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Head Prof. MUDr. M. Fára, DrSc.
Institute of Experimental Medicine
Director Doc. MUDr. V. Kusák, DrSc.

CEPHALOMETRIC GROWTH NORMS AND INBORN ANOMALIES
(Deviations of the interocular distance and the diagnosis of craniostenosis)

Z. ŠMAHEL

The need for anthropologic investigations into the problems of inborn morphologic anomalies was suggested as early as by the late academician Burian, who drew up the main lines of this program and applied them in practice in his scientific laboratory. After a short period of externe co-operation, Dr. Figalová as a member of the staff of the above mentioned laboratory embarked upon systematic studies of these problems. Since anthropometric norms are an essential prerequisite for comparative studies, her investigations were carried out along two lines, i.e. 1. the follow-up of patients, and 2. the examination of normal probands serving as controls. The question which characteristics and to what degree differ in the affected individuals from normal and how their growth patterns differ from the standard (in general and of specific growth patterns) can be settled only on the basis of exact growth data. Similarly only exact measurements provide the possibility to determine the extent of the damage to individual structures and to reveal minor deviations of size and form which remain undetected during medical examinations.

In modern medicine, where therapeutic and diagnostic methods are devised mainly on the comprehensive analysis of the manifestations of the disease, there is still a lack of comparative anthropologic studies of the normal population especially of those dealing with specific regions of the human body. For ethnical reasons it is not possible to use data reported by foreign investigators and for secular reasons it is equally not possible to use data obtained in an earlier period. Thus it was mandatory to obtain new data on the growth of facial bones and of the neurocranium in probands ranging in age from newborns to young adults. The first part of this project, i.e. the data on the growth within the period from zero to six years of age, were collected by Dr. Figalová. The studies were unfortunately interrupted by her sudden premature death

and were completed only later. I would like to mention here unobtrusive efforts of Dr. Figalová and report the results which she had obtained, as well as the results of subsequent studies based on the established norms.

GROWTH OF THE DIMENSIONS OF THE HEAD

The investigated series including the above mentioned age groups consisted of 1471 children. The measurements included 24 characteristics of the neurocranium and of the face. The results obtained were used for the determination of the norms and of the variability range in Czech children (1, 2). They characterize the growth and the development of the above mentioned parts of the body and represent the base line for comparative studies aimed at an objective assessment of diferences both of the morphology and of the growth in malformed individuals (e.g. with clefts). Attention was focused to specific growth patterns, as well as to the growth rate of individual characteristics, to sex differences, facial asymmetry, frequency of various types of the shape of the neurocranium, face, nose, etc., determined on the basis of calculated indexes, as well as to some general growth characteristics, e.g. to the relative growth or to the assessment of the relation between the growth of the face and the growth of the neurocranium, and of the relation of the growth of the vertical dimensions of the face compared to its horizontal dimensions.

The results disclosed a continous acceleration of growth in girls, who attain an identical proportion of the final size of all characteristics which is present in adults, at an earlier age than boys. The highest growth rate of horizontal dimensions of the face is observed within the first three years of life, but even at this period of time predominates the growth of vertical dimensions. Individual increments of the width dimensions represent a larger proportion of the total increase compared to those of the vertical dimensions, yet at the same time they represent a smaller proportion of the absolute size of the characteristics which must be compared mutualy in order to abtain comparative values. The predominance of vertical growth over horizontal growth occurring at least from the sixth month of life onwards, is confirmed equally by the ascending trend of the index facialis which is due to the higher growth rate of the facial height compared to the width of the face (in spite of the fact that the former dimension is smaller than the latter). In an earlier report we have described the characteristics of the so-called neural type of growth of the neurocranium and that of the general growth type of the facial skeleton and its deviation (e.g. the transitional type of the skull base representing a connecting part). Sex differences expressed in terms of per cent are smaller in horizontal facial dimensions than in vertical dimensions or in dimensions of the neurocranium. Metrical asymmetry of the face occurs frequently in boys than in girls and in those cases the right portion of the face is usually larger than the left side. A more marked asymmetry (with a difference of more than one centimeter between the two halfs of facial arches) is uncommon in normal children (in less than one per cent). A comparison with the data reported by Czech and foreign authors was presented in earlier papers (1, 2).

GROWTH OF THE UPPER LIP

The above mentioned studies form the basis of our own investigations of clefts (the results were published earlier in this periodical), as well as of the studies dealing with some particular problems. One of these is the question of the time of choice of surgical repair determined on the basis of the ascertained growth dynamics (3). An analysis of growth curves of the basic dimensions of the orofacial region, as well as the calculation of the area of the upper lip disclosed a lower growth rate in the period between the 27th and 33rd months of life. It was also demonstrated that only very little growth of the vertical dimension of the upper lip occurs after this period of life. These circumstances are favourable for surgical interventions, consisting in this case of a functional repair (at a convenient time and according to the option of the surgeon), since at this time surgery will have little effects on growth which again will only very little influence the results of the surgical repair. These corrections include e.g. an enlargement of the vestibular sulcus providing the possibility of an early and effective orthodontic treatment, the repair of an inperfectly closing lip preventing respiratory disorders, or the repair of an excessive constriction of a scar and lip which might interfere with an adequate development of the upper jaw. A discussion of these subjects was presented in the above mentioned report (3).

DIAGNOSIS OF THE DEVIATIONS OF THE INTEROCULAR DISTANCE

Another special problem represent the use of objective and uniform diagnostic procedures in changes of the interocular distance (this characteristic is often involved in developmental anomalies). On the basis of the normal distribution of this characteristic in children aged zero to six years, and with the use of the data reported by Hajnišová for children and adolescents ranging in age from six to eighteen years, and of the data ascertained in our group of normal adult controls, Günther's classification of euryopia and hypertelorism was adjusted so that it could be used in Middle European populations (4). This method has been used, so far, for the assessment of soft tissue characteristics, i.e. the distance between the inner and outer canthi. This fact should be reflected by the strict adherence to the correct nomenclature (intercanthal i.e. interocular distance, and bicanthal, i.e. biocular distance, in contrast to the interorbital and biorbital distances).

In agreement with Günther the intercanthal index (intercanthal distance in terms of per cent of the bicanthal distance) above 38 index units (i.u.) represents euryopia and above 42 i.u. hypertelorism. The upper limit of stenopia was increased, hovewer, to 30 i.u. and the hypothetic boundary of hypotelorism was determined as 26 i.u. (mesopia = 30—38 i.u.). The index circumference-·intercanthalis (the intercanthal distance expressed in terms of per cent of the circumference of the neurocranium) below 4.8 i.u. represents stenopia below 4.0 i.u. hypotelorism (hypothetically) above 6.4 i.u. euryopia and above 7.2 i.u. hypertelorism (mesopia = 4.8—6.4 i.u.). Compared to Günther's classification

we have reduced in the latter index the lower limit of euryopia and hypertelorism since they were not in agreement with the classification of these types by means of the intercanthal index, nor with the definitions of these terms (this index cannot be used during the first year of life because of constant changes of its mean values due to the high growth rate of the neurocranium).

For the classification of a slightly wider or narrower interocular space, i.e. euryopia and stenopia, which we consider as beeing still within the range of normal, we recommend to use the intercanthal index alone, as it is the common practice in anthropologic classifications. It is not possible to use simultaneously both indices since they do not reflect in the same way slight changes of the interocular distance. The intercanthal index provides an adequate characterization of the conditions within the ocular region of the face, but the other involved dimensions should be considered as well, since a decreased (increased) biocular distance results, equally, in an increase (decrease) of index values. However, it represents always a sensitive method for the detection of any proportional deviations. On the contrary both indexes should be used, always, for the detection of hypertelorism, since they supplement and verify each other and both of them reflect a pathological increase of the interocular distance. Questionable cases are reciprocally excluded as well as those where high values of the index are due to other causes (descreased biocular distance in the case of the intercanthal index and a small circumference of the neurocranium in the circumference-intercanthal index). When hypertelorism is diagnosed by means of these methods it should be verified by X-ray examination and if X-ray study fails to confirm its diagnosis it indicates the presence of a pseudohypertelorism. Whenever X-ray confirmation is lacking the term ocular hypertelorism should be used. Under these conditions not a single case of ocular hypertelorism was disclosed in a series of 1471 normal children.

In contrast to the above mentioned, the diagnosis of hypotelorism established on the basis of the two indexes is only approximative and of no practical value, the pertinent boundaries are mentioned only for the sake of completness (a smaller distance between the two orbits is not necessarily accompanied by a corresponding smaller distance between the two inner canthi). The suggested classification is satisfactory for the Middle European populations. The knowledge obtained so far by the use of the circumference-intercanthal index are of more general character. The results cannot be used for ethnically differing populations without verification and should be supplemented by a corresponding classification based on the position of the orbits. The advantage of this method consists in its objectivity.

At the present time we have renewed our studies of these problems. The impetus for this renewal provided the fact that the circumference-intercanthal index cannot be used within the first year of life or in individuals with pathological deformities of the skull which are associated with changes of the dimensions of the neurocranium (e.g. craniostenosis, hydrocephaly, microcephaly, macrocephaly etc.). In these cases we must use the zygomatico-canthal index (intercanthal distance in terms of per cent of the width of the face).

In the presence of ocular hypertelorism the values of this index are above 30 i.u. in children (up to sixteen years of age), and above 29 i.u. in adults (6). This index is also used for the individual determination of euryopia (or stenopia) in the case of a decrease (or increase) of the biocular distance by more than —1.5 SD (+1.5 SD), where the intercanthal index establishes the diagnosis of the described deviations even then when the interocular distance is within the range of the norm. The border-line value for euryopia will be 26.5 i.u. in children up to sixteen years of age and 25.5 i.u. (or more) in adults, the values for stenopia will be 21 i.u. in children and 20 i.u. (or lower values) in adults. We believe, however, that this procedure is superfluous for the evaluation of investigated series, since a decrease (increase) of the biocular distance by more than —1.5 SD (+1.5 SD) occurs only in about 7 per cent of individuals, i.e. 1/13. Since euryopia occurs approximately in 10 per cent of the Czech population, 7 per cent of these 10 per cent will be due to a decreased bioclar distance, i.e. $1/13 \times 1/10 = 0.8$ per cent, and thus will not influence significantly the results obtained (because of the 10 per cent incidence in the population). Similar results are obtained in stenopia occuring in our country in about 3 per cent of individuals and thus $1/13 \times 1/33 = 1/429 = 0.2$ per cent. These values represent, however, an estimated frequency, and are based on the moderately high positive correlation between the intercanthal and bicanthal distance (the values calculated for males are $r=0.57$ and for females $r=0.68$). Therefore we shall not subtract this value from the ascertained frequency (this subtraction could be made only after assessment of individual cases).

The analysis of our material indicates that the zygomatico-canthal index might be more convenient than the circumference-intercanthal index and therefore should be substituted for the latter. This is due not only to the shortcomings of the second index, but also to the fact that it is not desirable to determine the interrelation between a dimension of the neurocranium and a facial dimension, or between circumference and width dimensions, since our studies are amied at the determination of the width proportions on the face.

From the above mentioned follow the subsequent general conclusions for the metric diagnosis of somatic deviations of the size. For the detection of deviations within the range of normal (e.g. euryopia) we use a single basic index, for the detection of pathologic deviations (e.g. hypertelorism) two basic indexes, which serve for reciprocal verification (the deviation should be confirmed by both indexes). As a pathological deviation is considered a deviation from the norm of more than ± 3 standard deviations (the use of a lower value as ± 2 SD would indicate that a certain constant proportion of the investigated population is pathological, e.g. hyperteloric). Within the range of ± 3 SD we discriminate a medium form —1.5 SD to +1.5 SD and two intermediary forms up to —3 SD or +3 SD, which are considered as beeing still within the range of normal (including both stenopia and euryopia). This procedure is in full agreement with the classic classification of anthropologic indexes. In these cases where, for various reasons, it is not possible to establish the diagnosis on the basis of some basic index (e.g. in certain age

groups, or if the deviation of the secondary index characteristics exceedes ±1.5 SD, e.g. the biocular distance or the circumference of the head) a control index should be available (as a primary index characteristic is considered that which is the subject of studies into the occurrence of any deviation and which is therefore included in all basic and control indexes — in this case the interocular distance). This provides evidence that even in the diagnosis of pathological deviations, as e.g. hypertelorism, it is mandatory to ascertain whether some investigated characteristic (with the exception of the primary characteristic) does not differ from the mean value by more than ±1.5 SD and in the case that this actually occurs it is necessary to use a control index. Thus since at least two indexes which do not change with age and which do not differ in both sexes, are required for uniform classification, it is obviously sometimes very difficult to find them.

THE DIAGNOSIS OF CRANIOSTENOSIS

The last problem in which we have applied the norms obtained was the diagnosis of craniostenosis and of other deformities of the skull (5). Cephalometry provides the possibility of an early and objective detection of any growth and proportional deviations of the neurocranium within the first three years of life, characterized by its high growth rate. This method proved more reliable than X-ray or other diagnosic methods. Craniostenosis is characterized by a disproportional growth (impeded always in perpendicular direction to the obliterated suture) while proportionally enhanced or retarded growth is characteristic for primary brain lesions (e.g. microcephaly and hydrocephaly). During the use of the so far applied cephalometric methods it was not clear to what extent the proportional relations between the width of the neurocranium and that of the face should be taken into consideration in the assessment of suspected craniostenosis. The width of the face represents actually the most important characteristic allowing the assessment of the mutual proportions of these two portions of the skull and the width of the neurocranium represents the most sensitive indicator of proportional changes of the cranial vault and the most important characteristic in the diagnosis of craniostenosis. On the other hand, it is not possible, however, to overestimate this relation and to consider the interrelation between these two characteristics as very strong, as it happens sometimes (e.g. a markedly narrow neurocranium can represent an anomaly, even when it is associated with a narrow face a.s.). The enumeration of correlation coefficients for the relation between the width of the neurocranium and that of the face revealed that in children above six months of age it is not possible to rely on a high correlation of these dimensions ($r=0.5—0.7$) during the diagnosis of craniostenosis. Similarly the comparison of regression curves with actually ascertained values provided evidence that the linear function is not adequate for the representation of the investigated relation.

The quadratic dependence proved equally inadequate. Since we did not succeed in finding a function which would adequately represent the

relation between these two characteristics, their interrelations are illustrated by mesaured values presented in tabellar form. It allowes to determine the width of the neurocranium inclusive of the range of critical values for any ascertained width of the face in all age groupes of boys and girls. The table provides an exact and prompt information during the diagnosis of craniostenosis and the evaluation of other deformities of the skull and in particular for the screening of anomalies of the shape of the neurocranium in children. These data are pertinent only for the brachycephalic Czech population, the results concerning their correlations, however, have a wider and most probably even a general validity. The method used for the assessment of the data, based on the comparison with our own norms and on the estimation of cranial proportions was discussed in one of our previous papers (5).

SUMMARY

The results computed from the material obtained by the late Dr. Figalová in her studies into the growth of the neurocranium and of the face in children ranging in age from three months to six years are presented and the use of the norms in the studies of inborn anomalies is discussed. Knowledge on the general principles of growth are reviewed as well. On the basis of an analysis of growth curves of the orofacial region the time of choice for surgical repair in clefts taking into consideration the growth rate, is determined. The data were subsequently used for the adjustment of Günther's classification of stenopia, euryopia and hypertelorism, as well as for its supplementation in order to allow its use on the Middle European population. The principles for an uniform and objective assessment of changes of the interocular distance were established. The results obtained were used equally for the solving special problems associated with the diagnosis of craniostenosis.

RÉSUMÉ

Normes céphalométriques de croissance et les défauts congénitaux (déviations dans la distance interoculaire et le diagnostic des craniosténoses)

Šmahel Z.

On annote les résultats élaborés du matériel de la décédée Dr. P. Figalová traitant la croissance de la cavité céréble et du splanchnocranium des enfants en âge de 3 mois jusqu'à 6 ans et on indique l'utilisation des normes en étudiant les défauts congénitaux. On présente aussi les connaissances principales des régularités de croissance. A la base d'une analyse des courbes de croissance de la région orofaciale, on discute la problématique du choix du temps convenable de l'opération des fissures au point de vue de la croissance. Les données ont été utilisées pour corriger et compléter la classification de Günther de la sténopie, euryopie et hypertélorisme de sorte qu'elle soit valable pour la population de l'Europe Centrale et qu'on puisse déterminer les principes de l'évaluation uniforme et objective des altérations dans la distance interoculaire. Nous nous sommes appuyés sur ces résultats en résolvant des questions spéciales du diagnostic des craniosténoses.

ZUSAMMENFASSUNG

Kephalometrische Wachstumsnormen und angeborene Fehler (Deviation in der Zwischenaugenentfernung und Diagnostik der Kraniostenosen)

Šmahel Z.

Es wurden die aus dem Material der verschiedenen Dr. P. Figalová verarbeiteten Ergebnisse bezüglich des Wachstums des Hirnkastens und des Splanchnokraniums bei Kindern im Alter von 3 Monaten bis 6 Jahren annotiert und es wurde auf die Anwendung von Normen beim Studium der angeborenen Fehler hingewiesen. Es wurden auch die Hauperkenntnisse über die allgemeinen Wachstumsgesetze wiedergegeben. Anhand einer Analyse der Wachstumskurven der Orofazialgegend wurde die Problematik der Wahl der geeigneten Operationszeit bei Spalten vom Gesichtspunkt des Wachstums diskutiert. Die Daten wurden anschliessend zur Korrektur und Ergänzung der Günther-schen Klassifikation der Stenopie, Euryopie und des Hypertelorismus benutzt, damit diese für die gesamte mitteleuropäische Population gültig wird und es wurden die Grundsätze für eine einheitliche und objektive Beurteilung der Zwischenaugenentfernung festgestelt. Aus den Ergebnissen ging man auch aus bei der Lösung spezieller Fragen der Diagnostik der Kraniostenosen.

RESUMEN

Normas cefalometricas de crecimiento y defectos congenitales de deviación en la distancia interocular

Šmahel Z.

Están anotados los resultados tomados del material de la difunta Dr. P. Figalová sobre el aumento de la cavidad cranial y del splancnocranio en los niños de 3 meses a 6 años e indicado el uso de las normas en el estudio de defectos congénitos. Están también mencionados los principales conocimientos sobre las regularidades generales del crecimiento. A base de un análisis de las corvaduras de crecimiento del área orofacial se discuten los problemas de elegir el período operativo más conveniente en las fisuras desde el punto de vista del aumento. Los datos fueron usados para corregir y complementar la clasificación de Günther de la stenopia, euriopia y el hipertelorismo de tal manera para que fueran valederas para la población de Europa central y determinados los principios de una evaluación uniforme y objetiva de los cambios en la distancia interocular. Los resultados formaban punto de salida para la solución de cuestiones especiales de los diagnósticos de las cranioestenosis.

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Dr. Z. Šmahel, Šrobárova 50, 100 34 Praha 10, Czechoslovakia

S. M. Kirov's Leningrad Institute of Postgradual Education of Physicians, Leningrad (U.S.S.R.)
Department of Surgical and Orthodontic Stomatology
Director professor V. A. Kozlov

SURGICAL TREATMENT OF OPEN OCCLUSION

V. A. KOZLOV, K. V. TYUKALOV, A. N. KISLYAKOV

The open occlusion is one of the most severe anomalies involving teeth and jaws. It is often combined with difficult nasal breathing, disorded harmony of face appearance, disturbed masticatory function and speech. The anomaly may be caused genetically, or it may result from abnormal postnatal growth of the jaw bones. Then, various clinical forms depend on involvement of deformed maxilla, or mandible, or both.

