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TISSUE ADDITIONS IN FORKED FLAP COLUMELLA LENGTHENING

B. COSMAN*, G. F. CRIKELAIR**

The forked flap procedure is one of the most frequently used of the measures designed to elongate the bilateral cleft lip patient's shor columella. The sturdy viability of the tissue emp oyed, the preservation of the local area's appropriate color and texture, the feasibility of incorporating local scars, and the opportunity for simultaneous correction of ala flare are all advantages which recommend this technique. However, there are instances in which the width of the upper lip is limited, the septal and bone development of the nose are deficient, and the support of the nasal tip is so poor that the forked flap procedure alone cannot satisfy the reconstructive need. The effectiveness of simultaneously adding tissue from other sources to that made available by the forked flap is demonstrated in this report.

CASE REPORTS

Case 1. This 7 year old girl had had a complete bilateral cleft lip repair carried out with lateral flaps brought beneath the denuded prolabium. This had resulted in a tight, scarred, upper lip vermilion border with, however, a full upper lip immediatedly beneath the wide spread alae and bound down nasal tip. (Fig. 1.) Only a forked flap columella lengthening was carried out initially. (Fig. 2.) The tightness of the upper lip was then emphasized throughout its extent. The desirability of a lip-switch became clear and was subsequently performed. Its use initial y would have given a good result sooner. (Fig. 3.) The columella lengthening achieved has been maintained during 4 years of follow up.

Case 2. This boy had had a bilateral complete cleft lip repair. A lip revision had been carried out at age 3. Columella elongation by central pro-

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Figure 1. Result of bilateral cleft lip repair with lateral flaps carried beneath the prolabium. A short columella and tight free border of the lip has been produced.

Figure 2. After forked flap columella lengthening the nose has improved but the disparity between upper and lower lips appears more marked.

Figure 3. Upper and lower lip balance finally achieved by crosslip flap. Now 4 years after columella lengthening.

Figure 4. Scarred upper lip after several lip revision in a patient with bilateral cleft lip repair. Short columella and ala wings pointing downward instead of toward the columella are to be noted.

labial flap advancement had been attempted at age 4. Incomplete release of the nasal tip, broad based columella, and derotation of the alae wings were present. (Fig. 4.) When a forked flap lengthening was performed at age 7, the lack of septal development would have made the columella appear cryptic. Accordingly, at the same procedure a composite ear graft was inserted in front of the septum but behind the forked flap. (Fig. 5.) The improvement achieved has been maintained for 5 years. (Fig. 6.)

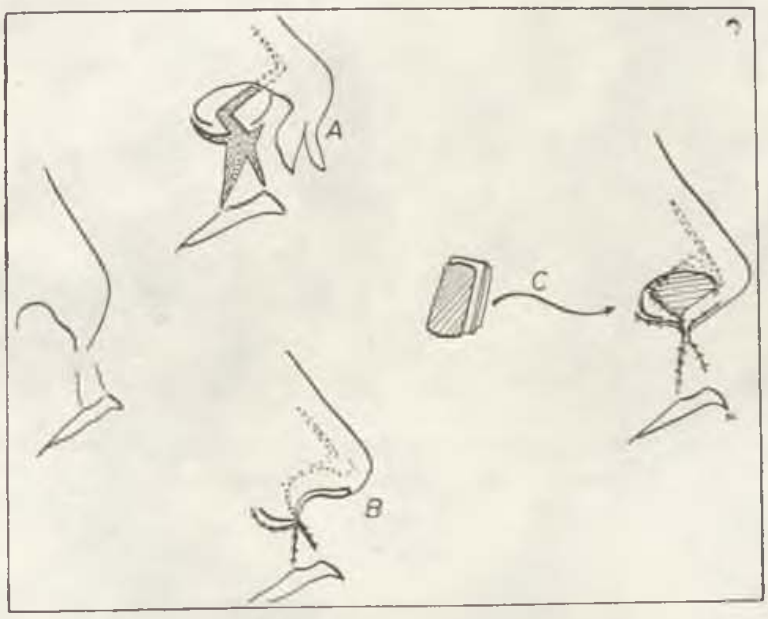

Figure 5. Diagramatic representation of forked flap columella lengthening (A) showing tendency of columella to remain cryptic because of lack of septal development (B). The situation is corrected by immediately inserting a composite ear graft behind the forked flap (C).

Case 3. This 11 year old girl had had a bilateral cleft lip (right-complete, left-incomplete) repaired in infancy. She presented with extensive lip scarring, vermilion notching and inequality, a short columella, and markedly retarded nasal development including nasal bone flattening, a short nose, and deficient nasal tip support. (Fig. 7.) Simultaneous forked flap columella lengthening, autogenous rib bone graft to the nose, and central lip revision by Abbe flap replacement was carried out. (Fig. 8—10.)

DISCUSSION

With improvement in primary lip repair, increasing emphasis has been laid on the treatment of secondary defects (1). The need for columella lengthening in the amelioration of bilateral cleft lip nasal deformity is well recognized (2—5). Prolabial tissue was used for this purpose at least as early as 1833 (6). The advantages of this local tissue in terms of its availability, color, and texture have made this source desirable despite the formation of lip scars difficult to disguise and the late development of hair

Figure 6. Five years following forked flap lengthening and composite ear graft with well maintained columella length and prominence as well as appropriate ala wing curve. — Figure 7. Marked lip deformity after repair of right complete and left incomplete cleft lip. Severe nasal deformity with short columella, marked nostril asymetry and overall hypoplasia of nasal bones and septal cartilage.

in the lip tissue used (1, 2, 5, 7). Other forms of local flaps such as Z-plasties, transposition flaps, ala floor rotations, and dorsal nasal advancements or island flaps have also been advocated (8, 9, 10). However, the disadvantages of lip flaps when coupled with situations in which the lip donor site itself

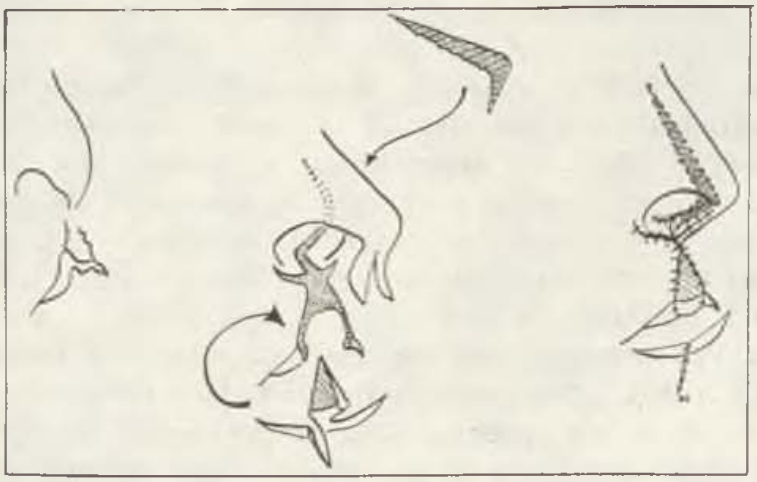

Figure 8. Diagramatic representation of simultaneous repair of nose and lip using forked flap columella lengthening with bone graft to nose and Abbe flap replacement of central lip.

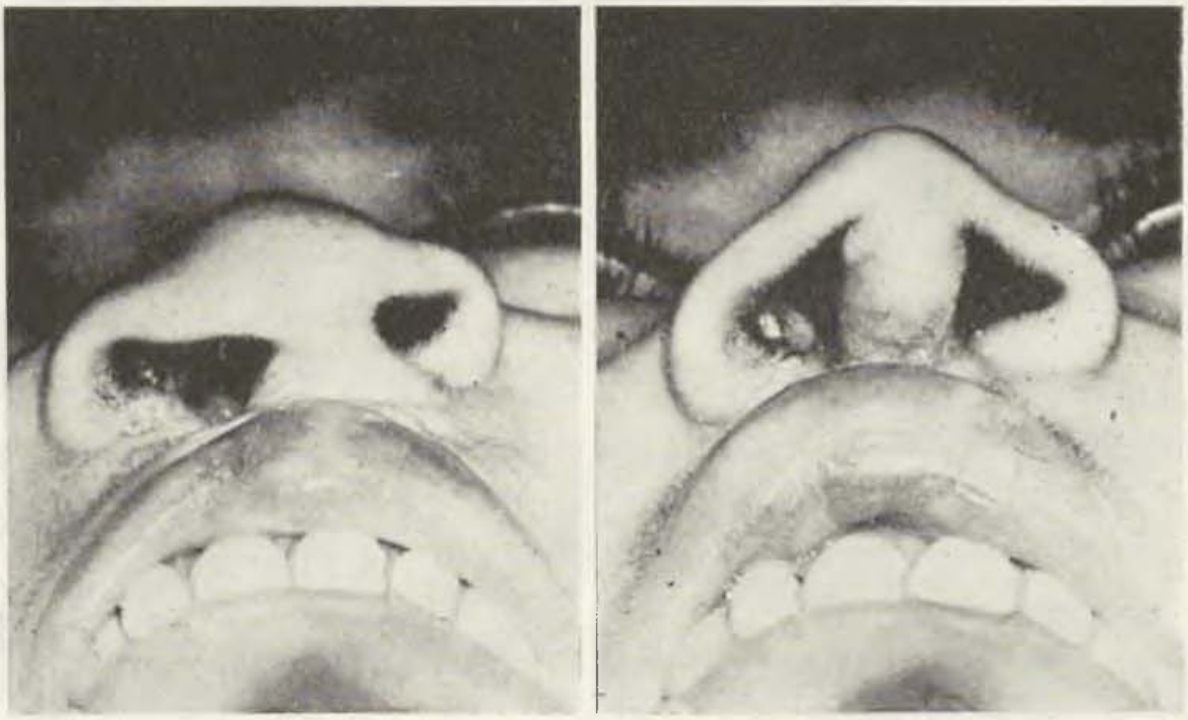

Figure 9. Close up of nose pre and postoperatively. Teeth are prosthetic.

is deficient have prompted the use of distant tissue such as composite ear and ala grafts despite the problems of color difference and/or the hazards of transfer (11).

The development of the forked flap technique is a contribution in the use of local prolabial lip tissue in that the method employs the already present and relatively hairless lip scars of the bilateral repair and, appropriately designed, the donor site scars as the philtrum markings (3, 12, 13). The layout of the incisions has the added dividend of facilitating ala flare reduction by nasal floor wedge excision and inward ala rotation-advancement. The wide acceptance of this procedure is testimony to its virtues.

There are, however, 3 categories of cases in which the forked flap procedure is insufficient as a remedy and in which additional tissue is needed. The first is that in which the upper lip is full beneath the alae and capable of donating the forked flap but very tight or scarred at its free margin consequent upon the initial repair technique. (Case 1, Fig. 1.) In these instances the forked flap tightens the upper portion of the lip which then, as a whole, clearly needs a lip-swich. (Fig. 2.) Rather then using a single central prolabial flap of the Gensoul type for the columella and filling the gap by a large lip-switch flap it has proved better to follow the forked flap technique, reducing the bulge in the upper portions of the lip but preserving the ample mucosa, thus allowing the use of an Abbe flap of limited bulk and of more appropriate philtrum shape (5) (Fig. 3.)

A second group of forked flap candidates requiring additional tissue comprises those whose anterior inferior septal development is moderately

deficient and in whom, consequently, the newly formed columella appears cryptic and retruded (case 2, Fig. 4—6). A most convenient approach to this problem is the insertion of a composite ear graft b e h i n d the forked flap. The bulk of the composite graft maintains the forward position of the new columella. It is, however, the flaps color, texture, and shape that are maintained as the face presenting to the world.

Figure 10. Three months postoperatively improvement in nose and lip are marked. Hypertrophic scarring is beginning to improve.

The last category includes those patients whose nasal development has been sufficiently retarded so that despite tip release, the nose is still short and lacking in elevation and in whom septal development is so deficient that support for the elevated tip is insufficient. (Case 3, Fig. 7—10.) These findings are usually associated with a tight, heavily scarred, upper lip. Despite the unpromising scarring of the lip the forked flaps maintain their viability well. The shaping of the columella is facillitated by the fork design. The scarred, irregular, central lip remnant is unsuitable for simulating a philtrum and is discarded and substituted for by an Abbe flap as in the first group. Nasal elevation, length, and tip support is supplied by a simultaneous cantilever or L-type bone graft (5). The relaxation of the nasal tip achieved by the forked flap, as well as the latter's good blood supply, make possible this immediate bone graft. The distal tip of the graft does not have the tendency to protrude or resorb as in too often the case when bone is inserted beneath a tight nasal tip.

SUMMARY

The forked flap technique of columella lengthening in bilateral cleft lip nasal deformity is a widely accepted procedure with many virtues. However, in patients whose initial repair has produced a tight vermilion border, the forked flap tightens the upper portion of the lip emphasizing the lip's deficiency. Saving the central mucosa but performing a small Abbe flap simultaneously with the forked flap columella lengthening permits a satisfactory solution. A tendency for the forked flap to give a cryptic or retruded appearing columella in those patients with septal developmental deficiency can be avoided by insertion of a composite graft behind the forked flap. The patient with underdeveloped nasal bones and poor tip support can be benefited by combining a primary bone graft and lip-switch with the forked flap columella advancement.

RÉSUMÉ

La réparation du manque des tissus au cours de l'allongissement de la cloison nasale à l'aide du lambeau en fourchette

B. Cosman, F. Crikelair

La technique d'allongissement de la cloison nasale chez les becs-de-lièvre bilatérals est employée couramment pour ces nombreux avantages. Pourtant dans des cas où la sutture précoce était suivie de tension de la lèvre la plastie en fourchette peut aggraver cette tension de la base de la lèvre et du nez. L'emploie de la plastie en fourchette accompagnée de la plastie d'Abbé — le lambeau au milieu de la lèvre épargnant la mucose du vestibule oral offre des résultats plus favorables. La cloison courte peut être allongie à l'aide du transplant composé du cartillage et de la peau provenant de la partie postérieure du pavillon d'oreille implanté derrière la plastie en fourchette. Chez les malades au squelette nasal sous-développé de même que chez ceux au bout du nez sans prominence l'allongissement de la cloison nasale doit être combiné par le transplant osseux.

ZUSAMMENFASSUNG

Gewebeergänzung bei der Verlängerung des Septums mit gabelförmigem Lappen

B. Cosman, F. Crikelair

Die Technik der Septumverlängerung mit gabelförmigem Lappen bei beidseitiger Lippenspalte wird ständig mit vielen Vorteilen angewandt. Trotzdem kann die Gabelplastik in Fällen, wo die primäre Sutur zur Spannlippe geführt hat, zu weiterer Spannung an der Base der Lippe und der Nase führen. Die Anwendung von gabelförmigen Lappen gemeinsam mit der Übertragung des Abbeschen Lappens in die Lippenmitte unter Beibehaltung der Vestibulumschleimhaut bringt bessere Ergebnisse. Das kurze Septum kann durch kombinierte Knochenknorpelübertragung von der Ohrmuschel hinter die vorgeschobenen Gabellappen verlängert werden. Bei Kranken mit wenig entwickeltem Nasenskelett und mit geringer Nasenspitzenprominenz muss die Septumverlängerung mit gleichzeitiger Knochenübertragung kombiniert werden.

RESUMEN

Complementación de los tejidos en el alargamiento del tabique por el lóbulo en forma horquilla

B. Cosman, F. Crikelair

La técnica del alargamiento del tabique por el lóbulo en forma de horquilla en la grieta bilateral se aplica permanentemente con muchas ventajas. A pesar de ello en los casos en los que la sutura primaria ocasionaba el labio tendido, puede la plástica en forma de horquilla ocasionar la tensión siguiente a base del labio y de la nariz. La aplicación de los lóbulos en forma de horquilla al mismo tiempo con la transplantación del lóbulo de Abbe al centro del labio con dejar la mucosa del vestíbulo trae los resultados mejores. El tabique corto se puede alargar por la transplantación complicada de piel-cartílago del pabellón detrás de los lóbulos en forma de horquilla empujados. En los pacientes con el esqueleto de la nariz poco desarrollado y con pequeña prominencia de la punta es necesario combinar el alargamienta del tabique con la transplantación simultánea del hueso.

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THE MORPHOGENESIS OF CLEFT PALATE INDUCED BY EXOGENOUS FACTORS

II. Induction of cleft by cortisone in randombred mice

M. DOSTÁL, R. JELÍNEK

Selection of a suitable experimental model represents an important component in the preparation of analysis of morphogenetic processes and their disturbance. In case of cleft palate induced in mouse foetus by cortisone, literature affords quite a number of data on sensitivity of different strains of mice. Reports of basic importance (Fraser, Fainstat 1951; Fraser et al. 1954) have described the varying frequency of cleft palate (CP) after application of the same dose of cortisone in different inbred strains. Sensitive inbred strains, in which frequency of cleft palate achieved up to 100 %, were practically the only ones used for studying the development of the palate and the causes leading to disturbances of this process, although already in 1957 Ingalls and Curley proved that there is no necessity to use mice of uniform genetic constitution in order to induce high frequency of cleft palate by corticoids.

It is needless to discuss the advantage of using inbred strains when studying interactions between genotype and external noxae. If however the effect of the selected external factor upon morphogenetic mechanisms is being followed up, it is of greater advantage to use randombred animals. They are to a greater extent resistant to nonspecific stimuli which in inbred animals considerably decrease the threshold of sensitivity towards the studied factors and conditions of the experiment as a whole (Smithberg 1967). The use of inbred animals affords the experimentator even further practical advantages. They possess higher fertility, lower spontaneous intrauterine mortality and they are considerably cheaper. For these reasons we decided to use, when studying the elementary morphogenetic mechanisms involved in formation of secondary palate, the randombred mice H + Velaz. First of all it was necessary to test their sensitivity to the teratogenic action of cortisone.

With regard to the conclusions of our study on the sensitivity period of cleft palate (Dostál, Jelínek 1970) merely a single dose of cortisone was used. The sensitivity was determined by comparison of the frequency of CP observed with the effects of dose spectrum applied in mice F_2/A/J x C57BL(6)/.

In primaparous female mice H-Velaz, mean weight 26,5 g, cortisone acetate in a dose of 7.5 mg was administered i.m. on 12., 13., 14., or 15. day of pregnancy (the day of presence of the vaginal plug was considered as

Table 1.

