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SIGNIFICANCE OF FACIAL PLASTIC OPERATIONS IN PSYCHICAL AND SOCIAL REHABILITATION

J. GOLDSTEIN, M. HANUSZKIEWICZ

The traditional Greek ideal of psychosomatic harmony (kalós kagathós) constitutes the basic problem of patients seeking plastic surgeon's help. In spite of the different cultural, historical or geographic conditions determinig the ideal of physical beauty, the existence of a desirable model and strong motivation to approach it is their common feature. A deformed, ugly man not only has problems connected with the self-awareness of his ugliness but also evokes aversion of the environment, and has less chances of success in life.

In this respect the face, the "soul's mirror", is of special importance. Therefore facial plastic surgery is strongly connected with psychological motives and consequences of operations, while success in treatment, i.e., restoration of the patient's physical, psychical and social balance requires, in most cases, close cooperation between the surgeon and the psychiatrist.

The role of these two specialities largely depends on the severity of deformation. All the patients may be roughly divided into 2 groups: these with a clearly visible facial deformation and those with slight or even doubtful beauty defect which is, however, strongly felt by them. Operations are essential for the first group of patients. By improving their appearance, they make possible a psychic and social rehabilitation. However, because the possibilities of surgery are limited, parallel psychotherapy of these patients is advisable. Psychiatry helps surgery here. Psychic immaturity of patients, who tend to associate their misfortunes with a minimum beauty defect, is essential for the second group. The main problem is a psychiatric one and, if operations are advisable at all, they can only complement psychotherapy. Here surgery helps psychiatry.

A closer psychological analysis calls for one more division. Psychological problems differ according to whether the deformations are congenital or acquired. This, differentiation is not of great importance for patients with slight deformations where psychic profile is decisive. It is, however, very important in cases of big deformations. Let us have a look at those groups of patients.

I. Big post-traumatic deformations. They usually happen to people with already well-shaped personality, and their reaction to the deformation depends on their maturity and will-power. The importance of operations is obvious. They restore

favourable aesthetic appearance and make possible a psychical and social rehabilitation. But even when the possibilities of improving the appearance are limited, the mere undergoing of operation and the possibility of consequent corrective interventions is for the patient a form of active resistance to ill fate, and it helps to regain psychic balance.

II. Big congenital deformations. The personality of these patients is formed in the shade of the deformation. People who are not treated, or improperly treated, are bound to be troubled, especially in the emotional sphere, because of the lack of acceptance from their environment. Such people usually become passive and closed-in. They refrain from taking up the more difficult tasks in order to avoid confrontation or conflicts with healthy people. Investigations of life history of improperly treated grown-ups with cleft lip and palate carried out in our Department many years ago demonstrated their decreased life activity: lower level of education, living on invalid pensions, and resigning from forming families. This stands in direct opposition to the fates of children who undergo complex treatment in our Centre. Most of them attend normal primary or secondary schools, get professional education and set up families. The role of plastic surgery is evident here. The medical teams influence on the child's parents and a close cooperation with them should also be appreciated. Wrong educational attitudes are very frequent among teachers and parents. They are over-protective, they pity the child or, on the contrary, they show aversion, indifference or even disgust. Both attitudes are harmful to the child's development. The role of the surgeon as advisor is essential here.

Puberty and adolescence are especially difficult for children with facial defects. All the problems of this age that the healthy children experience, are intensified because of disadvantageous appearance, limited professional possibilities, difficulties with finding a partner, etc. A systematic and effective treatment of the child from its birth, after which no or only slight traces of the congenital defect remain, is the best way of prevention of these difficulties. Unfortunately it is not always possible. Admission to the Department of Plastic Surgery sometimes helps the young man. Apart from the prospect of further improvement of appearance through operations, he meets with understanding and acceptance on the part of the staff and patients similar to him, which helps him in maintaining psychic balance.

III. Slight congenital or acquired defects. The group of people with slight facial defects is large and constitutes the majority of patients. Psychological and medical examinations of our patients demonstrated that many of them are emotinally upset out of proportion with the cause. Persistent thoughts of deformation, depressions and inferiority complex inhibit their activity. The mechanism of "escape into illness" is frequent; a small defect of beauty is held responsible for all the misfortunes. These patients' urge to be operated is so strong that they sometimes threaten suicide in case of refusal of surgical treatment.

Many experienced plastic surgeons warn against operating such patients, out of fear of consequences. The operation can not fulfill the patient's expectations, i.e., it cannot change his life situation. It may lead to his discontent, resentment of the surgeon and demands of further corrective operations. We are of the opinion that, in spite of the possible risk, we can and should help those patients, the majority

of whom undoubtfully suffer, although their discomfort is not objectively justifiable. A favourable psycho-corrective influence of operation, which is part of the complex treatment is, as a rule, observed. A kind of psychotherapy, in the form of positive, approving opinions on the results of operations, expressed by the entire staff of our Department, may be of some significance.

A special category of patients with slight facial deformations, who search for the help of plastic surgeon, should be mentioned in conclusion. These are mentally diseased, whose minimum or imachgiary defects of beauty may be the sign of dismorphophobia as the early symptom of psychosis, usually schizophrenia. Such patients are quite frequent and constitute up to 10 per cent of the third group. Treatment by operation is, as a rule, contraindicated in such cases. Failure of correct diagnosis and unnecessary operation can cause intensification of illness. But, in two exceptional cases, which we have had in our material, following the psychiatrist's advice, we performed corrective operations which had positive influence on further treatment of psychosis. The cases of the mentally diseased provide an especially evident example of the necessity of close cooperation between the plastic surgeon and the psychiatrist in treating facial deformations.

The number of people searching for help of plastic surgery is constantly growing and will probably still grow. The progress of medicine makes it possible to keep alive more and more children with congenital defects. Development of transport and industry increases the number of accidents fraught with mechanical, thermal and chemical traumas. Social consciousness and aesthetic demands grow together with development of education and culture. Finally — last but not least — the development of our civilization unfortunately leads to the increase of cases of psychosis and neurosis.

We are happy that, thanks to constant progress of plastic surgery, we can, more and more successfully, help the growing number of ill people and contribute to their complete psychical and social rehabilitation.

SUMMARY

Patients with facial deformation who seek the help of a plastic surgeon, usually present with various complicated psychological problems. Successful treatment of such patients requires close cooperation between the surgeon and the psychiatrist. Our experience indicates that there are different groups of patients in respect to the size and kind of the deformations, their influence on the patient's emotional and social life, and the possibilities of plastic surgery.

Patients with severe post-traumatic deformities first of all need surgical treatment, psychotherapy supplements the frequently limited possibilities of surgery. Patients with extensive congenital deformations usually have a seriously affected emotional sphere. Effective treatment of such cases, particularly in pubertal age and adolescence, requires almost equal participation of the surgeon and the psychiatrist. Patients with minor congenital or acquired facial lesions mainly need psychotherapy. In many such cases surgery is suggested as a supplementary but important therapeutic approach.

Thanks to a rationally planned and thoroughly performed joint surgical and psychological therapy, complete emotional and social rehabilitation has been achieved in many of our patients.

RÉSUMÉ

Importance des opérations plastiquers de la face pour la réhabilitation psychologique et sociale

Goldstein J., Hanuszkiewicz M.

Les malades avec les déformations de la face qui cherchent une aide médicale ont souvent de différents problèmes psychologiques compliqués. Pour être réussi, le traitement nécessite une étroite collaboration entre le chirurgien et le psychiatre. Nos expériences démontrent qu'il existe de différents groupes de malades en ce qui concern l'extension et le genre de la déformation et de son influence sur la vie émotive et socialee des malades, de meme que sur les possibilités de la chirurgie plastique. Les malades avec de graves déformations causées par un accident ont besoin surtout d'une aide chirurgicale, la psychothérapie ne fait que compléter les possibilités du chirurgien, souvent assez restraintes. Les malades avec de grosses déformations innées ont souvent aussi des affections dans le domaine émotif. Dans ces cas — ci, le traitement effectif exige la participation d'un chirurgien de même que d'un psychiatre ce qui est valable surtout pour la période de l'adolescence. Les patients avec de petit défauts innés ou acquis de la face ont besoin en générale de la psychothérapie. Dans les cas similaires la chirurgie est considérée comme un moyen complémentaire bien que important. — Grâce à la planification rationelle et à la combinaison du traitement chirurgicale et psychologue, on est arrivé chez beaucoup de patients a une réhabilitation émotive et sociale complète.

ZUSAMMENFASSUNG

Bedeutung der plastischen Gesichtsoperationen für die psychologische und soziale Rehabilitation

Goldstein J., Hanuszkiewicz M.

Kranke mit Gesichtsdeformationen, die die ärztliche Hilfe suchen, haben in der Regel verschiedene komplizierte psychologische Probleme. Die erfolgreiche Behanldung solcher Patienten erfordert eine enge Zusammenarbeit des Chirurgen mit dem Psychiater. Unsere Erfahrungen zeigen, dass es hinsichtlich des Umfanges und der Art der Deformationen und ihres Einflusses auf das emotionale und soziale Leben der Betroffenen sowie der Möglichkeiten der plastischen Chirurgie verschiedene Krankengruppen gibt. Kranke mit schweren posttraumatischen Deformationen benötigen vor allem chirurgische Hilfe, die Psychotherapie ergänzt die häufig begrenzten Möglichkeiten des Chirurgen. Patienten mit umfangreichen angeborenen Deformationen haben in der Regel auch ernste Affekte in der Emotionalsphäre. In solchen Fällen, besonders in der Zeit der Heranreifung und des Jünglingsalters, erfordert die effektive Behandlung fast gleichermassen die Beteiligung des Chirurgen und auch des Psychiaters. Patienten mit geringeren angeborenen oder erworbenen Gesichtsfehlern benötigen in der Regel Psychotherapie. In vielen ähnlichen Fällen wird die Chirurgie als ein ergänzendes, obwohl wichtiges Herangehen angesehen. Dank der rationellen Planung und der sorgfältigen Kombination der chirurgischen und psychologischen Behandlung wurde bei vielen unserer Patienten vollständige emotionale und soziale Rehabilitation erreicht.

RESUMEN

Importancia de operaciones plásticas de la cara para la rehabilitación sicológica y social

Goldstein J., Hanuszkiewicz M.

Los que con deformaciones faciales vienen a buscar la asistencia médica generalmente sufren de complicados problemas sicológicos. Para que el tratamiento de tales pacientes resulte exitoso se requiere uña estrecha colaboración entre el cirujano y el siquiatra. Nuestras experiencias demuestran que existen diferentes grupos de enfermos en cuanto a la envergadura y el tipo de deformaciones y su repercusión sobre la vida emocional y social de los pacientes así como sobre las posibilidades de la quirurgía plástica. Los pacientes con graves deformaciones postraumáticas necesitan, ante todo, de intervención quirúrgica siendo la sicoterapia sólo completiva de las posibilidades del quirurgo, con frecuencia muy limitadas. Los pacientes con vastas deformaciones congénitas, en cambio, generalmente traen graves afecciones a la esfera emocional. En tales casos, particularmente en la pubertad y adolescencia, el tratamiento para ser eficiente, requiere en igual medida la participación de tanto el cirujano como el siquiatra. Los pacientes con defectos menores, congénitos o adquiridos, de la cara necesitan generalmente de sicoterapia. En muchos casos similares la quirurgia se considera complementaria aunque por ello no menos importante. — Gracias a una planificación racional y una esmerada combinación de la terapia quirúrgica y sicológica muchos de nuestros pacientes han podido lograr una rehabilitación social y emocional completa.

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COMPLEX TREATMENT OF CLEFT LIP AND CLEFT PALATE

J. GOLDSTEIN, J. KRUK, W. JANUSZEWSKA

Cleft lip and cleft palate are, as we know, the most frequent congenital facial deformities, and belong to the 10 most common congenital defects. They occur in approximately 2 per 1000 cases of live born children. The cleft may concern the lip or the palate only, or both, it can be incomplete or complete, uni- or bilateral; it may be associated with other congenital defects or syndromes. At any rate, the consequences are serious and comprehensive: aesthetic, functional, psychological, and social. Cleft lip causes deformation, hurting the child's appearance. Cleft palate disturbs the functions of breathing and swallowing and, above all, speech which may be so unintelligible as to make the sick child's contact with its environment impossible. Such children are often badly treated by their schoolmates, friends, family, and acquire permanent psychological traumas. This has a negative effect on their development, especially emotional, as well as their attitude towards society. The frequency of clefts and the importance of their consequences make this defect a serious social problem.

Modern surgical treatment of clefts has been applied for over 40 years. Progress in understanding pathogenesis, and technical improvements have enabled surgeons to obtain satisfactory aesthetic and functional results. It has turned out, however, that the progress of surgery is not enough to solve the problem; some children never got to the surgical centres or got there too late, others returned home without defect but with lasting disturbances of occlusion and speech, as well as with psychological problems. This situation gave rise to the idea of complex treatment, i.e., a treatment conducted by a group of specialists, stage by stage, for many years — from the child's birth until its attainment of physical, psychical and social maturity.

The first and so far the only centre of this kind in Poland was organized in 1962 at the Maxillo-Facial Surgery Department at the Medical Academy of Lódź under the name of the Centre for Treatment of Congenital Facial Defects. In 1972 the Centre became attached to the Department of Plastic Surgery and extended its range of activities to all congenital defects of integument. Our experience is considerable. During the 17 years of the existence of the Centre over 4000 children with various congenital defects have been registered, over 2000 of which with cleft lip and/or cleft palate.

Every child born with a congenital defect is reported to us by mail or by telephone through the newborn sections of the hospitals in the Łódź region. The child is called in to the Centre for the first examination already in the first month of its life. During the first visit we get from the mother a detailed etiopathogenetic anamnesis as well as data concerning the child's development. Then the child is examined by specialists: pediatrician, plastic surgeon, maxillary surgeon, orthodontist, phoniatrician. Older children are consulted by a psychologist if necessary. In case of presence of other defects, the child is directed to appropriate specialists (laryngologist, ophtahlmologist, neurologist, urologist or others) who, however, are not members of the permanent Centre staff. After the examination the pediatrician and the nurse explain the principles of nursing the cleft child to the mother. The surgeon prescribes massages of the cleft lip and teaches the mother to do them, he also discusses the principles of cooperation between the parents and the medical team and informs the mother about the several stages of treatment of the child. The orthodontist takes the maxillary impression from children with complete lip and palate cleft to construct an individual apparatus directing the growth of the cleft parts of maxilla and facilitating the child's breathing and feeding.

Treatment scheme is established by the group of specialists according to the form of the defect and the general condition of the child, individually for every patient. The dates of the child's subsequent visits to the Centre are set up accordingly. Generally the operation of the lip is planned between the 6th and 8th month, and that of the palate between the 18th and 24th month of life. During the first half year the child is prepared for surgical treatment by the pediatrician and the orthodontist, the same specialists playing the major role in the child's care in the period between the operation of the lip and the palate.

A phoniatric examination takes place just before the palate operation, and afterwards the surgeon and the phoniatrician choose the most adequate method of operation for the given form of cleft. After the plastic reconstruction of the palate the child is examined many times by a phoniatrician who, if necessary, directs it for logopedic exercises, and sometimes qualifies it for a secondary plastic operation using the posterior pharyngeal flap.

In the pre-school and school periods the child remains under the orthodontist's care. He designs, when necessary, individual orthodontic apparatus, made by the dental technician employed by the Centre. At this age corrective operations of the soft parts of the nose, the upper lip and the oral vestibulum may be performed.

After puberty is reached, between the years 14—16, the central part of the face stops to grow. Then it is possible to perform corrective plastic operations on the bones of the nose and jaws. The role of the psychologist is very important in this period; he helps the child to select the most suitable secondary school and profession, as well as to solve the problems and difficulties of the adolescence intensified by consequences of the defect.

The system of complex treatment of clefts outlined above, apart from its medical advantages, is of profit to the parents, saving their time, effort and travelling expenses and making possible their close cooperation with the medical team in the treatment and up-bringing of their child.

The comparison of results obtained during the 17 years of existence of our Centre with results of purely surgical treatment in the earlier period clearly proves the superiority of the complex treatment. In most cases it makes it possible to obtain successful aesthetic and functional results in the form of favourable appearance, correct occlusion and intelligible speech. Thanks to this people with the defect can obtain education and carry on an adequate profession, lead normal family life and participate in social activities.

SUMMARY

Cleft lip and palate are classified as the most frequent congenital facial malformations and occur in two out of 1000 cases of live born infants. The defect causes a considerable face deformation and impairs breathing, swallowing and speech. In the Centre for Treatment of Congenital Defects at the Department of Plastic Surgery, Medical Academy, Łódź, 2000 children with cleft lip and palate were treated within 17 years' period.

The paper outlines the applied schedule of therapy by a team of specialists; thanks to it the treatment can be instituted in due time, carried out systematically and comprehensively and ensure favourable aesthetic and functional results. The availability of different specialists working in the Centre is also convenient for the parents of sick children — it spares their time, strain and travelling expenses.

RÉSUMÉ

Traitement complexe de la fissure de la lèvre et du palais

Goldstein J., Kruk J., Januszewska W.

Les fissures de la lèvre et du palais se classent parmi les malformations innées de la face les plus fréquentes et se trouvent chez 2 des 1000 nouveau-nés. Le défaut provoque de grosses déformations de la face et rend difficile la respiration, la possibilité d'avaler et la parole. Dans le centre du traitement des défauts innés au département de la chirurgie plastique de l'Academie médiacle à Łódź, 2000 enfants avec les fissures de la lèvre et du palais ont été traités au cours de 17 ans. — Dans l'article on montre la méthode médicale appliqée par un collectif de spécialistes. Grâce à eaux, le traitement peut commencer à temps, est mené systématiquement et responsablement et assure des résultats fonctionels et esthétiques favorables. Il convient aux parents des enfants malades que tous les spécialistes sont bien disponibles et qu'on leur évite la tension, les pertes de tempes et les frais de voyage inutiles.