In our practice, a classification of open occluison according to Köle (1961) has been used. The four groups are distinguished: in the first group, the open occlusion is due to perpendicular displacement of frontal teeth of maxilla, mandible or both; in the second group of patients, the deformity is caused by protrusion of maxillar teeth and vertical shift of the frontal part of the maxillar alveolar process; in the third group of patients, an abnormal size of lateral parts of the maxillar alveolar process in the perpendicular plane leads to the open occlusion; in the fourth group of patients, progenia and angular break of mandibular bone body result in the malocclusion.

The tratment of open occlusion by orthodontic methods is confined to particular periods of age, when the growth of jaw bones can be influenced. The orthodontic methods are inefficient in correction of inborn anomalies. Therefore, the surgical treatment is indicated (Kalamkarov 1975).

The total of 67 patients of both sexes with open bite, 14 to 32 years old, were under our observation since 1965 to 1976.

The first and the second group contained 16 patients in the age of 17 to 25 years. By all patients, a cortical osteotomy in the region of the frontal teeth was performed. Since the 12th to the 14th day after the operation, the subsequent orthodontic treatment was performed during an out-patient care. The perpendicular movement of teeth in the patients of the first gorup was achieved by means of rubber rings exerting a traction force upon them. This kind of treatment was finished 35—40 days later. For a twice longer time period, the shifted teeth were fixed by a retention band. Correction of open occlusion by patients of the first group took 130—150 days (Figs. 1 and 2). Orthodontic movement of teeth by patients of the second group was performed by means

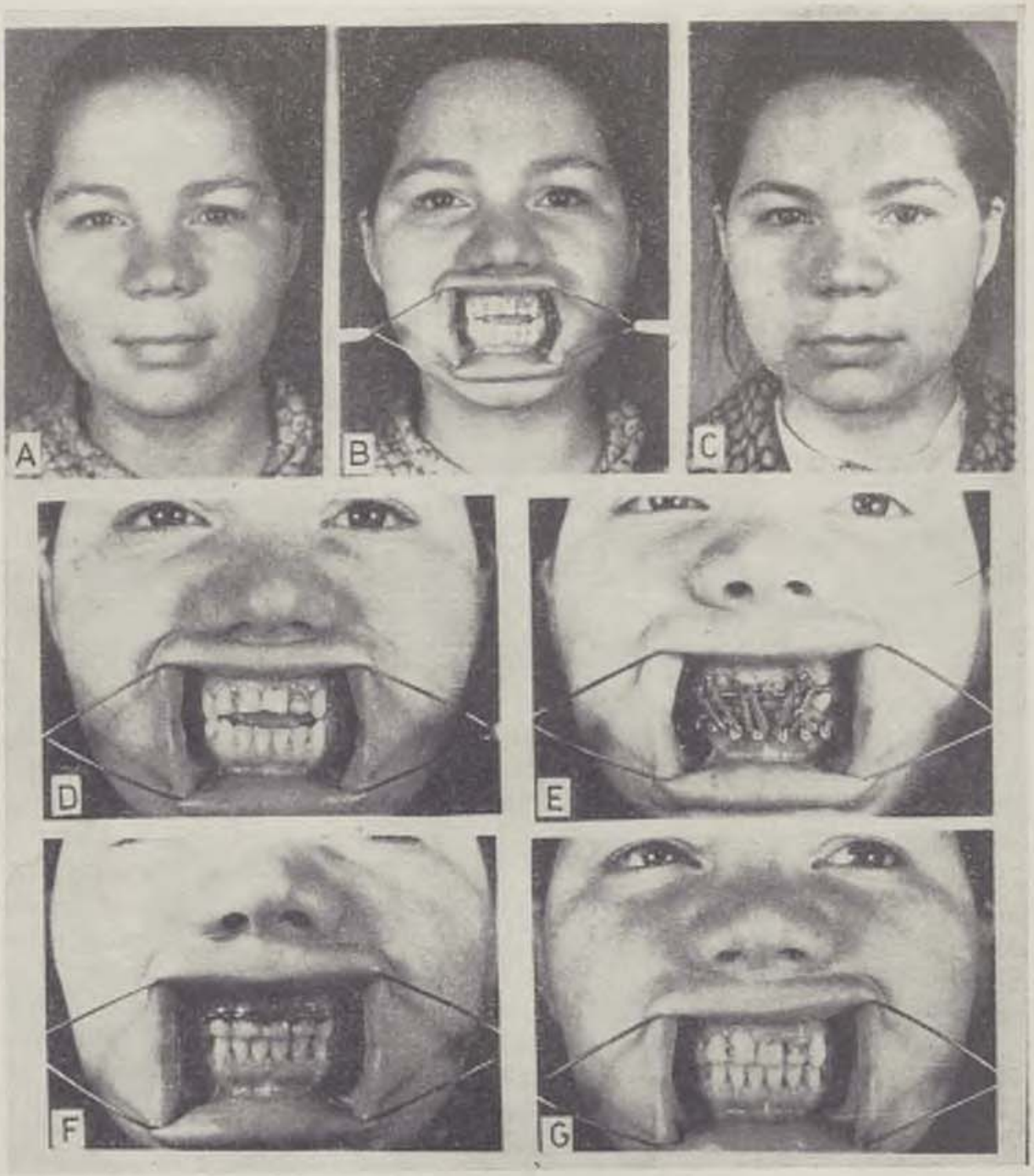

Fig. 1. The first group of patients. Photographs of face and occlusion of patient R., 19 years old. Diagnosis: open occlusion. a, b, d — face and occlusion before the treatment; the malocclusion is treated orthodontically: e — the elastics tied between the jaws applying a traction force upon them; f — retention arch on the maxillar teeth; c, g — face and occlusion after the treatment

of Angle's arch during an out-patient care in a policlinic. It was started 12—14 days after the operation. The orthodontic appliance was activated two times a week. Both screws of the arch were turned one half around and the ligatures were tied. The orthodontic treatment was finished 120—140 days after starting it by all the patients (Figs. 3 and 4).

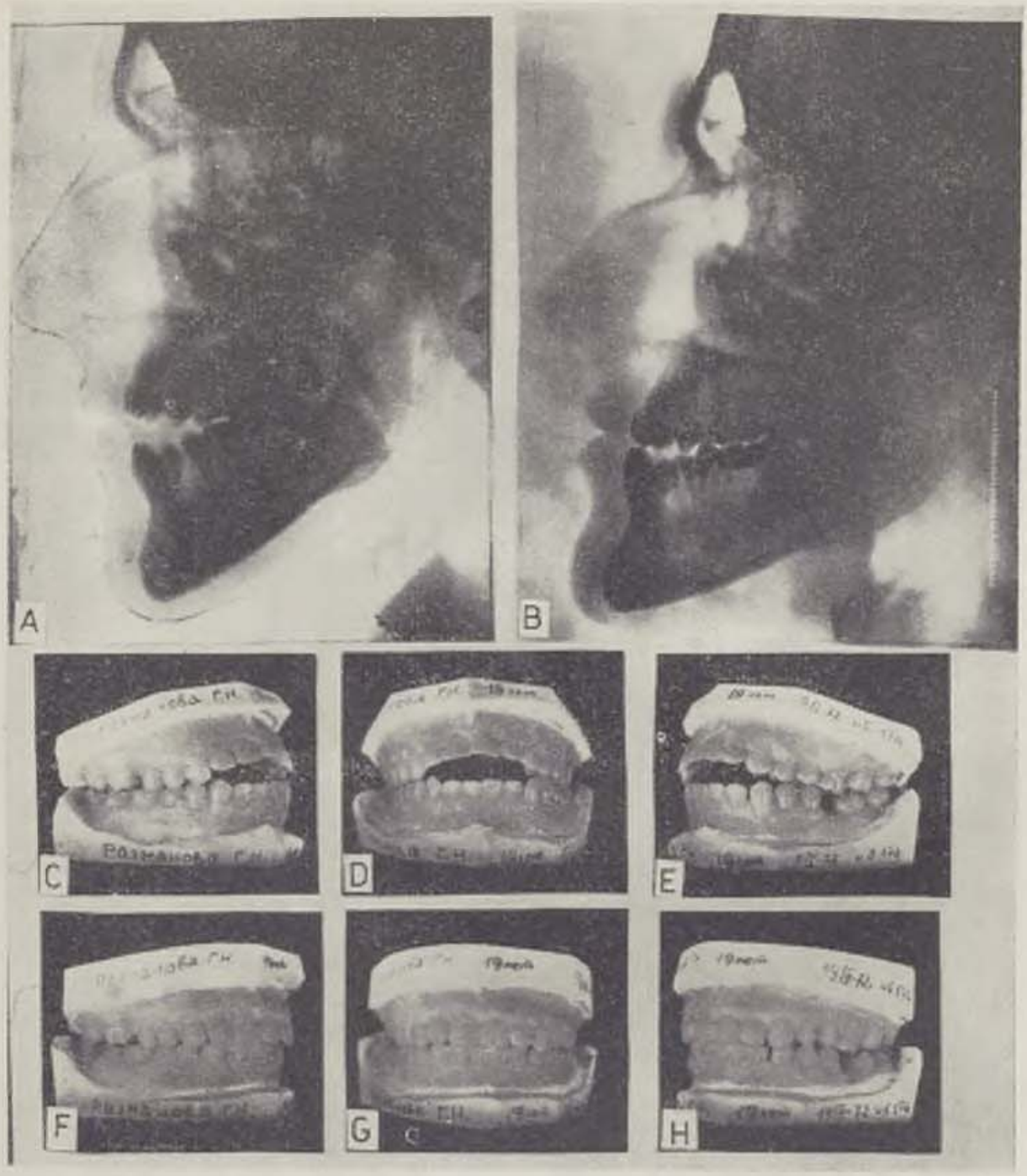

Fig. 2. The first group of patients. Positives of teleroentgenograms and photographs of jaw models of patient R., 19 years old. Teleroentgenograms: a — before treatment, b — after treatment; models of jaws: c, d, e — before treatment; f, g, h — after treatment

A mobilization of lateral parts of maxillar alveolar processes was performed in two stages according to Schuchardt by patients of the third group. This group contained 37 patients, 14 to 30 years old. As preparation to the operation, the wire splints with protective loops were applied on the teeth. The surgical treatment consisted of two stages, a time interval between them being 2—3 weeks. The treatment of the patients in the third group was finished 60 to 70 days after starting it (Figs. 5 and 6).

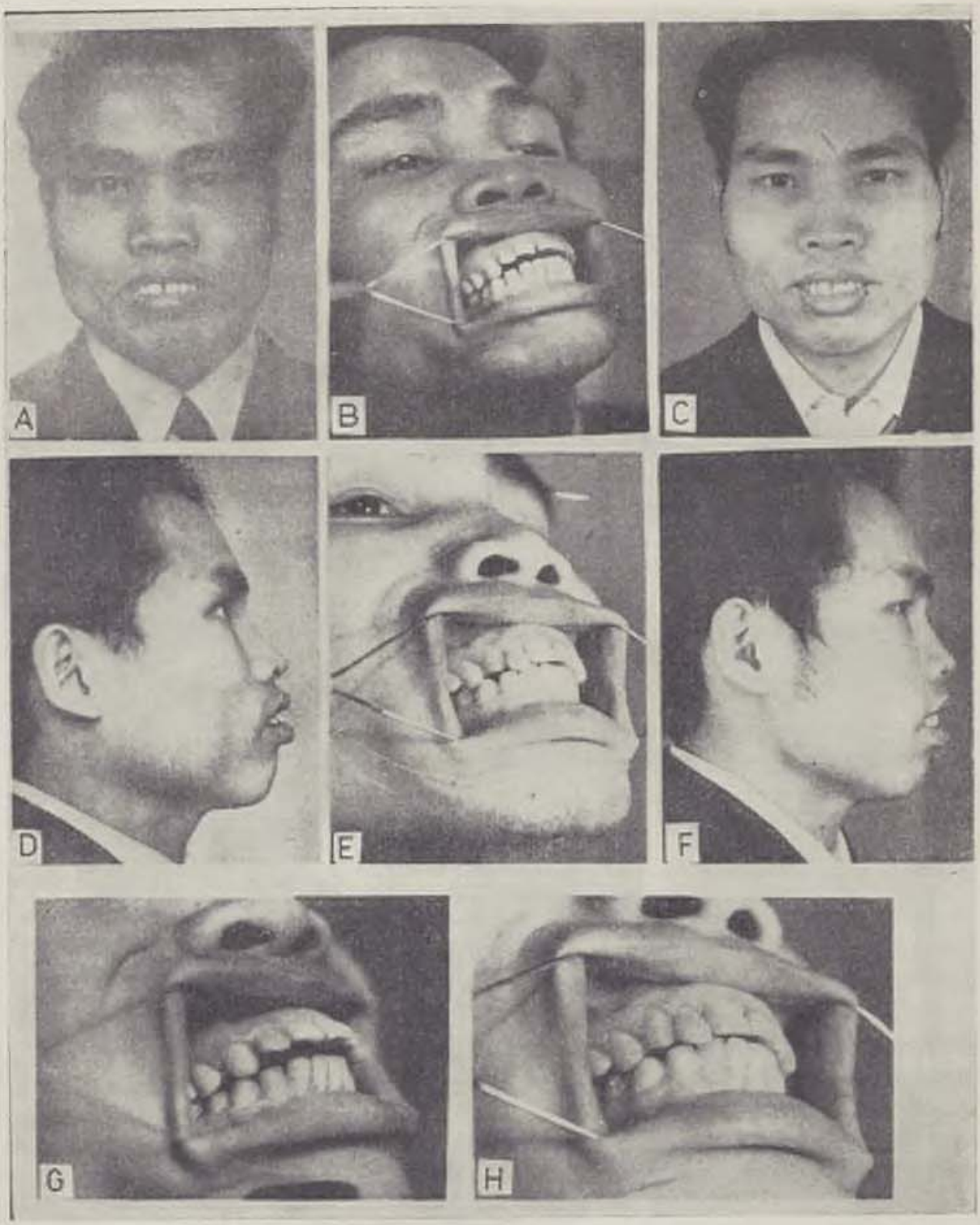

Fig. 3. The second group of patients. Photographs of face and occlusion of patient D., 20 years old. Diagnosis: open occlusion. a, b, d, g — face and occlusion before treatment, wide fissures between the frontal teeth of maxilla are seen; c, e, f, h — face and occlusion after treatment

To the fourth group belonged 14 patients in the age of 14 to 32 years. A mandibular surgery was performed, i.e the bilateral slipping osteotomy of both mandibular branches led obliquely in the perpendicular plane, followed

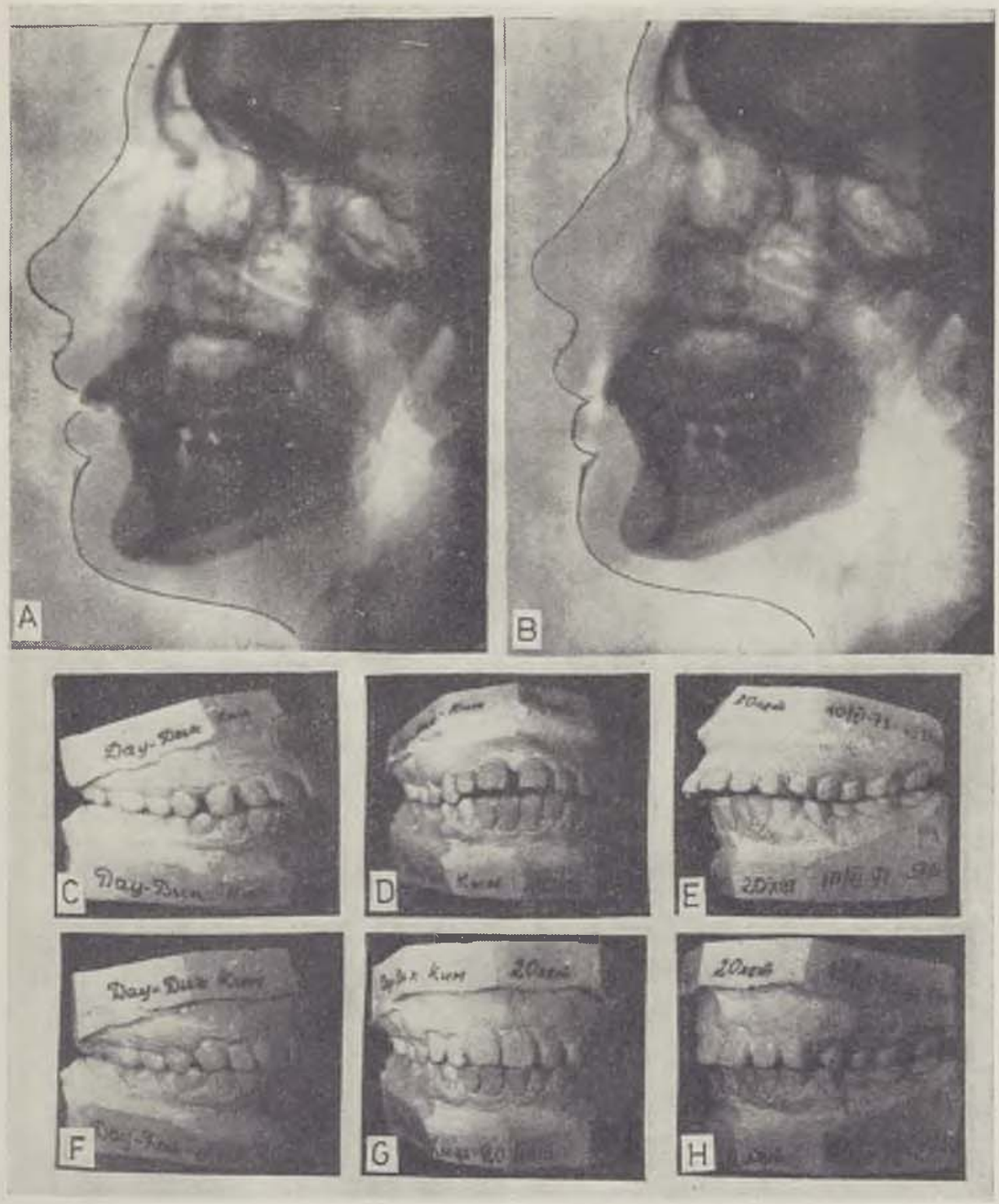

Fig. 4. The second group of patients. Positives of teleroentgenograms and photographs of jaw models of patient D., 20 years old. Teleroentgenograms: a — before treatment, b — after treatment; models of jaws: c, d, e — before treatment; f, g, h — after treatment

by establishment of correct relationships of maxillar and mandibular teeth in normocclusion. The acquired position of jaws was fixed by wire splints applied on teeth and by rubber elastic bands tied to both jaws. The treatment of patients of the fourt group took 40 to 50 days (Figs. 7 and 8).