Day	mice	embryos				
		total	normal	dead	CP	%CP
12.	6	55	7	5	43	86,0
13.	7	58	24	6	28	53,8
14.	5	44	37	5	2	5,1
15.	4	28	25	3	0	0,0

the first day of pregnancy). Condition of the palate was inspected on the 18. day. The number of experimental animal, of normal foetuses, dead embryos and CP frequency is stated on table. The highest CP frequency (86.0 %) occurs after cortisone administration on 12th day of pregnancy, if cortisone is administered on 13th day CP frequency amounts to 53.8 %, on 14th day it is 5.1 % and on 15th day CP was not induced in a single case. The percentage of dead foetuses has been practically the same on all days, the highest value being 11.4 % on 14th day. In foetuses of mice H-Velaz we did not find any partial palate clefts (CPP) which we described in hybrids F_2 (Dostál, Jelínek 1970). Throughout the tested period the CP frequency was however in both strains practically the same. In mice H-Velaz we proved in addition a statistically significant difference in the CP incidence after administration of cortisone on 12th day in comparison to the administration on 13th day of pregnancy. This means that in the case of administration of cortisone acetate to the mother, the embryonic morphogenetic system of palatine processes in randombred mice H-Velaz is most disturbed if cortisone is administered on 12th day of pregnancy.

SUMMARY

It may be stated that in randombred mice H-Velaz a single dose of cortisone administered to the mother, results in sufficiently large percentage of foetuses with CP. This affords their use in the analysis of elementary morphogenetic mechanisms involved in forming and closure of the secondary palate.

RÉSUMÉ

La morphogénèse des fentes du palais causée par les facteurs exogènes
II. L'induction de la fente à l'aide de cortisone
chez les souris non-imbrèdes

M. Dostál, R. Jelínek

Les auteurs — grâce à leur travail — peuvent constaté que, a l'aide de cortisone appliqué à la souris non-imbrèdes au cours de la gravidité, on peut obtenir la fente du palais dans un pourcentage assez élevé. Ce fait exprime leur emploie dans l'analyse des méchanismes élémentairs morphogénétiques, jouant un rôle important dans le procès de fermeture du palais.

ZUSAMMENFASSUNG

Die Morphogenese der durch exogene Faktoren bewirkten Gaumenspalte
II. Induktion der Spalte mit Kortison bei Nichtinzuchtmäusen

M. Dostál, R. Jelínek

Wir können feststellen, dass bei den Mäusen des Nichtinzuchtstammes H-Velaz durch einmalige Verabreichung von Kortison an die Mutter bei der Nachkommenschaft Gaumenspalte in ausreichend grosser Zahl von Fällen hervorgerufen werden kann, so dass die Anwendung derselben bei der Analyse der elementaren morphogenetischen Mechanismen, die sich bei der Schliessung des Gaumens betätigen, möglich ist.

RESUMEN

Morfogénesis de la grieta del paladar ocasionada por los factores oxogéneos
II. Inducción de la grieta con el cortisón en los ratones no consanguineos

M. Dostál, R. Jelínek

Podemos constatar que en los ratones no consanguineos de la cepa H-Velaz es posible por la aplicación aislada del cortisón a la madre ocasionar en los descendientes la grieta del paladar en la cantidad bastante grande de los casos, lo que hace posible su aplicación en la análisis de los mecanismos morfogenéticos elementalios, que se aplican en el cierre del paladar.

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11-OXYCORTICOSTEROIDS IN PERIPHERAL BLOOD OF PATIENTS WITH THERMIC BURNS

N. A. SHESTERNIA

In recent years, both Soviet and foreign authors showed great interest in the function of the adrenal cortex during burns sickness (2, 4, 6, 8). This was because secretion of its hormones presents one of the links of the complicated chain of neuro-endocrine regulatory mechanisms acting in the organism in response to changes in the external environments (10, 11). Apart from this — as is well known — the hormones of the adrenal cortex play an important part in tissue regeneration through their influence on metabolic processes.

In man, 11-oxycorticosteroids (hydrocortisone and corticosterone) may be found in the peripheral blood both free and fixed to one of the fractions of alpha-globulin, i. e., to transcortin. This must be assumed because only those hormones which are not fixed to protein can permeate the cell membrane and thus manifest their biological activity.

In the literature, there are but occasional communications about the research for biologically active 11-oxycorticosteroids in patients suffering from burns sickness (9). This is why an investigation concerning 11-oxycorticosteroids, both free and fixed to protein, with regard to their concentration in the plasma of peripheral blood in such patients, is dealt with in this report. Separation of protein-fixed from free corticosteroids was effected by DeMoor's method with columns of fine-grained sephadex G-50, and followed by fluorometric determination employing DeMoor's method as modified by Pavlikhina (5). The concentration of hydrocortisone and corticosterone in the peripheral blood of patients suffering from burns sickness was determined prior to and one-and-a-half hours after intramuscular injection of 25 u. ACTH. This procedure permitted disclosure of the potential capacities of the adrenal cortex.

The investigation was carried out in 40 patients at all stages of burns sickness. The age of the subjects ranged between 17 and 77 years, and the body surface burned comprised areas from 10% in burns of degree 2, up to 65% in burns of degree 3b. Grouping of these patients with regard to age, area burned and depth of the burn is shown in tab. 1.

Table 1

Registration of Patients According to Age, Degree of Burns and Area Burned

Degree	Area burned (in %)	Age (in years)							
		17—20	21—30	31—40	41—50	51—60	61—70	71—80	Total
2	10		3				1		4
3b	up to 10 total up to 20	1	4	3	1	1	1		11
3b	11 to 20 total 20 to 30	1	3	4	1	2		1	12
3b	more than 20 total more than 30		4	8				1	13
Total		2	14	15	2	3	2	2	40

Twenty-five apparently healthy subjects served as controls in whom the concentration of 11-oxycorticosteroids, both free and protein-fixed, was also determined in the peripheral blood. Here the mean values for corticosteroids not fixed to transcortin were found to be 2.63 ± 0.32 γ %. Both free and transcortin-fixed steroids together reached a concentration of 16.5 ± 1.15 γ %. The total values of the 11-oxycorticosteroid concentration at all stages of burns sickness are registered in tab. 2.

Sixteen patients were examined at the stage of shock. The blood was taken from the cubital vein usually on admission to the Institute and prior to the commencement of any treatment. Free and protein-fixed hormones together reached a concentration of 30.0 ± 3.0 %, which was almost double the corticosteroid percentage in the control group ($P<0.01$). After administra-

Table 2

Total Amount of Free and Transcortin-fixed Corticosteroids in γ per 100 ml Plasma

Stage of burns sickness	Number of observations	Prior to injection of ACTH			1—2 hours after injection of 25 u. ACTH		
		M	τ	*m*	*M*	τ	*m*
Shock	14	30,0	11,4	3,0	35,9	16,0	4,0
Toxaemia	17	21,9	9,5	2,3	27,4	10,8	2,6
Septicotoxaemia	17	13,5	6,24	1,5	18,0	8,1	2,0
Recovery	15	19,8	9,6	2,5	26,7	9,1	2,5

M = arithmetic mean, m = mean error, τ = standard deviation

tion of 25 u. ACTH, the mean values of corticosteroids slightly increased to 35.9 ± 4.0 γ %. The difference between the two values, however, is not significant (P>0.2). In other words, the adrenal cortex of these patients did not react to the administration of ACTH at the stage of shock.

Seventeen patients were investigated at the stage of toxaemia. Blood samples were taken on the fifth and tenth day after the accident. These days were chosen for studying the indices of adrenal function, because, according to Babiuk (1), toxaemia is particularly severe in this time interval. Prior to the administration of ACTH, the total concentration of free and protein-fixed corticosteroids amounted to 21.9 ± 2.3 γ %. After injection of the adrenocorticotrophic hormone, their concentration increased to 27.4 ± 2.6 γ %. The difference between these two values is statistically not significant (P>0.1). It, therefore, follows that the reserves of the adrenal cortex were diminished in patients at the stage of toxaemia.

The concentration of 11-oxycorticosteroids in the plasma of peripheral blood had markedly dropped in patients at the stage of toxaemia as compared with that of shock (P<0.05). This decrease may be explained by the stress-evoking factors having ceased to act, in the first place and in the second, by the increase in severity of toxeamia. Here it should be proper to point out that further increase in adrenal cortex function was registered on the tenth day burns sickness in parallel with the deterioration of the patients' general conditions. The difference in corticosteroid concentration between patients on the fifth and those on the tenth day after the accident is statisticall significant (P = 0.05).

Seventeen patients were examined at the following stage of burns sickness. The total concentration of hydrocortisone and corticosterone (both free and protein-fixed) amounted to 13.5 ± 1.5 γ %. After administration of ACTH, it showed a slight increased to 18.0 ± 2.0 γ %. The difference between the two values is statistically not significant (P>0.05). It, therefore, follows that the potential capacities of the adrenal cortex had been diminshed in patients at the stage of septicotoxaemia. At this, as compared to the preceding stage, a considerable drop in 11-oxycorticosteroid concentration had taken place. The difference between the arithmetic means reflecting the functional condition of the adrenal cortex at the compared stages of burns sickness, is statistically significant (P<0.01). Corticosteroid concentration in the plasma of peripheral blood was lower at the stage of septicotoxaemia than that of controls, but the difference is statistically not significant (P>0..1).

On discharge from the hospital, 15 patients with completely healed wounds were re-examined. Thirteen of the 40 patients treated at the hospital died; these were the ones with the deepest and largest burns exceeding 40 % of the body surface. Twelve patients were not subjected to examination on discharge from hospital. At the stage of convalescence, 11-oxycorticosteroid concentration in the peripheral blood amounted to 19.8 ± 2.5 γ %. After injection of ACTH it rose to 26.7 ± 2.5 γ %, which proves that adrenal-cortex function had been restored with the recovery of the patient.

Table 3

Concentration of Non-protein-fixed 11-oxycorticosteroids in the Plasma of Peripheral Blood (in γ%)

Stage	Number of observations	Prior to injection of ACTH			After injection of ACTH		
		M	τ	m	M	τ	m
Shock	14	9,0	4,4	1,1	8,0	2,5	0,7
Toxaemia	17	4,86	2,2	0,53	8,27	3,48	0,84
Septicotoxaemia	17	3,45	1,5	0,34	4,35	2,75	0,70
Recovery	15	4,75	1,78	0,45	6,76	2,0	0,52

The concentration of biologically active 11-oxycorticosteroids in the plasma of peripheral blood of patients at all stages of burns sickness is registered in tab. 3.

In patients with shock, the concentration of biologically active corticosteroids amounted to 9.0 ± 2.37 %γ (probability of this range covering the mean total amounts to 95 %). One-and-a-half hours after administration of ACTH, this concentration had dropped to 8.0 ± 1.51 γ% (with the same degree of probability). The difference between arithmetic means of the values prior to and after administration of ACTH is statistically not significant ($P > 0.4$). As compared with that of controls, the protein-fixed corticosteroid concentration was higher in patients with shock ($P < 0.001$). In single patients, with large thermic burns, a drop in the concentration of biologically active 11-oxycorticosteroids was observed after administration of ACTH (paradoxical reaction). Thus concentration of both free and all corticosteroids together in the peripheral blood proves that patients at the stage of shock do not react to ACTH administered from without.

With the beginning of the stage of toxaemia, the concentration of biologically active 11-oxycorticosteroids decreased to 4.86 ± 1.12 γ% (probability of this range covering the mean total amounts to 95 %). Such a drop in corticosteroids not fixed to protein (almost to one half of the concentration in shock) in patients at this stage of burns sickness is statistically significant ($P < 0.005$). After injection of ACTH, the concentration of biologically active steroids rose almost double, to 8.27 ± 1.78 γ% (same probability as above). On comparison of the amount of free with that of all corticosteroids together in these patients after administration of ACTH, it was found that they had both risen in parallel. Very likely, this indicates the degree to which transcortin capacity of fixing corticosteroids had been lowered.

In septicotoxaemia (i.e., 20 to 30 days or later after the accident) the amount of free corticosteroids continued to drop and reached the level of 3.45 ± 0.72 γ% (with 95 % probability of the range). After administration of

ACTH corticosteroid concentration increased insignificantly to 4.35 ± 1.48 γ% (with 95 % probability covering the range of the mean total). The values of the free and total 11-oxycorticosteroids both prior to and after administration of ACTH show a decrease in the potential capacities of adrenal cortex in patients with septicotoxaemia. At the same time, the concentration of biologically active corticosteroids is not lower than that in controls (there is no difference between the two values — $P > 0.5$). It may be assumed that the capacity of globulin for spontaneously fixing corticoids in patients at this stage of burns sickness is lowered, and thus the concentration of biologically active 11-oxycorticosteroids remains stable. The profound sense of the organism of striving for homeostasis, is evidently comprised in this feature.

During recovery, the concentration of biologically active 11-oxycorticosteroids vacillates between 4.75 ± 0.45 γ% (probability amounts to 95 %, the interval thus including the mean total). After injection of ACTH, it rises to 6.76 ± 1.11 γ% (with the same degree of probability as before). The difference in the concentration of corticosteroids prior to and after injection of ACTH is significant ($P < 0.01$). As compared to the controls, in patients at the stage of recovery the concentration of biologically active corticosteroids is slightly raised, but this increase is statistically not significant ($P > 0.2$). The above investigation of free and protein-fixed corticosteroids bears witness to the restoration of the functional capacities of the adrenal cortex during recovery from burns sickness. At this moment, it should be pointed out that the patients of the series investigated did not receive corticosteroids for any length of time.

APPRAISAL OF MATERIAL

According to the literature, transcortin presents the stabilizer of the effective concentration of corticosteroids in the blood, acting as a buffer to the changes in hormone secretion of the adrenal cortex. If steroid production is increased, protein, in certain limits, takes up the hormone from the water of the plasma and thus creates a reserve which is gradually mobilized when the secretory function of the andrenal cortex decreases. The results of the above investigation confirm this to a certain extent. According to Belyaev (2), secretion of 17-ketosteroids in patients at the stage of shock from deep burns in an area of up to 40 % of body surface, is low. But this does not yet prove that adrenal-cortex function has decreased. The above material indicates that in shock from burns a rise has been observed not only in total but also in biologically active 11-oxycorticosteroid concentration. Belyaev as well as Sevitt frequently observed a paradoxical reaction of eosinopenia in patients with extensive burns. This feature has not yet been explained. In some of the cases referred to above, it was observed that the amount of biologically active 11-oxycorticosteroids decreased in response to an injection of 25 u. of ACTH. Precisely this fact may, in our opinion, explain the paradoxical Thorn test by the decrease in the amount of biologically active steroids.

Franksson and Gemzell have shown that from all existing methods of evaluation of adrenal-cortex function, determination of hydrocortisone in the peripheral blood gives the best results. Recording the total and free 11-oxy-corticosteroids permits, in our opinion, assessment of the hormones in vivo from a quantitative point of view.

From the material dealt with above, it becomes evident that every stage of burns sickness has its quite characteristic concentration of total 11-oxy-corticosteroids in the peripheral blood. At the stage of shock, a sharp rise in corticosteroid concentration can be registered. At the stage of toxaemia, it decreases; at the stage of septicotoxaemia it drops further, and the potential capacity of the adrenal cortex also decreases. At the stage of recovery, the reserve capacities of the adrenal cortex are restored. Determination of the corticosteroid concentration in the peripheral blood may be used in combination with the recording of clinical findings for testing the transition of one stage of burns sickness into the other (by dynamic study of the adrenal-cortex function). Determination of the amount of free and protein-fixed 11-oxycorticosteroids permits assessing the functional condition of the adrenal cortex and deciding upon whether or not substitutional hormone therapy is indicated.

CONCLUSIONS

1. In patients with thermic burns at the stage of shock, a sharp rise in biologically active 11-oxycorticosteroids takes place.

2) At the stage of shock from burns, a definite increase in the concentration of 11-oxycorticosteroids as a response to an injection of 25 u. ACTH was not observed; consequently, administration of ACTH at this stage of burns sickness is useless.

3. In patients at the stage of toxaemia, a decrease in the amount of free and transcortin-fixed 11-oxycorticosteroids took place as compared to that at the stage of shock. Precisely this fact together with the clinical findings may indicate the transition of one stage of burns sickness into the other.

4. At the stage of septicotoxaemia, the glucocorticoid function of the adrenal cortex is decreased and, therefore, substitutional hormone therapy with corticosteroids appears rational at this stage.

5. At the stage of recovery, the function of the adrenal cortex is restored.

6. Determination of the total amount of transcortin-fixed and free 11-oxy-corticosteroids permits assessing the functional condition of the adrenal cortex and deciding upon the practically important question as to whether or not substitutional hormone therapy is indicated.

SUMMARY

The study deals with the concentration of free and transcortin-fixed 11-oxycorticosteroids in the peripheral blood investigated in 40 patients at all stages of burns sickness. The area burned ranged between 10 and 65 % of body surface. A sharp rise in transcortin-fixed corticosteroids was found

in patients at the stage of shock from burns. At this stage the patients did not react to the administration of ACTH with an increase in the concentration of biologically active and protein-fixed steroids. At the stage of septicotoxaemia the concentration of 11-oxycorticosteroids in the peripheral blood was lower than in the controls. The potential capacity of the adrenal cortex was found to be decreased at this stage. With recovery, the glucocorticoid function of the adrenal cortex was restored. The author concludes that administration of ACTH to patients with shock from burns is useless, while substitutional hormone therapy is rational at the stage of septicotoxaemia, because the reserve capacities of the adrenal cortex have been exhausted at this stage.

RÉSUMÉ

Les 11-oxycorticostéroides dans la circulation sanguine de périphérie chez les malades souffrant du traumatisme thermique.