ZUSAMMENFASSUNG

Komplexe Behandlung der Lippen- und Gaumenspalte

Goldstein J., Kruk J., Januszewska W.

Die Lippen- und Gaumenspalten gehören zu den häufigsten angeborenen Malformationen des Gesichtes und erscheinen annähernd zweimal unter 1000 lebendig geborenen Kindern. Der Defekt verursacht wesentliche Gesichtsdeformationen und erschwert die Atmung, das Schlucken und die Sprache. Im Zentrum für die Behandlung angebo-

rener Fehler am Lehrstuhl der plastischen Chirurgie der Medizinischen Akademie in Łódź wurden im Zeit raum von 17 Jahren 2000 Kinder mit Lippen- und Gaumenspalten behandelt. Im Artikel wurde das von einem Expertenteam benutzte Behandlungsverfahren beschrieben. Dank diesem Verfahren kann die Behandlung rechtzeitig eingesetzt, systematisch und verantwortungsvoll geführt werden und günstige esthetische und funktionelle Ergebnisse sichern. Den Eltern der kranken Kinder kommt die Erreichbarkeit aller Fachärzte sowie die Tatsache, dass ihnen die Nervenspannung, die Zeitverluste und Reisekosten erspart bleiben, entgegen.

RESUMEN

Tratamiento global de la escisión del labio y del paladar

Goldstein J., Kruk J., Januszewska W.

Las escisiones del labio y del paladar pertenecen a las malformaciones de la cara de mayor frecuencia dándose aproximadamente dos casos sobre cada 1000 niños nacidos vivos. Son producto del defecto considerables deformaciones de la cara junto con dificultades al respirar, tragar y hablar. En el Centro de Tratamiento de Defectos Congénitos adjunto a la cátedra de cirugía plástica de la Academia de Medicina en la ciudad de Łódź, Polonia, durante un período de 17 años se sometió al tratamiento a 2000 niños que padecían de escisiones del labio y del paladar. — En el artículo se indica el método de tratamiento utilizado por un equipo de especialistas. Gracias al método el tratamiento puede ser aplicado a tiempo, se desarrolla sistemáticamente y con responsabilidad asegurándose así resultados estéticos y funcionales. Es ventaja para los padres de los niños el fácil acceso a todos los especialistas a la vez que se ahorran la tensión nerviosa, pérdidas de tiempo y gastos de viaje.

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MANAGEMENT OF ISLAND AND FREE DORSALIS PEDIS FLAPS IN SURGERY OF LOWER EXTREMITIES

K. KOBUS, A. LICZNERSKI, J. STEPNIEWSKI, W. CHARKO

The treatment of lower extremity skin defects, especially in its distal parts, belongs, to challenging and difficult problems. The real "crux chirurgorum" make concomitance of bone involvement and surgery of the weight-bearing areas.

The conventional methods of treatment consist mainly in cross-leg flap and occasionally with tubular flap transfer. Above mentioned surgery is both long lasting and very tiresome to patients as it is connected with many possible complications. Sometimes, especially after extensive and deep burns, the lack of material suitable for cross-leg plasty consists of important stands in the way of traditional treatment.

During the last years the new concepts such as the muscle or mycutaneous flaps (3, 6), and various pedicle or free flap transfers, (1, 5, 7, 8) have been introduced to deal with the above discussed problems. As the former techniques have main application to the treatment of pressure sores and other defects in the thighs and upper parts of the legs, we have been rather interested in suitability of latter methods, and especially to use of island and free dorsalis pedis flaps. The main reason for the choice of such flaps has been connected with possibility of their innervation.

MATERIAL

Seven male patients with posttraumatic foot and lower 1/3 leg skin defects were managed using 3 island and 4 dorsalis pedis free flaps between June 1977 and April 1979. Tabl 1.

General anaesthesia was used for preparation and transplantation of flaps.

The technique used to raise the flap was essentially that of Mc Craw and Furlow (6). In addition to the vessels, in all island flaps and in 3 free flaps provided to the weight-bearing and exposed to trauma areas, the branches of the superficial peroneal nerve were also mobilized. In contradistinction to Robinson (10), the island flap delivery through a subcutaneous tunnel was rather avoided in fear of possible dammage and vessel constriction. For free flap transfer, after ulceration or scar excision the suitable recipient vessels and suralis nerve were dissected and prepared for anastomosis. To avoid or diminish eventual lower extremity ischemia, the recipient

Table 1

No	Age	Diagnosis	Period from injuries	Kind and size of flap	Complications	Discrimination test	Observation time	Functional result
1.	25	Posttraumatic ulceration of the calcanear region	4-years	I. S. F. 5 × 3.5 cm	—	1.2 cm	12 months	excellent
2.	5	Postburn contracture and severe deformity of the foot	4-years	I. S. F. 8 × 6 cm	mild infection on the donor site	1.5 cm	10 months	good
3.	27	Ulceration of the sole and calcanear region after scalpation	5-years	F. S. F. 12.5 × 9.5 cm	prolonged healing	1.5—2 cm	18 months	excellent
4.	28	Posttraumatic wound in the calcanear region	38 days	F. S. F. 11 × 9 cm	—	1.5—2 cm	11 months	excellent
5.	22	Postelectrical burn deformity on the dorsum pedis	1-year	F. S. F. 10 × 8 cm	partial necrosis 4 × 1 cm	1.5—2 cm	12 months	good
6.	44	Skin defect of the leg concomited with open fracture of the tibia	2 months	F. F. 10 × 9 cm	partial necrosis 4 × 0.5 cm and wound supuration due to osteitis		6 months	good
7.	56	Skin defect of the malleolus region after fracture of the tibia	2 months	I. S. F. 4 × 3 cm	wound infection on the donor site	1.5 cm	5 months	good

F. F. — free flap
F. S. F. — free sensory flap
I. S. F. — island sensory flap

vessels were cut in their most distal parts, like recent suggestion made by Shaw and al. (9). The vascular and epineural anastomoses were established in the typical manner under the microscope or magnifying glass, using 10-0 and 8-0 monofilament nylon interrupted sutures. During the post operative period mild elevation of lower limbs was applied. Low molecular Dextran, Aspirin and Persantine were administered for a period of 5—7 days.

In order to stress some practical problems we shall describe briefly 4 of the cases.

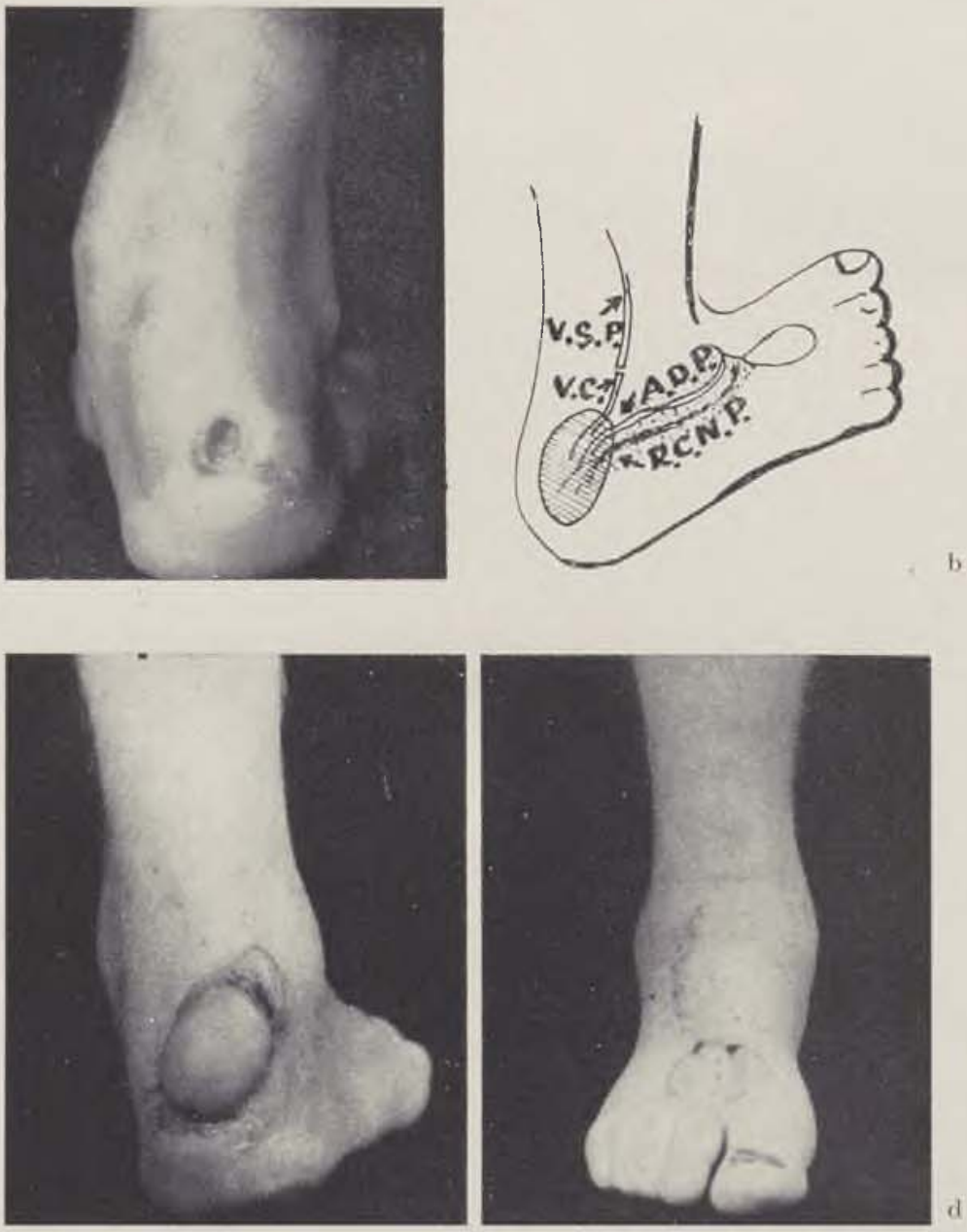


Fig. 1. Case 1. Postraumatic ulceration of the calcanear region 4-years after injury. a — The preoperative appearance. b — Scheme of operation: A. D. P. - arteria dorsalis pedis, R.C.N.P. — ramus cutaneus nervi peronaei, V. S. P - vena saphena parva, V. C-vena cutanea. c — Result of surgery, six weeks after operation. — d Donor site six weeks after surgery.

Case 1.

A 25-year-old man had sustained heel injury in a traffic accident with subsequent deep ulceration of 2 months duration. On January 31, 1978 the island flap from the dorsum of the same foot was raised and delivered through a subcutaneous tunnel to the heel. Despite preoperative evaluation, the pedicle - and especially the marginal vein — were too short, to cover the defect without tension. The cut of vein, and stump anastomosis to the branch of vena saphena parva diminished pulling a little, but in fear of possible venous backflow impairment the sutures were not tied. To

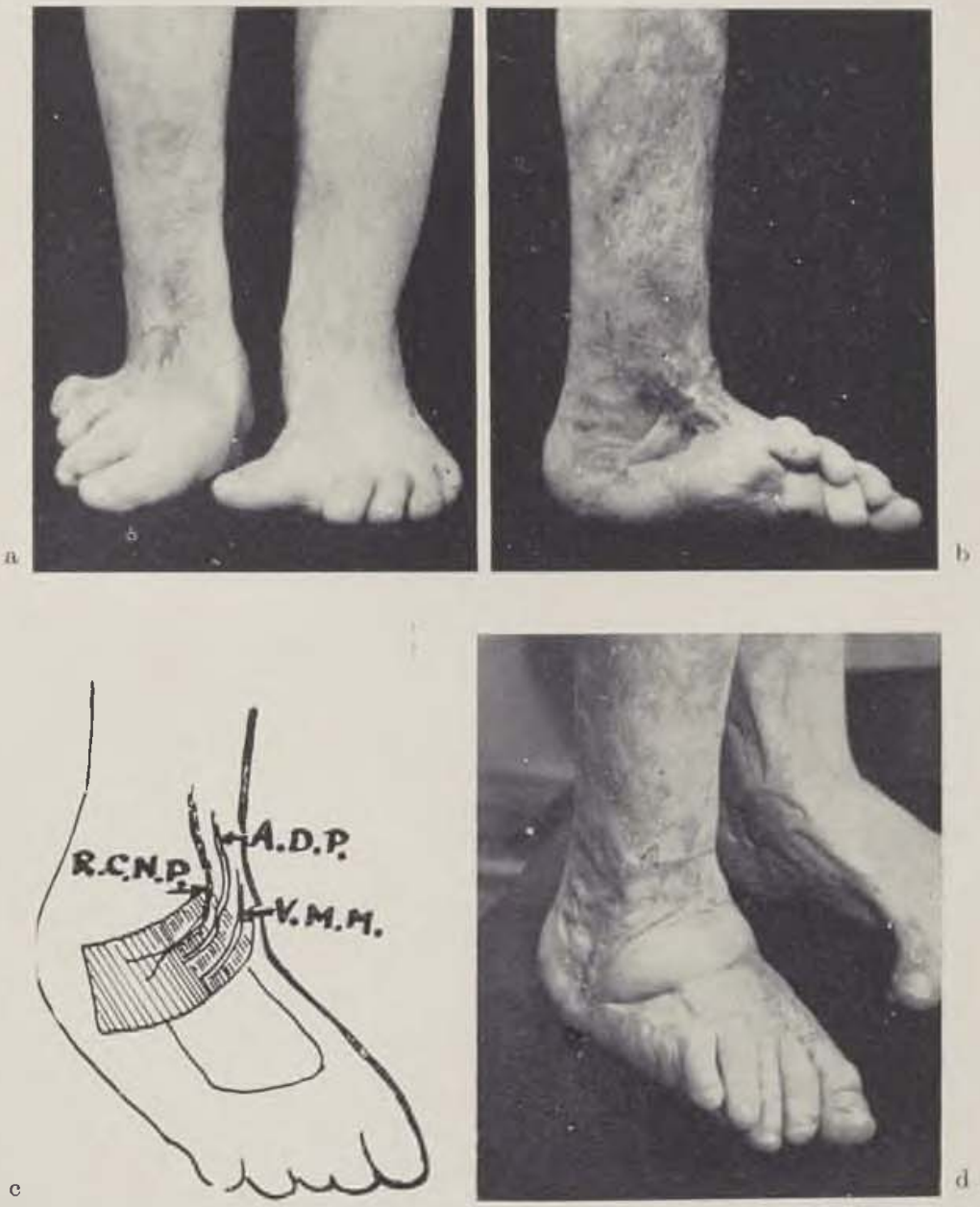
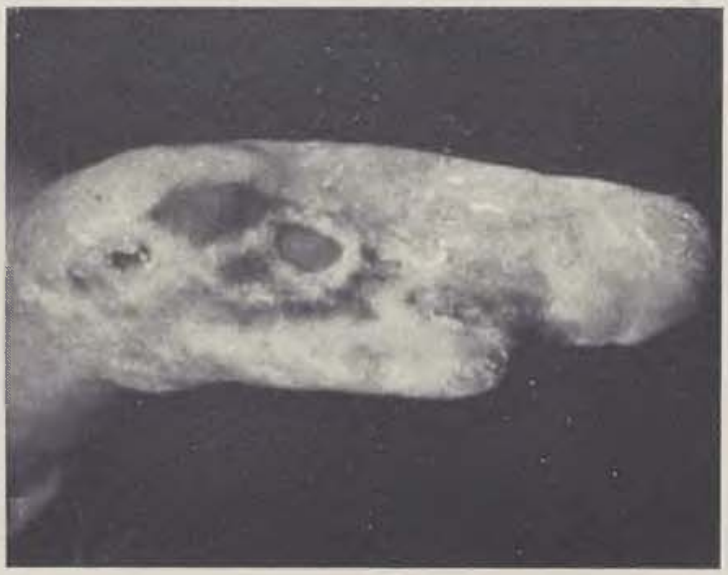


Fig. 2. Case 2. Postburn contracture and severe deformity of the foot 4 years after injury. a — Frontal view. b — Severe cicatrical deformation of the right foot -lateral view. c — Scheme of operation: A.D.P.-arteria dorsalis pedis, V.M.M.-vena marginalis mediana, R.C.N.P.-ramus cutaneus nervi peronaei. d — The right foot 3 months after surgery.

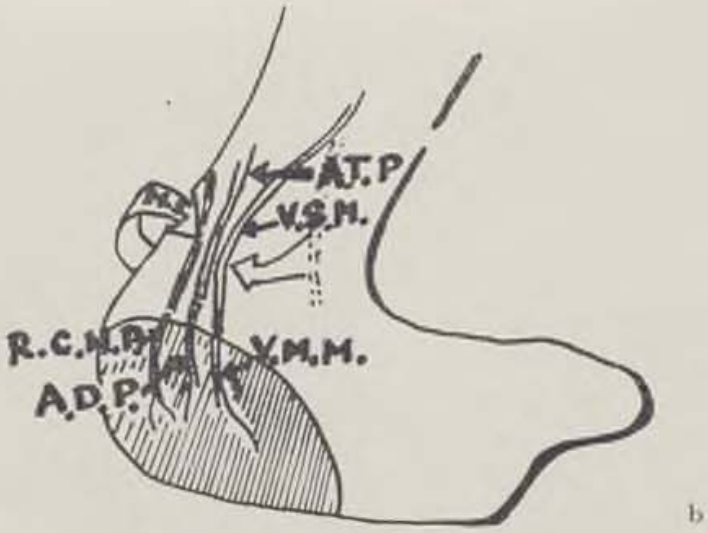
obtain gradual wound margin approximation the limb elevation was used and sutures were charged with hanging Mosquito clamps. On the 7th day the wound was closed easily and further postoperative cours was uneventful. On follow-up examination at 8 month later, mild hyperesthesia in the upper parts of the flap was revealed. Two-point discrimination was excellent, being 1,2 cm.

