

# A COMPARISON OF THE FUNDAMENTAL SIGNS OF THE EAR-LOBE IN NORMAL CHILDREN AND CHILDREN WITH FACIAL CLEFT

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The potential presence of anomalies in various bodily organs, or in some parts thereof relating to the shape and dimensions of these structures in subjects with cleft anomalies has been pointed out in several preceding contributions of ours (F. Burian, L. G. Farkaš, K. Hajniš 1964; K. Hajniš, L. G. Farkaš 1964; K. Hajniš, L. G. Farkaš 1965; K. Hajniš, L. G. Farkaš, M. Hajnišová). Our observations were based on some of Burian's ideas, not specified in detail (1954), resulting from his practice of many year's standing.

Supposed deviations of shape and dimensions different from the standards, and asymmetry of shape and dimensions in some parts of the body, and in comparison of both sides thereof, accompanying the cleft anomalies are explained by the theory of partial reduction of the growth potentialities resulting from impaired function of the centres as stated among others also by H. Derichsweiler (1959), and F. Skotnický (1963).

In order to substantiate or eliminate the above-mentioned thesis we carried out a comparative study on the basic dimensions and form abnormalities of the auricle with regard to its asymmetry. The data acquired in children with cheilo-, gnatho- and palatoschisis were compared with the average values of individual auricular dimensions as acquired in the course of anthropometric investigations of the Bohemian population in the 0 to 18 years age group, performed in the year 1964, the results of which research are considered by us to represent the standard norms for Bohemia and Moravia.

## MATERIAL AND METHODS

Our material was composed of 110 children with total or partial, unilateral or bilateral cleft anomalies, or else only with cleft palate, either of the soft or the hard palate. Among the mentioned 110 children there were 71 boys and 39 girls, all of them in the two to seventeen age group. The majority of them (as shown in the Tables, are of course concentrated in the age groups of three, three and a half, four, and further fourteen, fifteen, sixteen and seventeen years.

The basic metrical dimensions of the ear-lobes

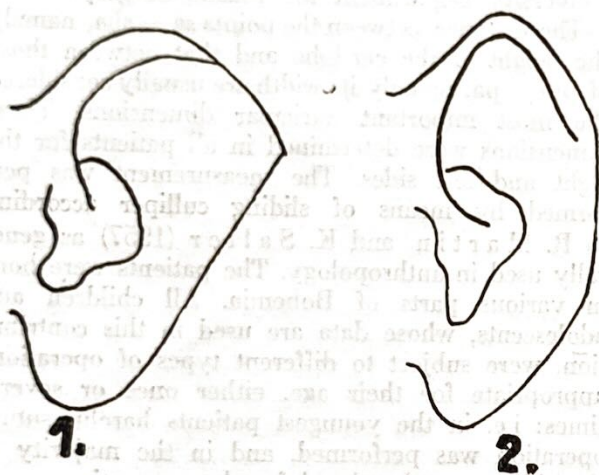
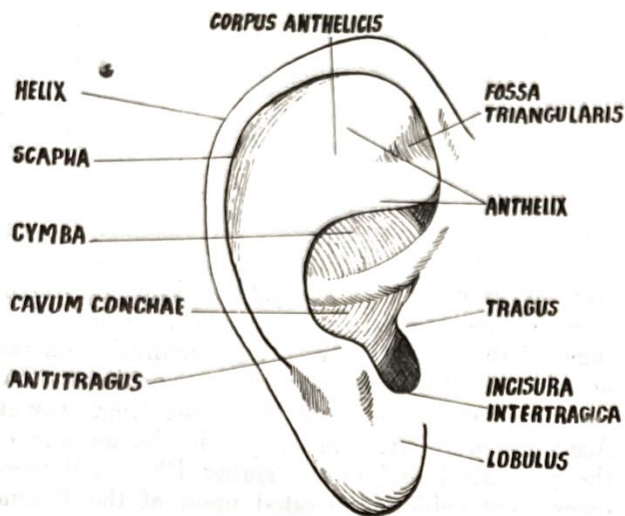
were ascertained in these children within the framework of more detailed cephalometrical investigations of these patients with cleft anomalies on the occasion of their control examinations in the Laboratory for Plastic Surgery of the Czechoslovak Academy of Sciences in Prague in the autumn of the year 1964 and in the spring 1965. (All these cases were subjects operated upon at the Prague University Department for Plastic Surgery.)

The distance between the points  $sa - sba$ , namely the height of the ear-lobe and that between those of  $pra - pa$ , namely its width are usually considered the most important auricular dimensions. These dimensions were determined in all patients for the right and left sides. The measurement was performed by means of sliding calliper according to R. Martin and K. Saller (1957) as generally used in anthropology. The patients were born in various parts of Bohemia. All children and adolescents, whose data are used in this contribution, were subject to different types of operations appropriate for their age, either once or several times: i.e. in the youngest patients harelip suture operation was performed, and in the majority of the older ones also the cleft palate operation.

Besides the above-mentioned most important dimensions and dimensional ear-lobe asymmetries, also the asymmetries of shape were considered by us at the same time, such as fully adherent ear lobule on the one side, and a free lobule on the other; the asymmetry of the Darwin's tuberculum well marked on one side, and not expressed on the other; that of a helix with a more marked convolution on one side as compared to the other, and others.