N. A. Chesternia

Le travail présente les données touchant la concentration des 11-oxycorticostéroides dans la circulation sanguine de périphérie soit libres, soit liés à la transcortine chez 40 des malades dans tous les stades de la maladie des brûlés. Le pourcentage de la surface brûlée montait de 10 à 65 % de la surface totale. Dans la période du choc, les corticostéroides liés à la transcortine montraient une élévation remarquable. De même les malades ne montraient aucune élévation dans la production des stéroides actifs au sens biologique ni de ceux liés aux protéines dans la période du choc. Dans la période de la toxaemie la concentration des 11-oxycorticostéroides dans la circulation sanguine de la périphérie était plus basse que celle des sujets en contrôle. La production potentielle des surrénales était de même moins exprimée dans cette période. Dans la période de reconvalescence la fonction glucocorticoide des surrénales devient au contraire apparente. La conclusion en est donnée au fait qu'il n'est point raisonnable d'appliquer ACTH dans la période du choc des brûlés mais qu'il faut commencer avec la thérapie de substitution dans la période de toxaemie, c'est-à-dire dans la période où la production potentielle des surrénales est diminuée.

ZUSAMMENFASSUNG

11-Oxykortikosteroide im peripheren Blut bei Kranken mit thermischen Verbrennungen

N. A. Schesternja

In der vorliegenden Arbeit werden Daten über die Konzentration freier und transkortin-gebundener 11-Oxykortikosteroide im peripheren Blut bei 40 Kranken in sämtlichen Stadien der Verbrennungserkrankung wiedergegebenen. Die verbrannte Fläche betrug bei den Kranken 10 bis 65 % der Körperoberfläche. Es wurde ein beträchtlicher Anstieg der transkortin-gebundenen Kortikosteroide bei Kranken im Stadium des Verbrennungsschocks festgestellt. Im Schockstadium reagierten die Kranken nicht durch gesteigerte Produktion biologisch aktiver oder proteingebundener Steroide auf das Verabreichen von ACTH. Im Stadium der Septikotoxämie war die Konzentration der 11-Oxykortikosteroide im peripheren Blut niedriger als bei den Kontrollen. Die potenziellen Fähigkeiten der Nebennierenrinde waren in diesem Stadium

gleichfalls vermindert. Nach Genesung wird die glukokortikoide Funktion der Nebennieren wiederhergestellt. Aus dem angeführten ist die Schlussfolgerung gezogen worden, dass es nicht angezeigt ist die hormonale Substitutionstherapie im Stadium der Septikotoxämie, also in der Zeit, als die potenziellen Fähigkeiten der Nebennierenrinde herabgesetzt sind, einzuleiten.

RESUMEN

11-oxicorticosteroides en la sangre periférica en los enfermos con las quemaduras térmicas

N. A. Sesternia

En la obra referida se presentan los hechos sobre la concentración de los 11-oxicorticosteroides libres y de los ligados al transcortin en la sangre periférica en 40 enfermos en todos estadios de la enfermedad de quemadura. La superficie quemada comprendó en ellos 10 hasta 65 por ciento de la superficie del cuerpo. Se comprobó una elevación considerable de los corticosteroides ligados al transcortin en los enfermos en el estadio del choque de quemadura. En el estadio del choque los enfermos no reaccionaban a la aplicación de ACTH con la producción aumentada de los steroides biológicamente activos o de los ligados a la albúmina. En el estadio de la septicotoxemie la concentración de los 11-oxicorticosteroides en la sangre periférica era más baja que la en los controles. Las capacidades potenciales de la corteza suprarenal redujeron también en este estadio. En la curación recupera la función glucocorticoidal de las glándulas. Se hicieron conclusiones sobre eso, que no era racional indicar el ACTH en el choque de quemadura y que era conveniente iniciar el tratamiento hormonal de sustitución en el estadio de la septicotoxemia, pues en el tiempo, cuando las capacidades potenciales de la corteza suprarenal son reducidas.

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THE UNCOUPLING PHENOMENON AND METABOLIC BLOCKS AFTER BURNS

R. DOLEČEK, W. MAHAFFEY

The decreased reserves of the utilizable energy (ATP) of the burned organism can be one of the possible common denominators in the pathogenesis of the burn disease. (1, 2) There are many factors that can cause this decrease (table 1). While factors 1, 2, 3, 6 and partially 7, are generally acknowledged, the factors 4 and 5 are still controversial. A metabolic block in the anaerobic glycolysis was described recently, in the granulation tissue of burned subjects, (3) the other was postulated in the Krebs' cycle, (1, 2) between alpha-ketoglutarate and succinate. The development of fatty liver in the postburn period could be explained by an impaired entry of free fatty acids (their 2 carbon groups) into the Krebs' cycle, caused either by a lack (relative one?) of 4 carbon groups (1,2), or by a derangement at condensing enzyme level.

Table 1

Factors lowering the quantity of utilizable energy after severe burns

1. Lack of food
2. Lack of oxygen in tissues
3. Increased tissue losses
4. Metabolic blocks, pareses
5. Uncoupling of phosphorylation from oxidation
6. Ional disturbances (increased potassium and magnesium losses)
7. Serious derangements of mitochondria, ribosomes, impaired stability of lysosomal membranes

Utilizable energy — energy in macroergic bonds

To prove the theory about the decrease of utilizable energy and about the presence of metabolic blocks, the following indicators in burned rat livers were followed: oxygen uptake and changes in P/O ratio in mitochondria (as an indicator the oxidative phosphorylation), condensing enzyme values, as well as those of alpha-ketoglutarate dehydrogenase. This is the preliminary report about the authors' first results.

METHODS

White female Wistar rats were used, their initial weight being 190—230 g. The burn was produced with a Bunsen burner, with flame, under a light halothane anesthesia. It was a third degree burn, covering 20% of rat's body surface (according to Lee's formula) (8). Rats were sacrified by decapitation after stunning. During the first 5 postburn days one half of them was given daily 1 ml of physiologic saline intraperitoneally, while the other half 1 ml of the modified neuroplegic M 2 mixture: Hydergine^{R} or DH-Ergotoxine (alpha-receptor blocker) + Panthesine^{R} (similar to procaine) + Sandosten-Calcium^{R} (antihistaminic). (1, 2)

Table 2

Oxygen uptake (in micro atoms) by mitochondria of burned rat livers

Substrate	alpha-ketoglutarate		succinate		malate	
Unburned rats	10.85 ± 1.2		11.23 ± 0.82		8.0 ± 2.1	
Treatment	phys.	M 2	phys.	M 2	phys.	M 2
Time after burn						
5 hrs	6.5 ± 2.5 $p<0.01$	10.7 ± 0.4	14.1 ± 2.2 $p<0.02$	12.0 ± 0.9	7.3 ± 1.0	7.1 ± 0.4
2 days	6.9 ± 2.5 $p<0.01$	7.9 ± 3.7	14.5 ± 1.2 $p<0.01$	13.4 ± 0.7 $p<0.02$	6.6 ± 0.8	7.1 ± 0.3
4 days	10.8±0.6	4.7 ± 1.1 $p<0.001$	12.2 ± 0.8	10.6 ± 4.7	8.0 ± 0.5	6.9 ± 1.8
7 days	4.3 ± 0.3 $p<0.001$	9.4 ± 0.4	12.0 ± 0.7	15.1 ± 0.6 $p<0.01$	6.0 ± 1.2	7.1 ± 0.7
14 days	8.1 ± 0.4 $p<0.01$	9.7 ± 0.3	10.0 ± 0.3	13.4 ± 0.6 $p<0.02$	7.1 ± 0.2	7.1 ± 0.4
21 days	10.9 ± 0.4	10.7 ± 0.4	12.2 ± 0.5	12.6 ± 0.8	7.7 ± 0.2	8.2 ± 0.1
28 days	9.5 ± 1.6	10.2 ± 0.2	10.8 ± 0.8	13.7 ± 1.6	7.7 ± 0.2	7.7 ± 0.2

20 rats were used in the experiment. 4 as normal, unburned controls. The experiment lasted for 30 min., at 30 °C. All samples were examined in triplicate.

As far as the postburn values were significantly different from the unburned, control values, the p value is given.

Respiration (oxygen uptake) of mitochondria was measured by the usual Warburg's technique (4), at 30 °C. Anorganic phosphate was estimated by the method of Lowry and Lopez (5), dehydrogenase of the alpha-ketoglutaric acid by the Kaufman et al. method (6), condensing enzyme by the method of Ochoa (7).

RESULTS

The preliminary results of the first experimental series are included in tables 2, 3, 4 and 5.

Table 3

Changes in P/O ratio of mitochondria in burned rat livers

Substrate	alpha-ketoglutarate		succinate		malate	
Unburned rats	2.91 ± 0.36		2.07 ± 0.39		2.67 ± 0.42	
Treatment	phys.	M 2	phys.	M 2	phys.	M 2
Time after burn						
5 hrs	2.8 ± 0.7	2.8 ± 0.1	1.55 ± 0.05 $p<0.05$	1.9 ± 0.1	1.9 ± 0.1 $p<0.01$	2.8 ±0.2
2 days	2.2 ± 0.7	2.3 ± 0.9	1.9 ± 0.00	1.8 ± 0.1	2.3 ± 0.2	2.7 ± 0.1
4 days	3.2 ± 0.2	1.8 ± 0.8 $p<0.01$	1.2 ± 0.00 $p<0.001$	1.5 ± 0.1 $p<0.05$	2.8 ± 0.3	2.5 ± 0.4
7 days	1.8 ± 0.3 $p<0.001$	3.1 ± 0.1	1.8 ± 0.00	1.7 ± 0.2	2.2 ± 0.1	2.7 ± 0.2
14 days	3.3 ± 0.1	2.7 ± 0.1	1.5 ± 0.3	1.5 ± 0.0 $p<0.05$	2.2 ± 0.1	2.4 ± 0.0
21 days	2.7 ± 0.1	2.8 ± 0.1	1.4 ± 0.00 $p<0.02$	1.8 ± 0.1	2.5 ± 0.0	2.4 ± 0.0
28 days	2.4 ± 0.3	2.4 ± 0.1	1.3 ± 0.00 $p<0.01$	1.4 ± 0.2 $p<0.02$	2.0 ± 0.2 $p<0.02$	2.5 ± 0.3

20 rats were used in this experiment, 4 as normal, unburned controls.
The experiment lasted for 30 min., at 30 °C. All samples were examined in triplicate.
As far as the postburn values were significantly different from the unburned, control values, the p value is given.

Table 4

Values of alpha-ketoglutarate dehydrogenase in burned rat livers (expressed as micromoles CO_2/30 min. /mg proteins).

Time after burn	Type of treatment		
	PHYS.	M 2	Durabolin^R (Superanabolon)
5 hrs	0.062 ± 0.004 (I)	0.051 ± 0.001 (II)	—
2 days	0.030 ± 0.006 (III)	0.060 ± 0.0066 (IV)	0.051 ± 0.006 (V)
4 days	0.052 ± 0.0037 (VI)	0.049 ± 0.0005 (VII)	0.043 ± 0.011 (VIII)
7 days	0.023 ± 0.0025 (IX)	0.062 ± 0.017 (X)	0.038 ± 0.005 (XI)
14 days	—	—	0.031 ± 0.004 (XII)

The normal, control values of unburned rats are 0.052 ± 0.011 (NN.) 18 rats were used in the experiment, 3 as normal, unburned controls. Statistical analysis (t-test): NN and III $p<0.05$, NN and IX $p<0.01$, NN and XII $p<0.05$, IX and X $p<0.01$.
PHYS. — physiologic saline M 2 — neuroplegic M2 mixture
Durabolin^R (Superanabolon) — an anabolic steroid

Table 5

Condensing enzyme values in burned rat livers (values expressed as micromoles NADH /min.)
Condensing enzyme values in burned rat livers
(values expressed as micromoles NADH/min./mg proteins).

Time after burn	Type of treatment	
	PHYS.	M 2
5 hrs	1.2	1.0
2 days	1.4	1.1
4 days	—	—
7 days	1.5	2.1
14 days	1.3	0.9
21 days	0.7	2.8
28 days	0.6	1.5

The normal, control values, of unburned rats are 2.05 ± 0.25

The values are expressed as the specif. act. $\times 10^3$

25 rats were used in the experiment, 3 rats were as normal, unburned controls.

The mean value of all rats, treated in the postburn period, with physiologic saline (PHYS.) was 1.1 ± 0.34 micromoles NADH/min./mg protein, while the rats treated with the neuroplegic M2 mixture had 1.6 ± 0.47. The first value (PHYS.) differs significantly from the normal, unburned values ($p<0.02$).

DISCUSSION

Regardless of the fact, that the results were obtained from experiments on a rather limited number of experimentally burned animals, a few preliminary conclusions can nevertheless be drawn from them.

1. In many cases the uncoupling phenomenon was present.

2. In many cases a significant decline of oxygen consumption (uptake) by mitochondria occurred when alpha-ketoglutarate was used as substrate.

3. Repeatedly a decline of alpha-ketoglutarate dehydrogenase in liver was found. This finding could explain a previously postulated metabolic block (1, 2) between alpha-ketoglutarate and succinate.

4. Condensing enzyme values in burned rats (livers) were significantly lower. This could be one of the possible explanation of pathogenesis of fatty liver development, in addition to the role played by the postulated relative lack of 4 carbon groups (oxaloacetate) (1, 2).

5. The modified neuroplegic M 2 mixture protected significantly the burned organism from the above changes.

6. The severely burned organism has a lower metabolic efficiency during production of its utilizable energy.

Further experiments are necessary to support the above findings.

SUMMARY

In burned rats (20 per cent of their body surface, III degree burns) an impaired metabolic efficiency can be found in the postburn period. The following preliminary findings were described: uncoupling phenomenon, decreased oxygen consumption (uptake) by mitochondria, metabolic blocks in the

Krebs' cycle (a decrease of alpha-ketoglutarate dehydrogenase in liver, decreased values of the condensing enzyme in liver). The modified neuroplegic M 2 mixture (Hydergine[R] or DH-Ergotoxine, Panthesine[R], Sandosten-Calcium[R]) protect significantly the burned organism from the above changes.

RÉSUMÉ

La séparation de la phosphorylation de l'oxydation et les blocs métaboliques en suite de brulures

R. Doleček, W. Mahaffey

Chez les rats brûlés (du troisième dégrès, 20 % de la surface) la suite du traumatisme thermique est celle de l'aggravation des fonctions métaboliques. Les auteurs décrivent la présence du phénomène de la séparation de l'oxydation de la phosphorylation, d'abaissement de consommation de l'oxygène par les mitochondries de foie, les blocs métaboliques dans le cycle de Krebs (abaissement en quantité de désydrogénase de l'acide alpha-cétoglutarique, l'abaissement en quantité d'enzyme de condensation). Le mélange modifié neuroplégique du nom M[2] (La hydergine[R], Panthésine[R] plus Sandostène-Calcium[R]) protège remarquablement l'organisme contre les changements cités ci-dessus.

ZUSAMMENFASSUNG

Entkoppelung der Oxidation von der Phosphorylation und Stoffwechselblöcke nach Verbrennung

R. Doleček, W. Mahaffey

Bei verbrannten Ratten (20 % der Körperoberfläche, III. Grad) erfolgt nach thermischem Unfall eine Verschlechterung des Stoffwechseltätigkeit. Es wurde berichtet über das Vorhandensein des Phänomens der Entkoppelung der Oxidation von der Phosphorylation, über Verminderung des Sauerstoffverbrauches durch die Mitochondrien der Leber und über Stoffwechselblöcke im Krebsschen Zyklus (Absinken der Werte der Alpha-Ketoglutarsäure-Dehydrogenase, Absinken der Werte des kondensierenden Enzyms). Die modifizierte neuroplegische Mischung M 2 (Hydergin[R], Panthesin[R] und Sandosten-Calcium[R]) schützt den Organismus ausschlaggebend vor den beschrieben Veränderungen.

RESUMEN

Desembrague de la oxidación a partir de la fosforilación y los bloques de metabolismo después de la quemadura

R. Doleček, W. Mahaffey

En las ratas quemadas (20 por ciento de la superficie del cuerpo, del tercer grado) llega después del accidente térmico al empeoramiento de la eficiencia de metabolismo. Se describieron la presencia del fenómeno del desembrague de la oxidación a partir de la fosforilación, la disminución del consumo del oxígeno por las mitocondrias del hídago, los bloques de metabolismo en el ciclo de Krebs (la disminución de los valores de la dehidrogenasis del ácido alfa-ketoglutárico las disminución de los valores del enzima condensable). La mixtura neuroplégica modificada M 2 (Hidergin[R], Panthesin[R] y Sandosten-Calcium[R]) protege expresivamente el organismo quemado contra los cambios arriba mencionados.

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7° Cours International de Chirurgie de la Main

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BIPEDICLED V-Y FLAP TECHNIQUE FOR PRIMARY REPAIR OF LOWER LIP DEFECTS

K. HOLLMANN

Wedge-shaped (heart-shaped) excisions have proved to be of particular value for the surgical treatment of lower lip tumors with a maximum diameter of about 1 cm. Larger tumors, however, require major displacements of adjacent tissue to close the defects due to excision of the tumor. Such a displacement of tissue primarily serves the purpose of reducing the tension at the suture line and, in addition, it is designed to restore a harmonious facial contour around the mouth. The Abbe-Estlander operation, as well as the procedures described by Bernard, Ganzer-Schuchardt, and Dieffenbach-Bergmann are widely used to this effect. All of these surgical techniques are predominantly primarily designed for major craniocaudal defects, whose

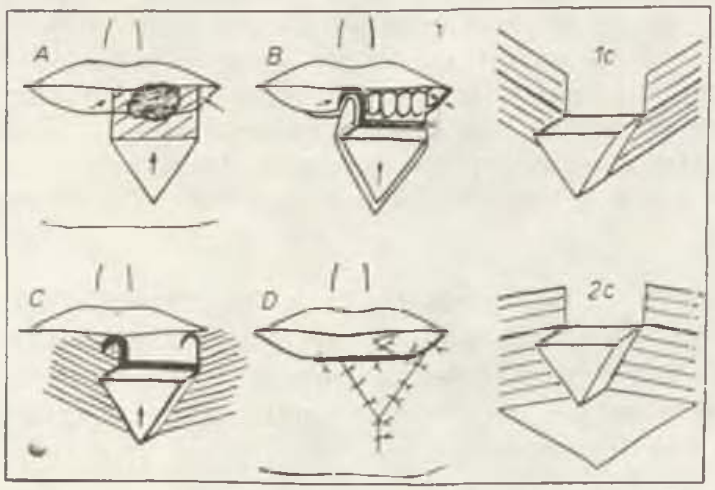

Fig. 1: A. Praeoperative Condition. Spotted area: tumor with surrounding tissue, to be resected. B. Tumor resected. Below the defect a triangle of cutis, subcutis & musculus (but not mucosa!) is circumcised. On both sides of the triangle the mucosa is separated (from the musculus layer) by blunt dissection and than incised transversely in the bottom of the vestibulum. — C. Mucosal bridge-flap with adhaerent full-thickeness triangle of the lower lip. (1c before, 2c after upward movement of that triangle.) — D. Condition at the end of operation.

