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RECONSTRUCTION IN POST-INJURY HYPERTELORISM

T. Németh, J. Kozák

The concept of ocular hypertelorism was first defined by Grieg in 1924 in two cases of congenital facial deformation as an abnormal increase in the interorbital distance. Hypertelorism in congenital facial defects may be due to overdeveloped ethmoidal sinuses, encephalocoele, increased pneumatization of the frontal sinuses, craniofacial or nasoocular clefts, or craniostenosis (Apert, Crouzon).

The technique of measuring the distance in hypertelorism has had its development. At first, the distance between pupils used to be measured but it was soon found out that this was an imprecise method particularly in strabismus, exophthalmos or in cases of loss or some other diseases of the eyeballs. Nowadays, we measure the distance at the point of the internal ocular ligament insertion or at the anterior edge of the lacrimal bone, best of all with the aid of computerized tomography.

According to Günther, there are three degrees of hypertelorism. In 1st-degree hypertelorism the distance between the two internal ocular ligaments ranges from 30 to 34 mm, in the 2nd degree from 34 to 40 mm, and in 3rd-degree hypertelorism in excess of 40 mm.

The present communication deals with post-traumatic hypertelorism seen in grave injuries of the nasomaxillary complex, in frontobasal injuries, and occasionally in Le For II—III types of fracture.

Two patients with serious post-injury hypertelorism were treated at our department in 1981, one, K. S., b. 1958, No. clin. rec. 10262, for a condition following a serious traffic accident involving loss of an eyeball and post-injury hypertelorism of 44 mm measured on a computerized tomograph (Fig. 1).

The other patient, N. L., b. 1946, No. clin. rec. 11535, had sustained an occupational injury in a funicular accident with a 20 metre fall resulting in post-injury hypertelorism of 43 mm measured on a CT (Fig. 2).

Both were first treated at their local hospitals where life saving operations and other necessary surgical and medicamentous treatment were provided.

The patients were subsequently referred to our department for severe deformations in the upper and medium facial regions. Following careful local and

Fig. 1a, b — 1a — Patient K. S. prior to reconstruction for hypertelorism. The right eyeball missing, replaced by an eye prosthesis. 1b — State after surgery with the course of the bitemporal incision still marked

general clinical investigation, subcranial naso-orbital osteotomy with frontal bone defect filling and nasal dorsum reconstruction was decided on for both patients. The operations were performed under general anaesthesia with Cephamezin antibiotic protection.

The coronary-bitemporal approach was chosen with the incision extending from one external meatus to the other across the scalp. This makes for a broad, well supplied frontal flap which — on lifting and pulling down permits easy bone preparation below the bipupilar line level. The hard tissues of the orbit below that line are approached from subcilliary incisions. Once the frontal flap has been folded down, the periosteum can be incised above the bone defect present and above the upper edges of the orbit. Its separation should be as sparing as possible, particularly in handling the thin periorbita, in order to have a good view of the operation field free from fatty prolapses. On reviewing the anatomical relationships, we cut out a 10 mm bone segment along the midline, and proceeded by loosening the medial walls of the orbits, taking care not to damage the internal ocular ligament, and completed the mobilization into the piriform aperture with the aid of osteotomy. Both segments, now loose,

Fig. 2a, b — 2a — Patient N. L.'s appearance before reconstruction for hypertelorism in the frontal and glabellar regions. 2b — State after operation

were shifted on to the median line, and their new position was fixed with bone sutures. Should the medial palpebral ligament be found to have been torn off in the process, we have to look it up to suture it carefully and to fix it in the required position. This ligament, deliberately severed during the operation, should unmistakeably be fixed to the underlying bone in the final stages of the reconstruction, best of all with a transosseal wire suture. The defects that have thus been caused in the orbit as well as the post-injury defect in the frontal bone are filled with grafts taken from the ilium. One longer, pre-shaped bone graft is used for the reconstruction of the nose. During the post-operative period which proceeded free from complications, we performed a CT check-up which showed the hypertelorism as having been corrected to 25 mm.

DISCUSSION

Treatment for post-injury hypertelorism is a sophisticated process. For that reason, the development of hypertelorism should be prevented by correct and responsible management of fresh injuries of the facial bones. This, however, is not always feasible, particularly in serious polytraumatic cases where life saving takes absolute priority.