Detailed growth standards of the auricle, beginning since the birth and continuing up to 18 years of age were worked out to serve for comparison with normal dimensions in Czech children for the purpose of evaluating auricle configuration in the children with cleft anomalies treated in the University Clinics. The above-mentioned dimensions in the individual patients examined were compared with these standards which are prepared for subsequent publication. This evaluation was performed separately for the right and left sides and, naturally, separately for boys and girls. The ear-lobe dimen-

sions were nevertheless compared with the standards as a whole, i.e. both dimensions (sa — sba as well as pra — pa) at the same time. In Table 1 — those auricles are classified as deviating from the dimensional standards (those auricles), which differentiated either towards a smaller or larger form in one of the basic dimensions, at least.



The design of the ear-lobe of the Macacus type (1) and Cercopithecus type (2).

The dimensions of both auricles are interesting also in cases of unilaterally cleft anomalies, for instance. Tables 8 and 9 serve for evaluation of this problem by containing all possible dimensional combinations for both the auricles with due consideration for the right-sided or left-sided or bilateral total cleft, or a cleft affecting only the lip, and also with regard to the cleft palate itself.

COMPARISON OF EAR-LOBE DIMENSION WITH THE NORMS

In Table 1 we present the number of three-year old children with cleft anomalies (both boys and girls) with basic ear-lobe dimension different from our standards, and the number of cases non-differentiated from the standard auricular dimensions. According to usual procedures in these cases as well as in all further ones, all children with ear-

TABLE 1

The number of cases different in length and width of the ear-lobe (sa-sba and pra-pa) or in one of these dimensions from the normal size among persons of the age of three years by  $\pm 1s$  at least

3 years	Boys (n = 5)		Girls (n = 8)	
	left	right	left	right
n	1	3	2	2
%	20,00	60,00	25,00	25,00
Cases which don't differ from normal ones				
n	4	2	6	6
%	80,00	40,00	75,00	75,00

lobes, the dimensions of which were in the  $\bar{x} \pm 1s$  were classified as subjects not deviating from the norm in this respect limits. These cases include 5 boys and 8 girls, 26 auricles in all, in this age group.



F. P. 26 286. Boy of 2 years. Fleshy lobulus. Cheiloschisin.

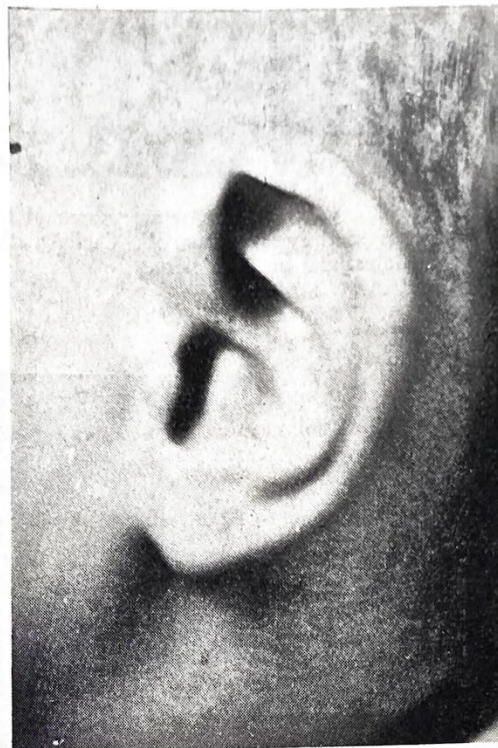
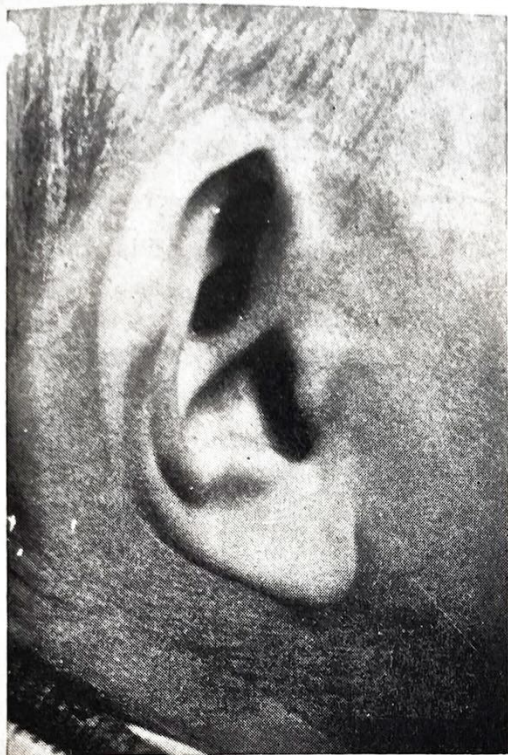


B. V. 21 936. Boy of 2 years. Hypoplastic lobulus. The earlobes standing off with extra deep concha. The partial cleft of lip on the left.

It is demonstrated in the upper part of the table in which the numbers of affected ear-lobes in boys and girls on their left as well as on their right sides are presented that besides the right side in boys their auricles of sizes different from the standard are present in one fifth up to one quarter in this age group. An exception is formed here with the right auricles in boys among which 60% auricles of dimensional deviations from the stan-

are rare clinical cases), and hence no important conclusions are to be drawn thereof.