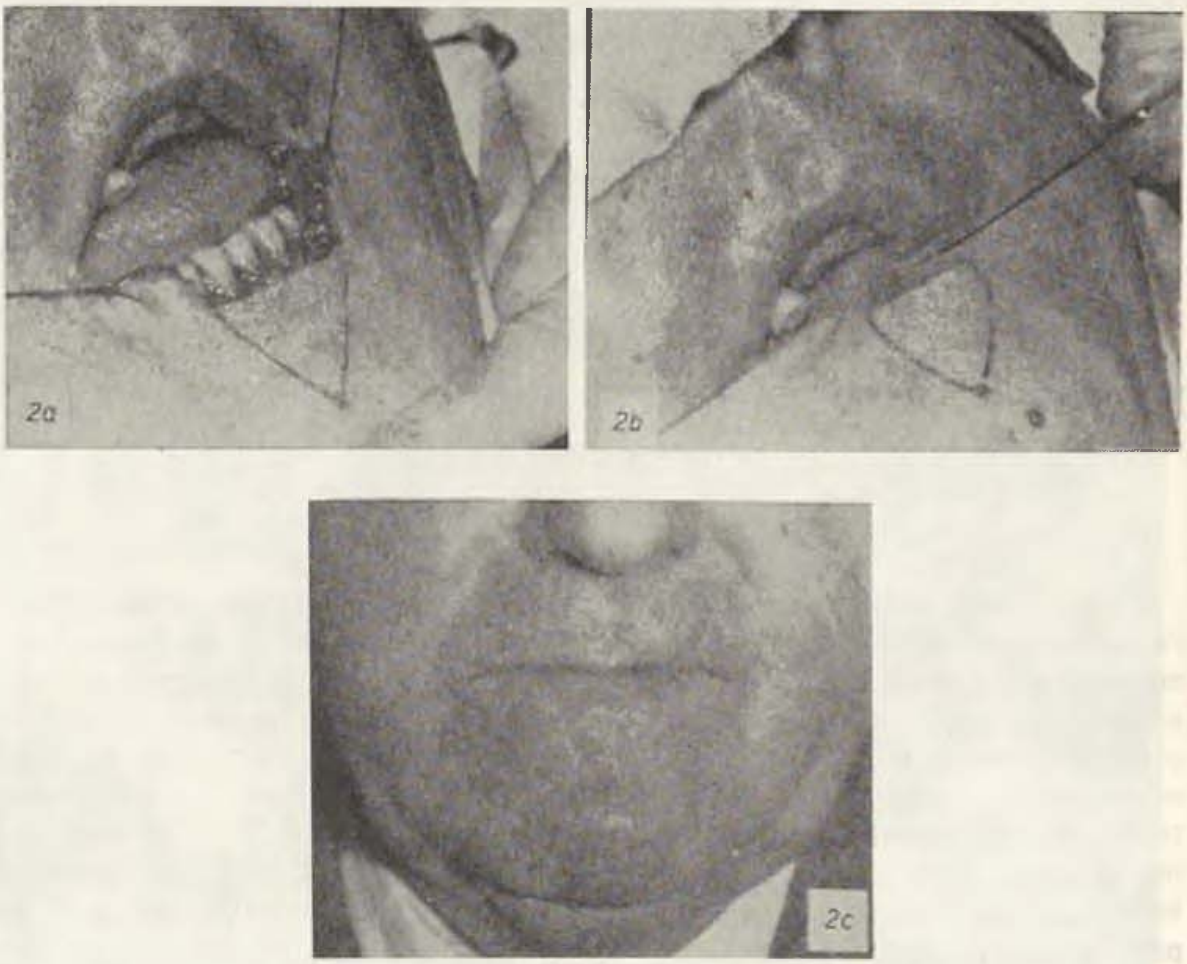

Fig. 2: a) Lower lip tumor removed radically. On the skin below the defect, the size of the triangle is outlined which is to be advanced into the defect. b) Tentative apposition of the lateral lip stumps. On simple wedge-shaped excision of the tumor, the lower lip would be subject to transversal tension as indicated on the photograph. That was not done because of that strong transversal tension, mostly in the region of the vermilion. (On the contrary no tension is to be seen in the next picture.) c) The patient 6 months following surgery by bipedicled V—Y flap technique.

transversal extension is rather small. Such tumors are, however, relatively less frequent than those with predominantly transversal involvement of the lower lip. A. F. Schulten reported a surgical reconstruction technique for such cases; this technique is, however, confined to superficial tumors predominantly affecting the vermilion.

Seven years ago we developed a special procedure for the treatment of lower lip tumors, which was first published in 1964 and has since been used at our department. It is particularly helpful in cases of deep-reaching tumors with predominantly transversal extension into the vermilion and the adjacent tissues. After radical removal of the tumor, a triangular full-thickness flap consisting of skin, muscle, and mucosa, which is bipedicled by way of mucosal bridges at the lateral lip stumps in the vestibulum oris, is advanced

into the defect from caudal towards cranial. Loss of vermilion due to the tumor excision can be compensated by using the lateral mucosal folds which are formed at the right and left sides of the primary defect by advancing the triangular skin flap. After partially separating the mucosal folds from the mucosal bridge by two lateral incisions at the right and left upper edges of the triangular flap, they can easily be rotated towards medial. (Fig. 1.)

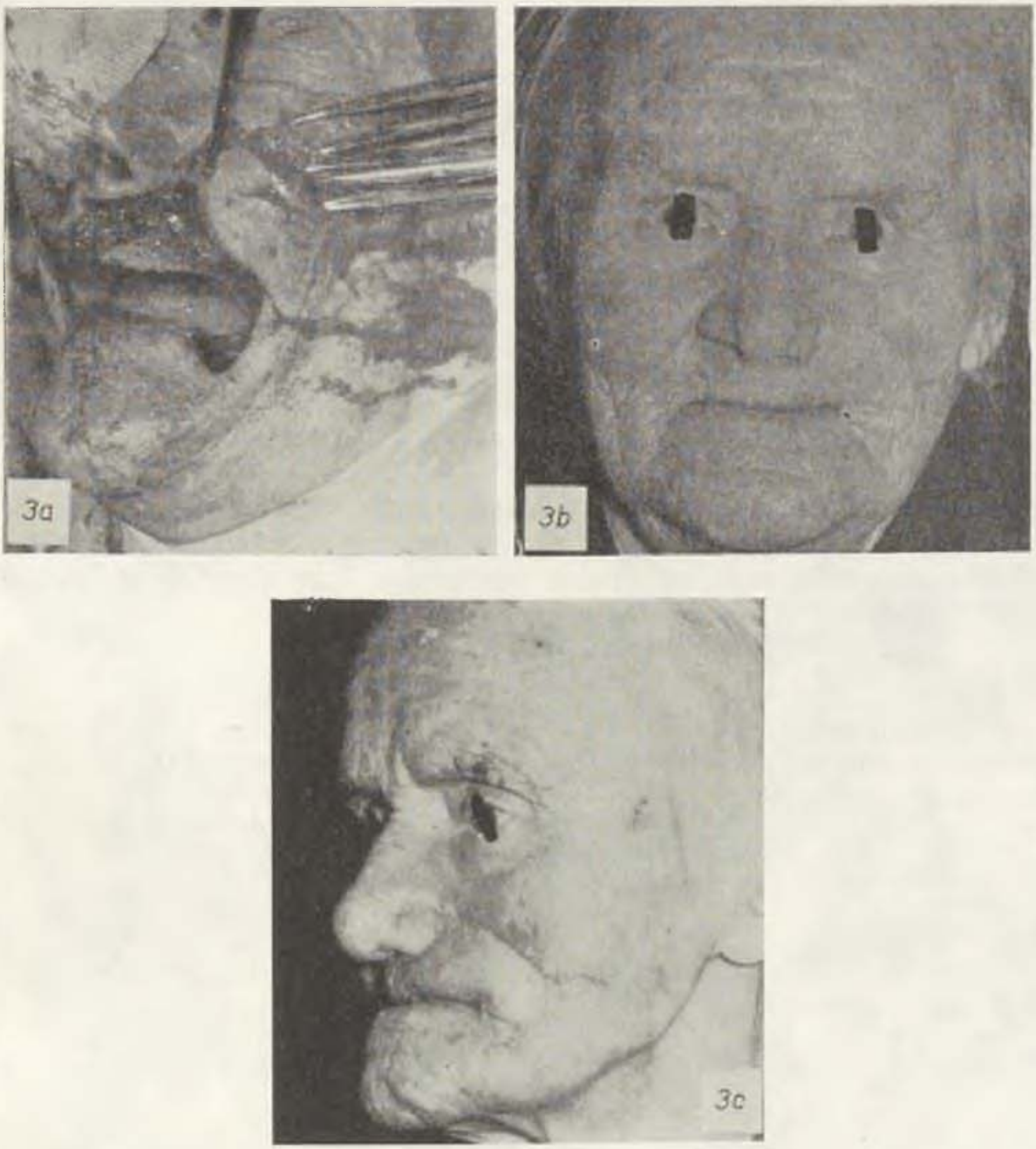

Fig. 3: a) After excision of carcinoma: Soft tissue defect involving the upper lip, the corner of the mouth and parts of the lower lip. Lateral from the defect, a bipedicled soft tissue flap has been circumcised and partly mobilized. — b) and c) 6½ months after surgery.

This surgical technique has been used in medial, symmetrical, as well as unilateral tumors of the lower lip; the esthetic results obtained were invariably satisfactory, even in cases in which loss of tissue after tumor extirpation extended over the entire width of the lower lip. As the lateral mucosal bridges in extended frontomental tumors, particularly those seen in older patients with suspected advanced arteriosclerosis, are rather small, the mucosa adjacent to the mucosal bridges in such cases was not used as a substitute for lost vermilion, as this may cause additional damage to the mucosa and this jeopardize the blood supply of the flap. Here vermilion was replaced by mucosa from the lower aspect of the tongue pedicled in a door-wing like manner at the tongue's free edge.

We were initially worried, lest the lip portion caudal to the tumor, which is advanced into the defect after tumor resection, would perhaps contain residual tumor tissue; on wedge-shaped tumor extirpation, this portion is removed together with the tumor. However, in none of our cases did we find signs indicative of a local recurrence during an observation period of seven years.

Although originally designed for tumors of the lower lip, this method can equally be used for primary and secondary (e.g. electricity burns) repair of traumatic defects. In addition, the technique can be modified to suit the requirements of defects in the area of the corner of the mouth and the upper lip. For this purpose the triangular soft tissue flap is excised from the cheek lateral to the defect and advanced towards medial. The tissue advanced into the defect is pedicled both at the upper and lower vestibulum, and the bridge flap consequently does not extend transversally from cheek to cheek, but rather from cranial towards caudal.

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FURTHER EXPERIENCES ON FREE TRANSFER OF HAIR BEARING SKIN

V. KARFÍK, J. ŠMAHEL

In the previous communication (Karfík, Šmahel 1968) we reported on a new procedure in free hair bearing skin-grafting, tested at our Department.

The method was initiated by an analysis of the problems of free transfer of skin with adipose tissue, which cannot be removed without damaging the base containing hair roots. Experiences by many other authors as well as by us, disclosed that the initial period of latency and plasmatic imbibition, lasting approximately 48 hours, is the most serious obstacle in the take. The success of such transfer depends mainly upon rapid renewal of blood circulation in the graft. An important part in the renewal of nutrition is played by vessel anastomoses formed between base and borders of defect and graft. This tends to be proved by the experience that composite grafts take all the more safely, the narrower they are.

Fig. 1. Sector between two stitches of skin wound in rat, 4 days after incision. The total specimen, vessels filled with Indian ink. Proliferation of capillaries at wound borders.

Another possibility of securing the take of a composite skin graft is, to lower the metabolic demands of the graft thus increasing its tolerance towards the period of plasmatic imbibition. This idea was realized for ex. by Rees et al. (1963) and Reichert (1964).

Schmidt and Reichert (1969) achieved good results when implanting composite skin grafts covered by milipor filter under the skin. These tactics are to secure nutrition of graft even from above.

Fig. 2. Frozen section of fresh rat flap. Stained with HE. Vessels filled with Indian ink.

Fig. 3. Frozen section of rat flap 4 days old. Distinct vessel reaction in connective tissue at lower edge of flap.

At our Department we followed up the idea of shortening the latency period by a tactical manoeuvre. We were initiated by the well known experience that a skin wound disrupted a few days after suture, heals after resuture within a shorter time period then after primary suture. More detailed studies (Savlov, Dunphy 1954, Weiber 1961, Šmahel 1965) disclosed that the phenomenon of shortening the period of take, is caused by the fact

that in resuture of ruptured wound the repair process starts in richly vascularized and cellulized tissues immediately — without the usual latency phase. It is justified to assume that in transfering skin grafts into reptured wound, a large amount of proliferating capillaries may form anastomoses with graft vessels more rapidly, renewing circulation earlier (Fig. 1). We verified this idea in experiments in rats (Šmahel 1969). We found that in grafting on a 2 days old bed, which we described as "prepared", the phase of plasmatic imbibition is roughly shortened by half. Revascularisation in grafts of full-thickness skin started in this tactical arrangement 18—22 hours

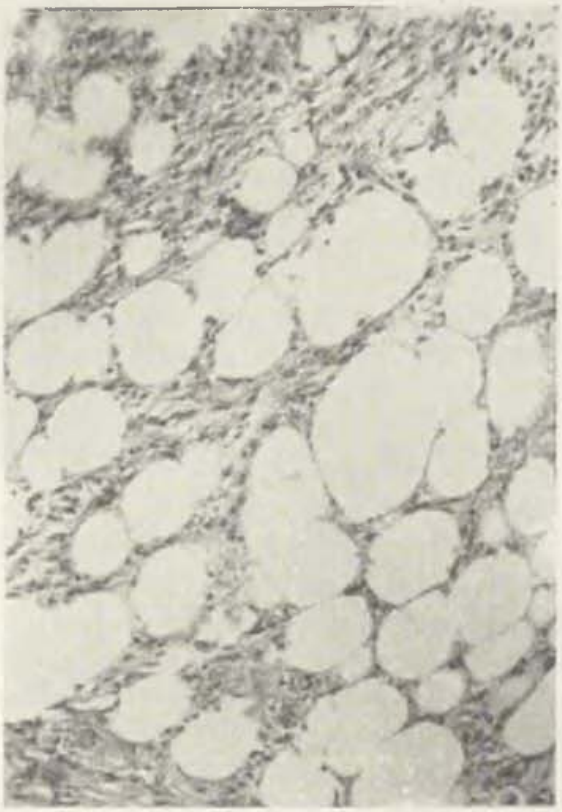

Fig. 4. Histologic section from the lower edge of a 6 days old pig flap. Coloured with HE. Formation of granulation tissue between fat cells.

after transfer and the grafts maintained their histological structure considerably better, than in transfer on fresh bed. This agrees with the general experience that on healthy granulation tissue grafts take more rapidly and safely than on a fresh defect.

DeHaan and Stark (1961, 1964) achieved good results when transfering composite skin grafts if they increased vascularization of the recipient site by pre-operational histamine iontophoresis.

When elaborating the method of free transfer of hair bearing skin, we were for a time satisfied with preparation of the delayed recipient site and we obtained in clinic promising results. When deciding upon the period for

Fig. 5. Patient before operation. Extensive defect of lids and defect of eyebrows after burn. — Fig. 6. Drawing of eyebrow defect, after reconstruction of eyelids.

the delay of the recipient site, i. e. the interval between incision in the eyebrow region and transfer, we considered as follows. Revascularisation of the skin graft on the fresh bed starts between the 2nd and 3rd day. The edges of the wound begin to take on the 3rd day after incision. This tends to prove that the capillaries grow into the defect within that time. This is according to our experiences the most favourable stage for delayed grafting. We decided upon the three day interval as the minimum period for the delay of the recipient site. We prolonged this period in case of scars in the eyebrow region. According to the most recent experiences, the brief 3 day interval seems to us to be the most favourable.

Accelerated take of the resuture was the initial point of further tactical considerations. We tried to establish a similar biologic situation also in free transfer, i.e. we attempted to prepare the graft too.

The idea to prepare the graft for transfer is one of the oldest traditions in plastic surgery and started by the beating of skin in India. Hirschberg (1893) suggested a tactical procedure by which he succeeded in free transfer of skin with subcutaneous layer. The principle of the method consisted of artificially induced hyperemia in transfered tissues. First the donor site was beaten. Then the flap was circumsized. When after several minutes reddish-rose colouring and oedema appeared, the pedicle was cut and skin with subcutaneous layer was freely transfered. In 1931 SOLMS reported good results if the transfer was carried out in two stages. In the first stage the

recipient site was excised and the graft lifted at the pedicle. After 24—48 hours the pedicle was cut and the graft freely transfered. He explained the favourable effect of his procedure by the fact that on the contact areas a sticking layer was formed and accelerated the connection of the bed with the graft and its nutrition. Hynes (1954) recommended in grafting poorly vascularized defects, that the graft should be removed and left at the donor site for 24 hours in order to afford it a supply of nutritional substances.

We studied the question of graft preparation in form of flap in animal experiments, in order to obtain information on morphologic processes which occur in the flap base. In rat skin we determined by injection of contrast substance at the base of the flaps after 4 days a significant reaction, characterized by formation of vessel bushes and of cellular infiltration (Fig. 2, 3). In skin flap in the pig we found on the 6th day the initial formation of granulation tissue (Fig. 4). We believe the multiplication of the capillary network at the flap base and slight inflammatory reaction of its tissue might influence the take of the graft in the delayed recipient site, favourably.