A
B
C
D
E
F
G
H
CH
I

Fig. 5. The third group of patients. Photographs of face and occlusion of patient M., 18 years old. Diagnosis: open occlusion, narrow maxilla, progenia. — a, d — the face before treatment; f, i — the occlusion before treatment; b, e — the face after surgical treatment, when the patient was released from the hospital; g — the occlusion after surgical treatment, when the patient was released from the hospital; c, f — the face ← one year after the treatment; j — the occlusion one year after the treatment

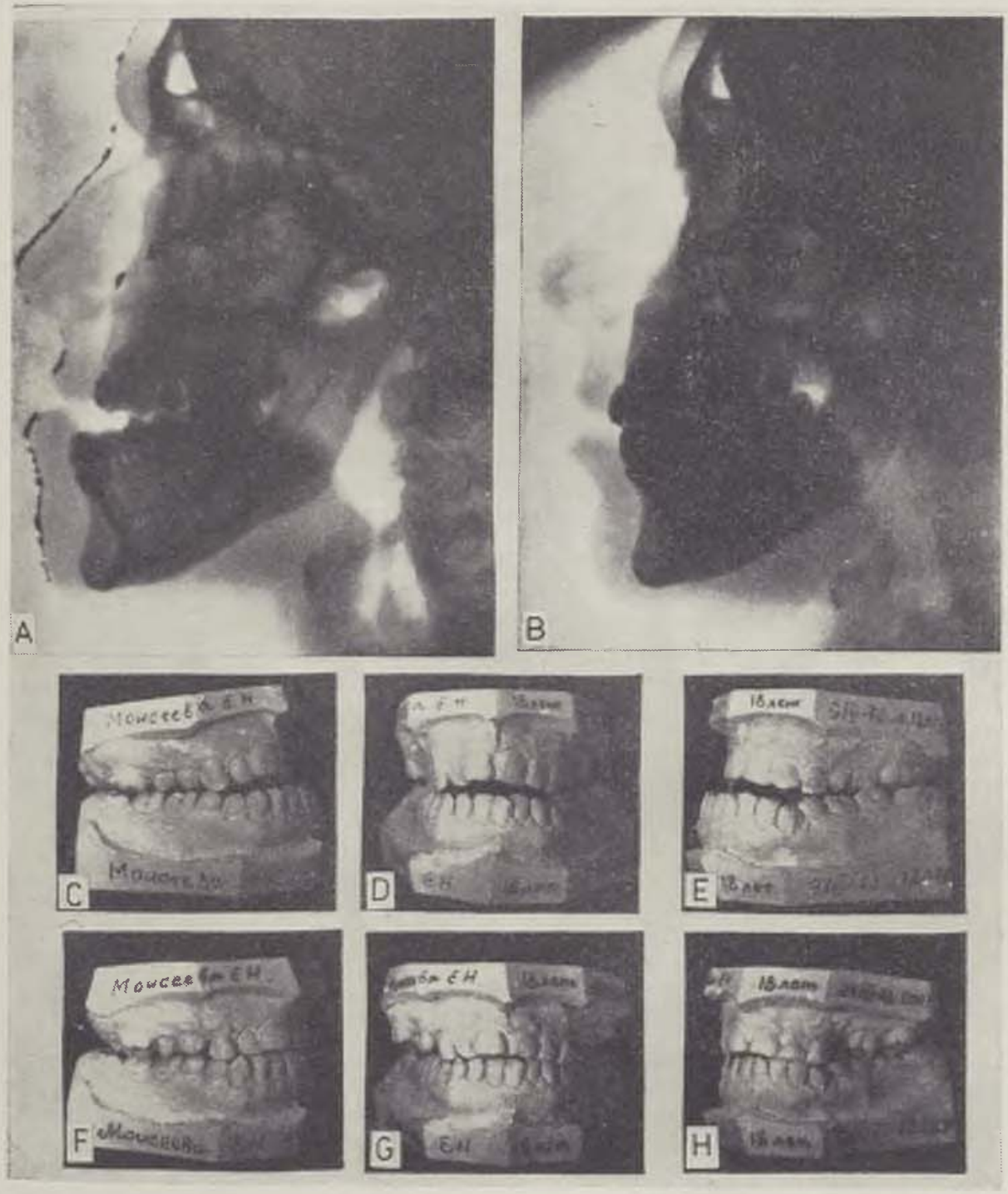

Fig. 6. The third group of patients. Positives of teleroentgenograms and photographs of jaw models of patient M., 18 years old. Teleroengenograms: a — before treatment, b — one year after treatment; models of jaws: c, d, e — before treatment; f, g, h — after treatment

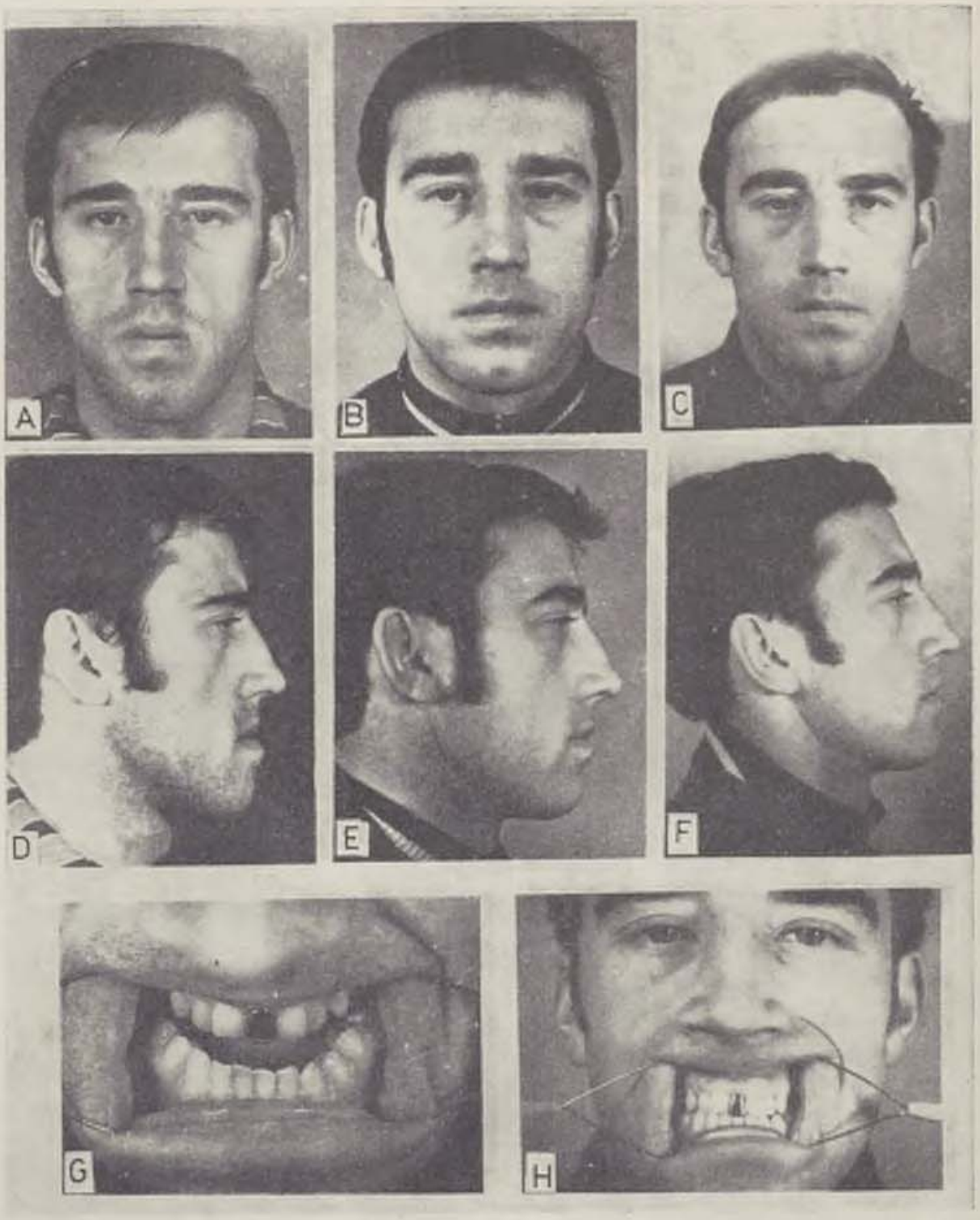

Fig. 7. The fourth group of patients. Photographs of face and occlusion of patient B., 24 years old. Diagnosis: open occlusion, complicated by mandibular progenia. — a, d — the face before treatment, note the elongated lower third of the face, the chin pushed forward and the lower lip overlapping the upper lip; g — the occlusion before treatment; b, e — the face after treatment; c, f — the face one year after the treatment; h — the occlusion one year after the treatment

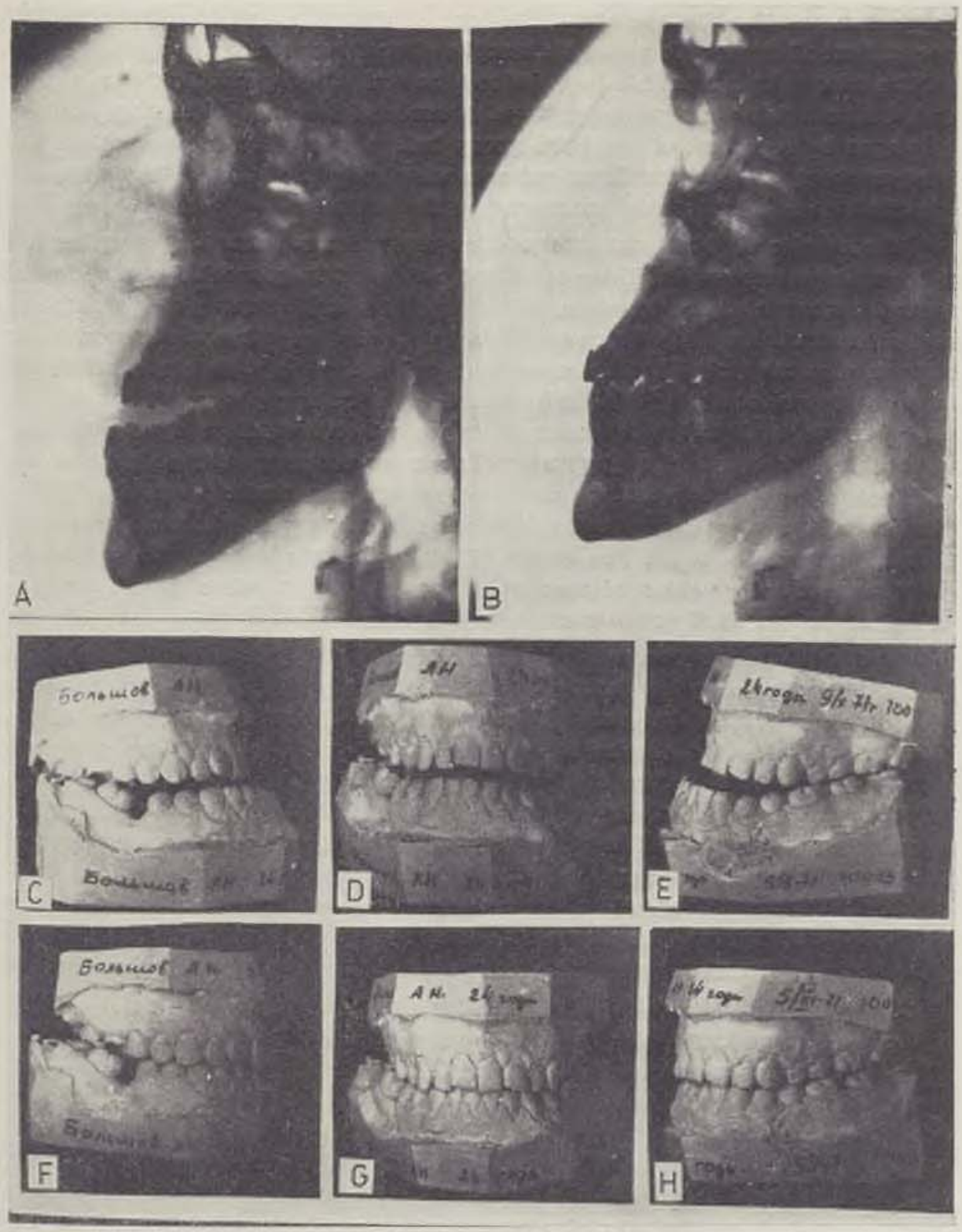

Fig. 8. The fourth group of patients. Positives of teleroentgenograms and photographs of jaw models of patient B., 24 years old. Teleroentgenograms: a — before treatment, b — after treatment; madels of jaws: c, d, e — before treatment; f, g,h — after treatment

One year after the operation, 64 patients from the total number of 67 were reexamined. The relapses occurred by 3 patients. One patient from the second group removed prematurely his retention appliance and the relapse developed

three months after the operation. The lack of discipline led to relapse also by one patient of the fourth group six months after the operation: the patient took off the wire splints from his teeth before the end of the prescribed time period and did not wear a sling-like bandage. Absence of free nasal breathing caused a relapse by a patient of the third group half a year after the operation. The relapes observed by these three patients were only partial and they were not qualified as an unsuccessful treatment by the petients.

The results of treatment of the other 61 patients were fully satisfactory, no complains were made. Their condition was good in general. Examination of their faces revealed no stretching of the upper lip or flattening of the nasal-lip and submandibular folds. Palpation of lymph nodes in neck and submandibular regions was not painful. The movements of mandible were quite free, the mucosa of oral cavity was of light rose colour lacking observable pathologic changes. The teeth in the operation zones were intact and firm. Percussion was not painful. The pathologic gingival pockets were not present. The pulp reaction on electric impulses supplied by an electric dental diagnostic device was higher than normal only by patients of the third group. One year after the operation, it was eqal to 50—70 μA. The values of other patients were in normal range. Later on, also the values of reactibility on electric impulses by all patients belonging to the third group became quite normal.

The roentgenograms of the teeth moved perpendicularly showed no pathologic changes in the tissues of their periapical regions: the rough lamellar structure of bone typical for maxilla was seen distinctly. The roots of the shifted teeth were surrounded by periodontal spaces seen as uniform unbroken lines. The mosaic structure of bone was found by patients of the third group on roentgenograms of lateral maxillar alveoli. An increased calcification of the operated zones alternated with an illegible lamellar structure on pictures of the bones. However, no changes of the teeth and of the bone closely surrounding them were observed. All roentgenograms showed unbroken uniform lines of periodontal spaces. The tissue of dental roots was not altered. The roentgenograms of the teeth and periaplical tissues showed no pathological changes by patients of the fourth gorup.

During subsequent following of 47 patients (for 3 to 11 years), no relapse of malocclusion occurred. The treatment led to the stable anatomic and functional result. By all the examined patients, the firm contact of teeth in central occlusion was found. As a result of adaption (self-regulation), the occlusion was nearly normal. The shifted teeth were firm and intact. Percussion was not painful. The reaction on electric impulses was normal. The colour of mucosa in the operated regions was also normal. The nasal breathing was free. The patients remarked better sleeping. An exterme drying out of mucosa in the oral cavity and in nasopharynx were not observed. The series of roentgenograms did not show overshading of the maxillar sinus. The patients did not complain at all and were fully satisfied with the results of the treatment.

Thus, the analysis of the long-term results achieved by treatment of all groups of the patients confirmed suitability of our complex method used for

correction of such a complicated anomaly. It led to stable anatomic and functional results. One-year care of the operated patients was quite sufficient in respect to estimation of the achieved results. During the subsequent time periods, no observable changes in interrelationships of the teeth were noticed, i.e. the possibility of the relapse was excluded.

This kind of complex surgical and orthodontical treatmant of open occlusion can be recomended for wide clinical use by adult patients, as the complications leading to irreversible changes of jaw and facial tissues were absent and stable favourable anatomic and functional results could be achived.

M. T.

SUMMARY

The results of surgical treatment of 67 patients with open bite, 14 to 32 years old, were described. The methods of the treatment were: cortical osteotomy, mobilization of lateral parts of maxillar alveolar processes performed in two stages and bilateral slipping osteotomy of both mandibular branches led obliquely in the perpendicular plane. The partial relapse of the anomaly was observed by 3 patients during the first six months after the operation. No pathological features were found, when 47 patients were examined as long as 11 years after the operation. The result of the operation was anatomically and functionally stable. For estimation of the results after surgical treatment of the open occlusion, it is quite sufficient to follow the patients for one year after the operation. Based on the results obtained, the complex surgical treatment followed by the orthodontic care of this anomaly can be recommended to wide clinical use.

RÉSUMÉ

Traitement opératoire de l'occlusion ouverte

Kozlov V.A., Tjukalov K.V., Kisljakov A.N.

On a présénté les résultats du traitement opératoire de 67 patients avec une occlusion ouverte en âge de 14 à 32 ans. Le traitement a été réalisé par les méthodes suivantes: ostéotomie corticale, mobilisation à deux étapes des parties latérales des processus alvéolaires du maxillaire supérieur, ostéotomie glissante bilatérale des branches du maxillaire inférieur faite obliquement dans le plan vertical. A cours des premiers six mois après l'intervention, une recidive de cette anomalie apparut chez 3 malades. En examinant 47 malades dans la période jusqu'à 11 ans après l'opération on n'a constaté aucun symptome pathologique. Le résultat obtenu était anatomiquement et fonctionnellement constant. L'observation d'un an suffit à faire une évaluation des résultats obtenus par le traitement opératoire des patients avec une occlusion ouverte. Sur les bases des résultats obtenus nous recommandons un traitement chirurgical complexe de cette anomalie avec une assistance consécutive à une large application clinique.

ZUSAMMENFASSUNG

Operative Behandlung des offenen Bisses

Kozlow V.A., Tjukalow K.V., Kisljakow A.N

Es wurden die Ergebnisse der operativen Behandlung von 67 Patienten mit offenem Biss im Alter von 14 bis 32 Jahren wiedergegeben. Die Behandlung wurde mit folgenden Methoden durchgeführt: kortikale Osteotomie, Zweietappenmobilisierung der Seitenteile der Aleveolarfortsätze des Oberkiefers und beiderseitige gleitende Osteotomie der Unterkieferäste, geführt schräg in Vertikalebene. Im Verlauf der ersten sechs Monate des postoperativen Zeitabstandes kam es zu einer teilweisen Rezidive der Anomalie bei 3 Kranken. Die Untersuchung von 47 Kranken im Zeitabstand von bis 11 Jahren nach der Operation entdeckte keine pathologischen Zeichen. Das erreichte Ergebnis war anatomisch und funktionell beständig. Einjährige Verfolgung nach der Operation genügt zur Auswertung der Ergebnisse, die durch die operative Behandlung der Patienten mit offener Okklusion erreicht wurden. Anhand der gewonnenen Ergebnisse empfehlen wir die komplexe chirurgische Behandlung dieser Anomalie mit anschliessender orthodontischer Betreuung zur breiten klinischen Anwendung.

RESUMEN

Tratamiento operativo de la oclusión abierta

Kozlov V.A., Tjukalov K.V., Kisljakov A.N.

Hemos presentado los resultados del tratamiento operativo de 67 pacientes con oclusión abierta en la edad de 14 a 32 años. El tratamiento fue hecho por los siguientes métodos: osteotomia cortical, mobilización de las partes laterales de los procesos alveolares del maxilar superior y osteotomia resbaladiza bilateral de los ramos del maxilar inferior conducida oblicuamente en el plano vertical. En el transcurso de los primeros seis meses del período postoperativo apareció recidiva parcial de la anomalia en 3 pacientes. Al examinar 47 pacientes durante el período hasta 11 años después de la operación no fueron encontrados ningunos síntomas patológicos. Los resultados conseguidos fueron constantes anatómica — y funcionalmente. Observación de un año después de la operación es suficience para le evaluación de los resultados conseguidos por tratamiento operativo de los pacientes con oclusión abierta. A base de los resultados conseguidos recomendamos tratamiento quirúrgico comlejo de esta anomalia con asistencia ortodóntica siguiente para un amplio use clinico.