A comparatively much higher percentage of auricles exceeding the standards than in the preceding group is present in the three and a half year age group as shown in Table 2. From the total number of 13 children there are 7 boys and 6 girls. Besides the affected right side in the boys, the presence of auricles of different size as com-



B. V. 49130. Boy of 3 years. The area and shape asymmetry of the ear-lobes. The right ear-lobe remarkably standing off. The hypoplastic lobulus on the left. Cheilo-gnatho-palatoschisis sin.

dards were detected. As shown in the lower part of the Table, the majority of ear-lobes (namely 75 to 80%) in the children with cleft anomalies of the three-year-age group are not different from the standards. In all these comparisons it is to be kept in mind that this age group is composed of only a small number of patients (because these

pared to the standards may be noticed approximately in two thirds up to 86% of all cases, hence they are really far more frequent than among the three-year-age group.

It is interesting that the most frequent deviations, as expressed with percentage in all groups and in the four-years old children as well, are again pre-

TABLE 2

The number of cases different in length and width of the ear-lobe or in one of these dimensions (sa-sba and pra-pa) from the normal size among persons of the age of three and a half years by  $\pm 1$  s at least.

Boys (n = 7)			Girls (n = 6)	
3 1/2 years	left	right	left	right
n	6	2	4	4
%	85,71	28,57	66,66	66,66
Cases which don't differ from normal ones				
n	1	5	2	2
%	14,28	71,42	33,33	33,33

TABLE 3

The number of cases different in length and width of the ear-lobe (sa-sba and pra-pa) or in one of these dimensions from the normal size among persons of the age of four years by  $\pm 1$  s at least.

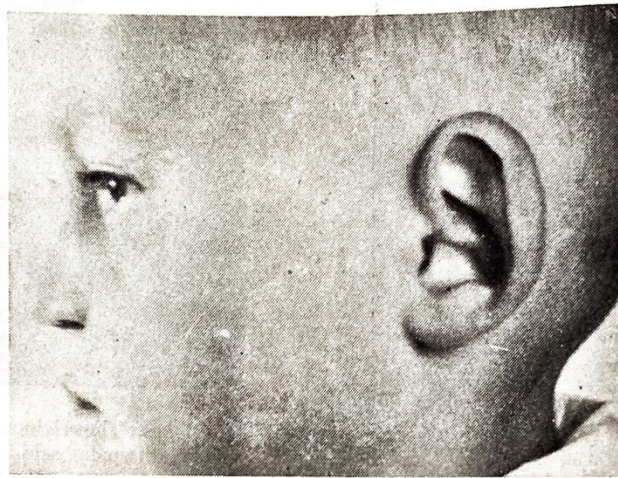
Boys (n = 7)			Girls (n = 7)	
4 years	left	right	left	right
n	7	2	3	3
%	100,00	28,57	42,85	42,85
Cases which don't differ from normal ones				
n	0	5	4	4
%	0,00	71,42	57,14	57,14



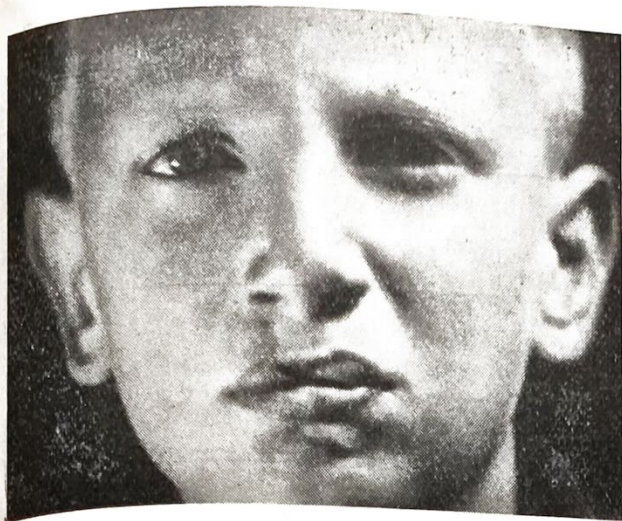
E. V. 12 166. Boy of 4 years. The asymmetry area of earlobes. The earlobes slightly standing off. Cheilo-gnathopalatoschisis on both sides.



B. F. 13490. Boy of 4 years. Strong standing off earlobes. The asymmetry of size. The left side cleft of lip and maxilla up to Foramen incisivum.



V. F. 42613. Boy of 5 years. Special shape deformations of helix. Cheilo-gnathopalatoschisis sin.



E. M. 8685. Boy of 8 years. The area and shape asymmetry of ear-lobes. The total cleft on the right side.

sent in boys' ear-lobes on their right side, the same as the case was with the both preceding age groups. The distribution of dimensional standards and deviations thereof in this age group is shown in Table 3. This group is composed of 14 patients in all (i.e. 28 auricles), these being 7 girls and 7 boys. In girls the percentage of abnormal dimensions of their auricles is again equal on both sides (namely 42,85 %) while in the boys their distribution is rather different on both sides. The dimensional deviations from the standards affected the left auricle in hundred per cent of cases while the abnormal dimensions thereof amounted on the right side only to 28,57 %, as registered with our examinations.

