) reported that a phonetic method (sounding *m*) gave a significantly greater interocclusal distance than a swallowing procedure. An essential factor in determining the postural position is probably the period elapsing between the command and the actual registration. The problem is complicated by a number of other factors on which the postural position is dependent (*Atwood*, 1956). It is evident, however, that different methods of obtaining the postural position give different results and this is of clinical significance.

The observed variability of the face height under different conditions shows that the postural position of the mandible is not entirely acceptable as a basis for determining the occlusal vertical dimension in making full dentures. Nor can any reduction in the occlusal vertical dimension of various origins be determined solely from measurements of the free-way space, since there is evidently a fairly rapid adaptation of the masticatory apparatus to the changes in vertical dimension. A reduction in the morphologic face height results in a reduction in the postural height, although the changes are not quite parallel.

If it is intended to use the postural position as a basis for determining the occlusal vertical dimension it should be borne in mind that the postural height varies according to the method used to get the patient to assume the postural position.

SUMMARY

As a continuation of an earlier study on the change in the face height in full-denture wearers (*Carlsson & Ericson*, 1965) a longitudinal X-ray cephalometric study has been performed. The se-

ries consisted of 19 women and 10 men who had received new full upper and lower dentures after having worn such dentures for at least 5 years. A series of profile radiographs were taken in the cephalostat at 3 follow-up examinations: the first when the dentures were delivered, the second 10—12 days and the third 3 months afterwards. The face height (nasion—gnathion) was measured on the radiographs with the old and new dentures in occlusion (morphologic face height) and the mandible in the postural position with and without the dentures inserted (postural face height). Two methods for obtaining the postural position were used: the relaxation method (no command) and a phonetic method (sounding *m*). The results of the measurements, which were subjected to statistical analysis, are presented in tables and diagrams.

(1) The mean morphologic face height increased by 4.5 mm on changeover to the new dentures, and decreased by 0.5 mm over the 3-month follow-up period.

(2) The postural face height varied according to the conditions:

(a) The mean postural face height was greater (1.3 mm) for the phonetic than the relaxation method.

(b) The mean postural face height was on average larger with the dentures inserted than without.

(c) The postural position with the dentures inserted differed for the old and new dentures — that is to say, it depended on the height of the dentures.

(d) The mean postural height changed from one examination to another.

Because of the variability in the postural height of the face the postural position of the mandible cannot be considered entirely acceptable as a basis for determining the occlusal vertical dimension when making full dentures, or as a measure of any decrease in the occlusal morphologic face height.

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RÉSUMÉ

HAUTEUR DE LA FACE EN POSITION DE REPOS CHEZ LES PORTEURS DE PROTHÈSES COMPLÈTES

ETUDE CÉPHALOMÉTRIQUE LONGITUDINALE PAR RADIOGRAPHIES

Faisant suite à une étude antérieure sur les modifications de hauteur de la face chez les porteurs de prothèses complètes (*Carlsson et Ericsson*, 1965), une étude céphalométrique longitudinale par radiographies a été effectuée. La série de patients comprenait 19 femmes et 10 hommes ayant reçu de nouvelles prothèses complètes du haut et du bas après en avoir porté pendant au moins cinq ans. Une série de radiographies de profil a été faite au céphalostat lors de trois examens de contrôle: le premier au moment de la pose des prothèses, le second au bout de 10 à 12 jours et le troisième au bout de trois mois. La hauteur de la face (nasion-gnathion) a été mesurée sur les radiographies, en occlusion avec les vieilles et avec les nouvelles (hauteur morphologique de la face), et en position de repos avec et sans prothèses (hauteur de la face en position de repos). Deux méthodes ont été employées pour obtenir la position de repos: la méthode de détente ("no command") et une méthode phonétique (prononciation du son "m"). Les résultats des mesures, soumis à une analyse statistique, sont présentés sous forme de tables et de diagrammes.

(1) La moyenne de la hauteur morphologique de la face augmentait de 4,5 mm lors du passage des vieilles prothèses aux nouvelles, et diminuait de 0,5 mm pendant les trois mois de la période de contrôle.