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Prof. V. A. Kozlov, Saltykov-Shtchedrin street 41, 193015 Leningrad, USSR

Tselinograd State Medical Institute, Tselinograd (U.S.S.R.)
Head Assoc. Prof. Docent N. M. Khomenko, M.D.
Department of Surgery
Head G. V. Tsoi, M.D.
Department of Orthopaedics and Traumatology,
Head Assoc. Prof. V. A. Redin, M.D.

FLAT FLAP PLASTY OF WOUNDS PERSISTING UNHEALED FOR A LONG TIME IN CRURAL AND FOOT REGIONS OF THE LEG

V. S. BONDAR

A full-tchickness skin flap on a pedicle, i.e. an italian mode of plasty, is often used for reconstructive operations on lower extremities.

Academician Burian (1962) remarked correctly that an advantage of the italian plasty is a possibility to transfer full-thickness skin flaps from upper extremities to face and chest, from chest to arm, from abdomen to forearm and hand, from one shin to the another, etc.

However, a purulent inflammation may develop on the wound areas remaining near the base of the flap on its inner side and in its bed.

Covering of the bed and flap's wound areas by split-skin autograft prevents such a failure. Thus, acombined flat flap on one or several pedicles is formed.

Clodius and Šmahel (1972) showed experimentally that approximately 55.7 % cells survive in the thick (10—12 mm) skin flaps excised together with all the subcutaneous tissue above fascia, supplied by one pedicle and separated from the bed.

The viability of the full-thickness flaps with one pedicle is labile. Further, "a surgeon performing an operation ... has to make all efforts leading to minimization of the operation's risk and to prevention of unsuccessful results" (Pešková 1972). Therefore, according to our opinion it is purposeful to form combined flat flaps on two nutritive pedicles (of the bridge-like form).

MATERIAL AND METHODS

The flat flap plasty of wounds persisting unhealed for a long time in crural and foot regions is performed in three steps.

The first stage of plasty — formation of the flap. It consists of planning of all aspects of the operation, followed by excision of a bridge-like skin band

on medial side of a shin or thigh, on the side opposite to the defect, which should be covered. The length and width of the skin band are in ratio 2 : 1 and all the tissue above fascia is liberated (Fig. 1a).

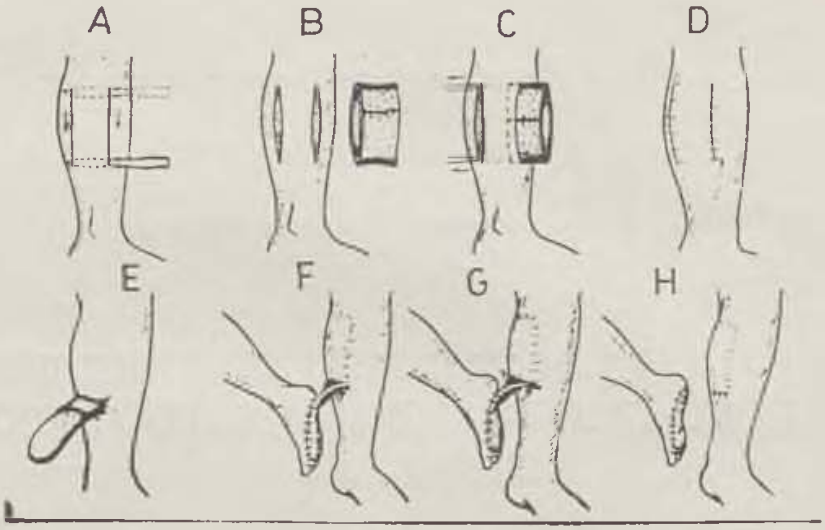

Fig. 1. Diagramm showing formation of the combined bridge-like flat flap on medial side of the shin and stages of plasty on the other extremity

The split-skin graft, 0.3—0.5 mm thick and twice greater than is the size of the bridge-like band, is excised on the different place of the body. It will be used for covering the wound areas of the flap and of its bed. Checker-board perforation of the graft, which is made subsequently, serves for draining of an exsudate and supply of nutritive plasmatic components. A ring with epidermis inside, which is formed by sewing the ends of the graft together, is inserted below the bridge-like skin band and into its bed, and sutured to them (Fig. 1b, c).

The flap must be fixed to borders of its bed (Fig. 1d), as prevention of shrinkage of the flap and optimal pressure on the inserted graft can be thus achieved. In fact, a submersed skin grafting is performed, as the free skin graft is transferred under the tissue.

It is purposeful to excise the full-thickness bridge-like skin band in the form of a rhombic parallelogram with equal sides (Fig. 2), if greater wound areas should be covered. In this way, the flap's size can be two times increased at the expense of enlargement of its bed.

The lateral triangular flaps (ABC and MHK, Fig. 2) are bended below the skin band and sutured to it, thus forming a fullthickness flat flap, conventionally called by us a rhombic flap. It could be partially or totally unfolded before sewing to the defect. The bed of such a flap is covered by local tissues in its angles and by split-skin graft (Fig. 3).

The first change of wound dressing was done 5—7 days later. Beginning from the 10th day after formation of the flap, the pedicle is gradually prepared for detachment by application of a wire hair-pin, pressing it for increasing time-periods (Fig. 1g).

The second stage of plasty — transfer of one pedicle on the defect. It is performed after 25—30 days (Fig. 1e). Excision together with surrounding tissues and splitting of the pedicle enables prolongation of the flap in respect to the size of the defect and covering of the newly formed wound by the graft inserted below the flap previously (Fig. 4).

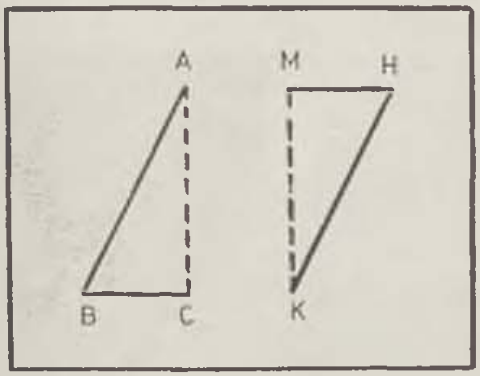

Fig. 2. Diagramm of the rhombic flat flap formation

Fig. 3. The appearance of the rhombic flat flap on the medial side of the left thigh

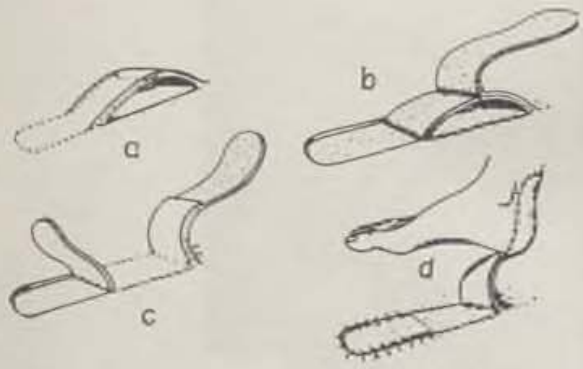

Fig. 4. Diagramm showing gradual lengthening of the combined bridgelike flat flap and suturing of one of its pedicles

Fig. 5. The appearance of blood vessel anastomoses 25 days after suturing of the flat flap to the defect on stump of the right foot

Following total or partial excision of the persisting unhealed wound, the detached flap's pedicle is sewn to it (Fig. 1f, g). The extremities are fixed together by a plaster cast, the construction of which should not interfere with changes of wound dressings.

As soon as 18—20 days later, the blood vessel anastomoses are present between the extremities connected by the flap (Fig. 5). The trophically altered tissues are supplied by supplementary blood and lymph vessels on this stage of plasty.

The third stage of plasty — detachment of the second flap's pedicle. It is performed after 30—35 days. The pedicle's detachment should be prepared

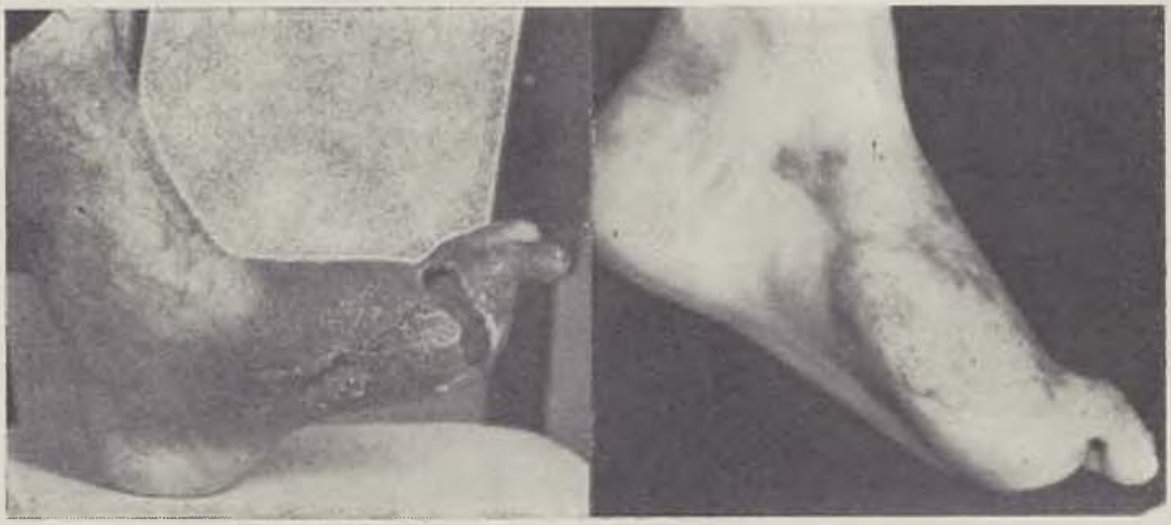

Fig. 6. Combined flat flap plasty of the throphic ulcer localized on the left foot. The appearance of an extremity before and after treatment is shown

Fig. 7. Combined flat flap plasty of the throphic ulcer localized on stump of the right foot. The appearance of an extremity before and after treatment is shown

previously, similarly as in the case of the first one. The level of detachment also depends on the size of the defect. If necessary, the surrounding tissues near the pedicle's base may be utilized. About 10—15 days later, an out-patient care is sufficient.

This method of plasty was used for treatment of unhealing wounds and trophic ulcers on the plantar side of the foot by 38 patients (Figs. 6 and 7) and for covering of the skin defects localized in the lower third of crural region, caused by traumatic osteomyelitis and trophic ulcers, by 20 patients (Fig. 8).

Fig. 8. Combined flat flap plasty of the trophic ulcer localized on the right shin. The appearance of and extermity before and after treatment is shown

ANALYSIS OF THE RESULTS AND ADVANTAGES OF THE METHOD

The results of plastic operations on wounds persisting unhealed for long time-periods and on trophic ulcers in crural and foot regions, performed by 58 patients 2 months to 26 years ago, can be expressed by number of complications.

The flap did not heal at all to the wound in 3 cases. It was caused by unfirm fixation of the extremities in two patients, the third one suffered from diabetes. The unhealed flaps were reattached secondarily and healed successfully in the two patients. The partial flap's necrosis took place by two patients, caused by excessive turning of the nutritive pedicle. The partial lysis of the free split-skin autograft transferred to flap's bed was observed by five patients. However, the additional skin grafting was unnecessary.

Analysing the long-term results of treatment, a chronic relapsing trophic ulcer localized in the centre of the healed flap was found in one patient, five months after release from the hospital. Its formation was due to deep neuro-

Fig. 9. Utilization of the distal nutritive pedicle of the combined flat bridge-like flap, formed on the medial side of the left shin

Fig. 10. Utilization of both pedicles for nutrition of the rhombic flat flap, formed on the medial side of the left thigh. Plastic operation on wounds persisting unhealed on stump of the right foot

genic alterations caused by previous bullet injury of sciatic nerve in the gluteal fold region. An amputation of an extremity was done by one patient, due to occurrence of neoplasma.

The plasty of unhealing wounds and trophic ulcers in crural and foot regions, made by means of a combined or rhombic flat flap taken from the opposite shin or thigh offers several possibilities. Not only proximal, but also distal nutritive pedicle can be utilized (Fig. 9). The flap can be transferred without intermediary stages. In necessary, the length of the flat flap may be two times increased.

In the case of reconstruction of the skin cover on plantar side of the foot, it is purposeful to suture the flat flap to the defect making use of both nutritive pedicles at once (Fig. 10). In this way, the number of operations and the duration of treatment are diminished.

The basic advantage of the described method should be seen in the use of full-thickness skin flap on a nutritive pedicle, containing subcutaneous fat tissue, for plasty of long-persisting wounds and trophic ulcers in crural or foot regions. The extremities are required to stay in a "relatively comfortable" position.

In comparison with difficulties in clinical treatment and slowly proceeding reparative regeneration of trophic ulcers localized on plantar side of the foot, the described method improves also trophicity of the altered tissues, as good blood vessel anastomoses are formed after flap's transfer from one extremity to the other.

Among different methods of the skin plasty on the nutritive pedicle, those methods leading to least suffering of the patient, requiring the least number of operations in the shortest time-periods and giving good results of treatment achieved by the simplest technique, should be preferred. M. T.

SUMMARY

The method of plasty of wounds persisting unhealed for a long time and of trophic ulcers in crural and foot regions was described. The combined or rhombic flat flap was used. It was prepared on shin or thigh opposite to the side of the defect.

The formation of such flaps and their gradual suturing to the defect were described. The treatment of 58 patients was analyzed and the basic advantages of this method were stressed.

The therapeutic value of this method is noted, as of an important factor leading to formation of supplementary blood and lymph vessel supply of the trophically altered tissues.

RÉSUMÉ

Plastie des plaies de la jambe et de la plante du pied qui ne cicatrisent pas longtemps faite à l'aide du lambeau plat

Bondar V. S.

On a décrit une méthode de plastie des plaises qui ne cicatrisent pas longtemps et des ulcers trophiques sur la jambe et la plante du pied en utilisant un lambeau combiné et rhomboïde formé sur la jambe ou à la cuisse de l'autre pied.

On a décrit la méthode de former de tels lambeaux et leur suture en étapes aux défauts qui doivent être recouverts. Même, on a fait l'analyse de 58 cas et montré les avantages de cette méthode.

Puis, on a indiqué l'importance thérapeutique de la méthode plastique mentionnée qui est un facteur important de la création de la circulation sanguine et lymphatique supplémentaire des tissus transformés trophiquement.

ZUSAMMENFASSUNG

Plastik lange nicht heilender Wunden des Schienbeins und der Fusssohle, mittels eines flachen Lappens

Bondar V. S.

Der Autor beschrieb ein Verfahren für die Plastik lange nicht heilender Wunden und trophischer Abszesse am Schienbein und an der Fussohle mittels eines kombinierten und rhombischen Lappens, der am Schienbein oder am Schenkel des anderen Fusses gebildet wurde.

Es wurde die Methodik der Gestaltung derartiger Lappen und der Etappennaht derselben auf den zu deckenden Defekt beschrieben. Es wurde die Analyse von 58 Fällen vorgenommen und es wurden die Hauptvorteile dieser Methode hervorgehoben.

Ferner wurde auf die therapeutische Bedeutung dieser plastischen Methode hingewiesen, die einen wichtigen Faktor darstellt, der zu einem ergänzenden Blut- und Lymphkreislauf der trophisch veränderten Gewebe führt.

RESUMEN

Plástica de heridas no cicatrizantes de la tibia y de la planta del pie mediante un lóbulo llano

Bondar V. S.

Fue descrito un método de plástica de heridas y úlceras tróficas no cicatrizantes largo tiempo en la tibia y planta del pie mediante un lóbulo combinado y rombal que fue formado en la tibia o en el muslo del otro pie.

Fueron descritos los métodos de cómo formar tales lóbulos y la sutura de los mismos para cubrir el defecto. Fue hecha el análisis de 58 casos y fijadas las principales ventajas de este método.

Además fue indicado el significado curativo del dicho método de plástica que es un factor importante que conduce a la formación de las circulaciones de sangre y linfática completivas de los tejidos cambiados tróficamente.

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Dr. V. S. Bondar, Mira Street 51-a, 473013 Tselinograd, USSR

Technical University, Budapest (Hungary)
Organical Technical-Chemical Department Central Hospital, Budapest
Drug Research Institute, Budapest

DATA TO THE BIOPHYSICS OF THERMAL INJURY

GY. LEPENYE, J. NOVÁK, L. NÉMETH

Critical superficial temperature causing skin necrosis was found by Moritz 44 °C when using 8 hours exposure time. Fraser got the same result. The difference between superficial and subcutaneous temperature according to Mendelsohn and Rositter, and Henriquez and Moritz was 6—18 °C.

It is not necessary to prove, this difference is a result of the cooling effect of the environment, reflexion of the skin-surface and heat-absorbtion of the skin-layers. It is well-known that the depth of the thermal injury depends upon exposure time, and difference betwen the actual temperature and the critical one (Buettner, Moritz). In our previous study (Novák and co-workers) we proved in case of radiant heat besides the above-mentioned factors intensity of heat transmission plays an important role.

According to Feller thermal injury of skin is determined among other factors by local blood-supply, but he did not give measurement data.

Frauendorf and co-workers used infrared light of 250 W for achieving hyperaemia. Fraser proved the role of two factors in determination of subcutaneous temperature of laboratory animals exposed to radiant heat: color of the skin and vascularization of the skin when stragulated, the skin of a limb suffers the same thickness burn in a shorter exposure time.

Städtler and co-workers produced burn injury of miceskin by contacting a 250 °C metal for 15 seconds. According to these authors' opinion the intra and extracellular water boils up and the steam thus produced impedes heat-emission, that is conserves the high temperature.

Stolwijk and Hardy performed thermographic measurements in room temperature, using infrared irradiation and found the increase in temperature was in direct proportion to the irradiation in the first 10—15 seconds. The results of their measurements indicate that the cooling effect of blood can not be achieved in the first phase of heating, even if the circulation of skin is not impaired by coagulation necrosis.

When examining the problem more thoroughly the question arises does the loss of heat toward other parts of the organism or under the injured skin play a role or not in the skin temperature.

In conformity with Moserova and co-workers we see the importance of this question in the fact that each factor decreasing the temperature of skin is essential from the point of view of thermic injury.

METHODS

In our experiments we used albino rats of 170—220 g weight, 50 % males and 50 % females as biological models. Annealing furnace served as source of radiant heat. Temperature of the furnace was 650 °C. A 4×4 cm radiation aperture was cut in the front-wall of the furnace. The temperature in the radiation aperture was measured with a thermometer. Intensity of heat irradiation was 1,0 W/cm^2.

We gave the back of the animals a close crop with a clippers and narcotized them with intraperitoneally given Intranarcon before fastening them to the board. A period of 25 minutes passed in every occasion between narcosis and heating.

The thermistor was inserted under the skin of the tail and pushed forward in the median line under the skin to be heated. In order to diminish the scatter of the results we fixed the thermistor (Fig. 1).