Case 2.

A 5-year-old boy had sustained the large burn (above 30% of body surface) 4 years before. The severe contracture and deformation of both feet developed with val-



a



b

Fig. 3. Case 3. Ulceration of the sole and calcanear region 5 years after scalpation injury a — The ulcerations on the weight bearing area before operation. b — Scheme of the vascular and nerve anastomoses: A.T.P.-arteria tibialis posterior, A.D.P.-arteria dorsalis pedis, V.S.M.-vena saphena magna, V.M.M.-vena marginalis mediana, N.S.- nervus suralis R.C.N.P.-ramus cutaneus nervi peronaei.

gization and bone involvement of the right foot. When referred to our unit, the child was hardly able to walk with assistance. As both legs were covered with deep scars we decided to transfer an island dorsalis pedis flap. Despite sharp dissection we were not able to correct the foot deformation fully. The deep defect was covered with a flap and the donor site was covered with split skin graft. The plaster cast was applied to maintain achieved redression. Except the mild wound infection, the healing wasp ractically uneventful. On follow-up examination 8 months later the important improvement of foot deformity was revealed. The sensitivity to touch, warm and cold were lower than normal and two-point discrimination was 10 mm.

Fig. 3. c — The same foot 18 months after operation. d — Lateral view.

Case 3.

A 27-year-old man was admitted to our department for treatment of chronic ulceration in the calcanear and plantar region. His history revealed that he had sustained a scalpation injury 5 years previously. On May 5, 1978, the posterior tibial artery, vena saphena magna and suralis nerve were dissected. The free dorsalis

pedis flap with branches of peroneal nerve was raised in the typical manner on the opposite foot. The vascular and nerve anastomoses were done and suction drainage was instituted. Despite prolonged healing at the distal part, the whole flap survived. On follow-up examination at 18 months the normal appearance and good function of the flap was revealed. Two-point discrimination was between 10 and 20 mm. The patient is working again as a farmer.

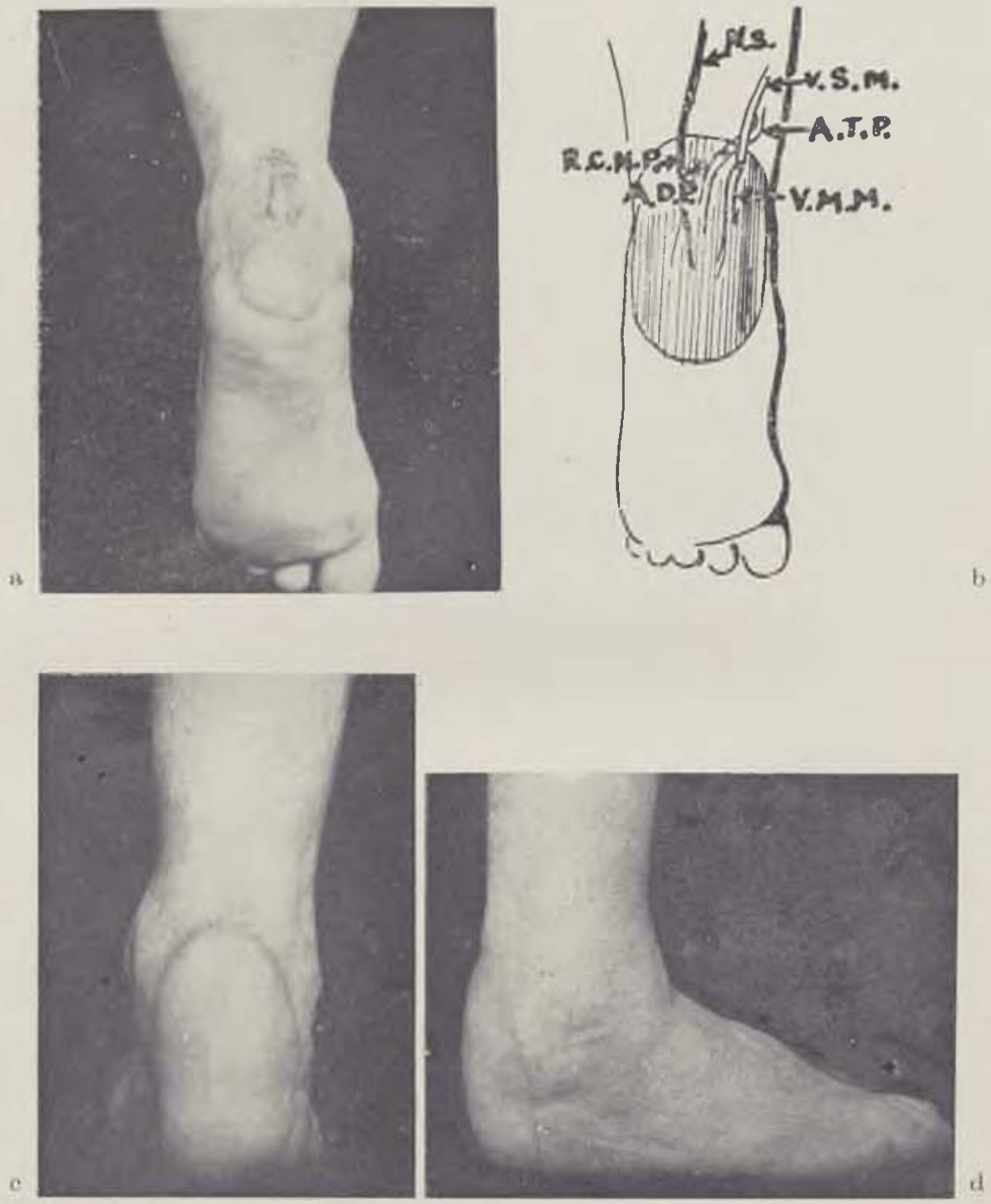


Fig. 4. Case 4. Posttraumatic wound in the calcanear region 38 days aftet trauma with concomitant Achilles tendon rupture. a — The granulating wound in the calcanear region before operation. b — Scheme of the vascular and nerve anastomoses: A.T.P. - arteria tibialis posteriot, A. D.P. - arteria dorsalis pedis, V.S.M.-vena saphena magna, V.M.M.-vena marginalis mediana, N.S.-nervus suralis, R.C.N.P.-ramus cutaneus nervi peronai. c — Final result 6 months after operation. d — Lateral view.

Case 4.

A 28-year-old man was referred to our hospital for treatment of large wound in the calcanear region, which followed crush injury 2 months previously. The skin scalping was concomited with fracture of tibia medial malleolus and rupture of Achilles tendon. On November 3, 1978, free dorsalis pedis flap (11×9 cm) was transferred by end-to-end anastomosis to the adequatly exposed recipient vessels, and branches of peroneal nerve were sutured to the suralis nerve. Healing occured without any problem whatsoever. On follow-up examination at 6 thmonth, the normal apperance of the flap was revealed. Two-point discrimination was between 10 and 20 mm. The patient could walk without any difficulties and wear the normal shoes.

DISCUSSION

Reconstructive procedure for closing wound of lower extremity present as yet unsolved problem, especially if there is presence of exposed bone or weight-bearing skin defects with underlying soft tissue destroying.

Local flaps are rather precarious, often do not provide sufficient amount of tissues and usually do not have sufficient mobility for transplantation. To the more suitable ones belong the oplantar flaps (1, 2, 8), despite their uncertain and delayed sensitivity. Our own opinion based on very little experience is not to be sure such optimistic as Curtin's (2), but we appreciate their usefulness in strictly chosen cases.

Distant flaps, such as cross-leg or abdominal pedicles, require multiple operations including delays, transfers, insetting and eventual modelling, all with well known inconveniences and possible complications. To the more unfavourable factors belong the lack of sensitivity, differences in anatomical structure of tissues and-as regards the tubular flaps- peculiar sensibility to infection.

Muscle flap transplantation with their intact neurovascular bundles (3) is very useful method but unfortunatly limited to certin anatomical area. For treatment of lower third of the leg and plantar region, only a few muscles are suitable, and almost all of them with the some restrictions:

— peroneous brevis
— peroneous tertius — not always present
— soleus — lower fibers only
— extensor digit. longus
— extensor hallucis } mainly to supplement other muscle
— abductor digiti minimi
— abductor hallucis } for small defects only

Similar limitations are connected with use of myocutaneous flaps (6). According to our own experience they are very suitable for surgery of pressure sores and other defects, but exclusively above the level of lower third of the leg.

Taking above into consideration, begining from 1977 our special interest has been concerned with management of island and free skin flaps by microvascular anastomoses.

The choice between the groin and dorsalis pedis free flaps seemed to us evident because of more suitable vessel diameter, anatomical properties of tissues and

possibility of innervation. The only inconveniences we found with rather tedious preparation and donor site cover with split skin grafts, even both graft healing and final appearance of donor surface were rather satisfactory.

The complications were less than in free groin and dorsalis pedis transfers to the other parts of the body (in total on 14 free flaps we have had 1 failure and two partial necroses). In all island and free sensory flaps, the satisfactory innervation was preserved or returned.

The last important problem connected with above discussed technique consists in possible lower extremity ischemia due to sacrifice and vessel thrombosis. In our material we have been not faced with this problem as yet, but to be true, all our patients were young ones. It seems to us that the performed vascular alterations and new supply to the scarred tissues have had hitherto only favourable effects but we can not predict eventual future impairment due to e. g. arteriosclerosis. Therefore we appreciate the necessity of preoperative vascular examinations as well as conservation of the major tibial arteries (4).

Reconsidering, the numerous advantages prevail in our opinion the real or sophisticated imperfections of the discussed method but accumulation of larger material and longer follow-up examinations are necessary for its final appreciation.

SUMMARY

Clinical application based on 7 cases of island and free dorsalis pedis flaps in treatment of defects and cicatrical deformities of foot and 1/3 of lower extremity distal part is described. Because of the possibility to preserve or reconstruct the sensation, the dorsalis pedis flaps are of great usefulness in covering weight bearing areas on the foot and other to injury exposed surfaces. In six cases in which transposition or anastomosis of sensory nerves were done, the two point discrimination test was between 1.5 and 2 cm. In all flaps permanent healing- — in without any trophic disfunctions was obtained.

RÉSUMÉ

Les lambeaux en îlot et transplantation libre de la peau dorsale du pied dans la chirurgie de l'extrémité inférieure

Kobus J., Licznerski A., Stepniewski J., Charko W.

On décrit des expériences cliniques d'application des lambeaux en îlot et de la transplantation libre de la peau dans 7 cas du traitement des défauts et des cicatrices déformant le dessousdu pied et la partie distale de l'extrémité inférieure. Les lambeaux en îlot et les transplants libres de la peau dorsale sont convenables pour couvrirl es parties du pied qui portent le poid et d'autres parties du pied propices à l'altération à cause de la possibilité de garder ou de restituer la sensibilité. Dans 6 cas où on a réalisé la transplantation avec l'anastomose des nerf senso- riques, le test de différentiation de deux points a été réussi a la distance de 1,5—2 cm. Dans tous les cas on a constaté une bonne guérisson sans aucun troubles trophiques.

ZUSAMMENFASSUNG

Anwendung der Hautinseln und der freien Hautlapentransplantaten von pes dorsalis in der Chirurgie der unteren Extremität

Kobus, K. Licznerski, A. Stepniewski, J. Charko W.

Die Autoren beschrieben klinische Erfahrungen mit sieben Fällen der Anwendung der Hautinseln und der freien Hautlapentransplantationen bei der Behandlung von Defektenund deformierenden Narben der Fusssohle und des distalen Drittels der unteren Extremitäten. Angesichts der Möglichkeit der Erhaltung oder Wiederherstellung der Empfindlichkeitsind die Hauttransplantate von pes dorsalis für die Deckung der lasttragenden Fussgegenden und anderer durch Schädigung gefährdeten Hautabschnitte sehr nützlich. Insechs Fällen, wo Transplantation oder Anastomose der sensorischen Nerven durchgeführt wurde, war der Test der Unterscheidung von zwei Punkten auf die Entfernung von 1,5—2 cm erfolgreich. In allen Fällen beobachtete man verlässliche Heilung ohne Störungen der trophischen Funktion.

RESUMEN

Empleo de islotes dérmicos y transplantación libre de la piel de "pedis dorsalis" en la cirujía de las extremidades inferiores

Kobus K., Licznerski A., Stepniewski J., Charko W.

Se desriben experiencias clínicas con 7 casos de empleo de islotes dérmicos y transplantación libre de la piel al tratar los defectos y las cicatrices deformatorias de la planta y la tercera parte distal de la extremidad inferior. Con vistas a su capacidad de conservar o renovar la sensibilidad los injertos cutáneos de pedis dorsalis se muestran de gran utilidad para recubrir las zonas del pie en las que reposa el peso así como otras partes de la cutis expuestas al deterioro. En los 6 casos en que se había realizado la transplantación o la anastomosis de los nervios sensorios la prueba de distinción de dos puntos resultó ser exitosa a la distancia de 1,5—2 cms. En todos los casos se pudo comprobar una completa curación sin defectos de la función trófica.

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REBUILDING OF FREE SKIN AUTOGRAFTS AND OF SKIN IN DONOR SITES BY BURN INJURIES

M. L. BIRYUKOV, G. I. DMITRYEV

Many studies of our and foreign authors are dealing with morphological changes occurring in the transferred autografts. However, contradictory data and opinions are often stated. It has been reported by some authors that the structure typical for normal skin was preserved in the healed skin autografts (Tsel 1959), while a significant rebuilding has been observed by other authors: the normal connective tissue was substituted by another one, the dermal papillae and the elastic fibres disappeared, the dermal appendages died off and slowly regenerated later on (Berlin 1966, Kovalenko 1975, Gillman 1953, Hinshaw and Miller 1965). In majority of the cases, the autografts applied clinically or experimentally were followed only for short periods of time.

The skin grafts may be collected once more from the same donor site (Bailey and Duck 1959), if the available sources of the skin are acutely found to be insufficient for covering of large wound areas or during reconstructive plastic operations. It was indicated by some authors that such flaps did not differ in way from the normal skin and healed similarly well as the grafts collected primarily (Glibin and Sosnovskaya 1967).

Only a few studies were concerned with morphological examination of the skin recovery in the donor sites. Again, some authors (Berlin 1966) observed a rapid and total regeneration of the tissue structures, while it was found by other authors that the skin regeneration proceding in the donor sites remained still unfinished 6 months or even 2—3 years later on and the skin regenerates were not quite identical with the intact skin (Belyakova et al. 1970). Keloid scars may develop on the donor sites (Bolkhovitinova and Pavlova 1977, Ohmori 1966).

When the patients suffering from consequences of the burn injuries were treated in our Institute, the pieces of the earlier applied grafts and the pieces of the skin collected repeatedly from the same donor sites were taken for histological examination.

1. Changes observed in the autografts applied on the granulating wounds

By 13 patients, the free skin grafts were applied on the granulating wounds

several weeks after the burn injury had occurred. The pieces of the grafted skin were taken during the next 4 months to 10 years (Table 1).

The microscopic examination (Figs. 1—5) of the autografts applied on the granulating wounds revealed great differences from the normal skin: the graft's epidermis was thin, no skin appendages were present or (in some cases)only a small number of them was found. Significant changes occurred in the connective tissue of the grafts; they consisted in proliferation of fibroblasts in the place of a scar having been formed in the wound and in development of a young fibrous tissue rich in fibroblasts interconnected by thin fibres. The old edematous and hyaline dermal connective tissue of the wound and the graft's connective tissue were substituted by this tissue. In the papillar layer of some grafts, small perivascular round cell infiltrations were seen; the epidermis was somewhat thicker and dermal pappillae were present in such places. No elastic fibres were present in the cicatricious connective tissue during the first months, they appeared a year later as thin elastic fibrills localized in the papillary layer. During the next 2—10 years, rather great number of thick elastic fibres was found in the graft's connective tissue standing out against a background formed by rough fibrous — hyaline scar tissue with horizontally oriented fibres and cells and often by fascial structures. The number of blood vessels was 2—3 times lower in the grafts, than in the normal skin. Their character corresponded to the precapillary type; the usual capillaries with thin walls were absent.

2. Changes occurring in autografts applied on ''normal'' tissues

By 18 patients, the scars were removed in different time periods after the burn injury (7 months to 22 years) and split (12 cases) or full-thickness (6 cases) skin autografts were applied on the "normal" tissues. Later on, the bioptic specimens

Table 1. The general data related to the skin autografts applied on granulating burn wounds. (M. = male, F. = female)

No. of the biopsied patient	Patients			Time period after the transplantation	Localization of the wound
	Surname	Sex	Age (years)		
161/71	M.	F.	6	4 months	neck
384/72	K.	M.	19	7 months	hand
1313/77	E.	M.	36	8 months	hand
138/73	P.	M.	13	10 months	neck
344/73	K.	M.	35	1 year	axillary region
65/74	M.	F.	1.7	1 year	foot
170/78	Ya.	M.	40	1 year 2 months	hand
225/78	S.	M.	12	1 year 2 months	shin
1392/77	R.	M.	26	1 year 3 months	hand
106/74	A.	M.	50	1 year 5 months	hand
142/74	S.	M.	33	2 years	arm
1417/77	T.	M.	47	4 years	neck
70/74	A.	F.	16	10 years	hand

Table 2. The general data related to the skin autografts applied on "normal" tissues following removal of the scars caused by burns

No. of the biopsied patient	Patients			Time period between burn injury and the operation (years)	Thickness of the graft (mm)	Time period after the transplantation	Localization
	Surname	Sex	Age (years)				
71/73	A.	F.	31	20.0	0.4	2 months 10 days	forearm
68/74	M.	M.	33	1.0	0.4	3 months	popliteal cavity
458/71	Zh.	M.	9	1.8	0.55	3 months	radiocarpal articulation
442/71	G.	M.	6	1.9	0.55	4 months	hand
143/73	K.	M.	31	2.0	0.5	4 months	shin
118/71	K.	M.	39	8.5	full	4.5 months	hand
149/74	P.	M.	35	1.8	0.5	6 months	hand
273/71	S.	M.	47	0.6	full	7 months	hand
455/72	Zh.	M.	32	22.0	0.5	8 months	shin
311/71	S.	M.	50	1.0	0.6	10 months	hand
410/71	K.	M.	43	0.9	full	11 months	hand
276/72	P.	M.	14	2.2	0.5	1 year 2 months	elbow joint
164/73	D.	M.	15	1.4	0.5	1 year 5 months	neck
11/74	T.	M.	24	20.0	0.8	2 years 6 months	hand
274/74	F.	F.	15	1.5—2.0	full	13 years	hand
164/74	F.	F.	15	1.5—2.0	full	13 years	hand
17/73	B.	F.	21	1.0	full	15 years	neck
25/73	A.	F.	17	?	0.5	15 years 10 months	hand

were collected from the autografts in different time periods ranging from 2 months and 10 days to 15 years (Table 2).