Among the age groups lower than those mentioned above there were investigated in the course of our control measurements also two boys aged two years and two other boys aged two and a half years. In the two-year-old ones there were in one case both the investigated dimensions of the left auricle deviated of more than 2 s as compared to the average characters in the corresponding age group, while on the right side a deviation of such importance in both investigated dimensions (sa — sba as well as pra — pa) was ascertained only in one patient while in the other two the basic auricle dimensions presented a deviation exceeding the standard only 1 s. In both boys aged two and a half years, too, a partial deviation from the standard of this age group was registered, viz. that a deviation exceeding 1 s in one case and a deviation exceeding even 2 s in the others.

Age groups larger than the preceding ones are presented with patients older than the former ones in Tables 1, 2, and 3. We measured ear-lobe dimensions also in one boy of five and a half years. The dimensions of his auricles did not deviate from the standard. Further two boys were examined, both seven years old, whose ear-lobes were of abnormal dimensions on both sides, and an eleven-year-old boy the auricles of whom were within the standard dimension range. In an eleven-year-old girl, on the contrary, affected only with

the cleft of the soft palate, the right auricle was exceeding the standard dimensions of this age group.

There were two thirteen-year-old patients, both girls who presented themselves for control examinations. In one of them both auricles were within the limits of the dimensional standards, ( $\bar{X} \pm 1 s$ ) while the other had an auricle slightly abnormal according to this character standards.

TABLE 4

The number of cases different in length and width of the ear-lobe (sa-sba and pra-pa) or in one of these dimensions from the normal size among persons of the age of fourteen years by  $\pm 1 s$  at least

Boys (n = 4)			Girls (n = 4)	
14 years	left	right	left	right
n	2	2	4	4
%	50,00	50,00	100,00	100,00
Cases which don't differ from normal ones				
n	2	2	0	0
%	50,00	50,00	0,00	0,00

The 14-year-old group is represented in Table 4 with 8 subjects only (with 4 girls and 4 boys). We are well aware of the fact that owing to this reduced number of patients our data concerning the dimensions of normal and abnormal auricles in this age group may serve only for information, and that the validity here is not such as the case is with series of statistically indicated minimum number of cases. While in boys of the fourteen-year-age group a half of ear-lobes show both-sided dimensions abnormal as compared with our standards, among the girls the deviation from the average dimensions exceeding at least one important standard deviation was present in all subjects, namely in 100 %.

TABLE 5

The number of cases different in length and width of the ear-lobe (sa-sba and pra-pa) or in one of these dimensions from the normal size among persons of the age of fifteen years by  $\pm 1 s$  at least

Boys (n = 23)			Girls (n = 6)	
15 years	left	right	left	right
n	17	16	3	5
%	73,91	69,56	50,00	83,33
Cases which don't differ from normal ones				
n	6	7	3	1
%	26,08	30,43	50,00	16,66

TABLE 7

The number of cases different in length and width of the ear-lobe (sa-sba and pra-pa) or in one of these dimensions from the normal size among persons of the age seventeen years by  $\pm 1$  s at least

Boys (n = 7)			Girls (n = 2)	
17 years	left	right	left	right
n	1	3	1	1
%	14,28	42,85	50,00	50,00
Cases which don't differ from normal ones				
n	6	4	1	1
%	85,71	57,14	50,00	50,00

TABLE 6

The number of cases different in length and width of the ear-lobe (sa-sba and pra-pa) or in one of these dimensions from the normal size among persons of the age sixteen years by  $\pm 1$  s at least

Boys (n = 9)			Girls (n = 3)	
16 years	left	right	left	right
n	6	7	1	2
%	66,66	77,77	33,33	66,66
Cases which don't differ from normal ones				
n	3	2	2	1
%	33,33	22,22	66,66	33,33

In the sixteen-year-old group we enjoyed the opportunity of comparing the basic auricle dimensions only in 9 boys and 3 girls, hence even in this age group our following results are to be judged very cautiously. As shown in Table 6, the abnormality of auricle dimensions is nevertheless present in girls in approximately equal percentage as in the whole fifteen-year-age group, the left side in girls excepted. Only in the girls' left auricles are reduced or exceeding dimensions less frequent approximately of 17% as compared to the group aged fifteen years. This statement is of course of no value as a proof, owing to the insufficient number of investigated cases.