The subcutaneous temperature was measured with the thermistor in the animals with their back facing the aperture of the furnace. We made a snapshot of the stop-watch and the thermometer in every 10 seconds. The plan of the measuring device is published in our previous paper (Novák and co-workers).

The animals were arranged in three groups. There was thirty animals in each group. In the first group the skin to be heated was deprived of its circulation by making a cirular cut, under-mining and resuturing with non-interrupted suture.

In the second group the skin to be heated was deprived of its circulation by the above-mentioned method, but before resuturing we put a 4×4 cm, 3 mm thick piece of felt under the skin as an insulation. The thermistor was placed between skin and felt (Fig. 2).

In the third group of animals the circulation of the skin to be heated was left intact. This group served as a control-group. To get some reference-data we made some measurements of the temperature of a piece of skin stretched on a frame.

Results of the experiments was evaluated biometrically, with 1 % probability.

RESULTS

The temperature of the skin left in situ (not deprived of circulation, group 3) increased approximately linear. In 100 seconds of heat radiation the starting temperature of 35 °C increased to 60 °C.

The subcutaneous temperature increased in the same way in group 1.

Mean values of subcutaneous temperature of heat-insulated skin differed significantly from that of the controll group.

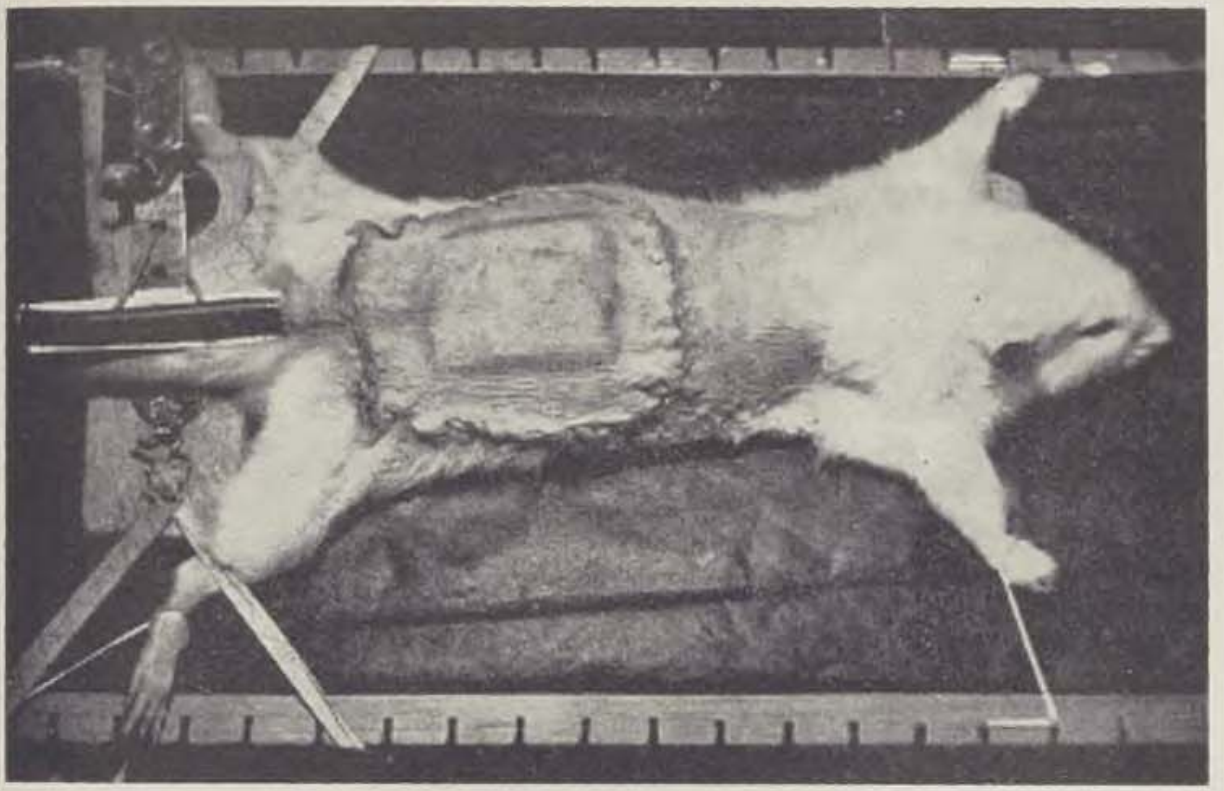


Fig. 1. The thermistor measuring the subcutaneous temperature is inserted under the skin of the tail of the rat and is pushed forward in the median line under the skin to be heated

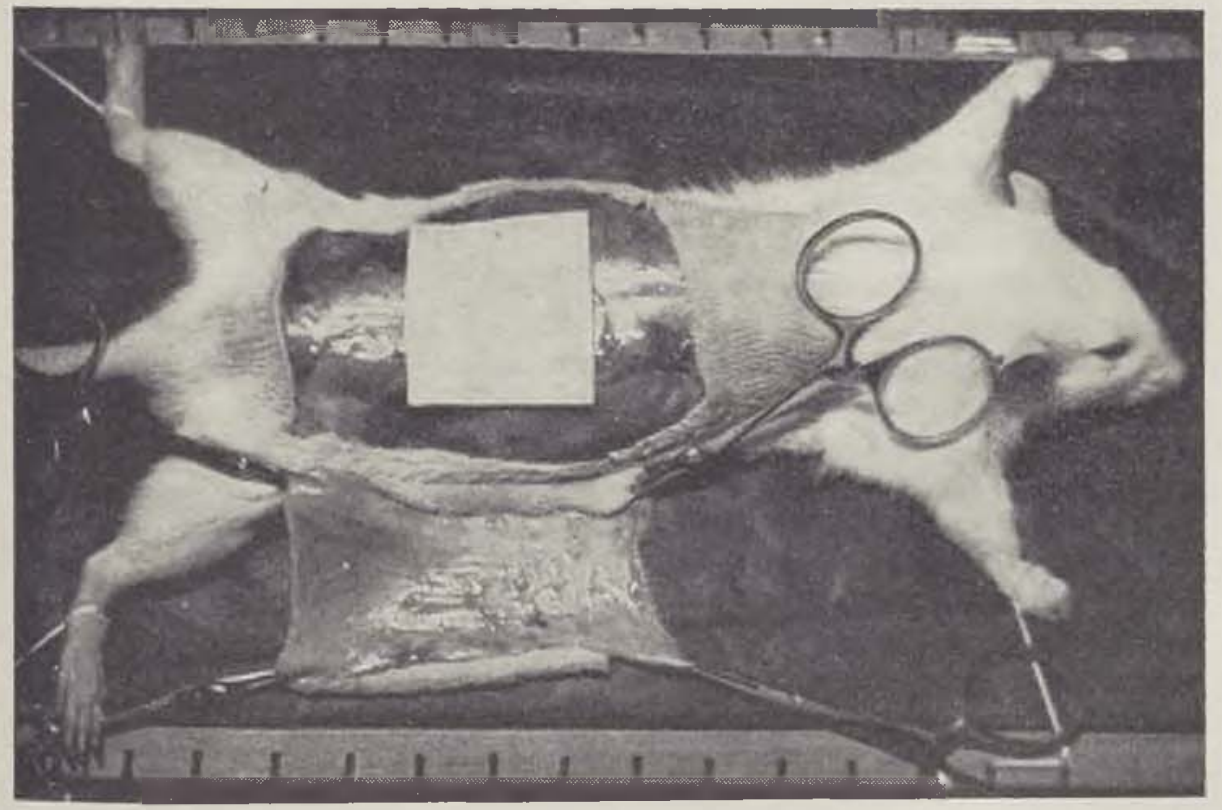
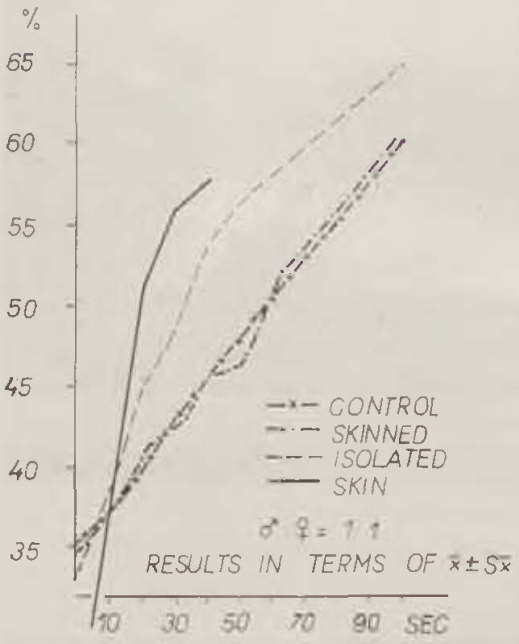


Fig. 2. In the second group of animals the skin to be heated was deprived of its circulation before resuturing a piece of felt was put under the skin as an isolation

The subcutaneous temperature increased more quickly; in 40 seconds it was almost 54 ^{0}C in contrast with the other two groups's 45--46 ^{0}C. The rate of increase of temperature from this point on somewhat diminished, but in 100 seconds the temperature was still 5 ^{0}C higher than that of the two other groups

The temperature curve of the skin stretched on frame increased most precipitously (Graph 1).



Graph 1. Mean values of subcutaneous temperature of heated-isolated skin differed significantly from that of the controll group. The temperature curve of the skin stretched on frame increased most precipitously. A colling effect of blood-stream could not be verified

DISCUSSION

In our experiment temperature of skin as a function of time changed the same way, irrespective of deprivation of circulation. On the ofther hand there was a significant difference if we put a felt insulation between skin a muscle tissues.

The fact that there was no difference between temperatures of skin either isolated of circulation (group 1) or not (group 3) seems to be astonishing, because according to the authors mentioned in the introduction, the blood-stream has a cooling effect.

Only S t o l w i j k a n d H a r d y fail to mention the bloodstream as a cooling factor, but they do not take into account thermal conduction in heating of tissues.

On grounds of our experiment we suppose that the blood-stream has no cooling effect, or plays an insignificant role in case of heating the skin.

In group 2 — where there was an insulation between skin and muscle there was a significant difference between group 2 and controll (group 3). Subcutaneous temperature increased more precipitously when using the insulation.

Thus it is proved that the subcutaneous tissues have a significant heat--absorbing effect.

This heat-absorbing effect is a result of thermal conductive and accumulative capacity of tissues underlying the skin. The heat-accumulating capacity is

a function of mass of tissue. Thus the heat-absorbing effect is different on the trunk and on the hand.

Our statements are proved by the results of measurements performed on the skin stretched on frame. From these reference-measurements we know, that the temperature of skin isolated from the organism rises more precipitously than that of not isolated.

On grouds of our experiment we state, that degree of tissue necrosis as a result of thermal injury is determined not only by the thickness of skin (blood-supply and some other factors), but by the heat absorbing effect of underlying tissues (conductive and accumulative capacity).

SUMMARY

Subcutaneous temperature of albino rats when using radiant heat was significantly higher when the skin was insulated from the underlying tissues. Cooling effect of blood-stream could not be verified.

According to the results of measurements in determination of degree of thermal injury thickness of skin, volume of the injured organ and heat-absorbing capacity of underlying tissues play decisive role.

RÉSUMÉ

Données biophysiques dans la lésion thermique

Lepenye Gy., Novák J., Németh L.

La température souscutanée des rats blancs était significativement plus élevée pendant l'irradiation thermique, si la peau était isolée des tissus couchés plus bas. L'effet réfrigérant du cours du sang n'a pas été vérifié.

D'après les résultats du mesurage, ce sont l'épaisseur de la peau, le volume de l'organe abîmé et la faculté d'absorber la chaleur des tissus souscutanés qui jouent le rôle déterminant dans la détermination de la lésion thermique.

ZUSAMMENFASSUNG

Biophysikalische Daten bei der thermischen Schädigung

Lepenye Gy., Novák J., Németh L.

Die subkutane Temperatur weisser Ratten war bei thermischer Bestrahlung signifikant höher, wenn die Haut von den tiefer liegenden Geweben isoliert war. Die Kühlwirkung des Blutstromes wurde nicht bestätigt.

Aus den Messungsergebnissen ergibt sich, dass bei der Bestimmung der thermischen Schädigung die Hautdicke, das Volumen des geschädigten Organs und die Fähigkeit subkutaner Gewebe Wärme zu absorbieren die entscheidende Rolle gespielt haben.

RESUMEN

Datos biofísicos en detrimento termal

Lepenye Gy., Novák J., Németh L.

Temperatura subcutánea en ratos blancos durante radiación termal fue significantemente más alta si la piel fue aislada de los tejidos puestos más profundamente. El efecto refrigerante de la corriente de la sangre no fue confirmado.

Según los resultados de medición lo eran el grueso de la piel, el volumen del órango deteriorado y la capacidad de los tejidos subcutáneos de absorber el calor que jugaban el papel decisivo en la determinación del grado del deterioro termal.

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Dr. Gy. Lepenye, Central Hospital, Budapest, Hungary

Central Institute of Haematology and Blood Transfusion, Moscow (USSR)

ON SIGNIFICANCE OF TRANSFUSION IN TREATMENT OF SHOCK CAUSED BY BURN INJURY

R. I. MURAZYAN

During the recent years, further good results have been achived in treatment of the shock caused by burn injury (Pekarskii and Shalimov 1976, Rozin et al. 1975, Kotchetygov 1973, Murazyan 1973, Moncrief 1973, Muir and Barclay 1974). It has been due to more advanced blood transfusion technique and handling of burns. In our opinion, the three factors played the major role:

1. Discovery and practical use of new blood preparations, blood substitutes and solutions of electrolytes.
2. Improved tactics and principles of shock treatment by burn injuries utilizing blood transfusion.
3. Description of the most informative parameters enabling reasonable estimation of the transfusion treatment effectivity.

More than 1000 patients in a state of shock after burn injury have been treated in the Central institute of haematology and blood transfusion during the last 25 years.

Great number of observations and experience with various techniques of transfusion, which were applied during shock caused by burn injury, led us to several conclusions. Firstly, the full blood remains to be one of the best liquids for treatment of acute shock after burn injury. Originally, it was applied during the first 24 hours of shock, but recently it is used after 48—72 hours of shock caused by burn injury. The vast destruction of patien's erythrocytes during the first 24 hours (breakdown of 20—30 % of circulating erythrocyte volume) seizes abruptly after 48—72 hours. Therefore, the erythrocytes transfused during the first 24 hours may damage microcirculation and cause stasis and destruction of erythrocytes.

Also other liquids, mainly preparations of dextran ("Polyglukin" and "Rheopolyglukin") and balanced salt solutions should be included in the scheme of the treatment of shock caused by burn injury.

Application of such solutions led to the best results by severe and the severest degrees of shock after burn injury. According to our experience, an appropriate application of full blood nad blood substitutes resulted in recovery of almost all young and middle-aged patients (16—50 years old), who suffered

from the shock after burn injury. The patients suffering from serious diseases before accident and patients with additional burns of upper respiratory pathways were excluded.

Further, the importance of hormonal preparations, complex of vitamins, Novocaine, neuroleptics, analgetic and cardiotonic drugs in treatment of severe forms of shock after burn injury has arisen during the last time.

The shock caused by burn injury is a complicated state accompanied by considerable changes of various organs and systems. The most significant are alterations of salt-water balance, protein metabolism and diuresis. However, the changes of haemodynamics (central and peripheral) are the first to be ascertained.

A diagram of haemodynamic alterations by shock after burn injury was proposed by us in 1975. In that way, the interdependence of deviations was underlined (see a diagram).

In our opinion, the pain is the main factor in development of haemodynamic disturbances (especially during the first hours of shock caused by burn injury), but the early toxaemia during the first 24 hours of the disease plays also a significant role. This fact was proved convincingly by Professor N.A. Fedoroff, academician of AMS USSR, and his school, who cooperates with our Institute. It was confirmed by our finding of myocardial affections during the first 24 hours of shock caused by burn injury, which were revealed by means of electrocardiography and kymography.

Changed permeability of blood vessels, loss of plasma and destruction of erythrocytes are important factors taking part in development of haemodynamic disturbances. The volume of blood pumped by heart per minute decreases and persistent hypovolaemia and aggregations of erythrocytes develop. Further consequences are hypotension, vasoconstriction, disturbed microcirculation, tissue hypoxia and acidosis. The last fact is also due to myocardial affection and destruction of erythrocytes.

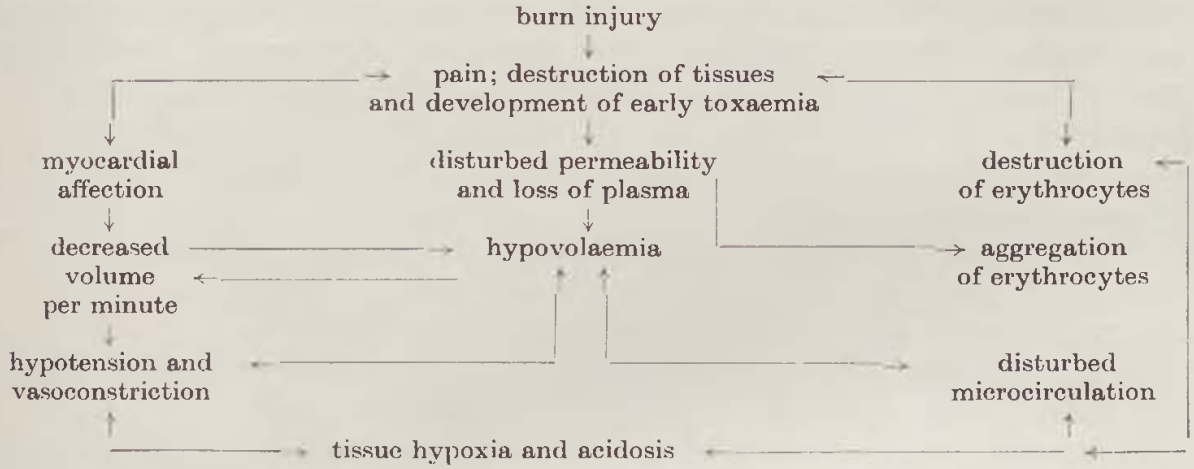
The treatment of shock after burn injury by means of transfusion should consist of diagnosis of such alterations, that are to be corrected subsequently. The most informative parameters enabling clinical treatment of haemodynamic disturbances seem to be:

1. central venous pressure;
2. degree of haemoconcentration (haemoglobin, haemotocrit, viscosity of blood);
3. volume of circulating blood and its components;
4. acid-base balance;
5. diuresis per hour and per day;
6. results of clinical examination of a patient (physical and auscultatory data, pulse and respiration frequency etc.).

In addition to ascertainment of the haemodynamic parameters, further data are need inrespect to estimation of a degree of water-salt and protein imbalances, myocardial, hepatic and lung functions and many others. Based on all these facts, it is clear that only in Centres for treatment of burns the most

successful treatment of shock caused by burn injury could be achieved, as not only transfusiologist, but also reanimatologist-anesthesiologist and possibly pathophysiologist, i.e. the whole shock brigade consisting of 3—5 people should participate in the care of the patient (permanent care of a nurse, inspection of a physician every hour).

The diagram of haemodynamic disturbances in shock caused by burn injury



The many times discussed problem of prolonged transportation of patients in shock seems to be better defined, nowadays. According to opinion of us and many clinicians, it is extremely undesirable to transport the patients in severe shock (deep burns of more than 20—30 % of body surface) since 2 hours after the accident (Vishnevskii and Schraiber 1968, Murazyan 1973 and others).