The microscopic examination of the grafts (Figs. 6—8) revealed only relatively small changes in the epidermis — its structure was quite normal in many cases, it was sometimes thinner, less frequently thicker; the content of melanin fluctuated in wide limits. The skin appendages were found in a half of the grafts. The connective tissue, in which the remnants of the original collagen fibres were often found. In 3 to 4 months, a considerable number of thick elastic fibres (hyperelastosis) was observed in the preserved parts of the graft's connective tissue. For 8—10 months and still later on, the connective tissue of the grafts retained its fibrous character or developed into a hyalinized scar. The number of blood vessels was diminished in the grafts. The endothelial cells markedly proliferated in them, the adventitial cells were elongated. Thus, the capillaries having a rich content of the cells resembled precapillaries. The usual capillaries with thin walls were absent. The capillaries were often disposed in groups, thus becoming similar to hypertrophic hemangiomas (analogous alterations of blood vessels often occur in scars caused by burn injuries). It was not possible to define any significant differences in structure of the grafts that would correspond to the age of the patients.

3. Changes affecting donor sites of the skin

The number of 13 patients, who suffered from serious deep burn injuries, had to undergo reconstructive operations repeatedly during 1—12 years following the first collecting of the grafts and the skin grafts were taken the second time from the previous donor sites on the thigh. On this occasion, the specimens were removed for histological examination (Table 3).

Table 3. The data related to donor sites of the skin

No. of the biopsied patient	Patients			Time period after the primary collecting of the graft (years)
	Surname	Sex	Age (years)	
40/74	G.	M.	8	1.0
111/74	A.	M.	56	1.5
80/73	L.	M.	43	1.5
40/74	S.	M.	33	1.5—2.0
10/73	S.	M.	11	3.0
390/72	L.	F.	9	3.0
471/72	K.	M.	49	3.0
338/72	S.	M.	13	4.0
341/72	M.	F.	14	7.0
32/73	A.	F.	16	10.0
276/71	L.	M.	17	10.0
255/74	S.	M.	16	10.0
311/74	S.	F.	19	12.0

The microscopic examination (Figs. 9 and 10) revealed an abnormal structure of the skin covering the donor sites in all the cases examined: the epidermis was always thinner and more or less atrophic, the skin appendages were absent or present in very low numbers. To the depth of 0.5 mm or more, the dermis developed into a scar of a fibrous type or of a fibrous — hyaline type during later time periods. The dermal papillae were absent, or present in a small number. The elastic layer developed very slowly: it was absent in the upper part of the dermis (about 0.5 mm) during 1 1/2 years; in the deeper layers, a hyperelastosis was seen. The content of the elastic fibres increased during 3 years. After 7—12 years, a considerable number of the elastic fibres was present in the whole thickness of the cicatricious dermal tissue below epidermis. The number of blood vessels in the regenerate was lower than in the normal skin. A proliferation of perivascular cells was expressed, especially elongated adventitial cells were numerous. The usual thin-walled capillaries were absent even in the papillary layer. Perpendicularly oriented blood vessels composed of many cells were seen in the deeper zone of the fibrotic dermal tissue.

CONCLUSION

It is shown by the presented data that the connective tissue of the grafts applied upon granulating burn wounds is rebuilt and replaced by a new poorely vascularized fibrous or fibrous - hyaline scar tissue, in which the elastic fibres appear not earlier than after 7—8 months; the number of the elastic fibres increases subsequently. A hyperplasia of the blood vessel endothelial and adventitial cells takes place. The graft's epidermis becomes atrophic, the skin appendages die off and almost do not regenerate.

Less expressed changes occur in the autografts applied on "normal" tissues during reconstructive operations. They are also rebuilt, but the epidermis often retains its normal thickness, the skin appendages are preserved significantly more frequently (in a half of the cases). The remnants of the original connective tissue survive in some places, being surrounded by a newly formed, sometimes hyaline, fibrous tissue. The elastic fibres appear rather early (already after 3 months) in such grafts; during long time periods, a hyperelastosis develops more markedly than in autografts applied on granulating burn wounds. In the grafts placed on "normal" tissues, the number of capillaries is diminished in comparison with the normal skin, they are thicker due to proliferation of endothelial and adventitial cells, thus resembling precapillaries or capillary hemangiomas.

In the donor sites, the skin regeneration remains unfinished and the normal structure is not restored even for 7—12 years .The dermal connective tissue is rebuilt forming a fibrous scar, the elastic tissue develops slowly and the cells of capillaries and precapillaries undergo a hyperplasia. The epidermis becomes atrophic, the skin appendages do not recover totally, even during many years. The scars formed in the regenerates are less coarse than in the autografts. Using a dermatome, the skin is collected and applied on serious burn wounds, however, this procedure is not deprived of consequences: a new skin formed on the donor site differs significantly from the normal one. The skin grafts collected secondarily from the same donor

sites are atrophic, fibrotic and are not identical with the primarily cut grafts; their cosmetic and functional properties are abated. Therefore, the skin grafts should be collected repeatedly from the donor sites that have already been used previously only in exceptional situations (during the reconstructive operations on patients, by whom the donor sources have been exhausted due to surgical treatment of large and deep burn injuries).

It is indicated by our morphological investigations that the skin autografts applied in treatment of serious burn injuries and of scars caused by burns are significantly rebuilt and become cicatricious. On the donor sites of such patients, the skin regeneration remains unfinished for many months and years and the full organotypic restoration is not achieved.

M. T.

SUMMARY

It was found by histological examination of the skin autografts applied on granulating burn wounds or on "normal" tissues in the case of reconstructive reoperations (in the time periods ranging from several months to 15 years) that the significant atrophic and cicatricious alterations took place especially in the autografts that covered the granulating burn wounds. When the skin autografts were placed on "normal" tissues during the reconstructive operations, the graft's dermis was partially preserved, although it became hyaline and a hyperelastosis developed.

The skin of the donor sites of the patients was followed for long periods of time (1 year to 15 years). In all the cases, the atrophic and cicatricious alterations were found in the regenerates.

RÉSUMÉ

Reconstruction des autogreffes cutanées libres et la peau des partie-donneurs en cas des brûlures

Biriukov M. L., Dmitriiev G. I.

Nous avons examiné par les méthodes histologiques les autogreffes cutanées qui ont été transplanté sur les plaies granuleuses de brûlure ou sur les tissus „sains "pendant les réopérations reconstructives réalisées après de différentes périodes de temps (depuis quelques mois jusqu' à 15 ans). Nous avons constaté d'importants changements d'atrophie et de cicatrisation surtout dans les autogreffes qui couvraient les plaies granuleuses de de brûlure. Quand les autogreffes cutanées ont été transplantées sur les tissus "„sains" pendant les opérations reconstructives, le derme de la greffe a été partiellement conservé bien que dans le derme s'était développé l'hyalinose et l'hyperelastose.

Nous avons suivi aussi pendant une longue période (1—15 ans) l'évolution de la peau couvrant les parties — donneurs. Dans tous les cas apparaissaient des changements d'atrophie et de cicatrisation dans la peau régénérante.

ZUSAMMENFASSUNG

Umbau der freien Hautautotransplantate und der Haut der Spendestellen bei Verbrennungen

Birjukow M. L., Dmitrijew G. I.

Wir untersuchten histologisch Hautautotransplantate, die an granulierende Brandwunden oder an „gesunde" Gewebe bei wiederherstellenden Reoperationen nach ver-

schieden langen Zeiträumen (einige Monate bis 15 Jahre) übertragen wurden. Wir fanden markante atrophische und narbige Veränderungen vor allem in Autotransplantaten, die granulierende Brandwunden deckten. Wenn die Hautautotransplantate an „gesunde" Gewebe bei wiederherstellenden Operationen übertragen wurden, blieb die Dermis des Transplantates teilweise erhalten, auch wenn in ihr Hyalinisierung stattfand und Hyperelastose sich entwickelte.

Ferner verfolgten wir eine lange Zeit (1—15 Jahre) die Entwicklung der Haut, die Spendestellen gedeckt hat. In allen Fällen entwickelten sich in den Regeneraten atrophische und narbige Veränderungen.

RESUMEN

Reconstrucción de autotransplantes libres de piel y la piel en los lugares de donación en caso de quemaduras.

Biriukov M. L., Dmitriev G. I.

Examinamos histológicamente los autotransplantes de piel que se habían transpuesto sobre las heridas por quemadura en proceso de granulación o sobre tejidos "sanos" por medio de reoperaciones reconstructivas, al cabo de diferentes períodos de tiempo (de algunos meses a 15 años). Comprobamos marcados cambios atróficos y cicatrizales sobre todo en aquellos autotransplantes que cubrían las heridas por quemadura en proceso de granulación. Siendo trasladados los autotranplantes de piel, en operaciones reconstructivas, sobre tejidos "sanos" se mantiene en parte conservada la dermis del transplante aunque en ella se ha operado la hialinización y se ha producido la hiperelastosis.

Durante mucho tiempo (de uno a quince años) hemos seguido también el desarrollo de la piel que recubría los lugares de donación. En todos los casos, en la piel regenerada se produjeron cambios atróficos y cicatrizales.

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RECONSTRUCTION OF LARGE DEFECTS OF BLOOD VESSELS ON EXTREMITIES BY MEANS OF A GRADUAL DISTRACTION (An experimental study.)

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A. M. KHELIMSKII, L. KH. LEVITINA, I. I. AZRAPKIN

A reconstruction of large defects occurring on main arteries of extremities is a complicated problem of a vascular surgery. The defects may arise as consequences of severe injuries that are often combined with fractures of bones, or as consequences of radically removed tumors or aneurysms. A great progress has been achieved in this field during the last several years, however, it is still inevitable to look for new ways leading to solution of this problem.

We realized that homo- and xenografts and even an autologous vein cannot be considered as fully valuable substitutes for the arteries neither anatomically nor functionally. This contention has been supported by relatively frequent unsatisfactory results of the vascular plasties (Connel 1962, Krakovskii 1971, Novikov 1972, Lytkin and Kolomiets 1973, Shalimov 1977).

A thoroughly new method(1) serving to reconstruction of the defects occuring on the main blood vessels of the extremities was designed and tested in experiments on dogs. It enables to reconstruct an integrity and length of the blood vessels without any need of grafting. According to our opinion, several basic disadvantages of the traditional methods may be circumvented and effectivity of the treatment may be improved in this way.

The main point of the suggested method is that the injured segment of the extremity is temporarily shortened to the size enabling union of the blood vessels' ends. Subsequently, the original length of the extremity is recovered by means of a gradual distraction. Depending on size of the vascular defect and presence or absence of a bone defect, different modifications of the operation technique may be used. (Fig. 1.) The experience with transversal osteosynthesis gained by one

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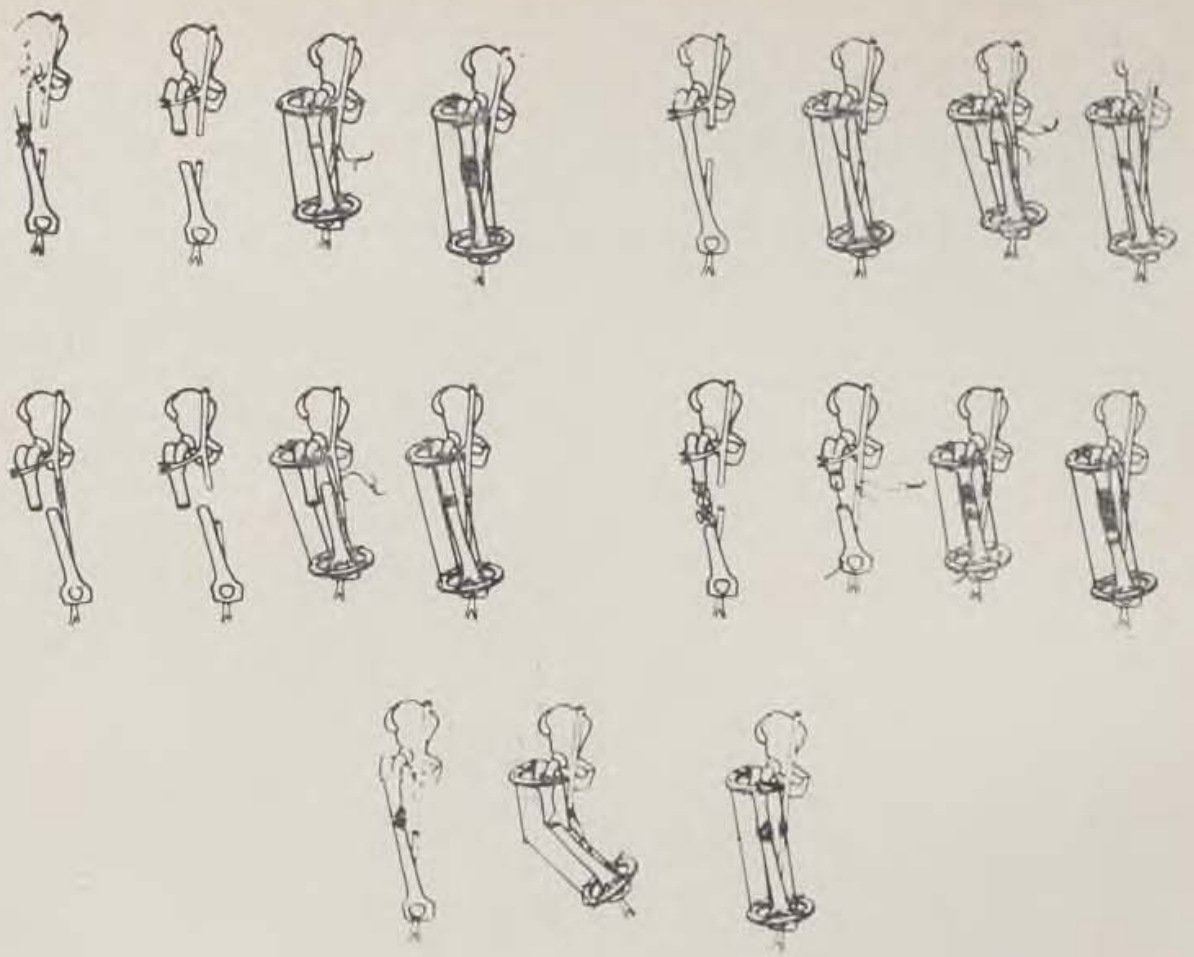

Fig. 1.: A diagramm showing different operation methods

author of the present paper (by G. A. Ilizarov) served as a basis on which this method was worked out. Special biological properties of bones were revealed that had previously been very little known about. It was shown that bones and soft tissues could be elongated practically to any size.

The method was tested in experiments on 44 adult normal dogs.

THE EXPERIMENTAL METHOD

The Ilizarov's apparatus consisting of an arc and two circles was applied on a thigh. A segment of femoral artery about 15—30 mm long (10—15% of the femur's length) was excised under general anaesthesia. An oblique or transversal osteotomy of femur was performed by 33 dogs and the osseous fragments were longitudinally shifted in the apparatus ("doubled"). Thus, the femur was shortened so much as the arterial ends were brought into contact and a vascular anastomosis "end-to-end" could be made. By 11 dogs, the femoral shortening was achieved by resection of an appropriate part of the diaphysis.

The sewing devices ASC 4 and ASC 8U were used for vascular anatomoses prepared by 37 animals; blood vessels of 7 animals were sutured manually.

The blood flow was interrupted for 40—90 minutes.

Table. Reconstruction of large defects occuring on blood vessels by their gradual

Examined parameters	The first group							
	Terms of observations (days)							
	Original values	1—3		6—7		10—14		
			1	2	3	1	2	3
Rgeographic index (%)	100	24.6	36.8	33.7	32,8	47.6	43.9	37.4
Tension of oxygen (%)								
in femoral muscles	100	51.3	62.2	60.0	58.8	80.1	74.4	69,5
in crural muscles	100	43.3	67.4	65.2	61.1	82	78.5	70.1
Time of blood coagulation (sec)	298.3	248	260	199	218	240	196	180
Time of plasma recalcification (sec)	173	122	107	109	117	125	120	107
Tolerance of plasma to heparin (sec)	308	195	138	193	166	165	151	150
Prothrombin consumption in plasma (sec)	24.3	30.5	35.5	42	38	36	40	38.6
Time of free heparin (sec)	10.8	5.6	5.0	3.8	4.0	6.7	5.0	4.8
Fibrinolysis in blood (%)	23.1	12.0	10.5	5.5	6.6	11	8.4	6.0
Fibrinogen (mg %)	408	615	580	812	758	999	899	679
Ethanol probe	—	3+	4+	4+	4+	3+	4+	4+

In addition to it, the femoral osteotomy and a subsequent distraction were performed, while the femoral artery was just exposed without cutting it by 4 dogs (a control group).