We are aware that the morphologic changes observed on the base of the flap are only one part of preparation phenomenon, its important features being doubtlessly biochemical changes. The proliferative reaction in the flap carries simultaneously the danger, that the increase of metabolically very demanding tissue might — on the contrary — impede the take. We believe therefore that the preparation of the graft in form of flap must also last a short period, not exceeding 3 days.

From these findings we derived a new method of substituting eyebrows by delayed transfer of scalp skin into the prepared delayed defect of the eyebrow.

Fig. 7. Lifting of flap behind auricle. — Fig. 8. Take of hair bearing skin after 6 months.

SURGICAL PROCEDURE

After preparatory drawing of the shape, skin in the eyebrow region is incised or excised (Fig. 5, 6). The defect is closed by fine sutures and steristrips. In the same stage we cut on the same side above the border of hair bearing skin behind the auricle, the required size of flap with low pedicle (Fig. 7). Width of flap should not exceed 10 mm. It is of advantage, if the fat layer is not too thick thus reduction of fatty tissue being unnecessary. For this reason we decide upon the hair line, behind the auricle. If the fat layer is thicker than necessary for preservation of hair follicules, we carry out a careful reduction. The lifted skin bleeds strongly on the borders of the corial layer. We resuture the flap with fine knotted stitches.

On the third day we open the wound on the forehead carefully. Behind the auricle the flap is lifted in a similar manner, it is cut off from the pedicle in the shape of the defect and inserted into the open wound on the forehead. We adapt the graft with several stitches and steristrips. The skin with hair is somewhat thicker, oedematous; no compressive bandage is required. It is important to achieve intimate contact between the tissues of the bed and the graft. Healing occurs within 6 days and by that time the stitches may be removed and the graft may be covered by ointment dressing. The resulting effect is demonstrated on Fig. 8.

DISCUSSION

In principle, the proposed method is a combination of delayed transfer of hair bearing skin into a prepared (delayed) recipient site. Because for the period of delay the defects as well as the prepared flap are closed by stitches which protect the wounds from infection, the condition for the take is favourable. We arrived at the method gradually as we verified it experimentally. When the delayed recipient site appeared to be satisfactory because the number of deep desquamations decreased, we tried to condition the graft itself. It ought to be stressed that already preparation of the bed affords an advantage for transfer of hair bearing skin. The principle of preparation-phenomenon of the graft in flap form, we consider as yet unsolved. In the experiments we obtained information on the morphologic. Greatest difficulty rendered the determination of the favourable period of delay, because group of the operated cases is sufficiently representative. According to experience gained so far a period of 3 days appears to be most suitable, especially in consideration of the delayed flap. The presence of fully developed granulation tissue on the bottom area of the delayed graft would rather complicate the transfer.

SUMMARY

Clinical experience with resuture of a ruptured wound and delayed transplantation of skin made us elaborate a new method of free transplantation of skin with hair. The method can be described as delayed transplantation

of skin with hair into a prepared defect of the brow. The hitherto assembled experiences give hope of more satisfactory results of this complicated transplantation of skin with hair and adipose tissue.

RÉSUMÉ

Notre expérience récente avec le transplant cutané chevelu

V. Karfík, J. Šmahel

Les expériences cliniques avec la résutture de la plaie rompue de même que celles avec le transplant en deux temps nous ont donné l'idée d'une nouvelle méthode du transplant libre de la peau chevelue. Cette méthode peut être décrite comme celle du transplant cutané chevelu en deux temps dans le défaut des sourcils traité d'avance. Les expériences jusqu'alors obtenus nous donnent l'espoir des résultats plus favorables de ce transplant cutané chevelu avec le tissu graisseux.

ZUSAMMENFASSUNG

Weitere Erfahrungen zur Übertragung von Haut mit Haar

V. Karfík, J. Šmahel

Klinische Erfahrungen mit der Resutur der zerrissenen Wunde und mit der aufgeschobenen Hautübertragung haben uns veranlasst, eine neue Methode der freien Transplantation von Haut mit Haar auszuarbeiten. Das Verfahren kann als aufgeschobene Übertragung von Haut mit Haar in den bereiteten Augenbrauendefekt beschrieben werden. Die bisher gewonnenen Erfahrungen geben uns die Hoffnung auf erfolgreichere Ergebnisse dieser komplizierten Übertragung von Haut mit Haar und Fettgewebe.

RESUMEN

Neuvas experiencias con la translación libre de la piel con los pelos

V. Karfík, J. Šmahel

Las experiencias clinícas con la resutura de la herida reventada y de la translación aplazada de la piel obligó a desarrollarnos un nuevo método de la transplantación libre de la piel con los pelos. Este método puede describirse como la traslación aplazada de la piel con los pelos en el defecto preparado de las cejas. Las experiencias ganadas hasta el presente nos dan la esperanza de los resultados más fructíferos de esta traslación complicada de la piel con los pelos y con el tejido de gordo.

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At the United Nations, on the date February 12, 1970, the International Society of Aesthetic Plastic Surgery was founded

Its objectives are:

1 — To organize, promulgate and disseminate, by teaching and scientific programs, an interchange of knowledge and ideas for the benefit of younger surgeons and trainees, as well as for surgeons already engaged in the practice of this specialty.

2 — to Atract, as members, qualified aesthetic plastic surgeons, in a society whose principal aims shall be the preservation and protection of Aesthetic Plastic Surgery, placing it before the scientific body of World Medicine so that it may assume its proper place within the field of surgery.

3 — To propose and promote proper legislation in order that only qualified plastic surgeons may be allowed to practice this branch of Plastic Surgery.

Central Institute of Postgraduate Medical Teaching, Department of Surgery
and Topographic Anatomy
Director Prof. B. V. Ognev, member-correspondent of Soviet Academy
of Medical Sciences, Moscow (USSR)

JOINING OF LYMPH ROUTES AND AUTOTRANSPLANTATION OF LYMPH NODES IN EXPERIMENTS

I. A. YUSUPOV

In the modern trend of surgery, special attention is paid to the topical problem of organ transplantation. The brilliant experimental studies of Carrel, Lexer, Demikhov, Ognev, Lapchinsky, Kirpatovsky et al. and many other authors have proved that, in principle, it is possible to transplant almost any organ. Today transplatation of auto- and homogenous organs has already become a clinical method.

Transplantation of an extremity, both auto- and homogenous, is carried out by joining practically all tissues of the transplanted organ with the respective parts of the recipient's organism, with the exception of the lymph routes, although the lymphatic system plays an important role in the biological processes of the organism.

It is also generally known that oedema develops after reimplantation of extremities or after surgical operations accompanied by wide excision of lymph nodes. Infection of the wound or treatment by irradiation greatly impedes regeneration of lymph vessels and leads to protraction and even stabilization of oedema. Oedema which has lasted for a long time, then provokes productive inflammation leading to fibrosis and, ultimately, resulting in elephantiasis. This is the reason why surgical reconstruction of lymph routes should be carried out as soon as possible. This would certainly improve the immediate and the functional results of surgical treatment.

Elaboration of methods for reconstructing the lymphatic system has become increasingly topical with organ transplantation, wide excision of lymph nodes and the treatment of certain diseases accompanied by the impairment of lymph drainage. Today the indispensability of such reconstruction is quite obvious. The first attempts at surgery applied to the lymphatic system, both clinical (Makhov, Lurye, Cockett, Goodwin) and experimental (Jaffe et Richter, Bogoyavlensky, Danese et al., Kirpatovsky et al., Yusupov, Málek et Vrubel), convincingly bear witness to this fact.

In view of this, the following experimental investigation was undertaken.

MATERIAL AND METHODS

In 88 dogs of middle age, 160 operations were carried out in four series of experiments. General anaesthesia by intrapleural injection of a 5% solution of Thiopenthal at a dose of 0.5 to 1.0 ml per 1 kg body weight, was employed in all cases.

In the first series, the popliteal lymph node was exposed by a 3—5 cm long skin incision, and divided into two halves by a horizontal cut between its afferent and efferent vessels. In order to prevent the lymph from being drained through the collateral vessel which sometimes connects the afferent with the efferent lymph routes and which lies in the fatty tissue surrounding the lymph node, this tissue was severed transversely (Fig. 1).

In the second series, the two halves of the divided lymph node were approximated and sutured together; in one group of animals with interrupted stitches, in the other with simple continuous suture. Kapron and silk was used as suture material.

In the third series only the lymph node capsule was divided by a circular incision and then the node enucleated from both halves of the capsule. Afterwards the two halves of the capsule were re-joined by continuous suture.

In the fourth series, the capsule was incised longitudinally and the node either enucleated, turned upside down and re-implanted, or the lymph node of the right limb was implanted into the capsule of the left limb and vice versa. Afterwards the incision in the capsule was closed by simple suture.

The number of observations in dependence on the time of observation is registered in the enclosed table.

For evaluting the results, two methods were employed which each served both as control of and supplement to the other. These were: direct vital lymphography and histological examination of excised tissue. A 70% solution of Triiotrast or Diodon was used as contrast substance for radiography; 2 to 4 ml of it were injected into the carefully dissected lymph vessel on the dorsum of the foot. A total of 169 lymphographies were thus carried out for experimental study and another 25 for control purposes. Altogether 600 radiographs were obtained and examined.

The excised lymph nodes were processed accordingly, cut in toto into histological sections of 8 to 12 μ thickness, and stained with haematoxylin-eosin or according to van Gison. Altogether 1800 histological slides were thus prepared and examined.

RESULTS AND THEIR EVALUATION

In the first series of experiments, the aim was to investigate the way lymph circulation in the hind limb of dog was restored after division of the popliteal lymph node between its afferent and efferent lymph vessels. The main interest was concentrated on the question whether or not lymph drainage was restored through the section surfaces of the two halves of the divided lymph node. The results of this series were compared with those of the se-

Table 1

Series of experiments		Time of observation (in days)										Total
		1	3	7	10	15	20	40	60	90	180	240	
I		4	4	5	6	3	5	3	4	—	—	—	34
II	1st group	2	2	2	4	3	5	3	2	3	2	—	28
	2nd group	4	3	2	3	2	5	3	2	2	2	—	28
III		4	4	4	4	4	4	5	3	4	—	—	36
IV		2	4	3	4	2	3	4	4	4	—	4	34
Total													160

cond series of experiments, where the two halves of the lymph node divided by the mode described above were joined by different types of capsular suture.

In the first three days after the operation, stagnation of lymph was observed in the afferent vessels and the lower half of the node, which manifested itself by the afferent vessels becoming wider a tortuous and by widening of the medullar sinuses in the lower half of the node. Lymph drainage through the popliteal region had not been restored. The lymph either meandered through the section surfaces of the node, or anastomoses between its afferent vessels and the medial lymphatic route developed thus materializing a collateral lymph drainage (Fig. 2). On the seventh day after operation, lymph circulation had been renewed in all cases by the popliteal route on account of an efferent vessel growing out of the lower half of the divided node, and eventually linking up with the existing vessels of the upper half (Fig. 3). Between the section surfaces of the node, areolar tissue had developed. Ten to 15 days after operation, regeneration of the afferent vessels had already started in the upper half of the node, and on the 20th day, two separate nodes had formed from the two halves of the originally single lymph node. Lymph circulation through these two new lymph nodes had been restored on account of regeneration of both the afferent vessels to the upper and the efferent vessels from the lower half of the divided, originally single node. The collateral routes of lymph drainage had ceased to function. The process of forming two from the one divided lymph node was completed by the 40th to 60th day after operation. Each of the two new nodes had formed its own capsule and its own afferent and efferent vessels (Fig. 4). The histological structure of these two lymph nodes was almost normal.

Lymph drainage had not been restored through the section surfaces of the divided lymph node. Instead, connective tissue had developed between these surfaces.

In the second series of experiments, it was intended to find out whether the lymph could pass through the upper half of the lymph node if sutured to the afferent vessels or through the lower half if sutured to the efferent vessels, and the way lymph circulation was restored in the limb under these circumstances.

One to three days after operation, the lymph drainage was restored through the junction only if the capsule had been sutured by continuous stitch; in those instances in which the capsule had been sutured by interrupted stiches, lymph drainage was not restored (Fig. 5). On the seventh day, lymph drainage had been restored in all cases no matter what kind of suture had been used for the capsule. This restoration was effected by the following three variants: 1) on account of regeneration of efferent vessels leaving the lower half of the divided lymph node whereby the juncture between the two halves of the node remained completely impassable (like in series I); 2) account of regeneration of an efferent vessel leaving the lower as well as of afferent vessels merging into the upper half of the divided node whereby the juncture between the two halves again remained completely impassable; 3) on account of regeneration of an efferent vessel leaving the lower half and the formation of new sinuses in the juncture between both halves of the divided lymph node. Between the contacting section surfaces of the two halves of the divided lymph node, either compact connective tissue had developed which proved completely impassable for lymph, or occasional narrow sinuses had been formed in this tissue, which, of course, were quite inadequate for draining the lymph from the limb. This had to be ensured by simultaneous regeneration of an efferent vessel from the lower half of the node. Ten to 15 days after operation, and even earlier, another, fourth variant had developed in parallel with the three variants described above. In this, lymph drainage was restored both directly through the juncture and by regeneration of collateral lymph vessels. On the 20th day another two variants of restoration of the lymph circulation were detected: lymph drainage was effected directly through the juncture (5th variant) or both through the juncture and through simultaneously regenerated afferent vessels to the upper and efferent vessels from the lower half of the divided lymph node (6th variant). On the 60th day after operation, the last (7th) variant was disclosed; the regenerated efferent vessel from the lower half merged directly into the upper half of the node, whereby the juncture between the two halves remained impassable. Thus the upper half of the divided lymph node became a kind of regional lymph node of the second order. Investigation of lymph circulation in the following period did not disclose and essentially new features with regard to the restoration of lymph drainage through the juncture between the two halves of the divided lymph node.

Although formation of new sinuses between the contacting section surfaces of the divided lymph node was detected by histological examination in 40% of cases in this series of experiments (Fig. 6), complete morphological restoration of all, or at least most sinuses in this area could not be observed. More frequently, compact connective tissue had developed between the section surfaces, which effected complete impassability of the juncture.

In the third series of experiments, the lymph node was peeled out of its capsule and the empty capsule sutured, thus creating an anastomosis between the afferent and efferent lymph vessels.

On the first day after operation, lymph drainage had been restored. The capsule, however, was somewhat distended and the suture leaked at places (Fig. 7). Three days after operation, lymph drainage through this anastomosis was quite free. The capsule which had been distended on the first day, began to shrink, and on the third day had regained its original calibre.

From the seventh day after operation onwards, the cavity of the lymph node capsule began to grow still smaller and by the 60th to 90th day, one or two lymphatic truncs had developed from the capsule, which linked the afferent with the efferent vessels (Fig. 8). Thus ultimately the lymph node capsule was transformed into a lymph vessel through which lymph drainage from the popliteal region was effected.

The junctures of the second group of both series II and III functioned best, since they led to restoration of lymph drainage already by the first day after operation.

In the fourth series of experiments, it was intended to find out whether, and to what degree, a lymph node enucleated from its capsule and immediately re-implanted into it, would take, and, apart from this, whether any and what role in its take was played by lymph circulation maintained in the impanted node.

The entire series of processes taking place in the intracapsulary implanted lymph node can be divided into several successive periods:

The first period (up to 24 hours after operation) was essentially characterized by destruction and necrosis of the larger parts and continued proliferation in the smaller, preserved and still viable parts of the impanted lymph node. At the end of this period, three zones could be distinguished in the implanted node: the central zone consisting of massive cell detritus which had developed as a result of complete necrosis and subsequent disintegration of all cell elements of the marrow; the interstitial zone characterized by very marked and intensive degeneration and decay of lymphatic tissue; and the peripheral zone in which the lymphatic tissue of the cortex had remained viable (Fig. 9).

The second period (from the 2nd to 3rd day after operation) was exclusively represented by destructive processes taking place in the implanted node. The entire node, except for a relatively narrow layer of reticular tissue situated in its periphery, had undergone disintegration. In the meshes of the reticular tissue of the periphery, small and sparce clusters of lymphocytes and lymphoblasts had been preserved.

The third period (from the 4th to 7th day after operation) was critical with regard to the further fate of the impanted lymph node. Either complete necrosis and subsequent replacement by fibrous tissue, or integration and re-vascularization of a narrow peripheral zone of reticular tissue, took place. Small numbers of lymphocytes and lymphoblasts appeared in this reticular tissue which thus made it look like considerably atrophied lymhatic tissue. The inner layer of this zone facing the necrotic centre of the node, in which

lymphatic cells were completely absent, only consisted of empty stroma of the node.

The fourth period (from the 8th to 10th day after operation) was characterized by regeneration of lymphatic tissue cell elements and further revascularization. Consequently, the empty reticular stroma became filled with a great number of lymphatic cells and began to take on the appearance of normal lymphatic tissue incorporated into the lymph circulation, where, in some cases, even primary, though as yet slighty atrophic microfollicles had developed (Fig. 10).

In the fifth period (from the 11th day after operation onwards), regeneration of cell elements continued and terminated in the formation of homogenous lymphatic tissue, evidently as the result of further regeneration and differentiation of the integrated lymphatic tissue, thus forming both a cortical layer represented by primary and secondary folicies and a medullary layer which usually consisted of homogenous lymphatic tissue (Fig. 11, 12).

Thus ultimately, small clusters of lymphatic tissue, i.e., small lymph nodes had been formed.

The investigation referred to above showed that lymph circulation had no influence whatsoever on the outcome of implantation. The decisive factor for the take of lymphatic tissue of a lymph node is re-vascularization. Integration and regeneration of lymphatic tissue was observed in 60% of cases; in two cases formation of small lymph nodes from the integrated lymphatic tissue was observed on the 90th day after operation.

CONCLUSIONS

1) Division of the popliteal lymph node in dog into two halves between its afferent and efferent vessels leads to formation of two solitary lymph nodes. Lymph flow through the section surfaces of the divided lymph node ist not restored because connective tissue develops between them.

2) Lymph circulation through the two lymph nodes formed from the one divided popliteal lymph node is renewed by the seventh day after operation on account of regeneration of an efferent vessel from the lower and, subsequently, of an afferent vessel to the upper half.