If the optimal mode of transfusion treatment was performed and many parameters of its effectivity were ascertained, the best results of treatment were achieved by young and middle-aged patients, while by old persons (especially by senile men) no improvements were observed during the last 10 years.

Another important question is justified: Is it possible to use only blood substitutes in treatment of shock caused by burn injury? Undoubtedly, this question is very important, as it may happen that transfusion media like full blood, native plasma and other blood preparations might not be for disposal. According to our experience, good results can be obtained by complex of blood substituting solutions, if they are used for treatment of shock of medium-level severity (burned surface less than 50% totally, deep burns not more than 20—30% of body surface).

More data are required for estimation of blood substitutes effectivity in treatment of severe shock after burn injury, however, very suggestive results were obtained by young patients.

A mode of treatment of shock after burn injury, using only blood substitutes, chosen in respect to their effect on observed disturbances of blood circulation, electrolytes and diuresis and to their detoxication effect, was developed by us.

During the last years, dextran preparations were often applied, being called by many authors "stronghold of shock treatment by burn injuries". Our studies and publications accomplished during many years revealed that "Polyglukin" in dose of 1000—2500 ml exerted the best haemodynamic effect in comparison with all other liquid media. "Gelatinol" is also very effective. The speed and durability of "Polyglukin's" haemodynamic effect is not only equivalent to the effect of the full blood, but often exceeds its effect.

According to our data, it is purposeful to use combinations of "Polyglukin" and "Rheopolyglukin", as the latter improves microcirculation and potentiates the effect of "Polyglukin". "Gemodez" and low-molecular "Polyvonol" are indispensable blood substitutes in prevention of early intoxication. They also improve diuresis. Their effect is better than the effect of blood and native or dried plasma, except immune blood, which contains besides antitoxic also antibacterial antibodies.

The electrolyte imbalancies may be well counter-acted by many solutions, especially by our own balanced electrolyte solution "Lactasol". Our obsevations confirmed that its use by beginning acidosis is fully justified.

The most efficient liquids used by disturbances of diuresis are solutions of urea and especially mannitol.

The most recent advances in treatment of shock caused by burn injury are due to use of hormonal preparations, heparin, neuroplegic drugs and solutions.

A big attention should be devoted to practical use of hyperbaric oxygenation in treatment of shock after burn injury. The cranio-cerebral hypothermy could also be possibly applied.

Thus, a significant progress in treatment of patients suffering from shock after burn injury could be encountered.

Further successes in the treatment will depend mostly on improvement of our practical knowledge, discovery of new drugs, deeper study of pathogenetic mechanisms and of possibilities enabling treatment of the expressed disturbances.

CONCLUSION

Based on experience gained during many years of treatment of shock after burn injury by more than 1000 patinets, the author explains the basic aspects of the transfusion treatment.

The practical recommendations and ways of further development leading to successful treatment of so seriously sick patients, are indicated.

M. T.

SUMMARY

In this article, the basic questions related to the treatment of shock after burn injury by means of transfusion are dealt with. The modes of treatment of the expressed disturbances are described and indispensability of preferential treatment of the haemodynamic changes is emphasized.

Various transfusion media are listed and their potency is defined in respect to their use in treatment of such a serious disease.

RÉSUMÉ

Importance du traitement d'un choc de brûlure par la transfusion

Murazjan R.I.

L'article traite les question principales du traitement d'un choc de brûlure par la transfusion. On décrit les modes de réparation des troubles apparus en soulignant la nécessité de la lutte contre les altérations hémodynamiques.

On introduit les moyens de transfusion et les buts de leur utilisation dans la lutte avec cet était ci grave.

ZUSAMMENFASSUNG

Über die Bedeutung der Transfusionstherapie des Verbrennungsschocks

Murazjan R.I.

Im Artikel behandelt man die Grundfragen der Transfusionstherapie des Verbrennungsschokcks. Es werden die Verfahren zur Bewältigung der entstandenen Störungen beschrieben, insbesondere wird die Notwendigkeit des Kampfes gegen hämodynamische Veränderungen hervorgehoben.

Es werden die Transfusionsmittel und die Ziele ihrer Anwendung im Kampf mit diesem schweren Zustand besprochen.

RESUMEN

Sobre la importancia del tratamiento por transfúsión del choque por causa de quemadura

Maruszjan R.I.

En la obra se trata de cuestions principales del tratamiento por transfusión de un choque por quemadura. Están descritos los métodos de cómo controlar los trastornos ocurridos, especialmente está destacada la necesidad de reprimir los cambios hemo dinámicos.

Están mencionados los medios de transfusión y les fines del uso de los mismos en la lucha con este estado grave.

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R. I. Murazyan, Festival avenue 22/6 (No 645), 125414 Moscow, USSR

Central Institute for Traumatology, Budapest (Hungary)

BURN CARE IN HUNGARY*

DR. D. GAÁL

In Hungary annually 4000—5000 burned patients — nearly 0.05 % of the population — need hospital admission; about one-half of the injured are children.

The rapid progress in the specialized treatment of severe burns started also in Hungary after the Second World War. The first department providing care only for burned patients was opened in a general hospital of the town Budapest in 1952. Fig. 1 shows the distribution of the existing and planed burn facilities for burned adults in Hungary. Today there are one burn center and three burn units in Hungary in terms of Feller's classification. Specialized treatment, conducted by an experienced surgeon, is permanently provided for an appreciable number of burned patients on the dermatological clinics of two regional universities. Unfortunately, the demand for beds far exceeds the capacity of the relatively few burn facilities, so that a great number of cases must be managed in surgical and traumatological departments.

Fig. 2 shows the distribution of the hospital admissions among the various facilities for 1976. In Budapest 90 % of the burned got admission to specialized burn facilities. On the country-side — outside of the region of the already existing regional burn units — only those severely burned patients are transfered to specialized burn facilities, who have some chance for recovery. The patients, who are immediately transported to a specialized burn facility after the first surgical management in a nearby hospital, were counted on this compilation as patients directly admitted to specialized burn units.

The great number of burn injuries on the country-side makes it imperative to organize burn programs in the traumatological departments of the regional hospitals. The planed distribution of these facilities is shown by Fig. 1.

The burned children get usually admission to children's surgical and traumatological departments, because the specialized burn facilities do not meet the requirements for childrens care. Since these children's wards have a consistent plan for the management of burns, they can be regarded as departments with burn programs. One of these departments lays stress upon research and teaching; it can be taken as a burn center. Since the bed capacity

* Report held on the meeting of the International Society for Burn Injuries in Geneva, Suiss, 16th May, 1977.

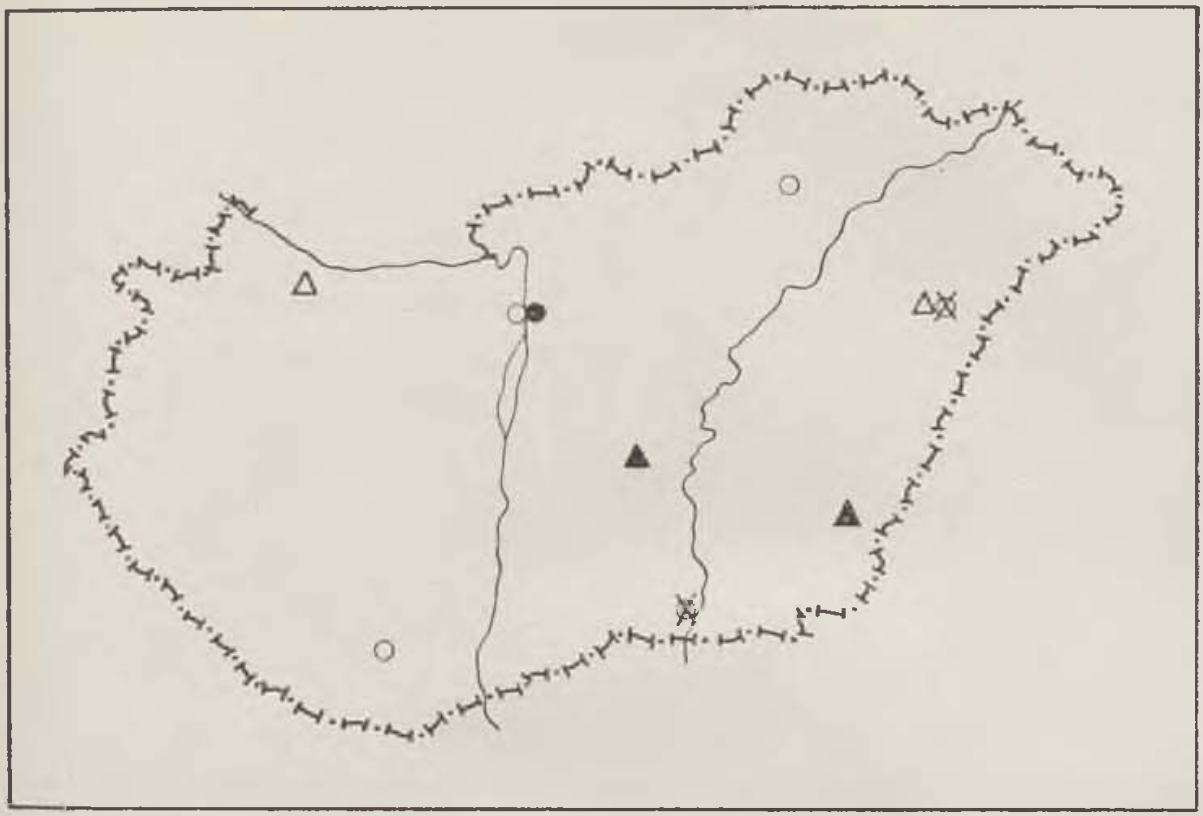

Fig. 1. Distribution of the existing and planed burn facilities for adults in Hungary [Existing: burn center ●, burn unit ○, dermatological clinic ⊗ ; planed: burn unit △, burn program ▲]

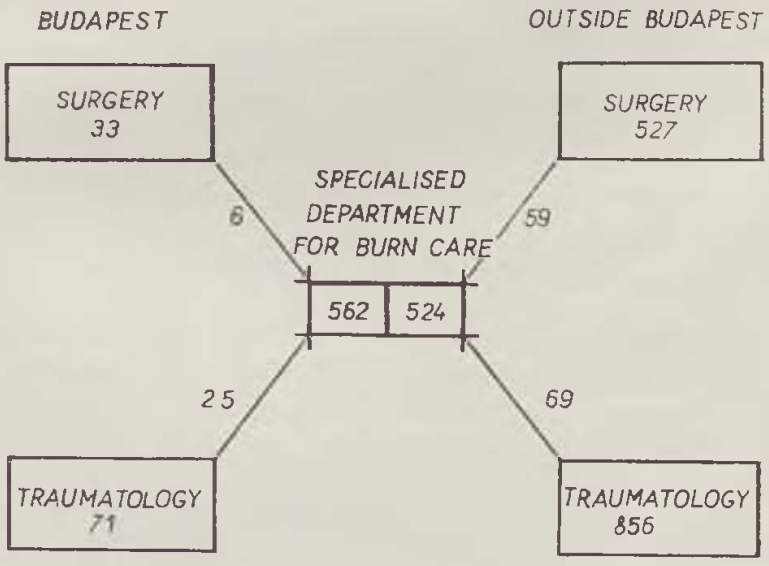

Fig. 2. Distribution on the burned patients among the various facilities. The number beside arrows denote the number of the transfered patients

for burned children specialized care is not satisfactory, several new facilities are planed. The distribution of the existing and planed burn facilities for children is depicted on Fig. 3.

An advantageous feature of the hungarian traumatological management seems to be that the Central Institute for Traumatology supervises all of the

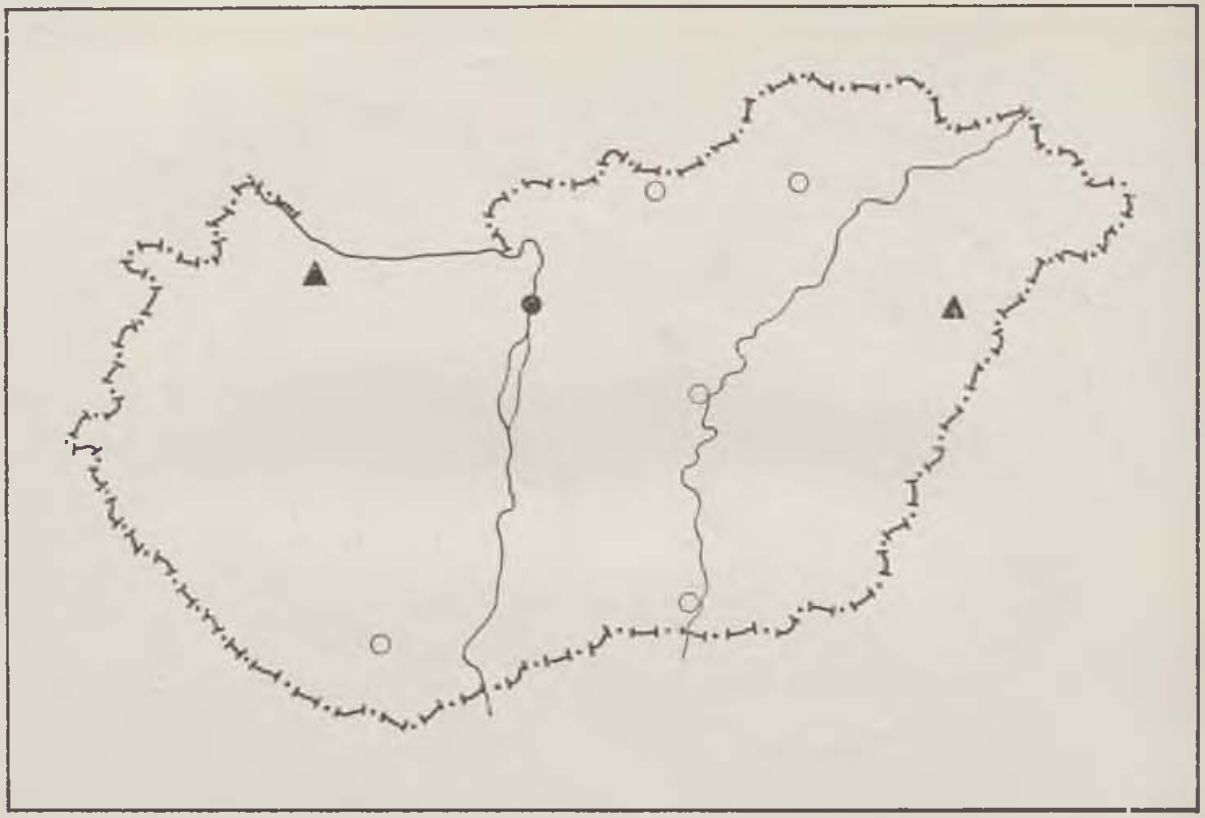

Fig. 3. Distribution of the existing and planed burn facilities for children in Hungary (Existing: burn center ●, burn programs ○, planed burn program ▲)

Thus there is a unified burn treatment both on the specialized burn facilities and on the traumatological and surgical departments. The essential points of the recommendations are the following:

I. Treatment of burn shock according to the Brooke-formula taking into account the patients state and the results of the laboratory studies.

II. Primary excision whenever it is resonable.

III. Hyperalimentation with 40 % glucose and protein in the case of severe burns.

IV. In local treatment there is a free choice among gentamycin and sulfamylon cream, sulfadiazine ointment and mercurochrom and silver nitrate solutions. Further on let me mention that in Hungary there are efforts to use hungarian xenografts.

The efficiency of the medical care is well supported by social efforts. The Section for Burn Surgery of the Hungarian Society for Traumatology was established in 1974. This body has now 123 members. Since the nurses play a very important role not only in the care of the burned patients but also in their psychological recovery, it is essential that the caring staff such as nurses traumatological departments and burn facilities. As a supervisor, the Institute gives therapeutic recommendations in form of methodical letters and sum marizes the statistical data indicating the efficiency of the suggested treatment.

Table 1 Mortality analysis. The upper number in each cage gives the number of the patients and the lower one is the number of the fatal cases

Mortality analysis (1970—1975)

% Burn / AGE	1—10	11—20	21—30	31—40	41—50	51—60	61—70	>70	Total
15—20	599	49	27/*3*	14/3	9/2	4/*4*	4/*4*	3/*3*	709/*19*
21—30	979	137	48/*1*	14/*1*	10/5	6/*2*	5/*4*	10/*10*	1209/*23*
31—40	530	115/*3*	29/	21/*5*	9/*5*	5/*3*	2/*1*	13/*13*	724/*30*
41—50	451/*2*	90/*2*	29/*3*	7/*3*	9/*6*	1/*1*	1/*1*	6/*6*	594/*24*
51—60	316/*4*	54/*4*	16/*4*	13/*8*	3/*2*	4/*4*	—/	4/*4*	410/*30*
61—70	196/*7*	52/*7*	14/*5*	13/*10*	1/*1*	2/*2*	3/*3*	7/*7*	288/*42*
>70	162/*24*	30/*14*	20/*15*	7/*6*	2/*2*	1/*1*	2/*2*	6/*6*	*230/70*
Total	3233/*37*	527/*30*	183/*31*	89/*36*	43/*23*	23/*17*	17/*15*	49/*49*	*4164/238*

and physiotherapists will be raised if they are to feel truly part of the team. To this end our Section has as members any persons involved in the care of the burned patients.

The most important achievment of the Burn Section was the establishment of the national burn information exchange. At first data from the patients records of the burn facilities treating more than 50 patients per year was collected from the years between 1970 and 1975. In this way the data of 4164 patients were aviable. Table 1 gives the mortality analysis from this compilation. These figures can be favorably compared with those published by others in the recents years, indicating the level of the burn treatment in Hungary. The detailed analysis of this compilation will be published later on.

Dr. D. Gaál, XI Sasadi út 45, H 1118 Budapest, Hungary

Institute of Orthopaedics and Traumatology
Medical Academy, Sofia (Bulgaria)
Director: Prof. Dr. J. Holevich

A TWO-STAGE OPERATION IN DUPUYTREN'S CONTRACTURE

S. KARAGANCHEVA, I. MATEV

The insatisfactory outcome of surgery in the heavy forms of Dupuytren's contracture (DC) compelled us to embark on operative management in two stages. It includes open fibrotomy as a preliminary stage followed by partial excision of palmar aponeurosis.

In cases of marked DC Bunnell (1956) suggested closed subcutaneous fasciotomy, supplemented by total fasciectomy within 10—14 days.

CASE MATERIAL

Two-stage operation was performed in 16 men (17 hands) at the hand surgery department of the Institute, over the period 1967 through 1974. The age of the treated patients ranged from 38 to 78, or average 58 years. The degree of contracture was determined on the basis of the classification proposed by Matev[1] in 1962 (Fig. 1). Seven hands were with II degree flexion contracture, i.e. with MP and PIP joint deformity, and ten hands were with III degree — contracture of all three digital joints, and hyperextension of the distal joint In the II degree group, two-stage operation was resorted to because of the heavy PIP joint deformation and poor condition of the palmar skin interfering with the use of local flaps. In all patients undergoing treatment the skin in the affected region and between the fingers was scarred with macerations and rhagades.

[1] 0 degree — presence of a palmar nodule without flexion contractures; I degree — flexion contracture of MP joint; II degree — flexion contracture of MP and PIP joints; III degree — flexion contracture of all three digital joints. In instances of more than one finger being affected the degree is estimated by the digit with heaviest involvement.