Depending on a starting time-point and a rate of distraction, the animals were arbitrarily classified into 3 groups.

The first group consisted of 11 dogs, by whom the distraction was started 3 days after the operation. The distraction was applied by 2 dogs in the rate of 1 mm per day, by 5 dogs in the rate of 2 mm per day and by 4 dogs in the rate of 3 mm per day. The elongation proceeded till the original length of the extremity was acquired. It took 10 to 21 days depending on the rate of distraction and on the size of the arterial defect.

The second group

17—21		30—60	Original values	1—3	6—7	10—14		17—21		40—60	100
rate of distraction (mm per day)											
1	2					0,5	1,0	0,5	1,0		
38	34,4	38	100	21,4	63,4	48,7	47,4	47	45	84.6	94,2*
82	76,9	96.4*	100	53,3	81	90,2*	89,7	90,9*	89	94.2*	—
84	80,6	52	100	39,2	51	76,6	75,6	90,2*	88	96,6*	—
243	148	178	399	314	387*	360	316	313	326	321	390*
103	113	116	174	128	180*	149	126	122	140	147	208*
154	127	235	378	253	358*	226	168	195	165	233	336*
42	41,2	35	26	34	27*	33	34,2	32	34	28*	27*
6,0	5,0	6,0	10,0	6,3	11*	8,0*	6,6	7,0	6,5	7,7*	9,8*
12	5,2	6,5	21,3	13,8	20*	19*	12,2	17,6*	13	17*	26,3*
1065	705	530	325	588	683	836	675	636	643	532	355*
3+	4+	2+	—	3+	2+	3+	3+	2+	3+	—	—

Note,
The statistically insignificant differences (in comparison with original values) are marked by "*".

The total of 14 animals were included in the second group. The distraction was started on the 8th day after the operation and the rate of distraction was 0.5 mm per day by 4 animals and 1 mm per day by the others.

The rate of distraction was periodically changed in the third group (8 animals). It was equal to 1 mm per day during the first week, then increased to 2 mm per day (5 animals) during the second week and 3 mm per day (3 animals) during the third week.

By 13 dogs from the total number of the dogs belonging to the last two groups, the elongation proceeded till the original length of the extremity was acquired. It took 14 to 60 days depending on the rate of distraction and on the size of the vascular defect.

Examined parameters	The third group							
	Original values	1—3	6—7	10—14	17—21		40—60	100
				1	2	3		
Rgeographic index (%)	100	20,4	63.4	47	43	37,7	83,3	93,2*
Tension of oxygen (%) in femoral muscles	100	53,3	81	90	81	73,3	98,8*	—
in crural muscles	100	39,2	51	75	81	78,8	96.3*	—
Time of blood coagulation (sec)	238	157	223*	180	151	141	302	390
Time of plasma recalcification (sec)	139	88,3	127*	110	143	80,6	122*	164
Tolerance of plasma to heparin (sec)	313	193	284*	252	200	167	297*	341*
Prothrombin consumption in plasma (sec)	29	35	31*	32	36	42	36	25*
Time of free heparin (sec)	9,0	6,0	7,3*	6,0	5,0	5,0	7,3*	8,3*
Fibrinolysis in blood (%)	16,4	11	13*	8	5,5	4	9,6	19*
Fibrinogen (mg %)	222	382	325	530	570	711	433	288*
Ethanol probe	—	3+	2+	3+	4+	4+	+	—

Even when the distraction was finished, the fixation was continued by some animals in each group till the fragments grew well together.

From the total of 44 dogs, 3 dogs were sacrificed before starting the distraction, 16 dogs were sacrificed in different terms during the distraction period, 10 dogs were sacrificed during subsequent fixation in the apparatus and 7 animals were followed as long as 368 days after the extremity's length and integrity had been recovered.

A thrombosis was observed in the vascular anastomosis on the first 3 days after the operation, i. e. before starting the distraction, by 7 animals. In one dog, the anastomosis was narrowed by a scar.

We examined a system of blood coagulation using biochemical methods, a peripheral blood flow using rheographic, oxytensometric and arteriographic methods and dynamics of osteogenesis by roentgenography. The morphological changes of the arteries were followed as well.

It seems unnecessary to describe the data on regeneration of the bone tissue under distraction conditions in this paper, as they have already been extensively explained elsewhere.

The pulse measured on the anterior tibial artery was usually weaker during the first hours after the operation, however, it almost did not differ from the pulse examined on the contralateral extremity a day later. A moderate oedema of the extremity appeared in the first three days, lasted for 6—7 days and then vanished.

In the same time period, significant deviations of haemodynamic and haemocoagulatory parameters were ascertained (see the Table). The rheographic index decreased to 20—25% of the original value, the tension of oxygen in the femoral muscles decreased to 51—53% and to 40—43% in the crural muscles. On the rheogramms, the dicrotic wave was slightly expressed and shifted towards the peak of the rheographic wave and the anacrotic phase was declining and prolonged.

It is indicated by the obtained data that the vascular tonus increased, the main role of arterioles being apparent. The coagulation system of blood is markedly activated, i. e. free heparin is decreased, the speed of coagulation is increased, the concentration of fibrinogen is higher, fibrinolysis is inhibited, degradation products of fibrin and fibrinogen are formed.

About 6—7 days after the operation, the parameters of haemodynamics and haemocoagulation improved, but still remained considerably low by the animals, by whom the distraction had already been applied for 3—4 days (the first group). In the same time, almost all tests of the blood coagulation system reached the original level and parameters of the peripheral blood flow improved by the animals of the second and the third groups (in the time preceding distraction).

On the 10th—14th day of the postoperation period, the deviations of the examined parameters from the original values were identical in all the three groups with the rate of distraction having been equal to 1 mm per day. While the oxygen metabolism in muscles was coming near to the normal level, a moderate decrease of vascular tonus and increased coagulation disposition of blood were noticed. The values of the examined tests remained approximately on the same level on the 17th—21st day.

About 40—60 days after the operation, almost all the haemodynamic or haemocoagulation parameters only slightly differed from the original values.

By the animals with the distraction progressing 2—3 mm per day, more expressed and persisting deviations of the peripheral blood flow and of the coagulation blood system were seen.

The same undulations of the haemodynamic and haemocoagulation parameters, as observed in the 2nd and the 3rd groups, were also found in the control group before the distraction and during it.

The arteriographic data indicated that no abnormalities developed in the arterial network of the extremity in different time periods of the experiment (Fig. 2).

The arteries that were operated on were sectioned longitudinally and examined histologically. On the 7th day after the operation, the cells of the subendothelial layer were seen to proliferate towards both sides of the anastomotic groove. The anastomotic groove was thoroughly filled up by the subendothelial layer on the 18th—21st day and all the region of the vascular suture was covered by endothelium.

About 51—54 days after the operation, the line of the suture was covered also by a muscular layer (Fig. 3).

It was seen on the transversal sections that the external elastic membrane became straightened proximally from the anastomotic site. Minute haemorrhages and small necroses of the muscular and elastic layers were found on the eversed vascular wall in the anastomotic region representing rather usual changes characteristic for the vascular suture. A defibering and straightening of the inner elastic membrane and a disordered circular orientation of the smooth muscle nuclei, followed later on by partial reorientation of individual muscle bundles from a transversal to a longitudinal direction, were seen in some portions on the 14^{th}—21^{st} day of the experiment. The latter changes were observed in 3 cases from the total of 16 cases by the animals, by whom the distraction progressed 0.5 mm or 1.0 mm per day; they occurred more frequently, if the elongation was 2 mm per day (in 3 cases from the total of 10 cases) or if the rate was 3 mm per day (in 5 cases from the total number of 7 cases).

The scar started to develop in adventitia of the removed arterial portion already 7 days after the operation. The cicatricious layer was well expressed on the 19^{th} to 23^{rd} day and it encircled all the blood vessel on the 51^{st}—54^{th} day being the thickest in the anastomotic zone. About 4—6 months after the operation, the cicatricious layer was extended along all the removed part of the artery. When the distraction was speeded up to 3 mm per day, thickenings of the subendothelial layer around the blood vessel, a development of a scar layer inserted between the muscular and external elastic membranes and a hyalinosis of individual collagen fibres present in the elastic membrane were observed.

In the control group, in which the artery was only exposed and the osteotomy of femur followed by the distraction were performed, the same scar layer development in adventitia was found as it was described following distraction of the sutured artery.

DISCUSSION

It was proved by our experiments that the suggested method can be used for reconstruction of the main blood vessels, if an arterial injury occurred. The operation is technically rather simple. A temporary shortening of the extremity in the Ilizarov's apparatus enables to put the central and peripheral arterial fragments in contact. In such conditions, the simplest and physiologically grounded "end-to end" anastomosis (Schlicht 1969) can be made without any particular difficulties.

The temporary shortening of the extremity ranging from 10% to 12% of the segment's length and its subsequent elongation did not lead to substantial changes of haemostasis. The deviations of haemodynamic and haemocoagulation parameters observed in the postoperational period seem to be unspecific in respect to the devised method and correspond to severity of the suffered injury (Kolyadenko and Bayramkulov 1975, Malova and Kuzmin 1975, Balakina and Anisimov 1976).

The distraction, which was started 7 days after the operation and progressed 0.5—1.0 mm per day, just insignificantly prolonged the presence of such alterations. Straightening and partial ruptures of the inner elastic membrane were often seen in the arterial wall during this regime of the distraction A scar layer developed in the adventitia. The more rapidly progressing distraction, i. e. in the rate of 2—3 mm

per day, lead to more significant deviations of the haemodynamic and haemocoagulation properties of the blood. However, the distracted arteries were still of normal appearance and structure, as indicated by arteriographic and anatomical data. Just histologically, a reorientation of some smooth muscle bundles from a transversal to a longitudinal direction was found. A thickening of the subendothelial layer, straightening and ruptures of the inner elastic membrane were most often observed.

According to Abrikosov (1947), the ruptures occurring in the elastic layer of the arterial wall indicate a growth of the blood vessel and, therefore, are often found in children. They occur particularly frequently in arteries of a muscular type especially in lower extremities, thus they are characteristic for the femoral artery as well. It is not excluded that the gradual distraction may play a growth-promoting role not only for bones, but also for blood vessels.

The process of scar formation in the adventitia and, partially, the thickening of the subendothelial layer are due to liberation of the blood vessel from the surrounding tissues and are characteristic for any surgical intervention on blood vessels. The vascular anastomoses become consolidated in usual terms.

Thus, no marked structural transformations occur in the sutured and distracted arteries, as shown by the histological findings.

The method, which has been suggested by us, is characterized by particular advantages. The use of any graft requires two vascular anastomoses to be formed. If our method is applied for reconstruction of the vascular defect, only one anastomosis is sufficient, thus remarkably decreasing a danger of thrombosis. Finally, the length and function of the extremity can be fully recovered.

The method of reconstruction of the main blood vessels on the extremities, which was worked out, may be applied in traumatology and in oncology. It makes possible to perform more radical operations and to preserve the extremity.

M. T.

SUMMARY

The method of plastic reconstruction of large defects occuring on main blood vessels of the extremities was worked out in experiments on 48 dogs. It consists in temporary shortening of the segment of the extremity, thus enabling an "end-to-end" suture of the injured blood vessel. Subsequently, the bone fragments are gradually distracted using the Ilizarov's apparatus, till the original length of the extremity is recovered.

A femoral artery was used as a model. Its portion equal to 10—15% of the thigh's length was resected. Then an osteotomy or resection of femur was performed, the fragments were longitudinally shifted and fixed in the Ilizarov's apparatus. The anastomosis was made on the arterial ends that were brought close together. Using the apparatus, the distraction was started after the operation. The rate of elongation equal to 0.5—1.0 mm per day starting 7 days after the operation was found to be optimal.

Blood-circulation and blood-coagulation systems were examined using physiological methods. No significant deviations were observed during the postoperational period. A normal appearance of the vascular network on the extremity was shown

by arteriography. The histological examination of the blood vessels performed long time after the operation revealed changes that were characteristic for any vascular surgery.

The method can be used in traumatology and oncology.

RÉSUMÉ

Reconstruction de gros défauts vasculaires sur les extrémités à l'aide d'un prolongement dosé (Travail expériementale)

Ilizarov G. A., Zusmanovitch F. N., Markhachov A. M., Khelimski A. M., Levitina L. Kh., Azrapkin I. I.

On a élaboré une méthode de la plastie de gros défauts des vaisseaux principaux des extrémités. Pendant les expériments de 48 chiens on a raccourcit temporellement le segment de l'extrémité ce qui a permis de coudre les vaisseaux endommagés „end — to-end". Après, on a procédé a la dilatation des fragments osseux dans l'appareil d'Ilizarov jusqu' à ce qu on a atteint la longueur iniciale de l'extrémité.

On s'est servi de l'artère femorale pour modèle. Une partie de l'artère représentant à peu près 10—15 % de la longueur du fémur a été réséquée. Puis on a fait l'osteotomie ou la resection du femur. Après cela, les fragments osseux ont été rapprochés et fixés dans l'appareil d'Ilizarov. Sur les buts de l'artère qui ont été rapprochés jusqu' à ce que l'un touche l'autre on a effectuer l'anastomose. Après l'opération, l'extrémité a été tendue a l'aide de l'appareil. Le prolongement optimal a été de 0,5—1,0 mm par jour, à commencer le 7e jour après l'opération.

En examinant la circulation sanguine et la coagulation du sang par les méthodes physiologiques on a constaté qu' il n'y a pas de déviation importantes en hémodynamique ou en hémocoagulation pendant la période postopératoire. La structure normale du réseau vasculaire de l'extrémité a été démontrée par les grafiques de l'artère. Les vaisseaux ont été examinés par les méthodes histologique après de longues périodes de temps; on a constaté des changements qui apparaissent après n'importe quel opération des vaisseaux. La méthode peut être appliquée en traumatologie et en oncologie.

ZUSAMMENFASSUNG

Wiederherstellung grosser Gefässdefekte an den Extremitäten mittels dosierter Verlängerung (Experimentelle Arbeit)

Ilizarow L. Ch., Zusmanowitsch F. N., Marchaschow A. M., Chelimskij A. M., Lewitina L. Ch., Azrapkin I. I.

Die Autoren entwickelten eine neue Methode der Plastik grosser Defekte der Hauptgefässe der Extremitäten. In Experimenten an 48 Hunden wurde ein Segment der Extremität vorübergehend verkürzt, wodurch es möglich wurde, die geschädigten Gefässe mit dem end-to-end-Verfahren zu nähen. Dann wurde allmähliche Distraktion der Knochenbruchstücke in der Apparatur nach Ilizarow durchgeführt, bis die ursprüngliche Länge der Extremität erreicht wurde.

Die Femoralarterie wurde als Modell benutzt. Ein Teil der Arterie, entsprechend in der Länge 10—15 % der Oberschenkellänge, wurde ausgeschnitten. Ferner wurde Osteotomie oder Resektion des Oberschenkelknochens durchgeführt. Dann wurden die Knochenfragmente gegeneinander herangeschoben und in der Apparatur nach Ilizarow fixiert. An den Enden der Arterie, die bis zum Kontakt zusammengeführt wurden, wurde Anastomose durchgeführt. Nach der Operation wurde die Extremität mittels des Apparates gestreckt. Die optimale Verlängerung war 0,5—1 mm pro Tag, beginnend am 7. Tag nach der Operation.

Durch die Untersuchung des Blutkreislaufes und Blutgerinnung mit physiologischen Methoden wurden während des postoperativen Zeitraumes in der Hämodynamik oder Blutgerinnung keine wesentlichen Abweichungen festgestellt. Arteriographisch wurde normale Struktur des Gefässnetzes der Extremität festgestellt. Die Gefässe wurden histologisch nach langen Zeitabständen untersucht; es wurden Veränderungen festgestellt, die nach jedem Operationseingriff an den Gefässen erscheinen.

Die Methode kann in der Traumatologie und Onkologie benutzt werden.

RESUMEN

Reconstrucción de grandes defectos vasculares en las extremidades por medio de alargamiento dosificado (Trabajo experimental)

Ilizarov G. A., Zusmanovich F. N., Marjashov A. M., Jelimski A. M., Levitina L. J., Azrapkin I. I.

Se ha elaborado el método de plástica de grandes defectos de los vasos principales de las extremidades. En experimentos con 48 perros temporalmente se ha acortado el segmento de la extremidad lo que permitió suturar los vasos perjudicados en forma "end-to-end". Después fue realizada la distracción de los fragmentos óseos en el aparato de Ilizarov hasta lograrse la longitud original de la extremidad.

La arteria femoral sirvió como modelo. Se efectuó la resección de una parte de la arteria de un largo igual al 10—15% del largo del muslo. Luego se hizo la osteotomía o la resección del fémur. A continuación, los fragmentos óseos se avanzaron hacia sí y se fijaron dentro del aparato de Ilizarov. En los extremos de la arteria, avanzados hasta tocarse, fue realizada la anastomosis. Terminada la operación la extremidad fue alargándose con ayuda del aparato. El alargamiento óptimo alcanzado en un día era de 0.5—1.0 mm, a partir del séptimo día después de la operación.

Al examinarse la circulación y coagulación de la sangre por métodos fisiológicos no se notaron fundamentales diferencias en la hemodinámica o la hemocoagulación en el transcurso del período post-operatorio. La arteriografía presentó igualmente una estructura normal de la red vascular de la extremidad. Los vasos se examinaron histológicamente al cabo de largos períodos de tiempo comprobándose sólo los cambios que generalmente aparecen en consecuencia de cualquier intervención operatoria en los vasos.

El método puede aprovecharse en la traumatología y oncología.

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FATAL OUTCOME OF CYTOMEGALOVIRUS INFECTIONS IN SEVERE BURNS

J. SEEMAN, R. KÖNIGOVÁ, I. LYSENKOVÁ

Infection is an important and dangerous complication in the course of burn disease.