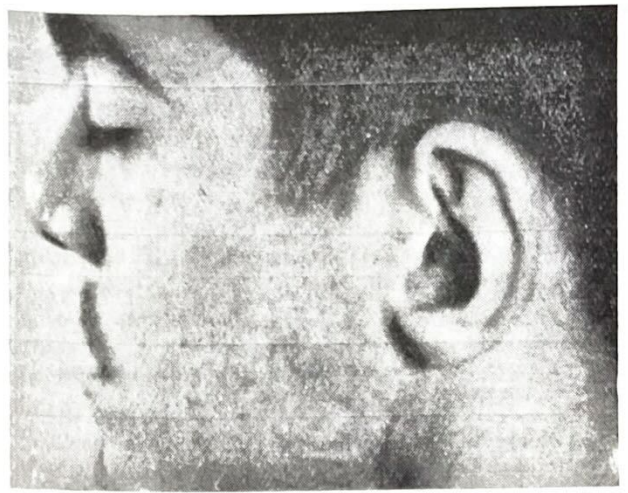
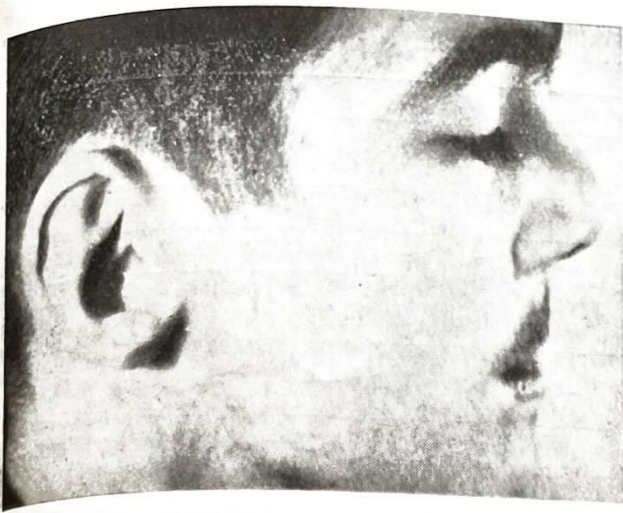
The number of subjects is even smaller in the seventeen-year-group than that in the sixteen-year-old one. There are only 7 boys and 2 girls seventeen years old. Only in one of these two girls were present bilaterally auricle dimensional abnormalities. The other young patient had both her auricles of normal dimensions and shape. Very interesting is the very low percentage of dimensional abnormalities in the auricles of the boys in this age group on their left sides (see Table 7). Their percentage frequency on the right side is obviously higher as compared to the left one, although in comparison with all younger age groups (the 14 to 16 year-old

ones) their frequency is expressed in percentage obviously lower on the right side as well.

Even in our small series of the 14- to 17-year-old patients of both sexes the frequency of auricles, the dimensions of which are exceeding the norm, is decreasing with age, as may easily be registered. This is to be noticed in Table 4 to 7, and with their reciprocal comparison, although the low number of the examined subjects in all age groups demonstrated admonishes us to proceed very cautiously with the interpretation of our results. It will be necessary to carry out a verification in larger numbers of cases, because they point to an important hypothesis. As demonstrated with the presented facts, it is possible to suppose that the number of dimensional deviations from the standard in the direction to smaller or larger ear-lobes very numerous in children affected with cheilo-, gnatho- or palatoschisis in the lower age groups, is decreasing with progressing age. Hence the far larger number of auricles with normal dimensions in the higher age groups. Probably it is necessary to suppose a gradual levelling of the auricle growth activity (which means either its increasing or decreasing as compared with the former dynamics) oriented in the direction toward normalization. Hence a passing reduction of the ear-lobe growth centre activity may be supposed in cases of smaller auricle dimensions only as compared to the standard and not its lasting impairment.

A very interesting question is that dealt with in the course of our inquiries as well, namely the problem whether the ear-lobe on the cleft side is affected preferably in its dimensions in unilateral clefts as compared to the standards. In addition to the influence of unilateral clefts acting upon the dimensions of both the auricles we tried to demonstrate even the influence of bilateral clefts, being that the total ones or the ones affecting only the lip or the jaw as well, and also the influence of an insolated palate cleft either of the hard or soft one.

The ratio of the dimensions of both the auricles (in relation to the standard of their own age group) on the cleft side and also the interrelation of ear-



G. M. 16 787. Boy of 17 years. The area and shape asymmetry of both ear-lobes. The total bilateral cleft.



D. R. 11 780. Girl of 19 years. On both sides characteristic enclosed lobulus. The total cleft on both sides (in the right-hand picture operated on).



B. N. 6449. Boy of 19 years. The different degree of free-built of lobulus. Fleshy helix. Cheilo-gnatho-palatoschisis dx.

lobe dimensions in bilateral total clefts or in the hard or soft cleft palate is shown in Table 8 for boys, and in Table 9 for girls.

While investigating into the frequency of various combinations of both auricle dimensions in boys

and girls in clefts of any type on the left side (in Tables 8 and 9), it was demonstrated that a large proportion of auricles in both sexes is distinguished by normal dimensions on both sides (namely 40%, 29,41% respectively). While auricles smaller than

TABLE 8  
The dependence of the area of ear-lobes on the side of the occurrence of clefts. Boys

		Cleft (of any type)							
		on the left side		on the right side		bilateral		palate	
		n	%	n	%	n	%	n	%
Ear-lobe	Bilateral larger than the normal	4	13,33	—	—	3	20,00	1	14,28
	Larger than the normal on the left side and of normal area on the right side	3	10,00	2	10,52	—	—	—	—
	Larger than the normal on the right side and of normal area on the left side	—	—	1	5,26	—	—	1	14,28
	Larger than the normal on the left side and smaller than the normal on the right side	—	—	—	—	1	6,66	—	—
	Larger than the normal on the right side and smaller than the normal on the left side	2	6,66	—	—	—	—	—	—
	Of normal area on the left side and smaller than the normal on the right side	1	3,33	3	15,78	1	6,66	—	—
	Of normal area on the right side and smaller than the normal on the left side	—	—	1	5,26	1	6,66	—	—
	Of normal area on both sides	12	40,00	10	52,63	6	40,00	2	28,57
	Bilaterally smaller than the normal	8	26,66	2	10,52	3	20,00	3	42,85