3) Lymph drainage through the two halves of the divided lymph node is renewed by the first day after operation, if the two parts are joined by continuous capsular suture; interrupted suture prevents renewal of lymph drainage.

4) Lymph drainage is restored by the seventh day after operation no matter what kind of suture is used to join the two halves of the capsule, but in the process of restoration, various variants of regeneration of efferent, afferent and collateral lymph vessels start to predominate over the renewal of patency in the juncture between the two halves of the divided node.

5) Between the section surfaces of the divided and subsequently sutured halves of the lymph node, scattered sinuses are formed (in 40% of cases) by the seventh day or later, but complete and morphologically perfect restoration of all sinuses never takes place. Most frequently (in 60% of cases), compact

connective tissue develops between these surfaces which leads to complete impassability of the juncture.

6) Creation of an anastomosis by joining the two empty halves of the capsule after enucleation of the lymph node leads to renewal of lymph drainage by the first day after operation. However, in the first one to three days, leakage of the suture may often be observed.

7) Intracapsular implantation of an unbroken lymph node results in integration and regeneration of a small part of it in the form of lymphatic tissue in most (60%) cases. Thus small lymph nodes with well developed cortival layers only, are formed. Complete restoration as to size and histological structure of a transplanted lymph node, never takes place.

8) Lymph circulation through an intracapsulary implanted lymph node has evidently no influence on its take. Decisive for the take and subsequent regeneration as well as for the functioning of the preserved lymphatic tissue of the node, is its re-vascularization.

SUMMARY

A total of 160 operations in four series of experiments were carried out in 88 dogs, whereby two methods of investigation were employed which served as control and supplement to each other. These methods were direct vital lymphography and histological examination. On the whole, 600 radiographs and 1800 histological slides were examined.

In the first series of experiments, the popliteal lymph node was divided between its afferent and efferent vessels, in order to study the restoration of lymph circulation in the limb. It was ascertained that lymph circulation had been restored by the seventh day after operation on account of regeneration of an efferent vessel from the lower half and, subsequently, of an afferent vessel to the upper half of divided lymph node. Lymph drainage through the section surfaces of the divided node was not restored, because connective tissue had developed between these surfaces. Ultimately, two solitary nodes developed from the one divided lymph node.

In the second series of experiments, the two halves of the divided lymph node were joined by capsular suture; in one group of animals by interrupted, in the other by continuous suture. In the second group (with continuous capsular suture), lymph drainage had been restored by the first day after operation, while in the first group (with interrupted suture), it had not yet been restored. By the seventh day, lymph drainage was restored no matter what kind of suture had been used, but in the process of restoration various variants of regeneration of efferent, afferent and collateral lymph vessels began to predominate over the renewal of patency of the actual juncture between the two halves of the divided lymph node. In 40% of cases, scattered sinuses developed between the section surfaces of the divided lymph node. However, complete, morphologically perfect restoration of all sinuses never took place. Most frequently compact connective tissue developed at this site, which led to complete impassability of the juncture.

In the third series of experiments, an anastomosis was created by suturing together the two empty halves of the capsule after enucleation of the lymph node from it. Lymph drainage had been restored by the first day after operation. By the seventh day, the cavity of the capsule had gradually grown smaller and was subsequently transformed into one or two lymph vessels.

In the fourth series of experiments, intracapsular implantation of a whole, unbroken lymph node was carried out. In 60% of cases, a narrow peripheral layer of implanted graft took and underwent regeneration forming lymphatic tissue or small and imperfect lymph nodes. Complete restoration of size and histological structure of the implanted lymph node did not take place. It was ascertained that lymph circulation through the intracapsularly implanted lymph node did not have any influence on its take; and subsequent regeneration as well as functioning of the lymphatic tissue of the node was its revascularization.

RÉSUMÉ

Une liaison experimentale des voies lymphatiques et l'autotransplantation des nodules lymphatiques

I. A. Yousoupof

Les auteurs ont entrepris 160 des opérations en quatre séries sur 88 chiens. Ils ont employé deux méthodes, qui présentent en même temps et la contrôle et l'accomplissement l'une à l'autre. Il s'agit respectivement de la lymphographie à rayons X directe vitale, suivit de la biopsie. Par cette méthode les auteurs ont examiné 600 des prises à rayons X et 1.800 des biopsies.

Dans la première série des examens ayant pour but d'étudier le renouvellement de la circulation lymphatique dans le membre endommagé, les auteurs ont totalement réséqué le nodule lymphatique entre les vaisseaux afférentes et efférentes. On a constaté, que la circulation lymphatique se renouvelle vers la septième journée suivant l'intervention à l'aide de la régénération des vaisseaux efférentes de la partie inférieure, et, seulement après, celle-ci finie, aura lieu la régénération des vaisseaux afférentes de la partie supérieure du nodule réséqué. La circulation lymphatique à travers les parties réséquées du nodule respectif ne se réalise jamais, car le tissu conjonctif prend place entre les surface réséquée, si bien que, à la place d'un nodule réséqué, résultent deux nodules tout à fait indépendant.

Dans la deuxième série des expériments les deux parties du nodule réséqué ont été liées par la sutture de sa capsule réalisée en deux manières: celle par les piqures continues et celles interrompues. Dans cette dernière grouppe (sutture par piqures) continues, la circulation lymphatique se renouvella dès la première journée post-opérative, tandis que la premiére grouppe — ne montra aucun renouvellement. Au cours de la septième journée, le circulation lymphatique était réétablie dans les deux groupes, mais dans le renouvellement de la circulation entre les deux parties réséqué du nodule respectif on voit de divers variantes de la régénération des vaisseaux afférentes, efférentes et collatérals. Dans 40 pour cent des cas a la sutture de la capsule du nodule lymphatique seulement des sinus dispers se sont formé. Une complète et morphologiquement parfaite régénération de tous les sinus n'a jamais été observéé. Dans la pluspart des cas le tissu conjonctiff compact prit place, ne permettant jamais le passage libre de la lymphe entre les deux parties du nodule lymphatique respectif.

Dans la troisième série où le nodule lui-même fut enlevé de sa capsule et les deux parties de la capsule sutturées, la circulation lymphatique fut renouvelée dès la première journée suivant l'intervention. Au cours de la septième journée, la cavité de la capsule vide commenca à diminuer et, petit à petit, elle se transforma dans une ou deux vaisseaux lymphatiques.

Dans la quatrième série des expériments les auteurs ont réalisé une transplantation intracapsulaire du nodule lymphatique entier. Dans 60% des cas les transplants ont pris et seulement une petite partie d'entre eux régénérait sous forme du tissu lymphatique ou bien encore des petits nodules imparfaits. Un renouvellement complèt des nodules lymphatiques transplantés ne se réalisa jamais ni sous forme de leur structure histologique, ni sous celle de leur grandeur. La circulation lymphatique à travers le nodule en transplantation ne semble avoir aucune influance quand à sa prise. L'important pour la prise, la régénération et la fonction du tissu lymphatique nodulaire en transplantation est toujours présenté par sa revascularisation.

ZUSAMMENFASSUNG

Experimentelle Verbindung der lymphatischen Wege und Autotransplantation der Lymphknoten

I. A. Yusupow

An 88 Hunden wurden 160 Operationen in vier Versuchsreihen vorgenommen. Hierbei sind zwei Methoden angewandt worden, welche als gegenseitige Kontrolle dienen und Ergänzung einer mit der anderen bilden. Es sind die direkte vitale Röntgen-Lymphographie und histologische Untersuchung. Auf diese Weise wurden 600 Röntgenogramme und 1.800 histologische Präparate untersucht.

In der ersten Versuchsreihe, in der die Wiederherstellung des lymphatischen Kreislaufes in der Gliedmasse studiert werden sollte, wurde der popliteale Lymphknoten zwischen den afferenten und ableitenden Gefässen vollständig durchgeschnitten. Es wurde festgestellt, dass sich der lymphatische Kreislauf am siebenten Tage nach Unterbrechung restituiert, und zwar auf der Basis der Regeneration in erster Reihe des die Lymphe aus der unteren Hälfte ableitenden Gefässes und hiernach auf der Basis der Regeneration des die Lymphe zur oberen Hälfte des durchgeschnittenen Knotens zuführenden Gefässes. Der Abfluss der Lymphe über die Wundflächen wird nicht wiederhergestellt, weil sich zwischen diesen Flächen Bindegewebe bildet. Aus einem durchgeschnittenen Lymphknoten bilden sich dann zwei selbständige Lymphknoten.

In der zweiten Versuchsreihe wurden die Hälften des durchgeschnittenen Lymphknotens vereinigt, indem die Kapsel zusammengenäht wurde; bei einer Gruppe von Tieren mittels unterbrochen geknoteter Nähte, bei einer anderen mit fortlaufender Naht. In dieser zweiten Gruppe, nämlich nach Sutur mit fortlaufender Naht, hat sich die Zirkulation der Lymphe bereits am ersten Tag wiederhergestellt; in der ersten Gruppe trat die Wiederherstellung der Lympströmmung vorläufig noch nicht auf. Am siebenten Tag war die Zirkulation der Lymphe in beiden Gruppen wiederhergestellt, aber nach der Wiederherstellung der Durchgängigkeit der eigentlichen Verbindung des durchgeschnittenen Lymphknotens beginnen verschiedene Regenerationsvarianten der ableitenden, afferenten und kolateralen Lymphgefässe überwiegen. In 40 % der Versuche sind durch die Sutur der Kapsel des Lymphknotens lediglich vereinzelte Sinuse wiederhergestellt worden. Volle, morphologisch vollständige Neubildung aller

Sinuse ist nicht zustandegekommen. Meist bildet sich kompaktes Bindegewebe, welches zur Ursache der absoluten Uudurchgängigkeit der Verbindung zwischen den zwei Hälften des Lymphknotens wird.

In dritter Versuchsserie ist der eigentliche Lymphknoten aus seiner Kapsel herausgenommen worden und die beiden Hälften der Kapsel wurden zusammengenäht. Der Abfluss der Lymphe restituierte sich am ersten postoperativen Tag. Am siebenten Tag begann sich die Höhle der leeren Kapsel verringern und gestaltete sich allmählich in ein oder zwei lymphatische Gefässe um.

In der vierten Versuchsserie wurde intrakapsuläre Transplantation des ganzen Lymphknotens vorgenommen. In 60 % der Versuche heilten die Transplantate an und ein geringer Teil derselben regenerierte in der Form des lymphatischen Gewebes oder von kleinen, unvollständigen Knoten. Vollständige Wiederherstellung der transplantierten Lymphknoten ist nicht zustandegekommen weder was ihre histologische Struktur anbelangt noch in Bezug auf ihre Grösse.

Die Zirkulation der Lymphe durch den intrakapsulär transplantierten Lymphknoten scheint auf seine Anheilung keinen Einfluss zu haben. Entscheidend bei der Anheilung, nachfolgenden Regeneration und Funktion des lymphatischen Gewebes des Knotens ist die Revaskularisierung.

RESUMEN

Ligazón experimental de los caminos linfáticos y la autotransplantación de los nodos linfáticos

I. A. Yusupov

En 88 perros se realizaron 160 operaciones en cuatro series de los experimentos. En ésto se aplicaron dos métodos, los que representaban el control recíproco y el complemento del uno para el otro; éstos son radio-linfografía y el examen histológico. De este modo se investigaron 600 radiografías y 1800 preparaciones histológicas.

En la primera serie de los experimentos en la que debían estudiar la recuperación de la circulación linfática en la extremidad el nodo linfático de corva entre los vasos de entrada y los de salida fue completamente cortado. Se comprobó que la circulación linfática se recuperaba al septimo día después de la interrupción, es decir sobre la base de la regeneración del vaso que se lleva la linfa de la mitad inferior y después del vaso que trae la linfa a la mitad superior del nodo cortado. La salida de la linfa por encima de las superficies de heridas del nodo cortado no se recupera, porque entre estas superficies se forma el tejido de ligamiento. De un nodo linfático cortado se forman después dos nodos independientes.

En la segunda serie de los experimentos las mitades del nodo linfático cortado se ligaron por la sutura de la capsula; en un grupo de los animales con los hilvanes entrecortadamente anudados y en el segundo grupo con el hilván continuador. En este segundo grupo, es decir después de la sutura con el hilván no entrecortado la salida de la linfa se renovó ya al primer día; mientras que en el primer grupo la circulación de la linfa no se recuperó. El séptimo día la circulación de la linfa se recuperó en los dos grupos, pero en la recuperación del paso de la ligazón propia del nodo cortado principian a predominar diversas variantes de la regeneración de los vasos de salida, los de entrada y de los vasos linfáticos colaterales. En los 40 por ciento experimentos con la sutura de la capsula del nodo linfático se recuperaron solamente los sinos esporádicos. La nueva formación completa, morfológicamente perfecta de todos sinos no se realizó. Las más veces se forma el tejido de ligamiento

compacto, la que ocasiona la impenetrabilidad absoluta de la ligazón de las dos mitades del nodo linfático.

En la tercera serie de los experimentos el nodo propio fue descascarado de su capsula y después ambas mitades de la capsula se recosieron. La salida de la linfa se recuperó al primer día después de la operación. El septimo día la cavidad de la capsula vacía principió a disminuirse y sucesivamente se transformó en uno o dos vasos linfáticos.

En el cuarto serie de los experimentos se realizó la transplantación intracapsular de todo el nodo linfáctico. En 60 por ciento de los experimentos los transplantes se encicatrizaron y su pequeña parte regeneró en forma del tejido linfático o en la de los nodos pequeños, imperfectos. La recuperación completa de los nodos transplantados no ocurrió ni en cuanto a su estructura histológica ni en cuanto a su dimensión. El paso de la linfa al través del nodo linfático intracapsularmente transplantado no parece tener ninguna influencia a su encicatrización. La revascularización es decisiva en la encicatrización, en la regeneración siguiente y en la función del tejido linfático del nodo.

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The Asian Pacific Federation of Plastic Surgeons is publishing Newsletter from July 1970. The leading article is written from prof. Dr. R. N. Sinha, president of the Federation.

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Clínica San Felipe, Lima (Perú)
Director Dr. Aldo Raffo

ULTRA SHORT GENERAL ANAESTHESIA IN PLASTIC SURGERY

H. LANDÁZURI

INTRODUCTION

We present in this paper an ultra short general anaesthetic derived from the Eugenol, the Propanidid that made local injections painless in more than 200 consecutive plastic operations by the author.

MATERIAL

In 204 patients, whose ages varied between 18 and 60 years and average age was 24 years, were operated on.

Of these 93 % were women.

Rhinoplasty	133
Profiloplasty	24
Multiplasty	15
Otoplasty	6
Rhytidectomies	9
Mamaplasty	4
Tumor or/and scars	6
Chin implants	3
Others	4
	204

In all the cases we have used the ultra short intravenous anaesthetic non barbituric, Propanidid which has the appearance of an odorless oil and is provided in 10 c.c. ampules containing 3 metoxy-4 (NN diethyl-carbamoyl-metoxy) fenyl acetic propyl-ester in a 5 % water solution emulgent not ionogenic, known experimentally for the last 6 years as FBA 1420.

There have been reports of 30,000 succesful anaesthesias in the last years. This product is basically an anaesthesic without analgesic effects.

When injected into the vein the ester acid unfolding takes place in the blood stream or at the first circulation, an then principally in the liver, and it is almost totally eliminated by the kidneys.

Being its anaesthetic effect short-lived, its action on the blood, liver, renal function, coronary and peripheric blood streams etc. is slight or non-existent.

Tolerance was tested on dogs by injuring the kidney by intravascular hemolisis with a dose of 25 to 50 times greater than that used for human beings. It is considered that cloropromazine has a sinergetic effect with Propanidid prolonging the duration of the anaesthesia. It is recommended to dilute it in water or physiologic serum at 2.5 % when used of children, very old people and cachectic, and in this way it can be administrated through a very fine needle.

METHOD

The procedure is as follows: 174 hospitalized patients were given Seconal 0.10 oral route and Siquil 0.10 or 0.15 according to their weight by intramuscular route. However, the 30 out patients did not receive any pre operative treatment.

When the patient is already in the operative room and ready to be operated on, and before he is anaesthetized it is recommended to have him clear his throat and swalow to counteract the increase of secretion that some times are produced.

After this, the anaesthesist doctor introduces into the vein with a 18 needle, the anaesthetic at a rate of 1 c.c. every 2 seconds till an amount of 5 to 7 c.c. is reached, according to the patients weight. At this moment the patient will take a deep breath indicating that he is under anaesthesia. Now Xilocaina can be administered at 2, 1 or ½ according to the amount of local anaesthesia to be used. Some times 1 or 2 c.c. more of Propanidid is suficient to avoid an early awakening of the patient. It is very seldom necessary to use the 10 c.c.

After this phase is over comes a waiting period of 1 to 3′ in which the patient recuperates and the rhinoplastic is started because the patient can swallow the blood without difficulty.

When the operation is such that no swallowing takes place, it can be started without waiting for the patient to come to complety.

On double operations, such as Ritidectomys, Multiplastys or Mamaplastys, after the first half of the operation is completed, the intravenous anaesthetic is administered again following the same rutine. In four patients we had to used 3 ampullas. It is not recommended to inject more than 3 ampullas in one operating session.

COMPLICATIONS

We have found that there is sometimes an increase of secretion at the nose and mouth, and sometimes short tremors, and only in 2 cases were there short laryngo-spasms that abated spontaneously.

Sometimes sneezing is observed when the infiltration is done for a Rhinoplasty.

In five cases the liquid came out of the vein without causing any injury. The literature on this product tell of a low percentage (1 %) of nauseas,

vomits, circulatory colapse and facial edema or urticaria. In our case studies none of these complications presented themselves.

Frequently, Propanidid will not be able to anesthetize patients under the effects of alcohol or cronic alcoholics.

COUNTER INDICATIONS

Cachectic children under 4 years old.
Hemolitic anemias.
Nefropaties with kidney injury.
Shock seizure conditions.
Acute alcoholic intoxication.
Hypo or hypertensive illness.
Serious cardiac or/and liver illness.

DISCUSSION

In the search to make plastic surgery as painless as possible we have used an ultra short general anaesthetic that being superficial and readily eliminated, does not produce serious complications that sometimes are present with general anaesthesias as cardiac arrest. In our cases as well as in the ones we have looked over, only minor complications have been reported.