In Burns centre 150 cases of severe burns were clinically and virologically treated. It has been shown that cytomegalovirus (CMV) infection is a dangerous risk for severely burned patients, because during surgical therapy endogenous CMV infection may be reactivated because debilitating conditions favour the acquisition of primary CMV infection. Seven of one hundred and fifty patients died due to the clinical manifestation of the cytomegalovirus infection. The clinical course and virological examination of two patients are described.

In differential diagnosis of various clinical complications it is necessary to take into consideration the possibility of cytomegalovirus infection.

The significance of virus infections in severe burns is not yet known to the whole extent.

Recent investigations indicated the group of herpetic viruses, especially cytomegalovirus (CMV), to be of great importance (Cappel, Hestermans, Toussaint, Vereerstraeten, van Beers, de Braekeleer, Schoutens, 1978, Howard, Miller, Najarian, 1974, Stagno, Reynolds, Tsiantos, Fuccillo, Smith, Tiller, Alford, 1975).

The clinical picture of these infections is very diverse and often atypical because of various complications in burn disease.

Our search has shown that cytomegalovirus infection, which has been studied in 150 severe burns, could be the final cause of death not only in the acute period but also in the convalescence phase. Cytomegalovirus antibodies were proved in 70 % of investigated patients from 9 to 63 years of age and with burns greater than 20 (to 80) per cent of total body surface area. About 750 individual blood samples were drawn once weekly and the serological diagnosis was established by the complement fixation test (CFT) with CMV antigen prepared from the strain AD 169. Cytomegalovirus isolation essays from urine were performed in tissue cultures from human embryonic lung.

This study aims at drawing attention not only to the role of CMV infection in burn disease as a whole, which we have already published (Seeman, Königová, 1976, Königová, Seeman, 1976), but to the fatal outcome of this complications.

RESULTS.

Seven of one hundred and fifty examined severe burns died due to cytomegalovirus infection. We present two patients with acquired type of CMV infection, who were affected with the localized form involving liver parenchyma.

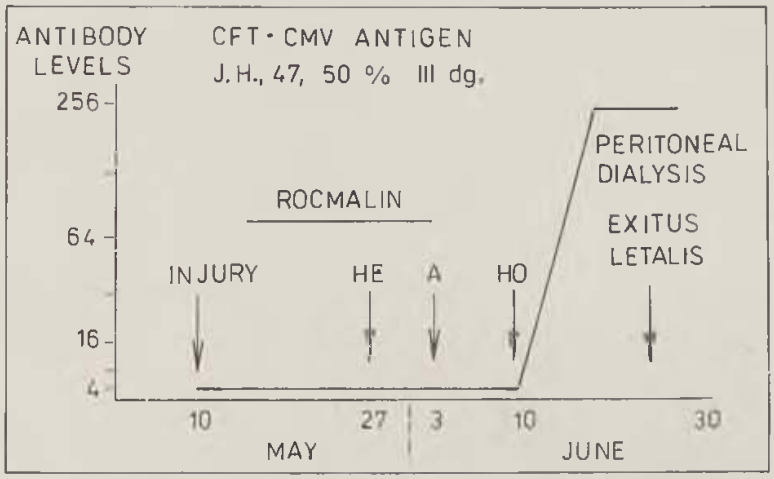

Fig.1.

The first patient, J. H., man, age 47, burn 50 per cent of third degree. Ninth day after the injury diarrhoe and elevation of transaminases (SGPT 50, SGOT 97) occured. In the following days necrectomy and repeated xenotransplantations and autotransplantations were performed. Because of the signs of septicemia he was transferred to the Septic unit of the Department of infectious diseases.

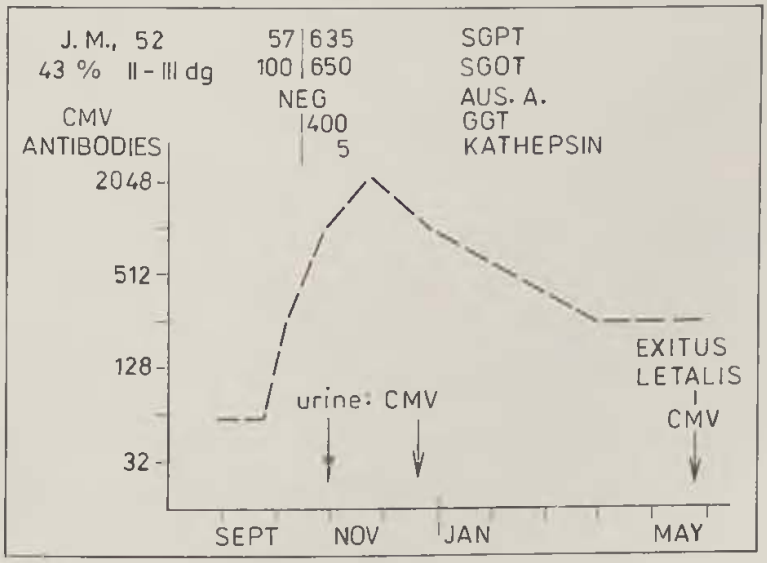

Fig. 2.

During the acute period the patient was serologically negative. A sudden rise of CMV antibody titres appeared in the septicemia, three weeks before death.

Our diagnosis of acute form of systemic cytomegalovirus infection was confirmed by the autopsy findings: acute liver dystrophy, nephritis, signs of septicemia.

The histological examination showed pathognomonic cytomegalic cells, which elucidated the etiological agent of liver involvement.

The septicemia, together with the patients exhaustion during the severe course of burn disease, shattered the defense of the patient. It enabled the development of CMV infection with fatal outcome.

In the second patient, J. M., age 53, burn 50 per cent of third degree, there appeared both clinical and biochemical signs of hepatitis during the acute period together with extremely high CMV antibody titres. Cytomegalovirus was proved in urine. The course of the burn and the liver involvement was favourable. The patient was discharged 66 days after injury. Fig. 2

Seven months later he was operated in the orthopedic hospital (reconstruction of the elbow joints) and second day after surgery he expired.

At autopsy the pathologist found also in this case an acute central necrosis of liver parenchyma together with the cytomegalic cells.

SUMMARY

Our study of severe burns has discovered the conditions which might reactivate the cytomegalovirus infection.

This communication supports the suggestion that severe burn pertains among the debilitating conditions which favour the acquisition of primary infection, the clinical manifestation of exogenous CMV infection and the exacerbation of unapparent cytomegalovirus infection.

In differential diagnosis of various clinical complications it is necessary to consider cytomegalovirus infection. An immediate virological examination may protect the patient from inadequate therapy and possible fatal outcome.

RÉSUMÉ

Terminaison létale de l'infection cytomégalovirale chez les grièvement brûlés

Seeman J., Konigová R., Lysenková L.

Pendant les études des malades grièvement brûlés on a constaté des conditions favorables à la manifestation de l'infection cytomegalovirale (CMV).

L'infection cytomegalovirale est dangereuse pour les malades grièvement brûlés. Cette constatation fait remarquer que chez les grièvement brûlés il se produit un état d'affaiblissement qui favorise soit l'évolution de l'infection CMV primaire, soit la manifestation clinique de la contagion cytomégalovirale exogène, éventuellement l'exacerbation de l'infection CMV inapparente.

Dans le centre de brûlement 7 malades d'un groupe de 150 malades grièvement brûlés sont morts en suite de l'infection cytomégalovirale. On documente l'évolution

de cette complication d'infection de la manière casuistique chez deux malades extensivement brûlés.

Dans la diagnose de différenciation des divers complications cliniques de la maladie causée par le brûlement il faut tenir compte de l'infection cytomégalovirale. L'examen virologique immédiat peut éviter une thérapie inadéquate des malades grièvement brulés, éventellement même la terminaison létale.

ZUSAMMENFASSUNG

Letaler Ausgang der Cytomegalovirusinfektion bei schwer Verbrannten

Seeman J., Königová R., Lysenková I.

In der Studie an schwer Verbrannten wurden Bedingungen festgestellt, bei denen es zur Manifestierung der Cytomegalovirusinfektion kommen kann.

Die Cytomegalovirusinfektion ist für die schwer Verbrannten gefährlich. Die vorliegende Mitteilung weist darauf hin, dass es bei den schwer Verbrannten zu einem Schwächezustand kommt, der entweder die Entwicklung der primären Cytomegalovirusinfektion, oder klinische Manifestierung einer exogenen Cytomegalovisusinfektion, oder eventuell die Exazerbation einer latenten Cytomegalovirusinfektion fördert.

Aus der Gruppe von 150 untersuchten schwer Verbrannten starben im Zentrum für die Behandlung von Verbrennungen sieben Kranke infolge der Cytomegalovirusinfektion. Kasuistisch wurde der Verlauf diser infektiösen Komplikation bei zwei umfangreich Verbrannten wiedergegeben.

In der Differentialdiagnose verschiedener klinischer Komplikationen der Verbrennungskrankheit muss an die Cytomegalovirusinfektion gedacht werden. Unverzügliche virologische Untersuchung kann den schwer Verbrannten vor inadäquater Therapie und gegebenenfalls auch vor dem letalen Ausgang schützen.

RESUMEN

Terminación fatal de infecciónes citomegalovirales en gravemente quemados.

Seeman J., Königová R., Lysenková I.

El estudio señala que en casos de personas gravemente quemadas se han comprobado condiciones en que puede llegar a manifestarse la infección citomegaloviral (CMV).

La infección citomegaloviral resulta muy peligrosa para las personas gravemente quemadas. Se señala en dicha información que la condición de debilitación en que se encuentran los gravemente quemados es propicia, o al desarrollo de una infección CMV primaria o a la manifestación clínica de una congestión citomegaloviral exógena, eventualmente a la exacerbación de una infección CMV inaparente.

De un grupo de 150 personas gravemente quemadas que se habían examinado, se murieron en el Centro para quemaduras 7 pacientes. En dos casos, tratándose de personas con fuertes quemaduras, la marcha de esta complicación infecciosa se detalla en forma casuística.

Al hacer el diagnóstico diferencial de distintas complicaciones clínicas inminentes en caso de quemaduras es necesario pensar en la infección citomegaloviral. Un inmediato examen virológico puede proteger al enfermo contra terapias inadecuadas, y, eventualmente incluso contra una terminación fatal.

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BIOCHEMICAL CHANGES IN BURN-AFFECTED LIVER

R. KÖNIGOVÁ, I. DOLINAYOVÁ

Numerous biochemical changes are found in severely burned patients throughout the course of treatment; in the emergency period of -burn shock, damage caused to the liver parenchyma is affected by fluid transfer (generalized oedema) and by increased adrenergic reaction with high catecholamine levels (vasoconstriction). Changes of this kind result from hypoxia and may, in terms of pathological anatomy, take the form of early steatosis of the liver parenchyma as evidenced by post-mortem histology findings (Bouška, 1978).

In the subsequent clinical course — in the acute period of the burn disease — the changes represent an enormous amount of stress for hepatic function:

a) poor gastrointestinal activity including frequent haemorrhagic complications in the alimentary tract,

b) bacterial toxins and catabolic waste products,

c) routinely used but repeatedly administered anaesthetics, antibiotics administered in high doses in those with extensive burns, and a number of other drugs.

In extensively burned patients with deep structure involvement, particularly so in patients with electric burns or patients with a history of metabolic disorder (similarly as in chronic ethylism), the demands on the body and on the liver parenchyma far outstrip the reserves of the organism. (Tab. 1). A total of 150 severely burned patients were followed up from January 1975 ta September 1979 period with a view to diagnosing hepatic lesion and its development in relation to other complications and therapeutic changes. Samples of blood for biochemical tests were taken twice a week for the simultaneous determination of gamma-glutamyl transpeptidase (gamma-GGT), glutamate-dehydrogenase (GLDH) and catheptin D quite apart from other routine tests (GOT, GPT, bilirubinaemia, ELFO, N-urea, creatinine, etc.).

METHODS

Photometric assessment of serum GLDH activity (UV-method using reduced nicotinamide-adenine dinucleotide) — Biochemica Test Combination GLDH Boehringer; polarographic estimations of cathepsin activity at pH 3.8 — 24 hour incubation at 37 °C; photometric methods utilizing gamma-L-glutamyl-p-nitranilide, Biochemica Test Combination GGT C-system (Tab. 2).

Table 1
January 1975 — September 1979:
150 severely burned patients
20 — 76% of total body surface
3 to 82 years

RESULTS

Out of the total number of 150 investigated patients 52 were selected, in whom increases in the enzymatic reactions of gamma -GGT, GLDH, and cathepsin activity had been observed without the anticipated changes in the values of routinely performed tests for transaminases (Tab. 3).

Table 2
Present tests (twice weekly):
gamma-glutamyl transpeptidase (gamma-GGT),
normal values — males up to 106 U/L,
females up to 66 U/L,
glutamate-dehydrogenase (GLDH),
normal values up to 1.2 U/L,
cathepsin D —
normal values 2.7 — 3.7 A/m^2,
other routine biochemical tests
(GOT, GPT, bilirubinaemia, ELFO, urea, creatinine)

Increased gamma-GGT activity was found in 2 patients immediately after injury to persist for 3 weeks which may have been in connection with the patients' history of alcohol abuse. 26 patients showed a transient increase in gamma-GGT activity during the period of shock, obviously attributable to intrahepatic cholestasis as part of generalized oedema. In 21 burned patients there was a temporary increase in gamma-GGT as a sign of the liver being overloaded in the course of the burn disease while they were receiving complex therapy. Inflammatory liver reaction in CMV infection proved to be the cause of stepped-up gamma-GGT activity in 3 severely burned patients.

The simultaneous increase in GLDH activity in this group of 3 patients proved to be a sign of hepatic dystrophy as ascertained during the post-mortem examination.

The above pathological findings were an impetus for more studies of GLDH activity, in all the burned, in whom hepatic lesion was presupposed.
(Tab. 4) High GLDH activity as a sign of hepatocytic necrosis (this particular enzyme is present exclusively in the mitochondria of hepatic cells) was found in extensively burned patients especially after repeated narcosis using Halothane (18 patients) and Narcotane (3 patients).

Table 3

Increases in gamma-GGT activity:
men — 130—1500 U/L ⌀ 320 U/L,
women — 85—360 U/L ⌀ 180 U/L,
alcohol abuse prior to injury (2 burned patients),
generalized oedema during emergency period of post-injury shock (26 burned),
iatrogenic liver overloading (21 burned),
infection — localized (3 burned patients) CMV

Investigations designed to find out possible relationship between liver function impairment and causes dating back to the pre-injury period helped to idenfity ARBOROL (=organophosphate) handling in one case, and acute virus hepatitis in another case, both preceding severe injury and resulting in marked increases in GLDH activity. Similar increases were also identified as characteristic in the above mentioned case of CMV infection.

Table 4

Increased GLDH activity: from 1.6—10 U/L ⌀ 3.8 U/L
repeated narcosis — Halothane (21 burned patients),
CMV infection — localized (3 patients),
ARBOROL (organophosphate) — (1 burned)
acute virus hepatitis (1 burned)

Significant differences in the blood levels of cathepsin — one of the constituents of lysosome — were proved in 52 patients with burns. What part the liver has to play in the mechanism of this increase has yet to be explained in more detail. Increases in its level up to double or triple the normal values were found in 43 burned patients aged 3 to 55 years, and in 9 patients over the age of 55. In the former, the transient increase in cathepsin levels was associated with stress-induced ulcers in 9 patients, and with signs of thrombosis in 21 patients. In 11 extensively burned patients with very poor prognosis, the levels rose to high values either as early as within 24 hours of the injury or by the end of the 6th day. This was probably in connection with extensive necrotic arcas and with the development of what is referred to as early sepsis. Pulmonary artery embolism was ascertained during post-mortem examination in 2 cases. In the latter group of elderly patients, the gradual build-up of cathepsin levels proved to be associated with the appearance of pressure sores in 5 patients. In 4 cases, increased cathepsin values heralded late sepsis with abscesses in all kinds of organs as subsequently confirmed at postmortem. (Tab. 5).

Table 5

Cathepsin value increase: 4.3—12.4 A/m² ⌀ 5.8 A/m²
Age group: *3—55 years* = 43 patients
Transient increase: — stress ulcers (9 patients)
— thrombosis (21 patients)

Exitus letalis
1st to 6th post-injury days: — early sepsis (11 burned) (extensive deep necrosis)
— pulm. art. embolism (2 patients)
Age group: *over 55 years of age* = 9 burned patients:
Transient increase: — pressure sores (5 patients)
Exitus letalis: — late sepsie (4 burned patients)
(abscesses in a variety of organs found at postmortem)

DISCUSSION

1. Any study dealing with burns should take into account the fact that the burn injury is a dynamic state accompanied by a number of reaction which keep changing in time. Complicated and often interrelated changes can affect organs and tissues are quite remote from the site of injury.

2. A precise idea of the actual condition of the severely burned patient and his prognosis can only be formed if all the relevant factors have been considered: the clinical situation, the biochemical test results, but — last not least — the patient's personal history and age, too.

3. Normal results of routine biochemical tests need not always be proof of the absence of complications. Some of the enzymatic reactions as used in our own may prove helpful in identifying all sorts of functional impairment or organic lesions. Cathepsin D in particular is a significant factor in establishing differential diagnosis.

J. H.

SUMMARY

150 severely burned patients were followed up in the intensive care unit from January 1975 to September 1979 with a view to diagnosing hepatic parenchyma damage and development in relation to other complications and changing therapy. Twice weekly checks were made of: gamma-glutamyl transpeptidase (GGT) activity, glutamate-dehydrogenase (GLDH), and cathepsin D activities, in addition to other routine tests. Increased gamma-GGT activity was found related partly to alcoholism, generalized oedema during post-burn shock, iatrogenic damage, partly to CMV infection. Increased GLDH activity — apart from the above listed causes — was also connected with repeated Halothane and Narcothane narcosis and with intoxication with Arborol, as well as with virus hepatitis in the patients' anamnesis. No satisfactory explanation is as yet available for the part the liver is likely to play in the mechanism of cathepsin increase. High levels of cathepsin were regularly found in thrombosis — often clinically mute —, in stress ulcers, decubit, and in early as well as late sepsis with abscesses in a variety of organs discovered at post-mortem. The above enzymatic reactions are therefore significant not only in terms of the differential diagnosis of some of the complications but also as regards prevntineo.