Once the decision has been made on reconstruction for post-injury hypertelorism, the patient should be carefully examined, seeking other specialists' advice if necessary, high-quality X-ray pictures of the skull should be taken, and, where possible, computerized tomography should be used for the precise measurement of the interorbital distance. Appropriate antibiotics are to be given the day before or two hours prior to the operation, depending on the mode of application. Using the bitemporal incision, we can dispense with making a vertical incision of the frontal flap for a better view of the operation field. While working on the orbits, it is advantageous to use cold light as it markedly improves and speeds up work behind the lacrimal sac and internal ocular ligament. Osteotomy is performed using fine bone drills and continuous cooling with physiological saline, or small straight or even curved chisels. There are essentially to possible surgical approaches — either leaving the lacrimal sac in place and working behind it, or — which is technically easier — exposing and displacing it complete with the transsected internal ocular ligament. This, however, makes perfect restitution of both a far more difficult affair.

Osteosuture of the mobilized segments has to be performed sparingly in view of the thinness and fragility of the bony lamellae in the field of operation. A plaster-of-Paris fixture is used for keeping in position the bone graft which gives shape to the dorsum of the nose. No osteosuture is used there. In the post-operative phase, the patient's general and local condition is monitored, giving antibiotics and trying to prevent the development of complications.

J. H.

SUMMARY

The authors report on a possible technique of reconstruction in post-injury hypertelorism with subcranial naso-orbital osteotomy, and describe the surgical procedures used in two of their patients in 1981. The time- and skill-consuming operation improves substantially the patients' cosmetic and, in particular, psychic condition in cases of serious injury with subsequent facial deformations.

RESUME

La correction de l'hypertélorisme posttraumatique

Németh, T., Kozák, J.

On a montré la possibilité d'une reconstruction de l'hypertélorisme posttraumatique à l'aide de l'ostéotomie nasoorbitaire subcranienne, quelle était exécutée sur deux malades en 1981, avec la description de la technique opératoire. L'intervention, qui réclame beaucoup de temps et une technique parfaite, améloire — grâce aux résultats cosmétiques — significativement l'état psychique du malade après de grands traumas desquels résultent de graves difformités au visage.

ZUSAMMENFASSUNG

Korrektur des posttraumatischen Hypertelorismus

Németh, T., Kozák, J.

In der vorliegenden Mitteilung zeigten wir die Möglichkeit der Wiederherstellung des posttraumatischen Hypertelorismus durch subkraniale nasoorbitale Osteotomie, die

wir im Jahre 1981 bei zwei Patienten mit der Beschreibung der Operationstechnik durchgeführt haben. Die technisch und zeitlich aufwendige Operation verbessert markant sowohl den kosmetischen als auch psychischen Zustand der Patienten nach schweren Unfällen mit nachfolgenden Gesichtsdeformationen.

RESUMEN

Corrección del hipertelorismo después del accidente

Németh, T., Kozák, J.

En nuestro trabajo señalamos la posibilidad de reconstrucción del hipertelorismo, producto de accidentes, mediante la osteotomía nasoorbital subcranial, que en 1981 realizamos en dos pacientes describiendo el método operativo. La operación requiere mucho tiempo y habilidad pero los resultados son enormes mejorías cosméticas y, ante todo, psíquicas en los pacientes que sufrieron graves accidentes con subsiguientes deformaciones de la cara.

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THE MUSCULOCUTANEOUS FLAP METHOD AS A SUBSTITUTE FOR THE METHOD OF DELAYED TRANSFER. REPORT ON A DISCOVERY

M. Orticochea

INTRODUCTION

Four methods of skin replacement in cutaneous loss have been described in the written history of medicine in the following chronological order:

A) In the 6th century B. C., skin flaps for the reconstruction of the nose were described by Sushruta in India. — In the 16th century, Gaspare Tagliacozzi, professor of anatomy in Bologna, used skin flaps from the proximal side of the arm and transplanted them to reconstruct the nose. Distant flap transplantation to recipient areas was Tagliacozzi's great contribution to the development of plastic surgery.

Centuries later, mainly in the 20th century, it was generally assumed that one or several delays increased the possibility of skin flap survival.