Comparing the hospitalized patients, that got preanaesthetic treatment and the out-patients, that got none, here was no apparent difference. We are at present in the search of other preanaesthetic medications with the idea of reducing the minor complications such as: sneezing, tremors, increase of secretions, etc.

We recommend, for greater safety, that the drug be administered by an anaesthesist doctor who will control the patient until he comes to; this happens after about 5 minutes. In this way we avoid the worry and responsability of the patient and can do our own work much better, and in case any complications presents there is a specialists doctor to take care of it.

The cost increase is discrete and we consider that it justifies the practice because it makes plastic surgery "really painless" which is priceless.

SUMMARY

In this paper more than 200 plastic surgery patients are presented in which an ultra short general anaesthetic is used, making the local anaesthesia painles and avoiding general anaesthesia and its hazards.

The indications, counter indications, minor complications and results are give.

The use of the product is recommended.

I thank Dr. Aldo Raffo and Dr. Lino Ripamonti for their collaboration in this paper.

RÉSUMÉ

Une anésthésie ultra-courte dans la chirurgie plastique

H. Landázuri

L'auteur présente l'expérience de 200 des opérations plastiques à l'aide de l'anésthésie ultra-courte laquelle rende l'anésthésie locale pas douloureuse tout en supprimant la nécessité de l'opération dans la narcose avec tous ces mésavantages. L'auteur cite et explique les indications et les contra-indication. Des petites complications sont exposées et expliquées. L'auteur récommende le préparat Propanidid Analogon Eponton, Bayer [article Bayer].

ZUSAMMENFASSUNG

Ultrakurze Allgemeinanästhesie in der plastischen Chirurgie

H. Landázuri

Bericht über 200 plastische Operationen unter Anwendung von ultrakurzer Allgemeinanästhesie, welche die örtliche Betäubung vollkommen schmerzlos macht und dadurch die Notwendigkeit einer Operation unter Allgmeinanästhesie mit allen ihren Gefahren behebt.

Die Indikationen und Kontraindikationen werden erörtert. Es werden geringe Komplikationen angeführt. Der Autor empfiehlt das Präparat Propanidid Analogon Epontol, Bayer (Erzeugnis Bayer].

RESUMEN

Anéstesis ultracorta total en la anaplastía

H. Landázuri

La noticia sobre dos cientos anaplastías en las que se aplicó la anéstesis ultracorto total la que hizó anéstesis local completamente sin dolor y así frecuentemente elimina la necesidad de la operación en la anéstesis total con todos sus riesgos.

Se especifican las indicaciones y contraindicaciones. Se indican las complicaciones insignificantes. El autor recomienda la preparación Propanidid Analogon Epontol, Bayer (el producto de Bayer].

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Annotation on results in research activity by the Laboratories of Plastic Surgery, Czechoslovak Academy of Sciences

METHODS OF INTRAAMNIAL APPLICATION IN MAMMAL GERMS

M. DOSTÁL, R. JELÍNEK

A method on reliable application of substances into amnial sac in mammal already during organic development, was developed. The method affords to follow up the interaction of the teratogen-morphogenetic system of the germ directly, this having been impossible when applying teratogen via the mother. The reason is that it is not possible to determine the form, quantity and period after which teratogen arrives at the germ. We do not know the metabolism of the substance in the mother organism and the function of placenta barrier.

By this method there was determined the most sensitive phase of the closing of the palate in mice, considering the teratogenic effect of corticoids and proof was rendered on the cause of resistance of rat germs to induce cleaving of palate by corticoids applied via the mother, not being due to the resistance of the morphogenetic system of the secondary palate, itself.

This method may be applied to advantage, when analysing the system of "mother organism-placenta-germ" from various aspect (teratology, embryology, pharmacology, microbiology).

Documentation is available at the work place.

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Annotation on results in research activity by the Laboratories of Plastic Surgery, Czechoslovak Academy of Sciences

STUDY OF THE POLYGENIC CHARACTER OF CLEFT PALATE IN MODEL EXPERIMENT IN INBRED MICE STRAINS

I. VALHOVÁ

Elaborated was the question of the polygenic character of cleft palate induced by cortisone in two strains of inbred mice. For the detailed analysis, methods were used which are applied for the study of quantitative heredity, consisting in determination of the relative importance of genetic and external conditions of variability in the phenotype character of the individual. It was determined that formation of the induced cleft palate is influenced in respect of genetic factors by 20% and in respect of the external environment factors by 80%. By carrying out the calculation for determining the number of genetic factors applying in the formation of the induced cleft, two pairs of genetic factors were determined.

The findings obtained by these calculations are of importance for determining the direction of the further research of the cleft defect in the model experiment, its results should aid in the clarification of the etiology of cleft defect in human population.

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Annotation on results in research activity by the Laboratory of Plastic Surgery, Czechoslovak Academy of Sciences

GROWTH AND DEVELOPMENT OF SPLANCHNOCRANIUM IN CHILDREN WITH TOTAL UNILATERAL CLEFT

Ž. HAVLOVÁ

Research was directed to the evaluation of morphologic and growth changes on the skeleton of face and set of teeth in 90 individuals with unilateral cleft lip, mandible and palate, of age class 4—7 years.

In each individual of the cleft group and in children of the corresponding control group, 56 orofacial signs were followed up by means of teleroentgen pictures of the skull and imprints of the teeth of the upper and lower mandible. The data obtained were processed by statistical method of linear regression on the computer MINSK 22. By comparative study on 20 prepared children skulls it was verified that the direct craniometrical measurements and the measurements on teleroentgen pictures are practically identical.

Compared was also the effect of two operational methods applied when closing the defect of hard and soft palate, upon growth and development of splanchnocranium. It was the method of primary suture in soft palate, carried out in the first year (30 individuals) and by method of retroposition and pharyngofixation, carried out in the fourth year (60 individuals).

SOME RESULTS

1) Main facial dimensions, i.e. height, width and depth, increase in cleft and healthy children approximately equally.

2) The individual parts of skull base increase in cleft and in healthy children in the same relation.

3) Insufficient sagital and vertical growth of central third of face (in vertical sense) in children with cleft, was not proved.

4) Interocular distance is greater in cleft children group than in control group.

5) Piriformis apperture is wider in cleft individuals than in healthy children.

6) No considerable changes in the region of the mandible cavities were proved by the applied methods in cleft individuals.

7) Critical orthodontical anomalies occured in the majority of examined cleft children.

8) Disturbed occlusion of the external segment (cross bite is meant) was only diagnosed in 36,6% of the cases in the group operated by the method of primary suture of the soft palate, in 81,4% of the cases in the group with faryngofixation and retroposition of palate. Results of the work serve as data for creating a matrix for growth and development of splanchnocranium in cleft children and from the practical point they aid the solution of the question of deciding upon operational method and suitable postooperational orthodontical care for cleft individuals.

Team work in cooperation with senior physician M. Brejcha M.D.CSc of the Department of Roentgenology District Institute of National Health Prague 3, with the Clinic of Roentgenology, Medical Faculty of Hygiene, Charles University, J. Brzorád and the Department of Anthropology, Faculty of Natural Sciences, Charles University — K. Hajniš, M. D., CSc.

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The Brazilian Society of Plastic Surgery announced its new Board of Directors for the Biennial 1970/1972

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Annotation on results in research activity by the Laboratory of Plastic Surgery, Czechoslovak Academy of Sciences

RELATION BETWEEN THE SEGREGATION OF GENETICALLY CONDITIONED SIGNS AND THE SEGREGATION OF INDUCED CLEFT PALATE IN FETUS F_2 HYBRID GENERATION

A. JIRSÁKOVÁ I. VALHOVÁ

It was experimentally verified, whether cleft palate induced by cortisone in two strains of inbred mice and the F_2 hybrides are bound to some genetically conditioned signs, as their analogy in human population should be important. Determined was the relation between the type histocopatibilic antigen (H-2 antigen) and cleft palate and between electrophoretically different types of haemoglobin and cleft palate. It was found that the incidence of induced cleft palate is not bound to the type of haemoglobin with statistical significance. In cleft palate formation genetic factors apply only by 20% this explaining that there need be no relation between cleft palate and other genetically conditioned signs. The work contributed to the increase of our knowledge on induced cleft palate in inbred mice strains, it, disclosed the importance of studying the interaction of genetic and non-genetic factors and on basis of these findings we shall continue in further research of cleft palate in model experiment.

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Kazan Scientific Research Institute of Traumatology and Orthopaedics, Kazan (USSR)
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INSTRUMENTS FOR PERFORATION OF SKIN GRAFTS

A. L. GIMMELFARB

In operation in which free full-thickness skin grafts are used (in the so-called free total skin transplatations by the method of Janelidze-Parin), the transplant must be perforated in order to ensure drainage of the wound discharge. Making perforation holes permits to take a graft which is smaller in size than the defect to be covered with it. As becomes evident from the author's experience, employment of a skin "sieve" fully prevents the graft from being detached from its bed by fluid accumulating under it, and thus ensures a minimum risk of necrosis.

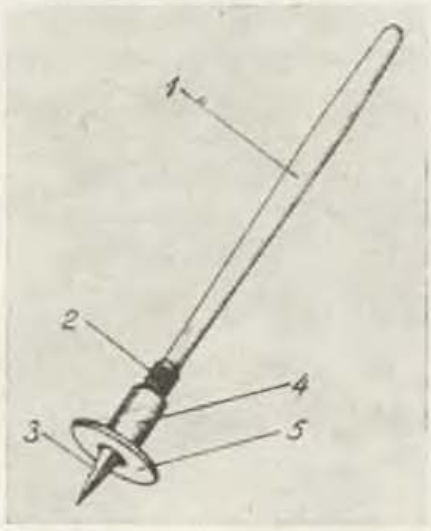

Fig. 1. Perforator for making single holes in a skin graft

Perforation of the graft can be carried out with a pointed scalpel. However, this has some disadvantages. It is, for instance, not possible to make holes of equal size, because the blade of the scalpel pierces the graft to a depth which can hardly be controled. Using a scalpel for the purpose also leads to additional traumatization of the graft by the blunt back of its blade which makes tiny tears in the tissue in this corner of the slit-shaped hole.

In order to eliminate these shortcomings, the author has constructed a perforator [Fig. 1*)].

The instrument has a handle (1) with a cut-in screw thread (2) on the one, widened end which terminates in a double-edged lancet (3). The nut (4) which fits the screw ends in a disc (5). By turning the nut, the disc is raised or lowered thus regulating the lenght of the lancet exposed.

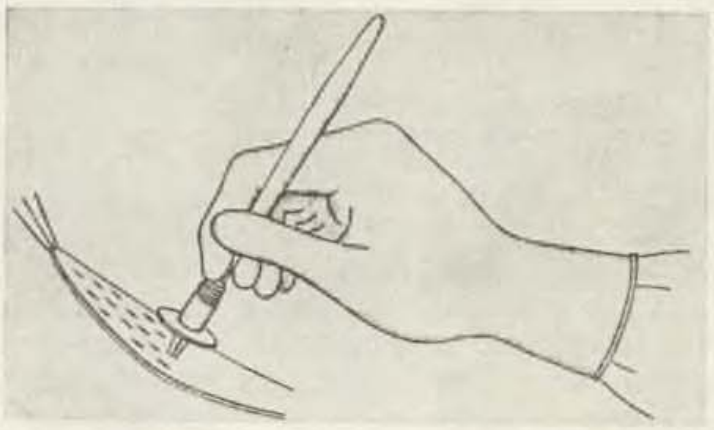

Fig. 2. Making of single holes in a skin graft

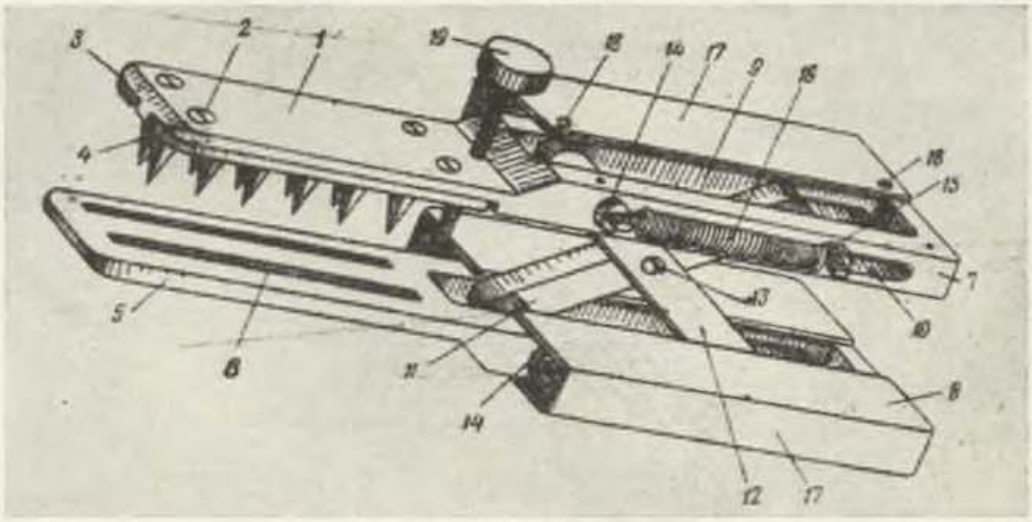

Fig. 3. Perforator for making a multitude of holes in a skin graft with one grip

On operation, the lancet blade is pushed into the graft to the depth limited by the disc-stop, which ensures making holes of equal size (Fig. 2). Because the edges of the lancet blade are sharp, additional traumatization of the graft, as occurs when using a scalpel, is eliminated.

The perforation holes in the graft should be arranged in the form of a chess-board, and the slit-shaped holes should be parallel to each other.

*) Author's certificate No 197861, dated April 17, 1967

Only observing of these directions permits taking a skin graft which is smaller than the defect to be covered with it. In small grafts the above perforator has proved its value.

Another device has been constructed by the author for perforation of large grafts [Fig. 3**)].

The instrument is a kind of pincers. Racks (3) with lancet blades (4) are fixed by screws (2) to the upper jaw (1). The lancets have the same shape as that described in perforator I, only here they are multiple, arranged in the form of a chessboard and parallel to each other. The lower jaw of the pincers (5) has two longitudinal slots (6) corresponding to the two rows of

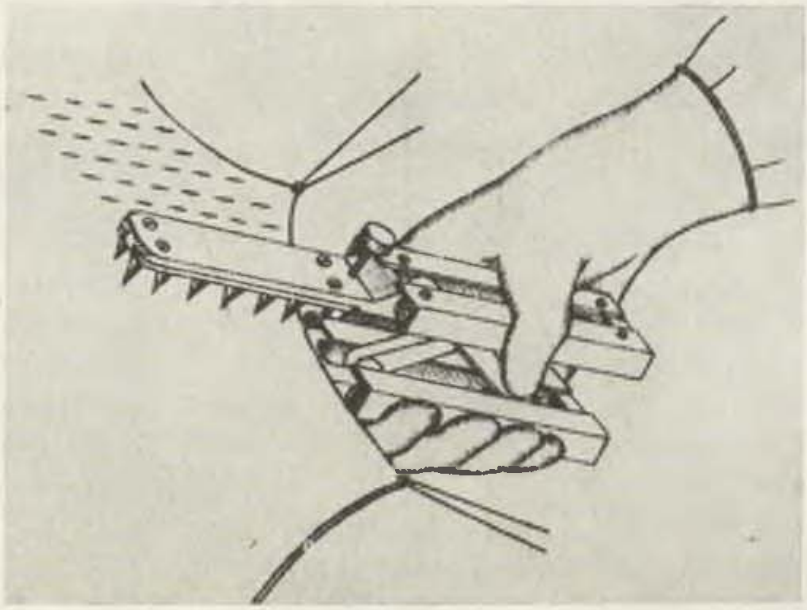

Fig. 4. Making of a multitude of holes in a skin graft with one grip

lancets in the upper jaw. In the handle parts of the pincers (7, 8), there are windows (9) and side slots (10). The windows contain two cross-bars (11, 12) joined in the middle by hinge (13). These cross-bars are fixed in front (14) to the pincer jaws and slide with their back-ends (15) in the side slots of the handle. Each fixed front-end of one bar is connected to the moving back-end of the other by a cylindral spring (16) (two springs altogether). The springs are covered by castings [17***)], which are fixed to the handle pieces of the jaws by screws (18). In the centre of the upper jaw there is a hand screw (19) serving as stop for regulating the depth to which the blades may pierce the graft.

The cross-bars make it possible to approximate the jaws keeping them parallel to each other. This ensures perforation holes of equal size. The

**) Author's certificate No 209631, dated Nov. 2, 1967.

***) In the figure the left upper casing has been removed.

springs which tend to bring the backend of the one bar to the front-end of the other on either side, always return the jaws to their original position.

For making perforation holes into a graft, the latter being kept spread out by rein sutures is placed between the jaws of the perforator. Then the jaws are shut by approximating the handles with the grip of one hand. The lancet blades pierce the graft and sink into the slots of the lower jaw as deeply as the stop-screw permits (Fig. 4).

Putting the stop-screw into required positions regulates the depth to which the blades may sink into the slots and thus also the size of the perforation holes. With the stop-screw fully turned down, the jaws of the perforator cannot be approximated, which means the instrument is in safety-position.

This perforator may also be employed for perforating heterogenous peritoneum grafts which, in the Institute, are used for covering the skin defects of donor sites in reconstructive operations.

SUMMARY

In transplantation of free full-thickness skin grafts by the method of Janelidze-Parin, the grafts must be perforated in order to ensure drainage of the wound discharge. Usually this is done with a pointed scalpel. Employment of a scalpel for the purpose, however, does not permit to control the size of the perforation holes and, in addition, the blunt back of the scalpel blade traumatizes the tissue.

In order to eliminate these shortcomings, the author has constructed a perforator (author's certificate No 197861, dated April 17, 1967), consisting of a double-edged lancet and a stopdevice to limit the depth to which the lancet may pierce the graft. This type of perforator is suitable for small grafts only.

For making perforation holes in large grafts, the author has constructed another type of perforator (author's certificate No 209631, dated Nov. 2, 1967) which has two rows of lancet-shaped dents arranged in the form of a chessboard. This type of perforator permits to make many holes into the graft with one grip and also to regulate their size.

