THE SITUATION OF FORAMEN MANDIBULAE AND ITS ASYMMETRY IN RECENT ADULTS ACCORDING TO AGE AND SEX

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The foramen mandibulae is situated in different ways: it lies in the middle between the anterior and the posterior border of the ramus, respectively, nearer to the mandibular notch (on the average 20 mm) than to the inferior border, 20 mm backwards from the middle part of alveolus dentis serotini inferioris (P a t u r e t, 1951), 30—35 mm from the inferior border of the mandible, 12—15 mm behind crus mediale cristae temporalis (M a i s o n n e t-C o u d a n e, 1950), 10 mm below the deepest part of incisura mandibulae (M o n o d), 10 mm above facies masticatoria of the lower molars, about the middle of the ramus.

Personal observations of the distance of mandibular foramen from the inferior, superior, anterior and posterior borders of the mandibular ramus concerned a) 36 male mandibles (72 specimens), age group from 22 to 73 years, b) 23 female mandibles (46 specimens), age group from 19 to 83 years. The macerated male and female jaws were divided into three similar groups of age, which, on the whole, were identical with the anthropological division into 1) adults between 19 (22) and 30 years, in the period of cutting through of all teeth, possibly without M_3, i.e. the third decennium, 2) maturus up to the 50th year, with advanced abrasion of the masticatory area, i.e. the fourth and fifth decennia, and with evanescence of the dental sockets as the result of loss of teeth (M a r t i n, 1928). These groups are compared with one another to indicate all differences in age and sex. The distances from the centre of the mandibular foramen were measured in the long axis of the ramus and perpendicular to it.

I. AGE DIFFERENCES AND ASYMMETRY IN MEN

In 36 mandibles, the distances of foramen mandibulae were measured on both sides (72 specimens) in the following age groups: 1) 22—29 years (13 mandibles, 26 specimens), 2) 30—47 years (17 mandibles, 34 specimens), 3) 53—73 years (6 mandibles, 12 specimens).

Results

22—29 years	Left	Right
	mm	
Distance from inferior border	29.2 (22—35)	28.1 (21—33)
superior border	21.8 (14—30)	21.9 (16—27)
anterior border	16.9 (13—20)	16.4 (13—22)
posterior border	13.8 (10—17)	13.2 (10—15)
30—47 years		
Distance from inferior border	28.9 (23—36)	28.3 (23—34)
superior border	23.4 (19—27)	23.5 (19—30)
anterior border	16.3 (10—26)	15.7 (10—19.5)
posterior border	14.4 (11.5—20)	13.9 (10—19)
53—73 ears		
Distance from inferior border	28.7 (21—35)	28.0 (22—33)
superior border	21.5 (17—29)	23.3 (18.5—30)
anterior border	16.1 (13—20)	15.8 (14—19)
posterior border	14.3 (12—16.5)	14.2 (12.5—17)

(The numbers in brackets represent minimum and maximum values)

Conclusions

a) The foramen mandibulae of men is more distant from the inferior border than (downward) from the superior, anterior, and posterior borders, respectively, on either side and in all age groups.

b) The distance of foramen mandibulae from the inferior border decreases in the senium a little. Its distance from the superior border is greatest in the fourth and fifth decennia, smaller in old age, smallest in the third decennium. Its distance from the anterior border is greatest in the third decennium, later it is smaller. The distance from the posterior border of the ramus is smallest in the third decennium, later it is greater.

c) The distances in general are greater in the fourth and fifth decennia (greatest development of the ramus) than (downward) in the third decennium and in old age.

d) The minimum and maximum values of the individual distances are, contrary to women (vide infra), scattered in all three age groups.

e) The left dimensions (L) are greater than the right ones (R) in the ratio 67:47.

In the individual age groups the ratio is as follows:

		22—29	30—47	53—73 years
Distance from				
inferior border	L : R	10 : 3	9 : 6	4 : 3
superior border	L : R	5 : 7	5 : 8	0 : 5
anterior border	L : R	5 : 0	6 : 5	3 : 2
posterior border	L : R	6 : 3	12 : 3	2 : 2

The distance of the mandibular foramen from the inferior border of the ramus is greater on the left side in all three groups. On the other hand, that from the mandibular notch is greater on the right side, especially in old age. The left foramen mandibulae lies in men higher than the right one, which is situated lower. The distance of the mandibular foramen from the anterior border of the ramus is always greater on the left than on the right side. The same applies to the distance from the posterior border of the ramus.