In 1917, Vladimir Filatov (2), a Russian surgeon, introduced a most important mode of skin flap, namely the tube flap allowing skin transplantation to recipient areas located far away from the donor areas. The tube flap was undoubtedly a magnificent technique. However, it carried the disadvantage of needing many operations. Weeks or months were necessary to replace the skin, especially in large reconstructions of the face or the lower extremities. Between roughly 1920 and 1970, the tube flap technique was used as an excellent procedure for the resurfacing of large skin losses.

B) In 1869, Jacques Louis Reverdin, a Swiss surgeon working in Prof. Guyon's service at the Paris Necker Hospital, presented for the Imperial Society of Surgery his work "Greffe épidermique" (10). In 1872, he produced another study on the subject (11), thus initiating the use of skin grafts in surgery. However, Reverdin received but little recognition, and his innovating brilliant idea which opened up new paths before plastic surgery was accepted by only two members of the Society (3). But it was time to propagate abroad Reverdin's extraordinary idea of universal application to the human body, an idea of invaluable benefit to plastic surgery patients.

Skin grafts are usually transplantations of epidermis and a portion of the dermis. With tendons and bones uncovered and with the recipient areas infected, the changes of success are greatly diminished. Split-thickness skin grafts consisting of the epidermis and the whole dermis are, as a rule, used particularly to cover recipient areas in an ideal condition.

C) The musculocutaneous flap method as an improvement on skin flaps on the outdated method of delayed transfer permits skin transplantations from one region to another immediately and under any circumstances, that is to say, in every and any region of the body. This particular method was developed by the author of the present report in 1969, and published in 1972 (5 and 8). Once published, my work encountered great difficulty before it was understood and recognized. It was only after a number of events too unpleasant to be reported here that my method became well known.

D) In 1973, O'Brien et al. (4) devised transplantation of the skin and subcutaneous tissue by anastomosing the arteries and veins of the recipient area with the arteries and veins of the transplanted skin and subcutaneous fatty tissue.

Microsurgery in skin transplantations, a new brilliant chapter of plastic and general surgery, was just beginning.

Discovery of the musculocutaneous flap method

In April 1969, a young patient presented in the Bogotá Shaio Foundation with a serious injury of the right lower extremity on the medial malleolus. A car accident one month before had caused fracture of the tibia. The tendons of the posterior tibial muscle and of the flexor digitorum longus had been exposed and become necrotic (Fig. 3-A). A large area of the raw wound was seriously infected. Profuse purulent effusion escaped from the bone, tendons and cutaneous borders which looked pink-coloured and cyanotic. The patient's serious condition required immediate action. The following options were considered:

a) A skin flap from the same lower extremity or from the opposite side would have required one, two or even three delays, which would have meant a waste of precious time. The patient's condition, already bad enough, would have deteriorated. For that reason, that particular option was ruled out.

b) A dermo-epidermic graft would have hardly taken on an anfractuous, infected recipient area formed by partially necrotic bone and tendons. While a reasonable solution was looked for the young man's condition was monitored.

By that time, I had evolved in the National Cancer Institute a technique of reconstruction of the penis (6). The method consisted in the construction of an undelayed musculocutaneous tube with self-innervation and tactile and erogenous sensitivity (Fig. 1, 2). The flap used for the purpose and constructed in a single surgical operation preserved several vascular pedicles. The post-operative stage was free from surgical complications and vascular damage