TABLE 9  
The dependence of the area of ear-lobes on the side of the occurrence of clefts. Girls

		Cleft (of any type)							
		on the left side		on the right side		bilateral		palate	
		n	%	n	%	n	%	n	%
Ear-lobe	Bilateral larger than the normal	1	5,88	2	25,00	1	11,11	—	—
	Larger than the normal on the left side and of normal area on the right side	2	11,76	—	—	—	—	—	—
	Larger than the normal on the right side and of normal area on the left side	1	5,88	—	—	—	—	—	—
	Larger than the normal on the left side and smaller than the normal on the right side	—	—	—	—	—	—	1	20,00
	Larger than the normal on the right side and smaller than the normal on the left side	—	—	—	—	—	—	—	—
	Of normal area on the left side and smaller than the normal on the right side	5	29,41	1	12,50	—	—	1	20,00
	Of normal area on the right side and smaller than the normal on the left side	1	5,88	—	—	—	—	—	—
	Of normal area on both sides	5	29,41	5	62,50	6	66,66	—	—
	Bilaterally smaller than the normal	2	11,76	—	—	2	22,22	3	60,00

the standard on both sides follow next in boys as far as their frequency is concerned (26,66%), these smaller auricles in girls with left-sided clefts are as frequent as those of normal dimensions on the left side, these being nevertheless smaller than the standard for the right side (namely 29,41%) which relations are very interesting, indeed. Also

the left ear-lobes which are of larger dimensions as compared with the standard, in cases of normal auricle dimensions on the right side they are comparatively frequent in left-sided clefts — in our series with nearly equal frequency in both sexes — viz.  $10,00 \times 11,76\%$ . Auricles which are smaller than in normal subjects, present on



both sides, are found with equal frequency as the preceding type of dimensional combination in both auricles of girls. Among the other combinations, the frequency of which for both sexes may be seen on the above-mentioned tables, the possibility of ear-lobes with dimensions greater than the standard on both sides is to be pointed out.

It may be noticed while following the auricle dimensions in subjects with the most different types of right-sided clefts that the auricles of normal dimensions are the most frequently present on both sides with these clefts, in girls as well as in boys. Because of the small number of cases, chiefly of girls the frequency percentage of the auricles is smaller than the standards for the right side, and of normal dimensions on the left one, apparently large (see Tables 8 and 9), owing to the fact that only three cases of boys and one girl only are forming this group, as a matter of fact. Even here, chiefly in boys, there are further combinations of the dimensions of both auricles, these being of course less frequent as demonstrated with both the above-mentioned Tables.

While analysing the interrelations of both ear-lobe dimensions in clefts of any type on both sides, it is obviously demonstrated that again the most frequent ones are both auricles of standard dimensions. Both in boys and in girls there are, however, in one third of cases also auricles of smaller dimensions of both sides than the standard ones, and in certain part of the patients, chiefly in boys, on the contrary, both ear-lobes larger than the standard appear (see Tables 8 and 9). Some other dimensional combinations of both the auricles in boys are not frequently present.

The smallest number of patients was in the group of isolated cleft palate cases both of the soft and also of the hard one. Because the number of our cases is small, especially in this group, no important conclusions can be drawn. All the same it is worth noticing that in our series with these cleft types there is prevalency of auricles smaller than the standard of both sides both in boys as well as in girls, and only in the second frequency row there are auricles of standard both-side dimensions in boys while this category was not present in girls at all. Further combinations of ear-lobe dimensions are very rare, most probably owing to the small number of cases dealt with in this series.

Considering the problem of mutual dependency of the dimensions of both ear-lobes (considering the standard) on the cleft side, it may be supposed that it is to be taken for granted neither in boys nor in girls that in a considerable part of cleft patients the normal auricle growth dynamics is not harmed at all. The growth regularity being interfered with as the case is so often in both the auricles not regarding the side affected with the cleft both in bilateral clefts as well as in isolated cleft palates auricles of smaller dimensions than the normal ones are more frequent in subjects of the same age group; auricles bilaterally larger than the standard ones are less frequent. There are also cases of an ear-lobe being larger than the standard

on one side, and smaller on the other in comparison with the standard, or those with normal auricle dimensions on one side and with a smaller or larger ones than the standard on the other, and so on. These deviations are less frequent than the first three cases quoted.

All the same it is necessary to point out that, of the both most important auricle dimensions, only one happens to be affected, the case being so even where the deviation from the standard amounts eventually to more than two standard deviation grades in the direction toward larger or smaller auricles. The other of these dimensions may be within the range of normal parameters. All such auricles were considered as being abnormal from the point of view of dimension present in our investigation because of the fact demonstrated with modern genetic research, namely that chiefly the total auricle surface is related to some further bodily or physiological characters. On the other hand, it is true as well that there are also some auricles in which the deviation from the standard exceeds that of 1 s, and even more so in both the most important dimensions used in our investigations at the same time.

There was a deviation from the average exceeding 3 s in some of our patients, which is quite a rare case. Such was the case only in one of both the dimensions, of course.

It seems to be most probable that in the auricular growth defects influenced by cleft abnormalities of the face and palate the width of the auricle uses to be affected more often (pra — pa) than its height (sa — sba) as we noticed in our individual comparisons of the most important auricle dimensions with the standards worked out for the Czech youth.