RÉSUMÉ

Changements biochimiques en cas de l'affection du foie après le brûlement

Königová R., Dolinayová I.

Pour différencier l'altération du foie et son évolution en relation avec les autres complications et avec la therapie évoluante on a suivi dans le centre des soins intensifs 150 malades grièvement brulés depuis le mois de janvier de 1975 jusqu'au septembre de 1979. En plus des examens courants on a examiné deux fois par semaine simultanément: l'activité de gamma - glutamyl transpeptide (GGT), de glutamat - dehydrogenase (GLDH) et de cathepsine D. L'activité élevé de gamma - GGT était liée d'un coté à l'abus de l'alcool, à l'oedême généralisé de choc de brûlement, à l'altération iatrogénique et de l'autre coté à l'infection CMV. L'activité élevé de GLDH était liée outre les causes nommées cidessus aussi à la narcose répétée par Halothane et Narcotane, à l'intoxication par Arborol et à l'hépatite de l'anamnèse. La fonction du foie dans le méchanisme de l'augmentation de cathepsine n'est pas encore claire. Le niveau élevé de cathepsine a été constaté régulièrement en cas d'une thrombose, souvent cliniquement muette, en cas des ulcères de stress, en cas de décubitus et en cas d'une septicémie iniciale ou tardive, où on a trouvé des abscèses dans les différents organes pendant l'autopsie. L'importances des réactions enzymatiques suivies consiste donc non seulement dans la diagnose de différenciation de certaines complications, mais aussi dans la possibilité de les prévenir.

ZUSAMMENFASSUNG

Biochemische Veränderungen bei der Verbrennungsschädigung der Leber

Königová R., Dolinayová I.

Zur Unterscheidung der Leberschädigung und ihrer Entwicklung in Beziehung zu anderen Komplikationen und zu der sich ändernden Therapie wurden 150 schwer Verbrannte auf der Einheit der Intensivtherapie im Zentrum vom Januar 1975 bis September 1979 verfolgt. Zweimal wöchentlich wurden gleichzeitig untersucht: die Aktivität der Gamma-glutamyltranspeptidase (GGT) der Glutamat-dehydrogenase (GLDH) und des Kathepsin D ausser sonstiger Routineuntersuchungen. Die erhöhte Aktivität der Gamma-glutamyltranspeptidase stand im Zusammenhang einerseits mit dem Alkoholabusus, mit dem generalisierten Ödem im Verbrennungsschock und mit iatrogener Schädigung, andererseits mit der Cytomegalovirusinfektion. Die erhöhte Aktivität der Glutamat-dehydrogenase stand im Zusammenhang — ausser der oben erwähnten Ursachen — auch mit der wiederholten Narkose mit Halothan und Narcotan und mit der Arborol-Vergiftung und der Virushepatitis in der Anamnese. Die Teilnahme der Leber am Mechanismus des Kathepsinanstieges ist bisher noch nicht klar. Hohe Kathepsinspiegel entdeckte man in der Regel bei — klinisch häufig stummer — Thrombose, bei Stressgeschwüren, bei Dekubitus und bei frühzeitiger und später Sepsis, wo bei der Sezierung Abszesse in verschiedensten Organen entdeckt wurden. Die Bedeutung der untersuchten Enzymreaktionen liegt also nicht nur in der Differentialdiagnose bestimmter Komplikationen, sondern auch in der Möglichkeit ihrer Vorbeugung.

RESUMEN

Cambios bioquímicos producto de la afectación del hígado en consecuencia de quemaduras.

Königová R., Dolinayová I.

Para diferenciar la afectación del hígado y su desarrollo frente a otras complicaciones y los cambios de terapia se investigaron 150 personas gravemente quemadas ingresadas en la unidad de tratamiento intensivo, desde enero de 1975 hasta septiembre de 1979. Dos veces a la semana se hicieron análisis simultáneas de la actividad de transpeptidasis gama-glutamila (GGT), glutamato-dehidrogenasis (GLDH) y catepsina D. aparte de otros exámenes de rutina. El incremento de la actividad gama-GGT se debía por un lado al abuso de alcohol, edema generalizado en el choque producto de quameduras, deterioración iatrógena, por otro lado en consecuencia de la infección CMV. El incremento de la actividad GLDH — aparte de las causas arriba mencionadas — tenía que ver también con la narcosis repetida por medio de Halothan y Narcotan y con la intoxicación por ARBOROL y la hepatitis viral en la anamnesia. La participación del hígado en el mecanismo del incremento de la catepsina no se ha aclarado todavía. Niveles altos de catepsina se comprobaron con regularidad en caso de trombosis — a menudo no manifiesta clínicamente — ,úlceras producto de stress, decúbitos y en caso de sepsis temprana y tardía cuando en la autopsia se descubrieron abscesos en muchos diferentes órganos. La importancia de las observadas reacciones enzimáticas, pues, consiste no sólo en el diagnóstico diferencial de algunas de las complicaciones pero también en la posibilidad de su prevención.

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Fig.1.: Patient S., 33 years old. Two years ago, a 0.2 mm thick skin autograft was applied on a granulating burn wound localized on arm. The connective tissue of the graft is fibrotic, the dermal papillae and skin appendages are absent. Stained by haematoxylin-eosin, magnif. 45×. Fig. 2.: The same, magnif. 200×.

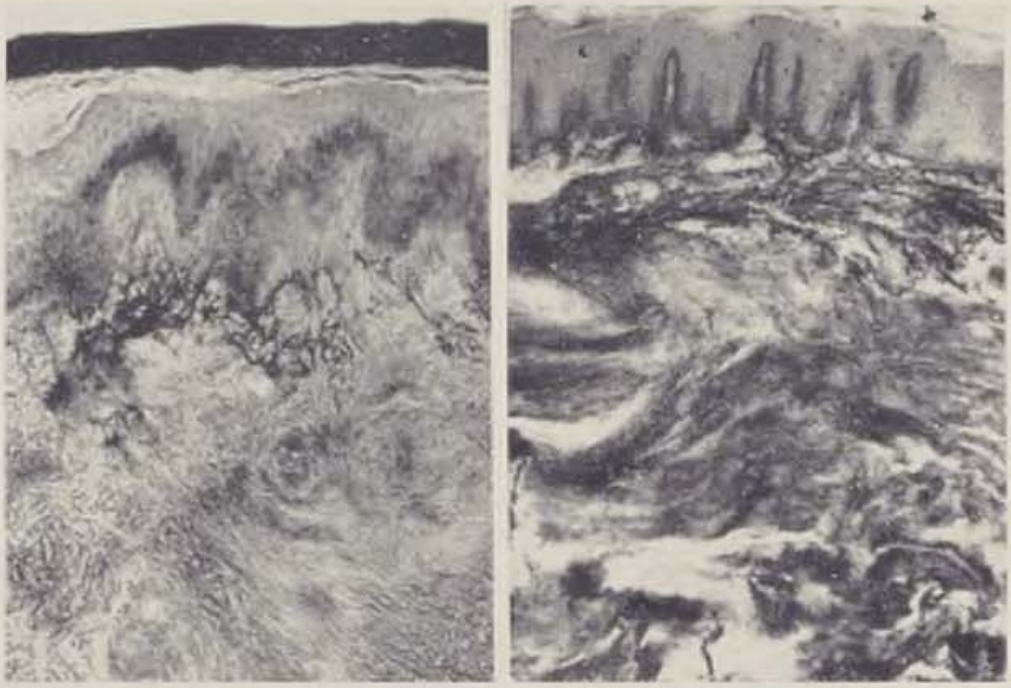

Fig. 3.: Patient K., 19 years old. Development of elastic fibres in the papillary layer of the skin autograft applied on a granulating burn wound, after 7 months. Stained according to Weigert, magnif. 90×. — Fig. 4.: Patient A., 50 years old. A hyperelastosis developed during 1 1/2 years in the autograft applied on the hyalinized burn wound. Stained according to Weigert, magnif. 35×.

Fig. 5.: Patient A., 16 years old. A hyperplasia of capillaries in the autograft applied on a granulating burn wound 10 years ago. A hyaline cicatricious tissue is present under the graft. Stained by haematosylin-eosin, magnif. 90×. — Fig. 6.: Patient F., 15 years old. Thirteen years ago, a fullthickness skin autograft was applied on the palmar surface of the hand, 1 1/2 — 2 years after the burn injury. The graft's dermis transformed into a hyaline scar. Stained by haematosylin-eosin, magnif. 200×.

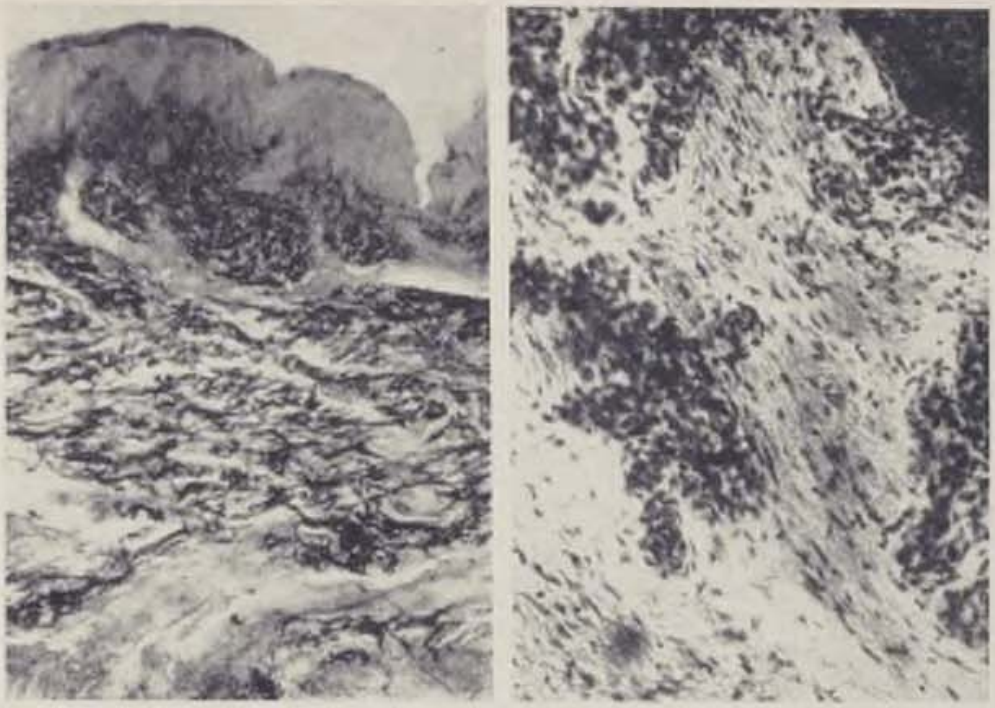

Fig. 7.: Patient B., 21 years old. A hyperelastosis occurring in the full-thickness autograft applied on the "normal" tissue and in the scar tissue below it, after 15 years. Stained according to Weigert, magnif. 35×. — Fig. 8.: Patient K., 31 years old. A hyperplasia of capillaries (angiomatosis) occurring in the autograft applied on the "normal" tissue, after 4 months. Stained by haematosylin-eosin, magnif. 90×.

Fig. 9.: Patient A., 16 years old. Ten years ago, a 0.3 mm thick skin graft was collected from the thigh. The skin appendages are absent, the dermis is fibrotic, the dermal papillae can be noticed in some places. Stained by haematoxylin-eosin, magnif. 45×. — Fig. 10.: Patient K., 49 years old. A hyperelastosis developed in the regenerated skin of a donor site, 3 years after collecting the graft. Stained according to Weigert, magnif. 90 ×.

G. A. Ilizarov, F. N. Zusmanovitch, A. M. Markhashov, A. M. Khelmskii,
L. Kh. Levitina, I. I. Azrapkin

RECONSTRUCTION OF LARGE DEFECTS OF BLOD VESSLS ON EXTREMITIES BY MEANS OF A GRADUAL DISTRACTION

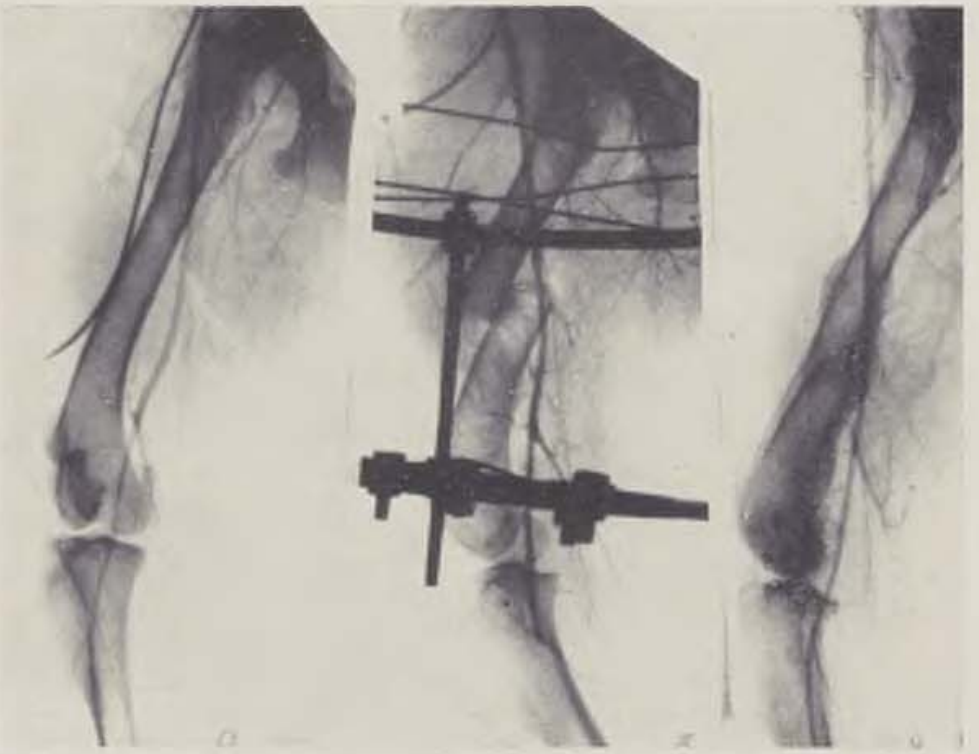

Fig. 2.: Angiogramms obtained by the living animals. a — before the operation, b — immediately after the operation, c — 368 days after the operation

Fig. 3.: The vascular anastomosis examined 51 days after the operation. The elastic fibres were shown by the stain. Magnif. 100×.

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SPECIFIC FEATURES OF ANAESTHESIA IN THE RECONSTRUCTION PERIOD IN SEVERE BURNS

E. JÍCHOVÁ, R. KÖNIGOVÁ

The achievements of the 20th century bring with themselves also increasing numbers of burn injuries sustained in individual and mass accidents. On the one hand, these may be part of polytraumatisms, or, on the other hand, independent burns, scalds, chemical and postiradiation affections. Of particular relevance are thermal injuries in children often caused by inadequate attention of the adults.

Even cases formerly rated as hopeless can now be saved at specialized centres staffed by teams of experts and well trained paramedical personnel, centres the number and standard of which have been on the increase all over the world. In practical terms this means that we now have more saved though often considerably disfigured patients requiring repeated reconstructive operations performed for reasons of function and aesthetic appearance. In scar deformations resulting in functional impairment certain reconstructive operations have to be performed as emergency measures, particularly in cases involving important areas of the face such as in ectropia of the eyelids. Scarry narrowing of the oral slit ranks among the most relevant indications for surgery. The patient suffers as he is able to take only liquid food supplied by means of flexible tubing. This poses problems not only as regards nutrition but also as regards anaesthesiology: a) minimum movement at the mandibular articulation due to contractures in the scarred face; b) scarry tissue extends as far as the neck supporting by their pull the contact of the tongue with the posterior wall of the pharynx in general anaesthesia using all sorts of anaesthetics; c) scarry contracture of the anterior area of the neck prevents the backward movement of the head thus rendering endotracheal intubation impossible. Ketamine is the only substance that will not reduce the muscle tone which makes it an anaesthetic of choice in this particular case.

Procedure

The premedicated patient is lying ready on the operating table, disinfected, covered with towels, with the surgeon ready for operation.