RÉSUMÉ

Les instruments servant à la perforation des transplants cutanés

A. L. Gimmelfarb

Dans la transplantation des greffes totales de la peau d'après la méthode de Janelidze-Parin il y a la nécessité de perforation du transplantant afin que la sécrétion puisse couler du lit du transplant. Cette perforation est faite le plus souvent par al pointe tranchante du bistouri. Cette méthode n'est pas capable de nous assurer la grandeur uniforme des perforations et, en surplus, la pointe émoussée du bistouri endommage le tissu de la greffe.

Pour enlever ces fautes, l'auteur a construi un perforateur (le certificat d'auteur no. 197861 de la date du 17. 4. 1967) à double pointe tranchante et en plus, doué d'une tenu de la profondeur d'incision. Ce perforateur sert pour les greffes de moyenne grandeur.

Pour les greffes plus grandes, il y a une autre construction de perforateur (certificat d'auteur no. 206631 du 2ème novembre 1967) au dents multiples posés en forme d'échiquier. Ce type du perforateur nous permet de faire des perforations multiples en une fois et, en même temps, de régler leurs gradeurs.

ZUSAMMENFASSUNG

Instrumente zur Perforierung kutaner Transplantate

A. L. Gimmelfarb

Bei der Übertragung freier Hautpfropfen in gesamter Hautdicke nach Janelidze-Parin muss das Transplantat perforiert werden, damit das Abfliessen von Sekret aus der Wunde gesichert wird. Diese Perforation wird meist mit der scharfen Skalpelspitze durchgeführt. Dieses Verfahren gewährt jedoch keinesfalls eine gleichmässige Grösse der Perforationen und ausserdem quetscht der stumpfe Rücken der Skalpelklinge das Gewebe des Profpfens.

Um diese Mängel zu beseitigen, konstruierte der Autor einen Perforator (Autorenbeglaubigung Nr. 197861 vom 17. 4. 1967) mit doppelter Klinge und mit einem Anschlag zur Einschränkung der Durchdringungstiefe. Dieser Perforator eignet sich für nicht allzugrosse Pfropfen.

Zur Perforierung grösserer Tranplantate empfiehlt sich eine andere Konstruktion des Perforators (Autorenbeglaubigung Nr. 206631 vom 2. 11. 1967) mit vielfachen, in der Form des Schachbretts gegliederten Zähnen. Dieser Perforatortyp macht es möglich, eine multiple Perforation des Pfropfens in einem Schlag durchzuführen und zugleich die Grösse der Perforationen zu regeln.

RESUMEN

Instrumentos para perforar los transplantes de piel

A. L. Gimmelfarb

Al transplanter los injertos libres de la piel en todo espesor segun Janelidze-Parin es necesario perforar el transplante para asegurar la salida de la secreción de la herida. Esta perforación se hace las más veces con la punta afilada del escalpelo. Pero este modo no garantiza la dimensión uniforme de las perforaciones y además de eso la espalda embotada de la hoja del escalpelo damnifica el tejido del injerto.

Para eliminar estas faltas el autor construyó un aparato de perforar (la confirmación del autor No. 197861 de 17. 4. 1967) con el corte de dos clases y con el mecanismo de trinquete para limitar la profundiad de la penetración. Este aparato es conveniente para los injertos de piel no muy grandes.

Para perforar los transplantes más grandes se recomienda otra construcción del aparato de perforar (la confirmación del autor No. 206631 de 2. 11. 1967) con mellas cuantiosas desplegadas en la forma del tablero de ajedres. Este tipo del aparato de perforar permite realizar la perforación del injerto con una función y al mismo tiempo regular la dimensión de las perforaciones.

A. L. Gimmelfarb, ul. M. Gorky, 3, Kazan, USSR

INSTRUCTIONS TO AUTHORS

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I. A. Yusupov

JOINING OF LYMPH ROUTES AND AUTOTRANSPLANTATION OF LYMPH NODES IN EXPERIMENTS

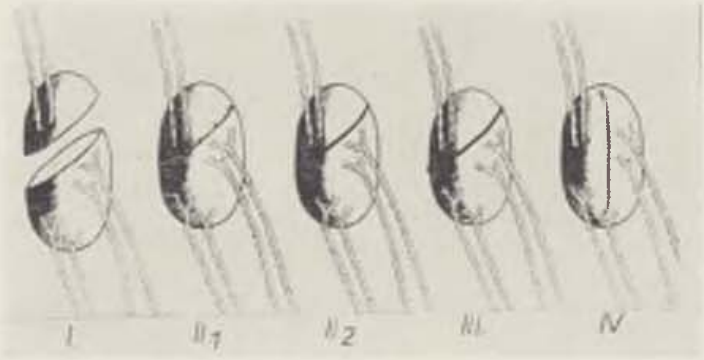

Fig. 1. Diagram of operation carried out in the different series

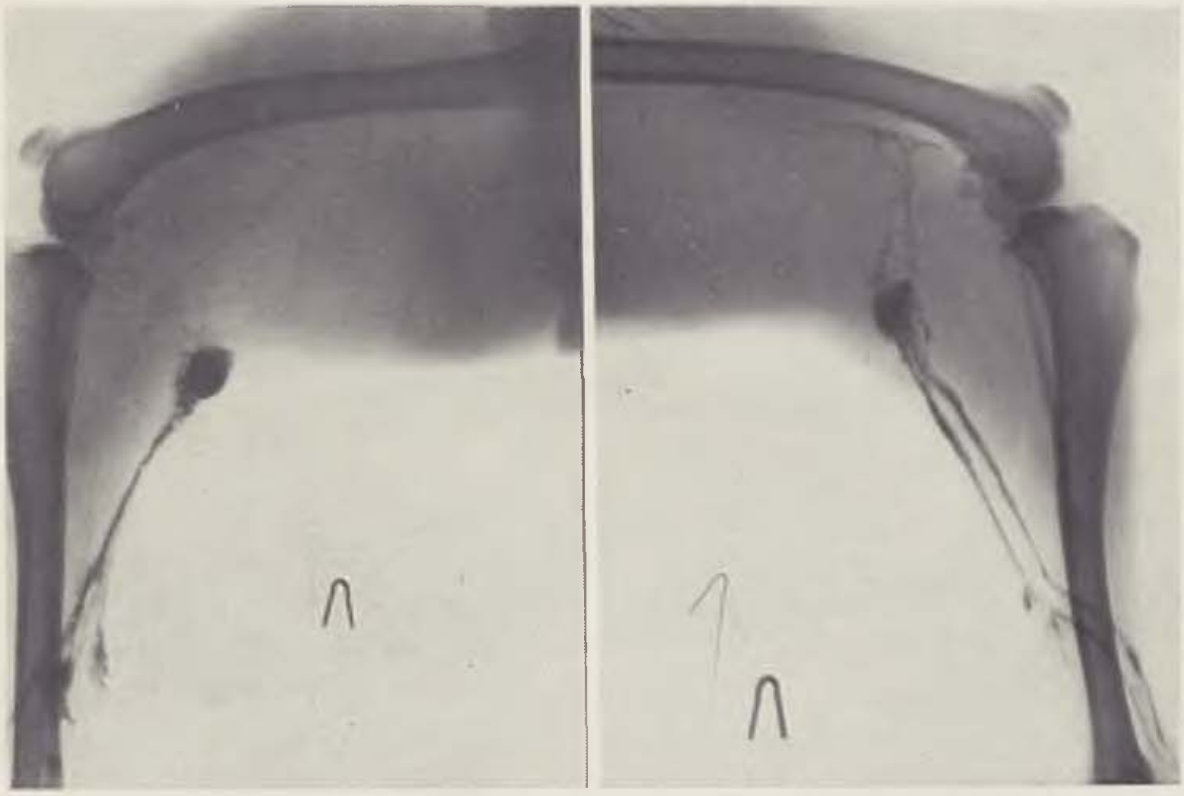

Fig. 2. Lymphography by injection of 3.5 ml of a 70% Diodon solution one day after operation. Medial lymph vessel has formed anastomosis with afferent vessel from lower third of leg. — Fig. 3. Lymphography by injection of 2 ml of a 70% Triiotrast solution seven days after operation. Efferent vessel from lower half of lymph node has regenerated

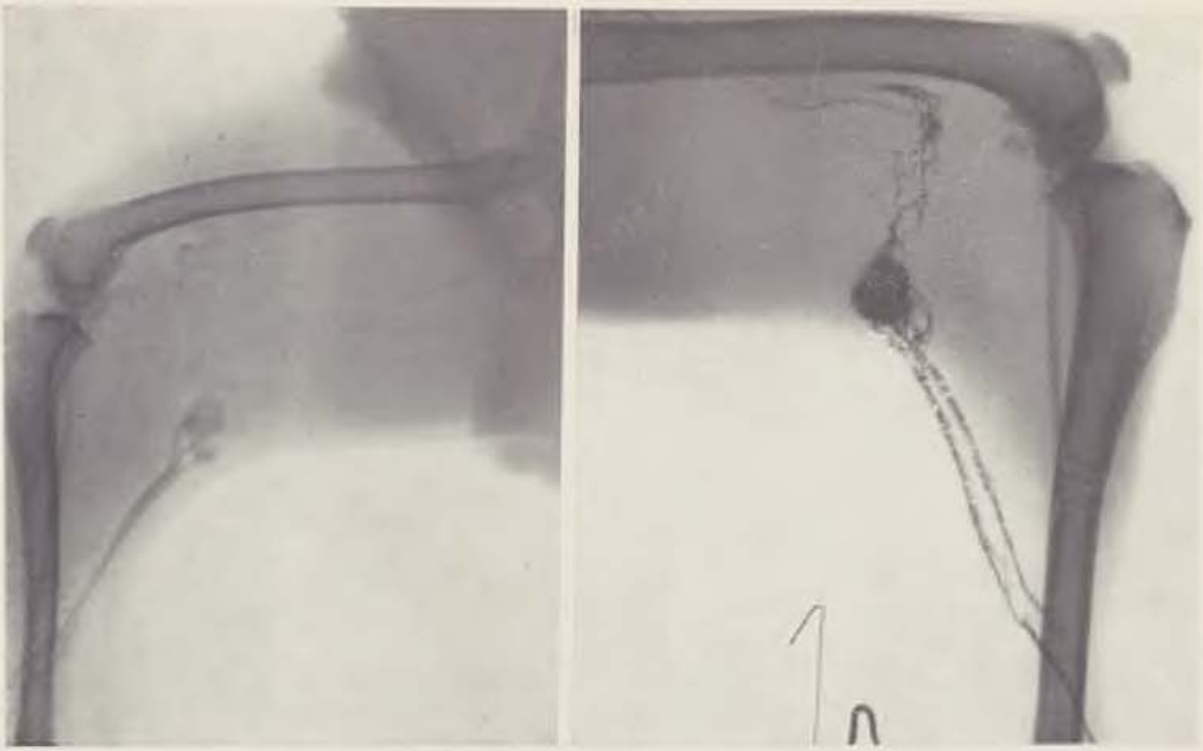

Fig. 4. Lymphography carried out 40 days after operation. Two solitary lymph nodes with afferent and efferent vessels have developed in popliteal region. — Fig. 5. Lymphography by injection of 3 ml of a 70% Triiotrast solution three days after operation (continuous suture joining the two halves of divided lymph node)

Fig. 6. Newly formed sinuses in space between the joined halves of divided lymph node 15 days after operation. Section stained with haematoxylin-eosin, magnified 35×

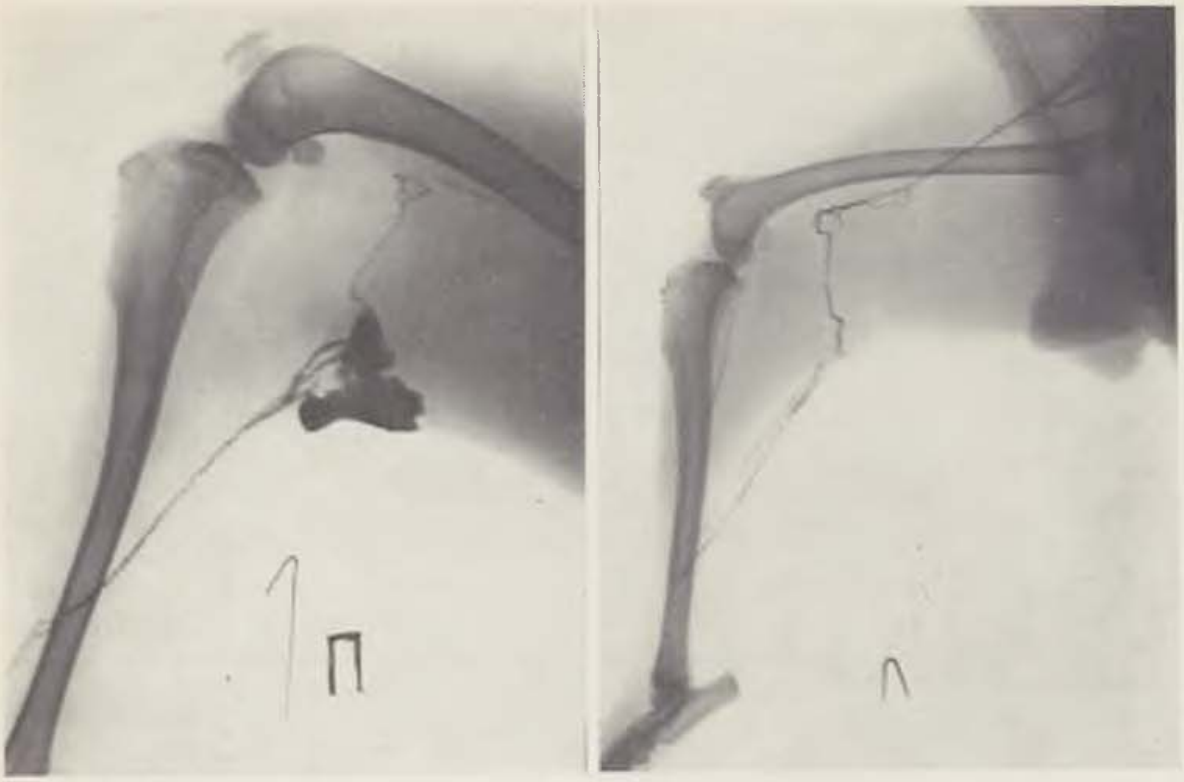

Fig. 7. Lymphography by injection of 4 ml of a 70% Triiotrast solution. Contrast substance has leaked out of lymph node sapsule into operation wound, although anastomosis is well patent. — Fig. 8. Lymphography carried out 90 days after operation. At site of lymph node capsule, a lymph vessel has developed

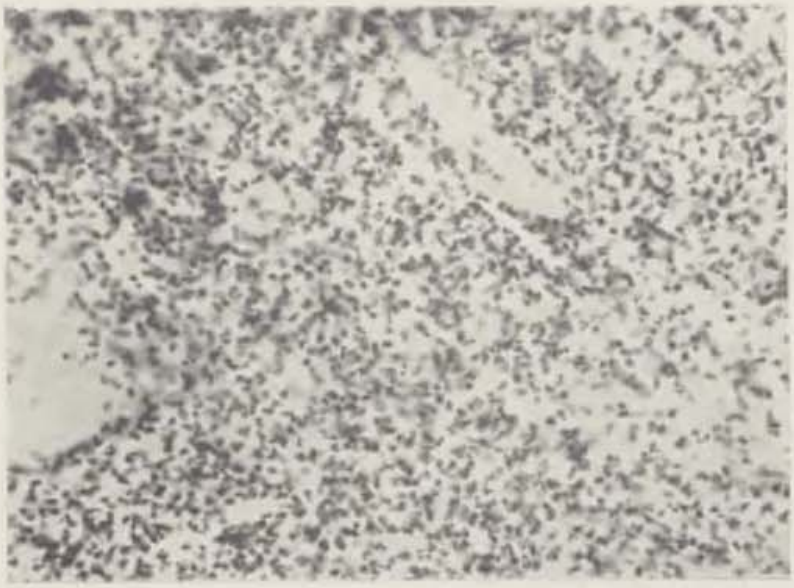

Fig. 9. Karyopyknosis and karyorhexis in border zone of lymphnode one day after operation. Section stained with haematoxylin-eosin, magnified 200×

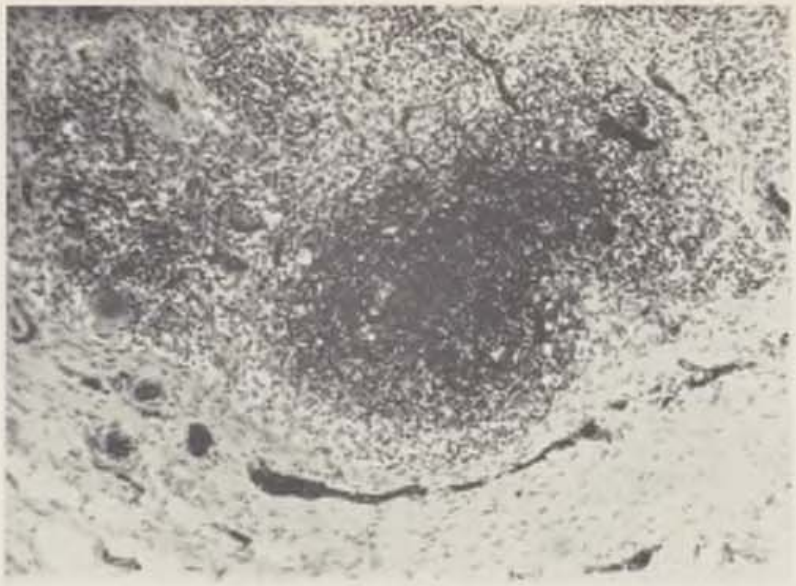

Fig. 10. Microfollicle and blood vessel filled with Indian ink ten days after operation (transplantation). Section stained according to van Gison, magnified 80×

Fig. 11. Lymphography by injection of 2.5 ml of a 70% Triiotrast solution 90 days after transplantation of lymph node. — Fig. 12. Newly formed small lymph node 90 days after operation. Section stained with haematoxylin-eosin, magnified 245×

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