II. AGE DIFFERENCES AND ASYMMETRY IN WOMEN

In 23 mandibles, the distances of the foramen mandibulae were measured on both sides (46 specimens) in the following age groups: 1) 19—27 years (9 mandibles, 18 specimens), 2) 30—44 years (6 mandibles, 12 specimens), 3) 60—83 years (8 mandibles, 16 specimens).

Conclusions

a) As in men, the foramen mandibulae is more distant from the inferior border (downward) than from the superior, anterior and posterior borders, respectively, on either side and in all age groups.

b) The distance of the foramen mandibulae from the inferior border of the ramus is smallest in the third decennium. In the fourth and fifth decennia it is greatest, while in old age it is moderately decreasing. The distance from the superior border is greatest in the third decennium. In the fourth and fifth decennia it is smallest; in old age it is moderately increasing. The same can be said about the distance from the anterior and posterior borders.

Results

19—27 years	Left	Right
	mm	
Distance from inferior border	25.7 (17—31)	23.3 (18—27)
superior border	20.7 (16—23)	21.5 (18—25.5)
anterior border	14.9 (12.5—17)	15.7 (13—19)
posterior border	12.9 (10—16.5)	13.1 (10 19)
30—44 years		
Distance from inferior border	27.5 (23—32)	25.9 (21—28)
superior border	18.4 (15—22)	20.0 (18—25)
anterior border	14.3 (9—18)	14.4 (11—16)
posterior border	12.2 (10.5—15)	11.7 (10—15)
60—83 years		
Distance from inferior border	27.4 (22—33)	25.0 (20—29)
superior border	19.9 (15—25.5)	20.8 (15—30)
anterior border	14.9 (11.5—22)	15.1 (12—20)
posterior border	12.2 (9.5—15)	12.4 (10—16.5)

(The numbers in brackets represent minimum and maximum values)

c) Greater distances are found in general in the third decennium (greatest development of ramus) than (downward) in the aged and in the fourth and fifth decennia.

d) Maximum values of the distance from the inferior border of the ramus are found in the fourth and fifth decennia, while from the superior, anterior and posterior borders in the third decennium. Minimum values are encountered in the distances from the inferior border in the third decennium, from the superior, anterior and posterior borders in the fourth and fifth decennia. In the aged the values are moderate.

e) The left dimensions (L) are more often greater than the right ones (R) in the ratio L : R = 39 : 33.

In the individual age groups the ratio is as follows:

		19—27	30—44	60—83 years
Distance from				
inferior border	L : R	6 : 1	5 : 1	7 : 0
superior border	L : R	1 : 7	1 : 3	2 : 5
anterior border	L : R	1 : 5	2 : 2	4 : 3
posterior border	L : R	3 : 2	3 : 0	4 : 4

The distance of the mandibular foramen from the inferior border of the jaw is distinctly greater on the left side, especially in old age. On the other hand, the distance from the mandibular notch is greater on the right side, the left mandibular foramen being situated higher in both women and men than the right one, which is situated lower. The distance of the foramen mandibulae from the anterior border of the ramus in the third decennium is greater on the right side; later, greater distances are absent. The distance from the posterior border is greater on the left side in the fourth and fifth decennia, otherwise it is the same.

DISCUSSION

In comparison with the data in the relevant literature there are some differences. The foramen mandibulae being not equally distant from the anterior and posterior borders of the ramus, as Paturet says: the distance from the anterior border has always been found to be greater than the distance from the posterior border. Conformably with Paturet it has been found that the mandibular foramen lies nearer to the mandibular notch (on the average 20 mm, Paturet) than to the inferior border of the ramus. The distance of 30—35 mm from the inferior border of the jaw (Maisonnet-Coudane) is too great, compared with our findings (men averaging 28.6 mm, women 25.7 mm). The distance of the foramen mandibulae measuring 12—15 mm from crus mediale cristae temporalis (Maisonnet-Coudane) is approximately the same, crus mediale cristae temporalis lying 3—4 mm behind the anterior border of the ramus (our findings: men averaging 15.8 mm, women 15 mm). Monod's data: mandibular foramen lying 10 mm beneath the lowest point of the mandibular notch is of too low a value. In men we found on the average 22.7 mm, in women 20.4 mm, followed by values more than twice as high. The mandibular foramen is not situated in the middle of the height of the ramus, as often indicated, but always above its centre.