There are even rare cases to be found where the ear-lobe is considerably narrowed, but its height is slightly increased when compared with the standards, these being cases of narrow auricles with a comparatively normal height. In extreme cases this type of auricles may be found even on the side opposite to the facial cleft (e.g. the four-year-old A. K. in our series).

The auricle dimensions asymmetry is frequent in cases of cheilo-, gnatho- and palatoschisis as may be seen from the aforeside and from our Tables. In addition to the dimensional asymmetry, comparatively frequent is a quite evident and hence very striking asymmetry of the form that means of characters which elude the measurement possibilities.

Outstanding asymmetries of the shape of the helix, lobulus, tragus and others were noticed in 10 patients altogether within our set, i.e. among 110 cases, 9,09% of all patients. We hold the opinion that it is of no practical importance for the clinician to register slight asymmetries of shape or deviations from standards (such as abnormally large or small Darwin's tuberculum, differences in lateral convolution with both auricles, bilateral bending of the auricle edge above the lobulus in the backward direction the importance of external

rotation of the lobulus, and others) which may be registered in the course of detailed inspection of the auricles, although they are not conspicuous at all at a superficial glance.

Very much projecting auricles were noticed also in 9 cases in our series.

Among some more striking characters of the asymmetry of shape we noticed, for example, a large free ear-lobe on the right side, oriented forward, and a very small quite adherent lobulus on the left (a complete cleft on the left side with a three-year-old boy — V. B. — 49 130). In the same patient we noticed an important deformation of the right ear-lobe in the sense of its partial cone-shaped convolution. Auricles of similar shape were registered in the mother of the patient whose cone-shaped convolution of the auricle is only slightly expressed and does not amount to the degree present in her son. A bilateral, quite flat helix, the convolution of which was absent in a boy of three and a half year (P. P. — 48 278) with total bilateral clefts was registered as well. A helix of identical type was noticed in his mother as well.

The right ear-lobe of A. R. (a girl of four years with cheilo- and gnathoschisis on the left side) is pointed on the upper helix edge; the helix itself is only partially convoluted here; reminding of a certain degree of the Cercopithecus auricle type. The lobulus and the whole lower third of the ear-lobe is extremely protruding in the lateral direction. In the older brother of the just mentioned patient (J. R. — 45 248) with cheilo-, gnatho- and palatoschisis on the left side, the right auricle is again shaped in such a way that it reminds of the Cercopithecus type and the relief of the right auricle is flatter than that of the left one. The ear-lobe of the right side is fully adherent, while the one on the other side has grown on only partially.

The fifteen-year-old V. K. (44 116) is a boy with total cleft on the left side, and has, besides a total dimensional ear-lobe asymmetry also a substantially larger (higher) left lobulus, this being undoubtedly connected with the generally greater height of the left auricle as compared with the right one. Beside that he has an abnormal protrusion of the lower third of the left auricle, including the ear-lobe, in the lateral direction.

Another boy of fifteen years (F. V. — 42 613) with total left-side cleft has an auricle shape of the Macacus type on slightly expressed both sides. A protrusion of the lower part of the left auricle in the lateral direction was noticed also in another boy of fifteen years (S. P. — 42 696) with total bilateral cleft. The right ear-lobe of this patient's mother reminds of the Macacus form with its shape.

In a further fifteen-year-old boy (P. D. — 41 910) with a total bilateral cleft and bilaterally very small auricles we noticed (beside other details) a depression of the right ear-lobe in the area between its upper and the middle third. While on the right side there is practically no ear lobulus at all in this patient, the left auricle has its lobulus half-adherent. The right auricle of another boy of fifteen (J. S. — 19 448) with a cheilo-, gnatho-, palatoschisis on the

right side, has on its right helix under the Darwin's tuberculum an incision which is not present on the left side. Both auricles are striking in their projection. In a girl of fifteen (Z. M. — 32 322) with a cleft of her soft palate, and partially of the hard one too, the left ear-lobe approaches again the Macacus type, and also the auricles of a three-year-old boy S. R. (46 123) with bilateral clefts remind us of the same type.

An entirely flat helix and adherent ear-lobulus are found with the right auricle of a sixteen-year-old boy with a total cleft on his right side. A similar flat auricle without helix convolution, the outlines of which are generally rounded, not being pointed into the Macacus or Cercopithecus form, was also found in the course of the examination of a boy of sixteen (J. B.) with total cleft on the right side.

Smaller ear-lobe dimensions on one side as compared to the other are sometimes complicated with general hypoplasia of one half of the face, such as the case was with the seventeen-year-old V. V. (16 262), for instance, with total cleft on both sides or very markedly in the sixteen-year-old J. S. (32 368) merely with cleft palate, and in others.