After general anaesthesia using Ketamine has been induced (according to the patient's weight), the surgeon performs relieving incisions according to the specific situation so as to permit movement in the mandibular joint and the backward movement of the head. Intubation should in this particular case be ideally performed

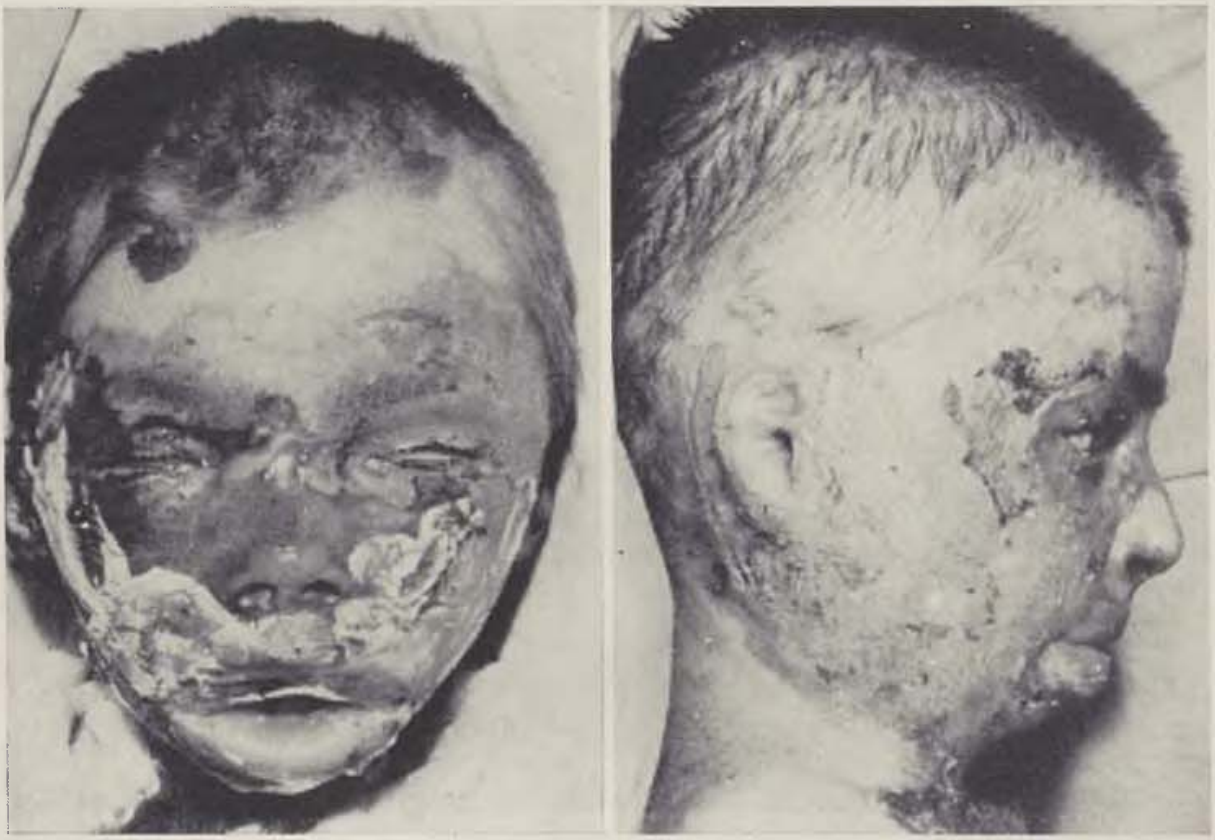

Fig. 1.: Patient S. T., girl aged 9, facial burns with 63% of total body surface affected (on day 2 after injury). — Fig. 2.: Patient S. T., girl aged 9, after healing with mentocollic angle obliterated by rigid scars

through the nose so as to make it possible for the surgeon to work unimpeded in the circumoral region. This might only be prevented or made more difficult by the possible simultaneous presence of scarry deformation of the nose. Bleeding incisions and possible excised scarry areas are temporarily covered and compressed. The anaesthesiologist wearing sterile clothes introduces the endotracheal tube together with adequate tamponade and fixation so that the surgeon should have a clear operating field in the region of the neck and head. Intubation may prove to be rather difficult owing to the rigidity of the surrounding tissues. As a matter of course, the patient has infusion introduced for the continual maintenance of anaesthesia. Most of the surgical operations of this kind take more than 2 hours to finish with a considerable blood loss which has to be replaced.

As an example of this type of problem, let us quote the case of S. T., a girl of 9, whose slip caught fire from an electric heat radiator causing severe (60% 2nd-

and 3rd-degree) burns, localization: face, neck, trunk, extremities. The girl was admitted and after 9 weeks of treatment discharged. During the first check-up (Aug. 1, 1978), scarry contracture of the front side of the neck was found, a condition which kept aggravating with the shrinking of facial grafted area, thus simultaneously

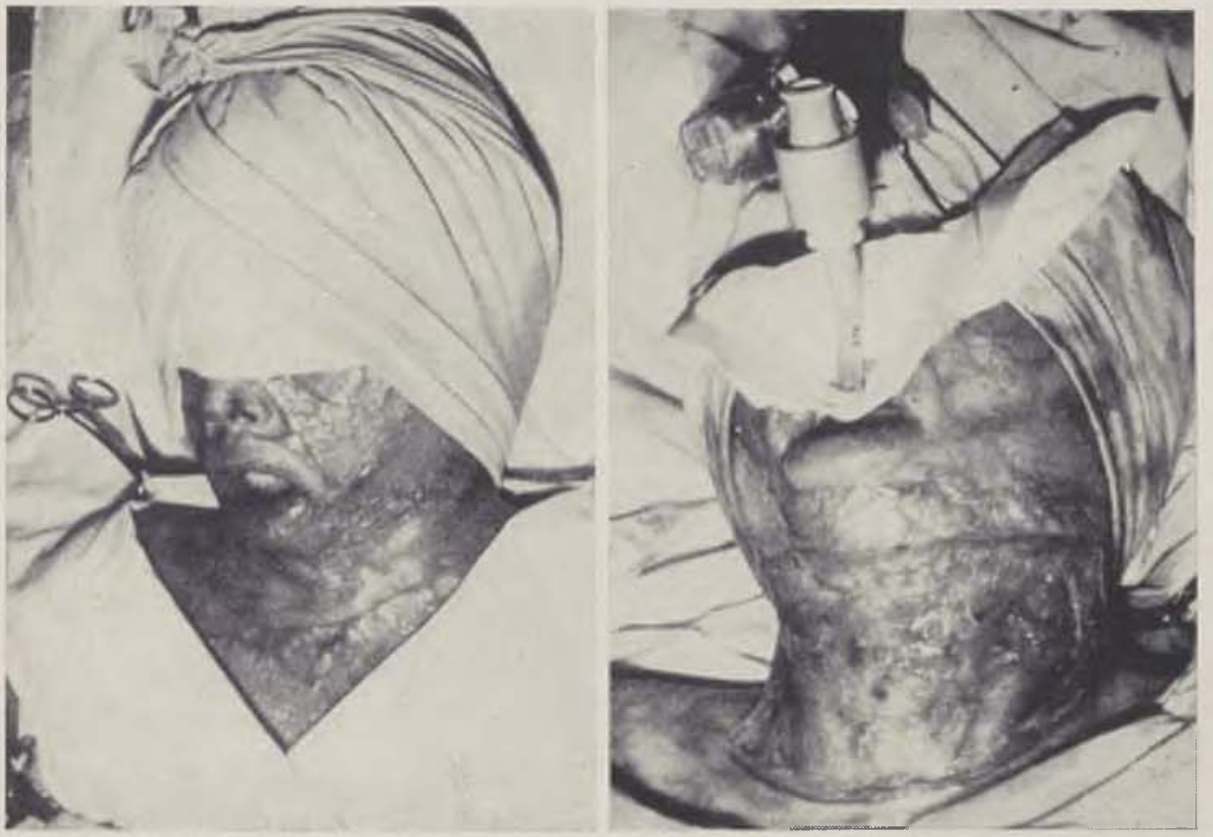

Fig. 3.: Patient S. T., ready for reconstructive operation on the neck. —
Fig. 4.: Patient S. T., scarry area on the neck excised — endotracheal intubation performed

aggravating ectropia of the lower eyelids which, however, were not affected by the burns. On Aug. 3, 1978, the first reconstructive surgery was performed relieving the contracture on the neck with thick dermodepidermal autograft used for coverage. Under Ketamine anaesthesia, the scars on the front area of the neck were incised and the edges were spread apart to a distance of 10 cm. With the contracture thus relieved, endotracheal intubation was introduced (Dr. Šturma) and a Cellona imprint taken so that a laminated collar could be made (Dr. Bláha). The subsequent course involved reconstructive surgery on both cheeks and upper eyelids. A number of surgical operations will follow until the end of puberty to keep up with the child's growth and development.

The situation is made particularly hard when a child reaches the age of becoming aware of the fact that the affection prevents him or her from keeping normal social relationships. This, in turn, may lead to a general deterioration of the adolescent's

psychic condition and, consequently, to generally lesser resistance to therapy. This particular moment is especially critical in children approaching the age of puberty. However, there are numerous of cases of such severe affection being made up for by the adolescent patient through compensatory mechanisms which, on the cont-

Fig. 5.: Patient S. T., transplants sutured into the defect. — Fig. 6.: Patient S.T., aged 9, following more reconstructive surgery — autografts added to facial region

rary, are conduced to a positive turn in the order of priorities and values, to an intensive orientation towards a particular goal in life, as well as to the acceptance of changed living conditions. Lending support to such compensatory mechanisms belongs among the no less important tasks of the doctor. Successful treatment will also depend to a large extent on good human relations between the medical and paramedical staff on the one hand and the patient on the other hand. Their social interrelationship is built on mutual respect — on the doctor's humane attitude to the patient, and on the patient's absolute confidence in the doctor. As for the doctor or surgeon, this is conditional on basca ethical attitudes inherent in the medical profession as such.

The situation will be different in countries where the doctor-patient relationship is unabashedly based on commercial considerations. The rules of such relationship are determined by lists of pecuniary charges for health services, a circumstance which may prove to be a serious complication for the course of reconstruction and rehabilitation. Psychiatric complications involving frequent suicides thus obscure whatever good results have been achieved in the treatment of those severely

burned. In our own clinical work there is no record of patient suicide for we tend to perform reconstructive operations so long as our experience permits meeting the patient' s individual needs requirements. A number of such problems are non-existent in a society where medical care is free and where it has become an integral part of life in society.

J. H.

SUMMARY

The authoresses analyze post-burn conditions requiring special techniques in repair operations, quoting the case of a 9-year-old girl where endotracheal intubation was made possible by the assistance of a surgeon. Emphasis is laid on the advantages of the socialist health care system permitting such operations according to the patient's own needs regardless of cost.

RÉSUMÉ

Particularités d'anesthésie dans la période reconstructive en cas des brûlures graves

Jíchová E., Königová R.

L'article traite les états après le brûlement qui exigent les abords spéciaux pendant les opérations reconstructives. On montre le cas d'une malade de 9 ans où il a été possible de réaliser l'intubatio endotrachéale en assistance d'un chirurgien. On fait remarquer les cotés positifs de la santé publique socialiste qui permet de pareilles interventions en accord avec les besoins des malades.

ZUSAMMENFASSUNG

Besonderheiten der Anästhesie im Zeitraum der Wiederherstellung bei schweren Verbrennungen

Jíchová E., Königová R.

Der Artikel behandelt Zustände nach Verbrennungen, die bei den Wiederherstellungsoperationen ein spezielles Herangehen erfordern. Es wird auf den Fall einer neun Jahre alten Patientin hingewiesen, wo endotracheale Intubation bei der Assistenz eines Chirurgen durchgeführt werden konnte. Die Autoren heben die Vorteile des sozialistischen Gesundheitswesens hervor, die diese Eingriffe nach dem Bedürfnis des Patienten ermöglichen.

RESUMEN

Particularidades de la anestesia en el período de reconstrucción de las quemaduras graves

Jíchová E., Königová R.

El artículo trata sobre tales estados después de quemaduras que requieren especiales procedimientos al realizarse la reconstrucción plástica. Se señala el caso de una paciente de nueve años de edad en que se pudo llevar a cabo la intubación endotraqueal con asistencia de un cirujano. Se destacan los logros de la medicina socialista que posibilita la realización de estas intervenciones según la necesidad del paciente.

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IN MEMORIAM

On November 18, 1979, Marie Chytilová, M. D., CSc. left the ranks of Czechoslovak plastic surgeons for ever. She was one of the generation of surgeons trained by Academician F. Burian, the founder of this line of specialization.

After more than a decade of practical work in general surgery and traumatology at Prof. Novák's institute, Dr. Chytilová became qualified in the field of plastic surgery. In the years 1946—1948 she was in charge of the Kyjov hospital department of paediatric and plastic surgery. From there she went back to Brno to help Prof. Karfík build up a specialized clinical department at Brno-Královo Pole. In 1955, she returned to her original place of work, the Research Institute of Traumatology as it is now. Alongside her clinical work she devoted a great deal of effort to research activities. In 1963, she successfully defended her dissertation "Autoimmunization Processes and Their Effect on Wound Healing" as a thesis for her CSc. degree. In the same year, she was sent as an expert of the Czechoslovak Ministry of Health to Magdeburg, the GDR, where she founded and was for three years in charge of the first specialized ward of plastic surgery at the local department of surgery. Her very successful work was awarded several high GDR distinctions. After her return home she resumed work in the Research Institute of Traumatology where she devoted herself to research work which she continued even after retirement until disease prevented her from doing so.

Dr. Chytilová presented well over 50 lectures and published 57 scientific papers and studies at home and abroad. Some of them remained unfinished. She also published many reviews of foreign literature and international congresses, and spent ten years preparing abstracts from the field of plastic surgery for Excerpta Medica.

Dr. Chytilová's clinical studies were devoted mainly to paediatric surgery (craniostenoses, ptosis of the eyelids, atresia of the auditory meatus, haemangiomas, hand burns, etc.) and to skin transplant operations both in plastic surgery and in general surgery and in traumatology. Of particular significance are mainly her studies of the complex problems of autoaggression and compatibility of tissues.

Dr. Chytilová had a well developed sense of team work and of putting together and giving guidance to young coworkers, offering them selflessly much of her extensive knowledge and rich experience but also setting an invaluable example of modesty, precision, meticulousness, and fervour for research work. She was also an example in her kind, thoughtful approach to her patients.

The death of Dr. M. Chytilová is a sad departure from the ranks of Czechoslovak plastic surgeons of a kind and exquisite human being such as can never be forgotten. She deserves to be paid our homage.

Prof. H. Pešková, M. D., DrSc.

NEW BOOKS

Burns: K. Troshev, Publishers: Meditsina i fyskultura, Sofia, 1979.

A small-size, sixty-page publication intended by the author, a plastic surgeon of Varna, Bulgaria, for the general public a presented in a scientific popular style.

In chapter 1 the author describes the structure and function of skin for every layman to understand, listing the causes and types of burns, the significance of the extent and intensity of burns ranging from lst-degree to 4th-degree lesions, a drawing attention to the differences and to the significance of the burned patient's age.

There is a well balanced chapter on the burn disease, its development and general eiffect on internal organs of the body. Dr. Troshev gives a list of the principles of first aid which he classifies as lay a medcal types of aid, and first aid in multiple burns.

Burn therapy is divided into total, local and surgical (amputation, necrectomy, and different types of transplantation).

The next chapter outlines the possibilities of rehabilitation in therapeutical institutes as well as instructions on how to take care of the skin and scars in the patients' homes.

There are also accounts of the aftereffects which in more extensive burns may later affect blood circulation, the urinary tract, the liver, or aggravate concomitant arteriosclerosis, the patient's mental condition, etc.

The last two chapters discuss methods of working capacity rating and prevention of such grave injuries. There are examples taken from the author's own and foreign practice, as well as some of the statistical data.

The book is written in a comprehensible way to satisfy lay curiosity, and there is a wealth of the latest information on the significance and treatment of burns. It is bound to serve its purpose as far as the general public is concerned, though it should be equally attractive even for those who treat burns professionally.

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Surgery of the Cleft Palate; Š. Demjén, Publishers: Osveta, Martin 1979.

The book with its 82 pages of text and 107 literary references is printed on glossy paper in two columns — in Slovak and in English. There are 26 photographs and coloured drawings.

Section 1 is devoted to the history of cleft palate surgery with the author paying deserved attention mainly to those techniques which represented progress and improvement.

Section 2 is a valuable presention of the functional anatomy of the palate with descriptions of the shape, anchoring and function of the muscle tissue involved, as well as of blood and nerve supply. The author dwells especially on the mechanism of the nasopharyngeal closure which is of particular importance for satisfactory speech after operation.

Section 3 covers the pathological-anatomical aspects of cleft palate and the basic principles and techniques of palatoplasty. Some of the conditions necessary for satisfactory palate function are analyzed with particular attention devoted to the incision of nerve-vascular bundles as performed in the Killner-Wardill version of V — Y and W — Y plastic operations. Professor Demjén, who has performed well over one thousand such operations since 1951, is a fervent believer in this as yet not generally used technique. The Prague Burian school, for instance, prefers shifting the palate while merely lifting the fasciculi without severing them using primary pharyngoplasty involving the use of a modified upper-pedicled flap.

In the last section the author describes the Killner-Wardill technique, which he himself has modified in details, from the required instruments, patient positioning, narcosis, tongue handling, up to the operation proper. Even experienced surgeons are likely to find in this particular section a number of ideas to enrich and facilitate their operation technique. There are highly instructional captions supplementing the coloured drawings. As the name of the artist is not given in the book I suppose it must be the author himself.

Professor Demjén, an experienced plastic surgeon, deserves a great deal of credit for the establishment and development of plastic surgery in Slovakia where he has trained a number younger plastic surgenos. His book is a contribution to our specialized literature in that it includes the description of the author's own modification of a successful technique. Perhaps he should have indicated — in a larger group of patients — how he made sure that the patients had not developed jaw growth disorders later on in life, his own results of postoperative neurological investigation, or phoniatric assessment according to the usual criteria. In my opinion, the reader would also be interested to know more about the author's cooperation with Kremenak and Greewe on experiments conducted in the USA.

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STOP FOR A MOMENT AND CONSIDER YOUR HEALTH

DAY AFTER DAY AND YEAR AFTER YEAR YOU ARE CONSTANTLY CHASING SOME AIM OR ANOTHER, YOU STRETCH THE MAINSPRING OF YOUR HEALTH TO THE VERY MAXIMUM. AND HOW LONG DO YOU THING YOU CAN CONTINUE TO DO SO? REMEMBER THAT YOU HAVE ONLY ONE HEALTH AND FINALLY MAKE UP YOUR MIND TO GRANT IT, AT A VERY REASONABLE PRICE, WHAT IT DESERVES: COMPLEX TREATMENT AT ONE OF THE OLDEST AND THE MOST WIDELY RECOGNIZED SPAS IN EUROPE.

CZECHOSLOVAK SPAS — OASES OF HEALTH,
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