OPERATIVE TECHNIQUE

The presence of a pronounced, bulging aponeurosis under the skin is a precondition to undertake fibrotomy as a preliminary stage. It is performed using the open technique with a small, longitudinal palmar skin incision, running along the length of the protruding fibrous band. Careful transverse

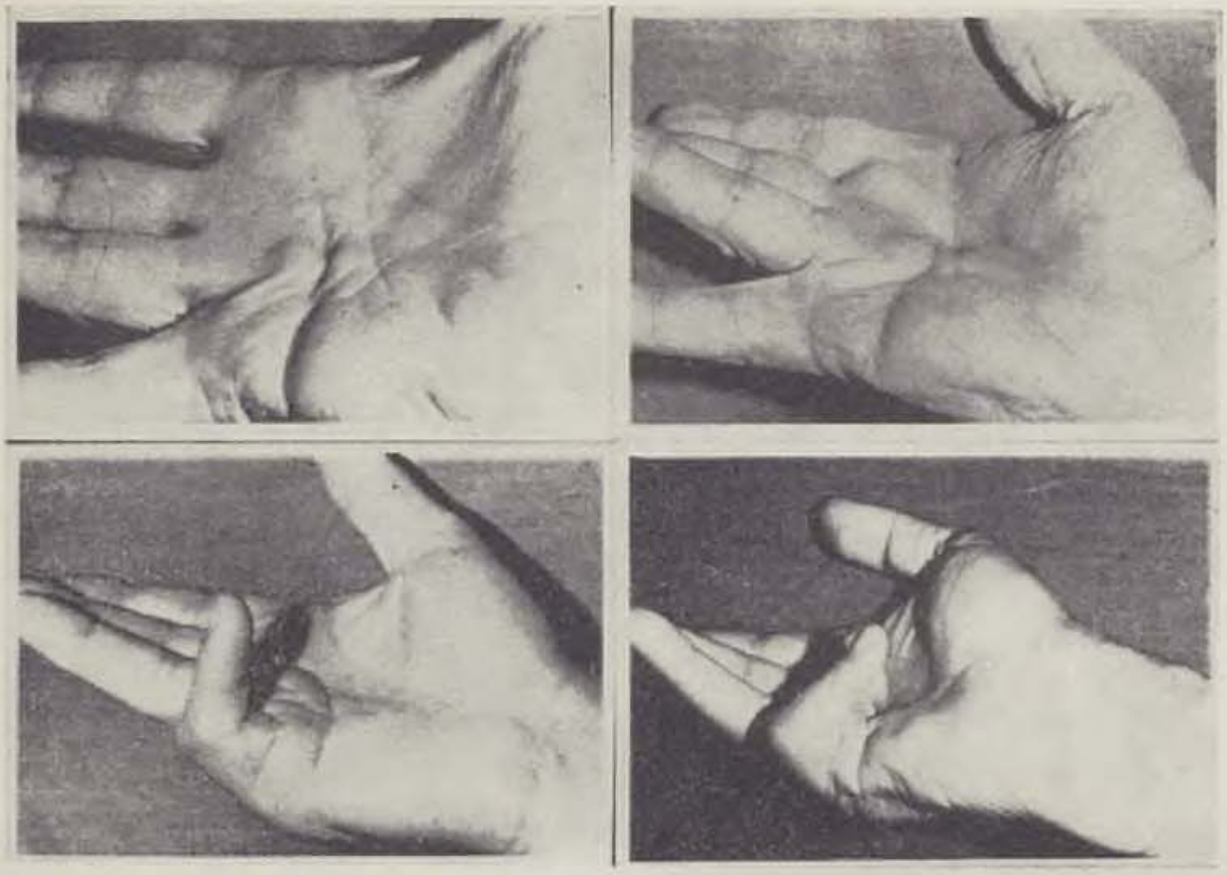

Fig. 1. The classification of DC according to Matev: a) zero degree, b) first degree, c) second degree and d) third degree

Fig. 2: Elastic wire splint used after fibrotomy

division of the band is made under the protection of a mosquito instrument. Thus, a substantial MP joint correction is achieved, and the finger is drawn out of the palm. In rare cases an analogical, secondary fibrotomy at digital base level is necessary to reduce the heavy flexion contracture of the PIP joint. As a rule, the postoperative period runs an uneventful course, and operative wound healing occurs within about ten days. The longitudinal skin incision allows early mobilization — as early as the day after the operation. After removal of the sutures, a small soft splint with elastic traction is applied to maintain and improve post-fibrotomy correction (Fig. 2).

In a second stage, within about a month, partial palmar aponeurosis excision, i.e. removal of its pathologically changed part, is carried out. Extended asymmetric Z-plasty after Matev (1967) is the operative access most frequently

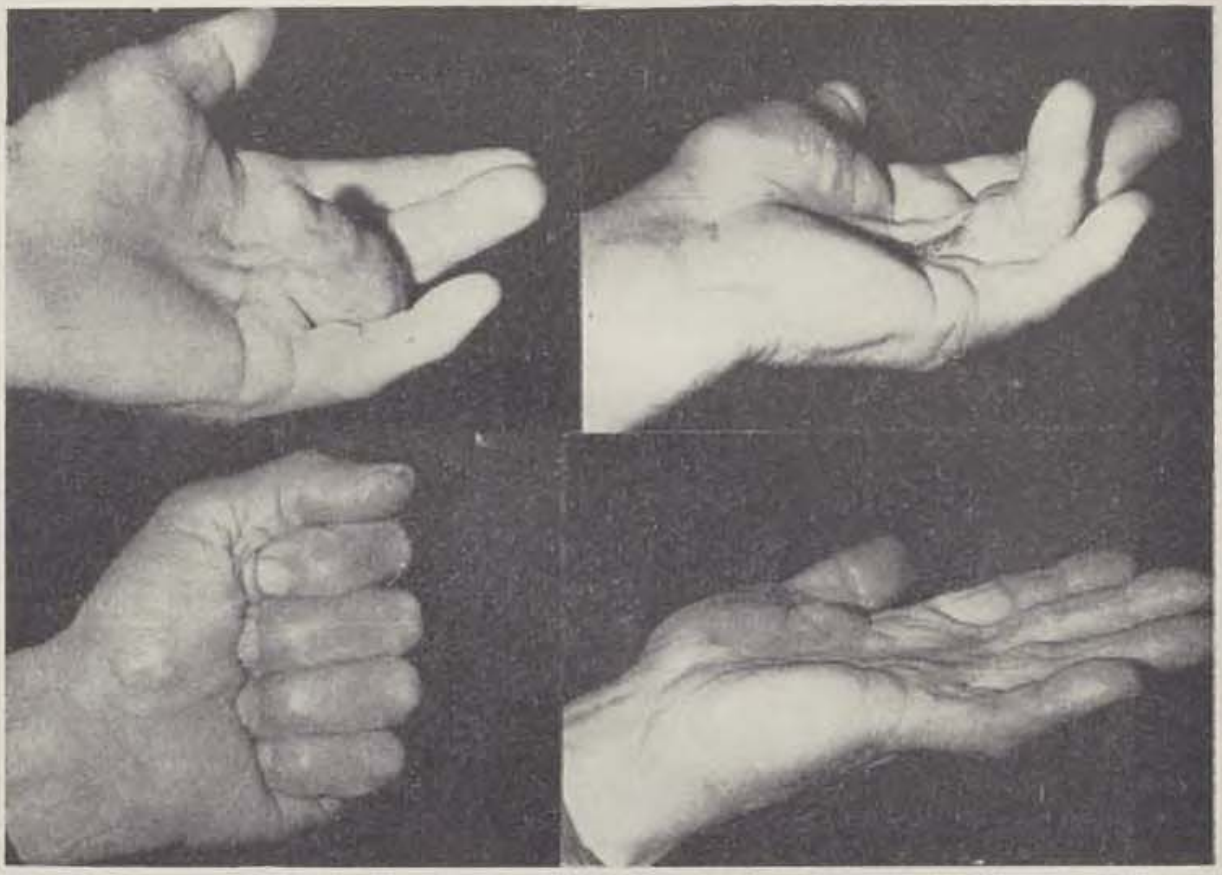

Fig. 3. a) Condition of the hand before the beginning of operative treatment, b) the hand within 15 days of fibrotomy, c) and d) condition six years after two-stage operation

employed. It is essential that part of the incision falls on the operative scar of fasciotomy. After palmar aponeurosis exposure, the ends of the cord divided during fibrotomy are bridged by a readily detectable intermediate scar. The altered aponeurosis is excised till the superficial arteriovenous arch is reached, and distalwards — to the middle phalanx level.

In all instances healing of the operative wound occurred by first intention. Hand functions were regained within 4—6 weeks, except for a 38-year-old male patient who was able to make complete fist with the operated hand barely three months after partial excision of palmar aponeurosis (Fig.).

RESULTS AND DISCUSSION

The long-term results are followed up in fourteen patients with 14 operated hands for periods ranging from 2 to 6 years, or 3.3 years average follow-up after the intervention. Excellent outcome — full function of the operated hand, free of joint contractures and recurrences is recorded in four hands (28.5 per cent) (Fig. 3). A good outcome is established in nine hands (64.3 per cent) — complete function with presence of up to 40 degress contracture of the PIP joint in the operated digit, or recurrence manifested with palmar nodules in the operative field area. Flexion contractures of the PIP joints not invariably

lend themselves to complete correction (Hueston, 1963; Honner, Lamb and James, 1971) because of the presence of permanent anatomical changes — collateral ligaments and palmar articular capsule retraction. Palmar nodules do not interfere with function and do not require treatment, but they represent a potential hazard of further progress of the morbid process. The only instatisfactory result is noted in a male aged 73 years where contracture of the fifth finger relapsed to preoperative degree.

In the department a total of 319 patients with DC underwent treatment over a period of 20 years. Comparative study of the obtained results after one and two-stage excision of the palmar aponeurosis in patients with comparable DC severity, age and follow-up terms shows a clearcut superiority of the two-stage procedure.

The more favourable results following two-stage operation are no doubt due to the preliminary fasciotomy which converts the flexion contracture of the affected finger from a severe one into a medium or slight degree one. After fibrotomy, the retracted skin where deep creases, rhagades and macerations are observed becomes loose, calm and elongated. Its trophicity shows a prompt improvement. Concomitant mycotic infections between the fingers subside. All this contributes to a reduction of the operative risk attributable to skin failures which are very frequent after one-stage treatment of the heavy forms of DC. Neurovascular bundles are benefically influenced and gradually lengthened. In the second stage, when the flexion contracture is already considerably reduced, exposure of the altered aponeurosis is accomplished much more readily and thoroughly, and thus the operative work is rendered simple and easy.

Two-stage operation is a way to avoid amputation of the fifth finger in the heaviest forms of DC. In our series of seventeen operated hands, fifth-finger localization of the condition was recorded in 13 cases. Eleven of them were followed up for terms ranging from 2 to 6 years after the intervention: a single recurrence was observed which might be considered as a success having in mind the poor prognosis of the management of heavy forms of DC with the localization indicated above.

CONCLUSION

The two-stage procedure has a definite place in the surgical treatment of DC with severe digital contractures. The advantages of the method are: 1. Correction of flexion contracture and skin deficiency in stages. 2. Possibility of wider exposure of the altered aponeurosis in the second operative stage. 3. Diminished risk of postoperative complications, and preclusion of the amputation of heavily involved digits.

SUMMARY

Using a two-stage operative procedure, including fibrotomy as a preliminary session with subsequent partial excision of palmar aponeurosis, an attempt is made by the authors to solve the problem of severe Dupuytren's contractures.

The indications for two-stage operation are established, and the surgical technique is described. After analysis of the results, a comparative study is made with one-stage surgical procedures, used in the treatment of DC.

RÉSUMÉ

Opération à deux étapes dans la contracture de Dupuytren

Karagankheva S., Matev I.

Les auteurs tentainet de résoudre le problème d'une contracture de Dupuytren très grave. Ils ont utilisé le procédé d'opération à deux étapes qui comme une intervention préalable comprenait la fibrotomie et puis l'excision partielle de l'aponévrose palmaire. On a déterminé les indications pour une opération à deux étapes et décrit la technique chirurgicale. Les expériences obtenues sont comparées à l'aide d'une analyse avec les résultats de l'intervention chirurgicale à une étape utilisée couramment dans le traitement de la contracture de Dupuytren.

ZUSAMMENFASSUNG

Zweiphasige Operation bei der Dupuytrenschen Kontraktur

Karaganchewa S., Matew I.

Die Autoren versuchten das Problem der schweren Dupuytrenschen Kontraktur zu losen. Sie benutzten eine zweiphasige Operationsprozedur, die als vorhergehenden Eingriff fibrotomie beinhaltete und anschliessend Teilexzisionen der Palmaraponeurose verfolgte. Es wurden die Indikationen für die zweiphasige Operation bestimmt und die chirurgische Technik beschrieben. Die gewonnenen Ergebnisse wurden anhand der Analyse mit den Ergebnissen der einphasigen chirurgischen Operation verglichen, die bei der Behandlung der Dupuytrenschen Kontraktur laufend verwendet wird.

RESUMEN

Operaciones de dos etaps en la contractura de Dupuytren

Karaganjeva S., Matev I.

Los autores trataron de resolver el problema de la contractura grave de Dupuytren. Usaron el procedimiento operativo de dos etaps el que, como intervención preliminaria, incluía fibrotomia y además se fijaba en excisiones parciales de la aponeurosis palmar. Fueron establecidas las indicaciones para la operación de dos etapas y descrita la técnica quirúrgica. Las experiencias obtenidas se comparan a base de un análisis con los resultados obtenidos en la operación quirúrgica de una etapa usada corrientemente al tratar la contractura de Dupuytren.

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Dr. S. Karagancheva, 56 P. Napetov Street, Sofia - 1614, Bulgaria

Georgia Baptist Medical Center,
Department of Surgery (Plastic),
Atlanta, Georgia, U.S.A.

MOEBIUS SYNDROME ASSOCIATED WITH BILATERAL HYPOPIGMENTATION OF THE AREOLA
Case Report

NABIL I. ELSAHY

Moebius syndrome is characterized essentially by congenital paralysis of the sixth and seventh cranial nerves. Other conditions that may be associated with Moebius syndrome are: atrophy of the tongue, syndactylism, hypoplasia of digits or their absence, involvement of other cranial nerves, most often the

Fig. 1

hypoglossal, absence of the pectoralis muscles, epicanthus, external ear deformities, and mental retardation (1—4).

The purpose of this paper is to report an unusual association of localized areas of hypopigmentation in the lateral aspect of both breasts in a patient with Moebius syndrome.

CASE REPORT

A 22 year old white female presented with typical Moebius (Fig. 1). No family history of similar condition was obtained and the mother was not on any drugs during pregnancy.

Fig. 1. The typical masklike facies of Moebius syndrome

Fig. 2

Examination revealed normal intelligence, complete bilateral paralysis of both the obducens and the facial nerves, hypoplasia of the tongue and a localized area of hypopigmentation in the lateral aspect of both areola in the same location in both breasts (Fig. 2).

DISCUSSION

In 1973, I reported a case of Moebius syndrome associated with the mother taking thalidomide during gestation (1). I felt that this case presented the importance of the environmental factors rather than the genetic factors in the pathogenesis of Moebius syndrome. The absence of any hereditary etiology in the case presented here augments that feeling.

Fig. 2. The crescent area of hypopigmentation of the areola in the same location in both breasts

The association of bilateral congenital paralysis of the sixth and seventh cranial nerves with bilateral hypopigmentation of the areola at the exact location in both breasts is an interesting observation, although no explantation can be given. No similar association has been reported before.

SUMMARY

A case of Moebius syndrome associated with localized area hypopigmentation in both areola at the exact location is reported. The importance of the environmental factors in the etiology of Moebius syndrome has been stressed.

RÉSUMÉ

Syndrome de Moebius accompagné d'une hypopigmentation bilatérale des aréoles du mamelon

Elsahy Nabil I.

On décrit un cas de syndrome de Moebius combiné avec une hypopigmentation circonscrite des deux aréoles du mamelon et avec une localisation précisement symétrique. Dans l'étiologie de Moebius, on souligne le rôle important des facteures exogènes.

ZUSAMMENFASSUNG

Das Moebiussche Syndrom, begleitet durch bilaterale Hypopigmentation der Areolen der Brustwarzen

Elsahy Nabil I.

Beschreiben wurde ein Fall des Moebiusschen Syndroms, kombiniert mit begrenzter Hypopigmentation beider Areolen der Brustwarzen mit genau symmetrischer Lokalisierung. Die wichtige Rolle der exogenen Faktoren in der Ätiologie des Moebiusschen Syndroms wurde hervorgehoben.

RESUMEN

El síndrome des Moebius acompañado de hipopigmentación bilateral de las areolas de la mama

Elsahy Nabil I.

Está descrito un caso del síndrome de Moebius combinado con hipopigmentación circunscrita de ambas areolas de la mama con localización exactamenta simétrica. Está destacado el papel importante de los factores exógenos en la etiología del síndrome de Moebius.

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Nabil I. Elsahy, M.D., Georgia Baptist Medical Center, 340 Boulevard, N.E. — Atlanta, Georgia 30312, U.S.A.

Georgia Baptist Medical Center,
Department of Surgery (Plastic),
Atlanta, Georgia, U.S.A.

NEUROFIBROMATOSIS ASSOCIATED WITH UNILATERAL PTOSIS AND PROTRUDING EAR

NABIL . ELSAHY

Neurofibromatosis or Von Recklingshausen's disease is a dominantly inherited condition characterized by the presence of multiple neurofibromata and cafe-au-lait spots. Of interest is the fairlay common association of neurofibromatosis with pheochromocytoma, scoliosis, increased length of long bones, meningioma, glioma, fibrous dysplasia, congenital vertebral anomalies, subperiosteal bone cysts, pseudoarthrosis of the tibia, stenosis of the aqueduct with obstructive hydrocephalus, mental retardation, spina bifida, hypospadias, glaucoma, elephantiasis and pes cavus (1—4). Other presenting complaints may be thyroiditis, diabetes insipidus, congenital heart disease and syndactyly (4).

The purpose of this paper is to report an unusual case of Von Recklinghausen's disease associated with unilateral ptosis and protruding ear; an association that has never been reported before.

CASE REPORT

A 20 year old white female presented with congenital ptosis of the left upper eyelid and protrusion of the left ear (Fig. 1). Examination of the patient revealed multiple neurofibromata (Fig. 2) and cafe-au-lait spots (Fig. 3) on the trunk and multiple areas of hyperpigmentation in the axilla (Fig. 4). The patient stated that these areas of hyperpigmentation and the neurofibromata had appeared shortly after her pregnancy three years previously and gradually increased in number and size. Other history and physical examinations were essentially negative. Biopsy of the lesion confirmed the diagnosis of neurofibromatosis.

DISCUSSION

Although the Von Recklinghausen's disease is an inherited condition (mendelian dominant), the presence of six or more cafe-au-lait spots with a diameter greater than 1.5 cm is diagnostic of the disease even when there is no familial history (5).