(2) La hauteur de la face en position de repos variait suivant les conditions:

(a) La moyenne de la hauteur de la face en position de repos était plus grande (1,3 mm) pour la méthode phonétique que pour la méthode de détente.

(b) La moyenne de la hauteur de la face en position de repos était dans l'ensemble plus grande avec les prothèses que sans.

(c) La position de repos avec prothèses était différente suivant que l'on utilisait les vieilles prothèses ou les nouvelles lors

des mesures — c'est-à-dire qu'elle dépendait de la hauteur des prothèses.

(d) La moyenne de la hauteur de la face en position de repos changeait d'un examen à l'autre.

La hauteur de la face en position de repos étant de la sorte extrêmement variable, il ne semble guère acceptable de se baser sur elle d'une manière indiscriminée pour déterminer la hauteur d'occlusion lors de la confection de prothèses complètes, ni pour mesurer les réductions de la hauteur morphologique de la face.

ZUSAMMENFASSUNG

DIE RUHEHÖHE DES GESICHTES BEI VOLLPROTHESENTRÄGERN
EINE LONGITUDINALE, RÖNTGENKEPHALOMETRICHE UNTERSUCHUNG

Als eine Ergänzung und Fortsetzung einer früheren Arbeit von Veränderungen der Gesichtshöhe bei Vollprothesenträgern (*Carlsson & Ericson,* 1965) ist eine longitudinale, röntgenkephalometrische Untersuchung ausgeführt worden. Das Patientenmaterial umfasst 19 Frauen und 10 Männer, die neue Vollprothesen erhalten haben, nachdem sie mindestens 5 Jahre Vollprothesen in beiden Kiefern getragen haben. Eine Serie Profilröntgenbilder wurde bei 3 Kontrollzeitpunkten im Kephalostaten aufgenommen: 1) bei dem Eingliedern der neuen Vollprothese, 2) 10—12 Tage und 3) 3 Monate danach. Die Gesichtshöhe, Nasion—Gnathion (N—Gn), wurde auf den Röntgenbildern gemessen. Die folgenden Definitionen wurden angewandt:

die morphologische Gesichtshöhe — N—Gn mit neuen und alten Vollprothesen in Okklusion,

die Ruhehöhe des Gesichtes — N—Gn mit dem Unterkiefer in Ruhestellung, mit oder ohne Prothesen im Munde.

Zwei Methoden wurden probiert, um den Unterkiefer die Ruhestellung einzunehmen: eine Abspannungsmethode und eine Phonetische Methode (Aussprechen der Laute „m"). Die Messergebnisse sind statisch behandelt und in Tabellen und Diagrammen präsentiert worden. Die wesentlichsten Resultate können in folgenden Punkten zusammenfasst werden:

1) Die morphologische Gesichtshöhe erhöhte sich durchschnittlich ur 4,5 mm beim Eingliedern der neuen Vollprothese und

nahm mit 0,5 mm während der 3 Monate langen Observationszeit ab.

2) Die Ruhehöhe des Gesichtes variiert unter verschiedenen Verhältnissen:

a) Die Ruhehöhe ist grösser (durchschnittlich 1,3 mm) bei der phonetischen Methode als bei der Abspannungsmethode für die Bestimmung der Ruheschwebelage.

b) Die Ruhehöhe ist durchschnittlich grösser mit als ohne Vollprothese im Munde.

c) Die Ruhehöhe mit Vollprothese im Munde variiert durchschnittlich mit der Bisshöhe der Vollprothese.

d) Die Ruhehöhe variiert durchschnittlich zwischen verschiedenen Untersuchungszeitpunkten.

In der Diskussion wird betont, dass die Variabilität der Ruhehöhe des Gesichtes bedeutet, dass die Ruhestellung des Unterkiefers nicht kritiklos als Ausgangspunkt für die Bestimmung der Bisshöhe bei Herstellung von Vollprothesen oder für Messung einer eingetroffenen Bissenkung ausgenützt werden kann.

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