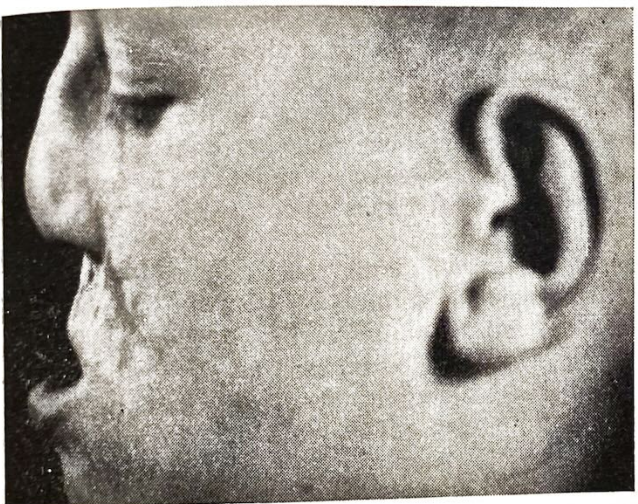
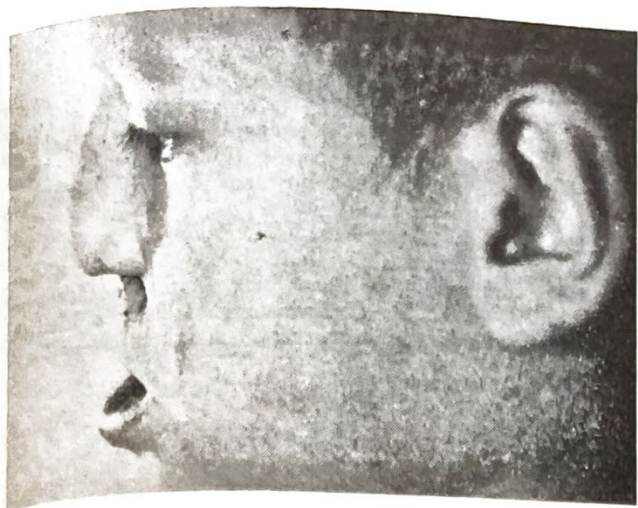
Defects of shape or auricle abnormalities already pointed out by us do not necessarily accompany the cleft anomalies of the face although being obviously far more frequent among such subjects than in the healthy population. In some cases where we had the possibility to examine also one or both of the parents of the investigated patients even when in the most superficial manner, we registered, and this is very interesting, in some part of the examined parents various ear-lobe abnormalities of form and dimensions, namely even in cases where they were not present in children with cleft anomalies. Therefore it may be supposed that auricle defects of form and dimensions behave like recessive-heterozygote characters, and that they may appear even isolated in the absence of cleft abnormalities. They are by right labelled as "microcharacters" signaling the eventual possibility of cleft anomalies in the next generation (see K. H a j n i š, L. G. F a r k a š 1964 and 1965).

## CONCLUSIONS

Ear-lobe asymmetry of shape and dimensions, the dimensional deviations from the standards of the corresponding age groups, relations of auricle dimensions on the cleft side, and various other abnormalities of shape (chiefly the very conspicuous) were registered and analysed on the basis of control examination of the most important auricle dimensions and morphological characters in 110 children with cleft anomalies (namely in 71 boys and 39 girls).

The following conclusions may be drawn:

1. In children with all types of cleft lip, jaw and palate the frequency of auricle abnormalities of shape and dimensions is higher than in the normal population up to a statistically significant degree, while the asymmetries of shape and dimensions are numerous as well.
2. The number of auricles, the dimensions of



B. R. 9385. With growing age better articulation and better configuration of left ear-lobe by the same boy. 5 years, 7 years, 8 years of age. Total bilateral cleft. Condition after the operation (on another place).

which are different from the standard, i.e. larger or smaller than the norm, the deviations from the standard exceeding 1 s, are comparatively equal in both sexes, both on the left and right side, as demonstrated in Tables 1 to 7.

3. The frequency percentage of dimensional deviations as registered in the younger age

groups shows decreasing trends in the pubertal and post-pubertal growth phases which is supposed according to the results of Tables 4 to 7. These observations are conforming to our similar conclusions concerning the evolutionary anomalies frequency in normal population. In case that this opinion of ours is correct, it will serve us as a proof of only temporary action of the basic anomaly upon the ear-lobe growth.

4. The auricles are of normal dimensions on both sides in a plurality of patients with all types of the cleft. In the remaining part of the children with cleft anomalies the ear-lobes are larger or smaller on both sides when compared to the standards. In a small percentage there are even various combinations of both the auricular dimensional deviations.
5. The thesis supposing that in all cases the auricle on the cleft side must be smaller than the standard dimensions required, was not substantiated.
6. Defective ear-lobe shape and asymmetry of its forms as well are of very frequent occurrence among the subjects with cleft anomalies. Ear lobulus free in different degree, differences in helix convolution in dimensions of Darwin's tuberculum in ear relief depth, and other differences between the both sides are most frequent.
7. Even the auricles of the *Macacus* form (eventually a suggestion thereof) or those inclining to the *Cercopithecus* type were registered by us in some patients with cleft anomalies.
8. Owing to the fact that some auricle shape deformities and dimensional asymmetries were found in our research in some cases even with the parents and grand-parents of the children with cleft anomalies, although there were no clefts present in these parents themselves, it may be supposed by the frequency of the ear-lobe defects concerning shape and dimensions that these anomalies behave like recessive-heterozygote characters. Hence we may suppose that the hereditary cleft disposition are accompanied with their presence in the above-mentioned direction whereby cleft anomalies need not be developed in each generation, although the potential presence of the facial cleft anomalies in the following generations is signaled with that.

The above-mentioned observations are pointing to the possibility of a special genetic cleft group accompanied with congenital auricle deformation.

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