Fig. 1. Von Recklingshausen's disease associated with ptosis of the left upper eyelid and protrusion of the left auricle

Fig. 2. Multiple neurofibromata

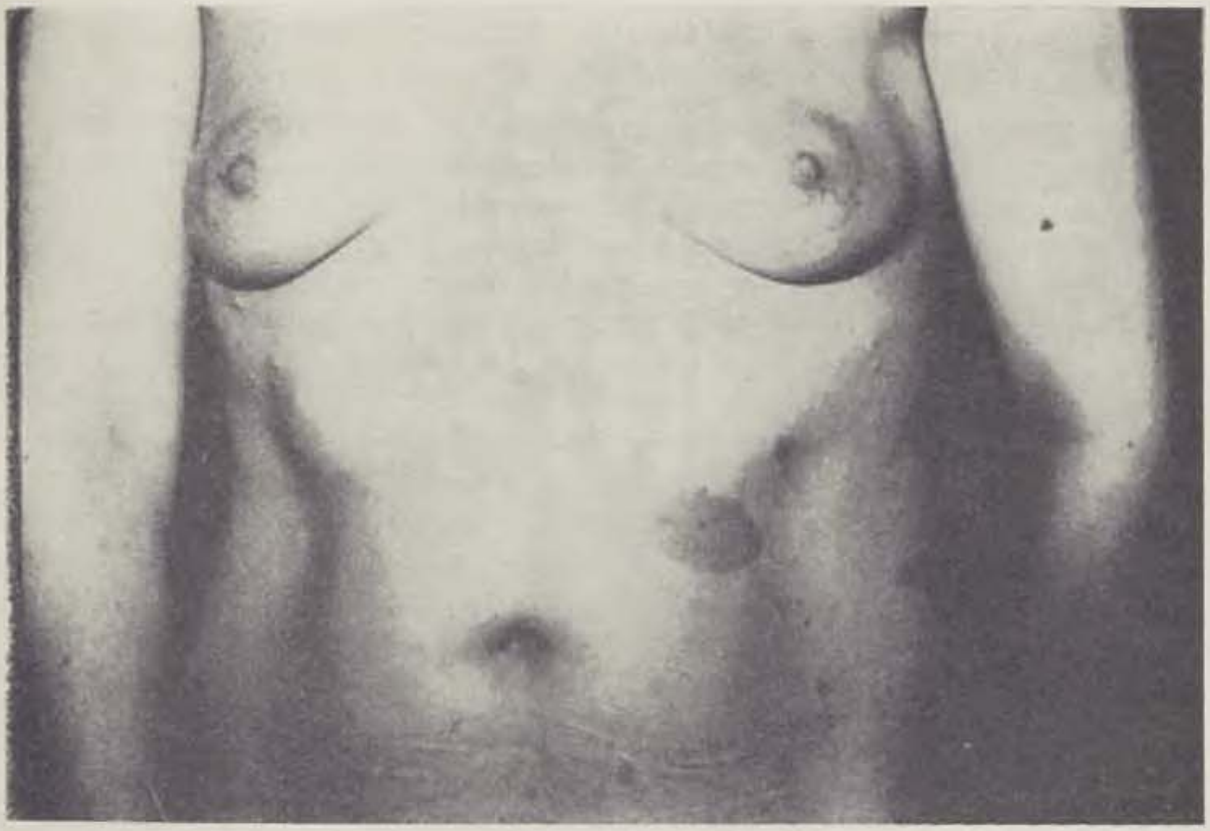

Fig. 3. Multiple cafe-au-lait spots

Fig. 4. Multiple areas of hyperpigmentation of the axilla

The case presented is an example of multiple neurofibromatosis and care spots without a familial history.

Von Recklinghausen originally postulated that neurofibromas were derived mainly from the perineurial connective tissue and thus were mesodermal in origin. However, the demonstration of nonspecific cholinesterase activity in neurofibromas has provided evidence that they are not mesodermal growths (6). Verocay (7) suggested that the cells of the tumors were Schwann cells and thus neuroectodermal in origin. Electron microscopy has established the Schwann cell as the main cell type in neurofibromas (8). Foot (9) and McNairy and Montgomery (10) expressed the opinion that probably both ectodermal Schwann cells and perineurial connective tissue cells participated in the formation of the tumors. In the case presented deformity of the eyelid is due to Schwann cells involvement, i.e. neuroectodermal in origin; while deformity of the ear is due to cartilogenous involvement (not sufficiently pronounced antihelical fold) i.e. mesodermal in origin. The combined neuroectodermal and mesodermal origin of the syndrome supports the view of the last above mentioned authors on the histogenesis of neurofibromatosis.

SUMMARY

A case of Von Reclinghausen's disease associated with ptosis of the left upper eyelid and prominent left ear is described. The histogenesis of the syndrome is discussed.

RÉSUMÉ

Neurofibromatose réunie avec la ptosis unilatérale et la protrusion de l'oreille

Nabil I. Elsahy

On décrit la maladie de Von Recklinghausen accompagnée par la ptosis de la paupière supérieure gauche et la protrusion de l'oreille gauche. — On discute l'histogénèse du syndrome.

ZUSAMMENFASSUNG

Neurofibromatose, verbunden mit einseitiger Ptose und Protrusion des Ohres

Nabil I. Elsahy

Beschrieben wird ein Fall von Morbus Recklinghausen begleitet von Ptose des linken Oberlides und Protrusion des linken Ohres. — Diskutiert wird die Histogenese des Syndroms.

RESUMEN

Neurofibromatosis unida con la ptosis unilateral y la prostrusión de la oreja

Nabil I. Elsahy

Está descrito un caso de la enfermedad de Von Recklinghausen acompañada con la ptosis de la pálpebra superior izquierda y de la protrusión de le oreja izquierda. Está discutida la histogenesis del síndrome.

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Nabil I. Elsahy, M.D., Georgia Baptist Medical Center, 340 Boulevard, N.E. — Atlanta, Georgia 30312, U.S.A.

NEWS

The 3rd Congress of the European Section of the International Confederation of Plastic and Reconstructive Surgery was held in the Hague, Holland, on May 22—27, 1977 with 335 registered participants attending.

The Congress was opened under the auspices of Prince Bernard in the afternoon of May 23. The first papers were delivered by Madden of the USA and Gabiani of Switzerland on the morphology of the process of wound healing with a particular view to the stage of wound shrinkage. In the afternoon, deliberations took place in four halls. Under D. Sörensen of Denmark as moderator, several reports on wound and burn healing were presented. Ocker of Hamburg and Somerlag of Glasgow devoted their attention to shrinkage in wound healing as well as during the subsequent long period, and to the influence different types of suture material may have on wound healing. Hardt reported on his experience with different autogenous materials in cranial defects, Schmidler contributed an experimental work on the epicardium, Jansen de Limpens on the treatment of hypertrophic scars and keloids; Hermans recommended more surgical activity in scalds, particularly in children; Gülgonen reported on the problems of children's hand burns in Turkey, Kivelitz demonstrated the treatment of severe soft-tissue injuries in the lower extremities; a group of specialists from the Hague presented their results of the allotransplantation of human skin cultivated in saline for a period of 6 weeks. Heiner spoke on different techniques of closing facial defects, while Stell of Liverpool studied the relationship between the area of a flap and the breadth of its pedicle. In another lecture hall, with Grignon of Paris as moderator, communications were heard on the subjects of aesthetic facial surgery, mainly nasal correction. Wintsch of Arrau demonstrated an interesting technique, devised by himself, using flaps of subcutaneous tissue from the neighbouring areas to act as auricular replacements; Clodius spoke of his experience of surgical operations for large facial haemangiomas. In a third hall, presided over by Verdan of Lausanne, problems of surgery of the hand were discussed. There was an interesting communication by Mandel of Vienna on the possibilities of tendon operations in what was referred to as non-man's land; Brug of Münster presented his experience with a two-phase pedicled flexor graft; Dietrich spoke on indications for surgery in club-hand, Das of Newcastle on skin losses in children's fingertips. In hall No. 4, Robbe of Belgium presided over papers on microsurgery. Holle of Vienna presented more experience with differentiated sensorimotor suture of the nerve in the wrist. Berger reported on the uses of colour thermography in repair operations on the nerves and in microvascular techniques. Biemer demonstrated the transplantation of extensive flaps from the inguinal region to defects in remote parts of the body, using microvascular anastomoses; papers presented by Burg of Münster and by Biemer of Munich gave an outline of experience and results in hand and finger replantation, while Bloch, in what was an interesting report, summed up the complications and conditions for success in a growing number of replantations of the extremities.

The next day, communications were presented on maxillofacial anomalies, with Converse of the USA as moderator, who also discussed the basic principles of

operation technique in craniofacial dysostosis. Limborgh of Amsterdam analyzed the basic principles of the morphogenesis of maxillofacial malformations, Fogh Andersen devoted his attention to the causes of the development of maxillofacial anomalies, Haar to the significance of genetic counselling, Fogh Andersen to the development of technical procedures in operations for harelip, Kriens in operations for cleft palate. A round-table discussion on the subject was held in the afternoon. Hall No. 1 was the scene of discussions on the subject of breast reconstruction following amputation for carcinoma. The discussion was launched by Dong, an oncologist of Amsterdam, and continued with Molnar's paper on the TNM system in outling surgical strategy; Bohmert, Iovanovich, Prpić, and Höhler demonstrated some of the results of breast reconstruction after amputation. Meanwhile, a miscellany of communications was presented, with Mouly of Paris in the chair. Knote and Bohmert spoke of skin flap viability in experiments and in clinical practice, Somerland discussed the problems of covering defects on the sole of the foot; Schrader reported on late complications after operations for breast enlargement, Lemperle on the possibilities of funnel-chest surgery, Bruck of Vienna on his modification of vaginal reconstruction using split-skin grafts from the thighs; Kesselring reported on 39 cases of male transsexuals, Haas of Munich on Thompson's operation in lymphoedema.

On the 3rd day, with Gibson in the chair, the problems of lymphoedema were discussed in a series of 8 papers opened by Casley-Smith's report on the work of the lymphatic system and by Földi's on the physiology of lymph formation. At the same time, the psychological aspects of plastic surgery were discussed in another hall with Schmidt-Tinteman in the chair.

On the fourth day, Millesi of Vienna and Gobbett of London acted as moderatos in a series of communications on the technique of microsurgery in plastic surgery. Gobbett spoke on the history and development in the field, Tamai of Japan demonstrated some of the results of vascular microsurgery in clinical practice, Millesi discussed the basic technique of nerve microsurgery; 3 papers were devoted to the possibilities and actual results of facial paralysis correction. In the afternoon, the problems of microsurgery were gone into in a round-table discussion, while elsewhere, in the other lecture halls, different maxillofacial anomalies were discussed, with Matthews in the chair; papers on reconstructive operations after the surgical excision of tumours continued also in the morning of the fifth day. Meanwhile, problems involved in transsexualism were also dealt with.

At a joint session, Matthews' decision to resign his position as Chairman of the European Society was received with regret and thanks, whereupon Athens was chosen as the meeting place of the next Congress in four yers' time.

Quite apart from the efficient organization, the satisfactory course and undoubted success of the Congress were to a great extent due to the fact that all the medical and social undertakings could take place in a modern, technically perfectly equipped Congress building located in the peaceful setting of beautiful parks in what proved to be unusally fine sort of summer weather for that period of the year. Moreover, there was good transport connection with the centre of the city. Good facilities had been arranged for members of the delegates' families: visits to galleries, concerts, sightseeing trips and tours offering the opportunity to learn about the country's history and to get to know the Dutch people's life at present. A joint evening get-together with music, dancing, laughter, and sincere merry-making at the close of the event proved to full of cordiality and devoid of any formalism.

Prof. Dr. H. Pešková, DrSc.,
130 00, Prague 3, Husinecká 4

Verdan C., Chamay A.: **Chirurgie des Tendons de la Main** (Surgery in Tendons of the Hand). Expansion Scientifique, Paris, 1976, Frs 130.

This paperbacked book on glossy paper with 240 pages and 189 illustrations was compiled by 21 authors, members of the GEM (Groupe d'étude de la main). The initiator and editor, C. Verdan of Lausanne, assisted by A. Chamay, has been concerned with surgery of the hand for years. As early as 1952, Verdan published a book on the surgery and function of tendons. The present monograph with a preface and introduction to the surgery of tendons is arranged in 6 chapters.

Chapter 1 — anatomy and physiology — consists of 4 contributions. G. Wincler of Lausanne describes the normal anatomy of flexors and extensors and their microscopic vascularization, C. Setti of Parma together with C. Verdan write on the subject of lymphatic circulation, M. Fahrer of Brisbane, Australia, on the anatomy of deep flexors and lumbrical muscles. J. M. F. Landsmeer of Leiden has added an introduction to the functional analysis of the fingers and the hand.

Chapter 2 — experimental surgery and healing — contains 2 studies. Referring to Kohout's experimental work, W. K. Lindsay of Toronto writes on tendon injury healing while D. Potenza of East Meadow, USA, gives the results of an extensive study on the mechanism of healing in injured flexors and tendon grafts. The experiments were carried out on adult dogs of both sexes.

Chapter 3, the most extensive of all, dealing with the surgery of flexors, consists of 8 papers. The first, by Verdan, is an outline of all that a surgeon ought to know about torn tendon repairs — from the clinical picture, methods of recommended incisions in the hand and the forearm, to the technique of suture and descriptions of the development of injured tendon rapairs as reported from all over the world. Two of the papers, namely those by C. Verdan in cooperation with G. P. Crawford of Lausanne, and by H. F. Kleinert and A. J. Weiland of Louisville, Kentucky, are devoted to injured flexor repair in what is known as Bunnel's no-man's land (Verdan's zone II) in the osteofibrous canal. This is followed by E. A. Nalebuff's (Boston) work on surgical procedure in the rare cases of the superficial flexor remaining intact even after the deep flexor has been injured or torn. An extensive study by J. H. Boyes and H. H. Stark of Los Angeles is concerned with graft reconstruction in deep flexors of the fingers and the palm of the hand. Summing up their experience the authors conclude that primary suture can bring good results manily up to the age of 6 and after the age of 40 when, on the contrary, the results of grafting are far less successful than between the ages of 6 and 40. Contributions by J. Hunter of Philadelphia and by A. Chamay, C. Verdan and C. Simonette of Lausanne report on flexor reconstruction in two phases. In the last paper of this chapter, C. Verdan gives his views on how to repair flexors outside the digital canal, i.e. in the palm of the hand, in the carpal tunnel, and in the pollex.

Chapter 4 — surgery of the extensors — contains works by R. Tubian of Paris on repair surgery in the digital region, and by A. Chamay on repairs in the region of the dorsum of the hand.

Chapter 5 is a collection of papers, five of which by Verdan are on the subjects of tenolysis, on the main principles of transplanting tendons from the forearm to the hand, on spontaneous tendon rupture in rheumatism, on what is terms as the spring finger (le doigt a ressort), as well as on stenosing tenovaginitis. N. Gschwend of Zurich chose the subject of rheumatic changes in the tendons to write about the opportunities offered by surgical treatment.

The monograph ends with a work by C.B. Wynn-Parry of London on functional after-treatment and rehabilitation folowing surgical operations on tendons.

All the papers are put in a comprehensive and lucid form and accompanied by photographs of anatomical preparations, histological pictures, operative findings and functional results, and all include comprehensive diagrams. Each of the chapters is followed by a list of references to world literature. This should be appreciated as it is bound to make easier the task of those interested in this extremely important and complex set of problems.

One can only agree with Verdan, namely that much of what he wrote in his book of 1952 continues to hold good. On the other hand, a great deal of new things had to be added because of the contributions by a growing body of specialists who have developed interest in the surgery of the hand over the past few years. The above monograph sums up the latest experience and knowledge of the surgery of tendons and, I am sure, it cannot and will not be missing from the bookcase of any surgeon. Let me use this opportunity to express our sincere thanks to all the authors, particularly to C. Verdan.

Prof. Dr. H. Pešková, DrSc.

Dermatochirurgie in Klinik und Praxis. (Dermatosurgery in Clinical and General Practice.) Springer, Berlin, 1977.

A collection of 33 papers presented at the 1st Symposium of Dermatosurgery in Munich and edited in book form by B. Konz and G. Burg contains 238 pages and 144 illustrations. The authors include 23 dermatologists, 9 surgeons, and 1 anaesthesiologist. The papers are divided in 3 groups.

Following an introduction by O. Braun-Falca, group 1 contists of 8 papers. The authors stress the significance of biopsy and histological investigations, referring to anaesthesia, photographic documentations, the required instruments, the basic principles of incisions made along physiological lines, the possibilities of closing and covering defects, etc. They also discuss the extent and types of surgical operations at dermatological clinics equipped for surgery such as exist in some countries, as well as the opportunities for surgical operations in practice.

12 of the papers are included in group 2, i.e. dermatosurgical operations in tumours. Most of them are devoted to facial carcinomas, while Wilhelm's is concerned with tumours in the extremities. Following an analysis of indications for the surgical treatment of basocellular and spinocellular carcinomas (Hundeiker), Günter Burg, in an extremely interesting and comprehensive communication, writes about the need for microscopical control, showing in easily readable tables the differences between clinically detectable, subclinical and histologically demonstrable sizes of the tumor, then a pattern of three-dimensional histological investigation as well an Mohs' familiar and the author's own bioptical method of ascertaining the area and the depth of the tumor. The same author in co-operation with Robinson discusses the clinical significance of microscopically controlled surgery documenting it with illustrations of major operations. Their patients, often with a history of multiple operations for relapses of the disease, are kept under constant medical surveillance for many years and with excellent results.

Drepper, while concerned with surgery for melanomas, stresses the need for sufficiently large and deep excision, the advantages of an en bloc removal of affected nodes if they are present, as well as the need for comprehensive postoperative radio- and chemotherapy with the immunological reaction duly observed. He himself reports good results achieved with the preparation Trinimun.

Group 3 — special dermatosurgery — contains 12 papers, 2 of them on the surgical strategy in axillary hyperhydrosis, 1 on the plastic surgery method in phimosis, another on surgical operations for tumours of the penis, 2 on rhinophyma, and yet others on hair transplants, dermabrasion, on the removal of tattooing,

and on an early removal of rubbed in dirt. The papers include the authors' own results, using either established or personally modified methods.

The proceedings, printed on glossy paper in the form of a semi-hardbacked book and richly documented, are bound to be regarded as an interesting contribution to the libraries of all those engaged in the surgical treatment of malignant skin affections, particurlarly in the functionally and aesthetically highly important part of the body surface — the face.

Prof. Dr. H. Pešková, DrSc.

News

The Czechoslovak Society of Plastic and Reconstructiva Surgery has elected the following offecers for the next two years: President: Prof. V. Kubáček, M.D., Sc.D. Secretary: Prof. M. Fára, M.D., Sc.D.

INSTRUCTIONS TO AUTHORS

Acta Chirurgiae Plasticae, the international journal of plastic surgery, is issued in two versions four times a year. One version is in English (or, as requested by the author, in French or German) and the other in Russian. The aim of the Journal is to make specialists acquainted with the work of authors of the socialist countries, but studies from other countries are also published and welcomed.

Articles are accepted for publication which deal with the problems of plastic surgery and allied branches (clinical, laboratory, experimental studies); they must be original and not yet been published elsewhere. Articles written by authors of the countries which are represented in the editorial board of the Journal, must be given their imprimatur by the respective members.

Kindly send your manuscripts to the following address: Acta Chirurgiae Plasticae, c/o R. Vrabec, M. D., the secretary, Legerova 63, Praha 2, Czechoslovakia.

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