CONCLUSIONS

1) Foramen mandibulae is more distant from the inferior border of the ramus than (downward) from its superior, anterior and posterior borders, on either side, in adults and aged, and in both sexes.

2) In men, the distance of the mandibular foramen from the inferior border of the jaw is greater on the left side. The distance from the mandibular notch, on the other hand, is greater on the right side, especially in the aged. Its distance from the anterior border is greater on the left side. The same applies to the distance from the posterior border of the ramus.

3) In women, the distances of the mandibular foramen from the borders of the ramus are on both sides smaller than in men. The distance of the foramen mandibulae from the anterior border in women is greater on the right side in the third decennium (in men on the left side); later, differences are absent. The distance of the foramen from the inferior border is more striking on the left side in old women than in old men. The distance of the foramen from the posterior border of the ramus is a little greater on the left side in the fourth and fifth decennia, otherwise there is no difference. The relations of the differences between the distances of the mandibular foramen from the borders of the right and left rami are in women in general identical with the results in men.

4) In women, the values of the distance of the foramen mandibulae from the inferior border are maximum in the fourth anf fifth decennia, while from the superior, anterior and posterior borders in the third decennium. Minimum values are measured in the distances from the inferior border in the third decennium, while from the superior, anterior and posterior borders in the fourth and fifth decennia. In the senium, the values are moderate. In men, maximum and minimum values of the individual distances are scattered in all three age groups.

5) In men and women, the distances of the mandibular foramen from the borders of the ramus are more often greater on the left side than on the right side and more striking in men than in women.

6) In men and women, the left foramen mandibulae is situated higher than the right one, which is lower. The difference in women makes 2.1 mm, while in men only 0.8 mm.

7) Mean values calculated in adult men:

	Left	Right
	min	
Distance from inferior border	29.0 mm (21—36 mm)	28.2 mm (21—34 mm)
superior border	22.5 mm (14—30 mm)	22.9 mm (16—30 mm)
anterior border	16.5 mm (10—26 mm)	15.1 mm (10—19.5 mm)
posterior border	14.1 mm (10—20 mm)	13.7 mm (10—19 mm)
Mean values calculated in adult women:		
Distance from inferior border	26.7 mm (17—33 mm)	24.6 mm (18—29 mm)
superior border	19.8 mm (15—25.5 mm)	20.9 mm (15—30 mm)
anterior border	14.8 mm (9—22 mm)	15.1 mm (11—20 mm)
posterior border	12.5 mm (9.5—16.5 mm)	12.5 mm (10—19 mm)

8) Distances irrespective of the left or right side:

Men	
Distance from	
inferior border	28.6 (21—36)
superior border	22.7 (14—30)
anterior border	15.8 (10—26)
posterior border	13.9 (10—20)
Women	
Distance from	
inferior border	25.7 (17—33)
superior border	20.4 (15—30)
anterior border	15.0 (9—22)
posterior border	12.5 (9.5—19)
(The numbers in brackets represent minimum and maximum values)	

9) The variability of the distances of the foramen mandibulae from the borders of the ramus is great. The listed absolute values are not useful as reliable anatomical and anthropological feature in distinguishing male and female mandibles or in differentiating the age.

SUMMARY

The distances of the foramen mandibulae from the inferior, superior, anterior and posterior borders of the ramus were measured on macerated mandibles of men and women in the third decennium, in the fourth and fifth decennia, and in the senium. On the basis of the absolute values obtained, were calculated the relations of the individual distances, the more frequent incidence of higher or lower values from the viewpoint of asymmetry, conformity and differences in all three age groups in both sexes, minimum and maximum values of the individual distances in the age groups of women and the mean values for men and women, including the distances irrespective of the left or right side, as seen in the conclusions. The wide spectrum of variation of the distances is not a reliable criterion for differentiating the sex and the age of an unknown mandible.

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