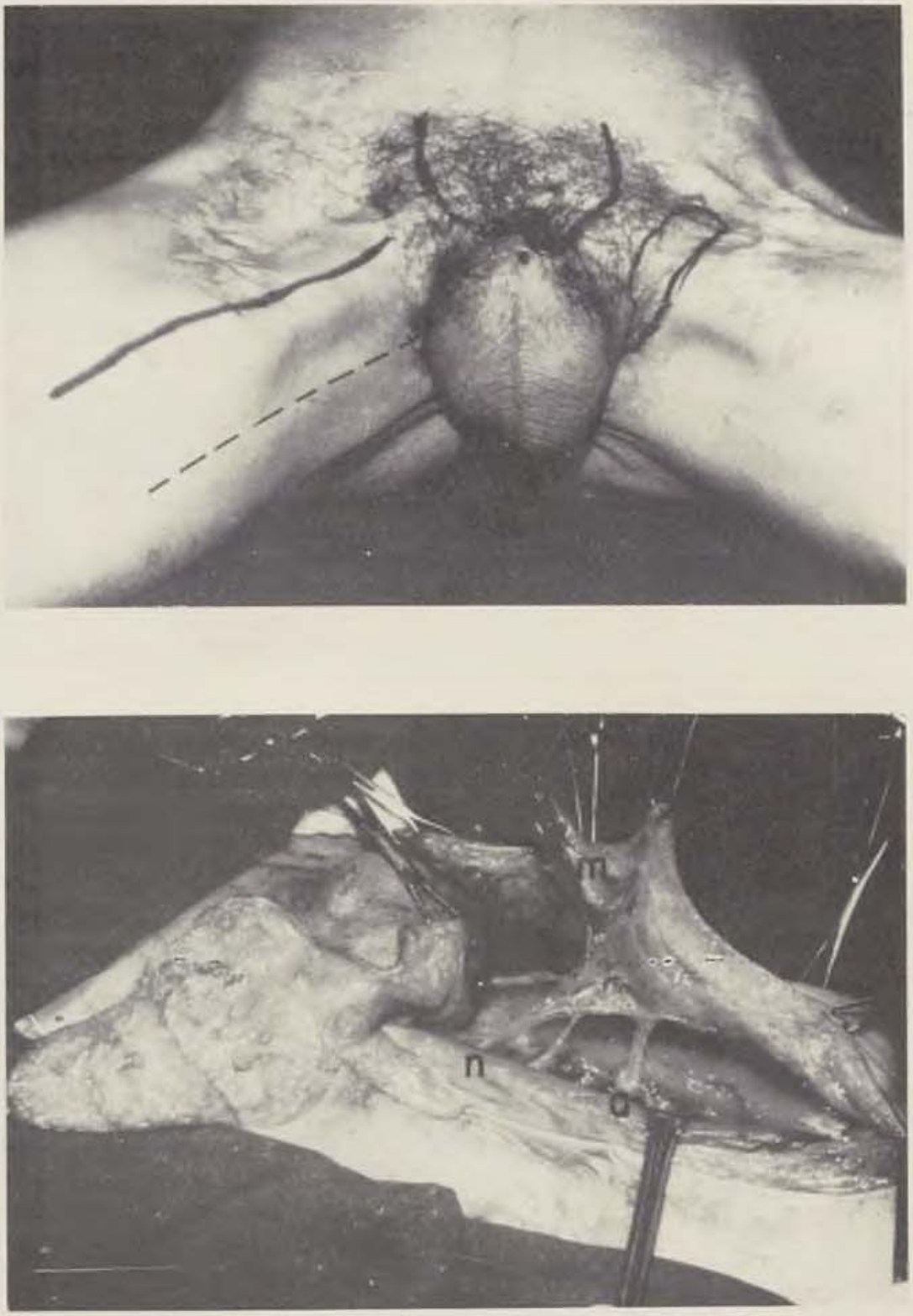

Fig. 1. — First stage of penis reconstruction. A) — The musculocutaneous flap donor area with the gracilis outlined on the right thigh (dotted line). B) — The musculocutaneous flap made of the skin of the internal side of the thigh and gracilis (m) raise complete with it own nerve and vascular supply. n. — Anterior branch of the obturator nerve. a. — Third vascular pedicle of the gracilis muscle arising from the superficial femoral vessels

(Fig. 2). This convinced me of being on the right tract although, at that time, I did not realize that the flap used for the reconstruction of the penis could also be used in other regions and for different purposes.

During the nineteens and twentieth centuries, many surgeons used the musculocutaneous flap to repair specific regions of the body such as the

Fig. 2. — Penis reconstruction after the first surgical stage. a. — Third vascular pedicle of the gracilis arising from the superficial femoral vessels. The undelayed musculocutaneous tube with rich blood supply. A tunnel is created under the skin across the left inguinal region to form a tube for the reconstruction of the urethra

face (9), the palate (1) or the penis (6), an obvious procedure considering the close proximity of the skin and its underlying muscles. Many surgeons included a muscle or a portion of the muscle in the musculocutaneous flap.

However, nobody seems to have ever contemplated or described the musculocutaneous flap as one that could be used universally in any region of the body. Its wonderful quality of allowing self-supplied cutaneous transplantations to any region of the body was as yet unknown.

As I was leaving the National Cancer Institute after visiting the patient under my care (Fig. 2), it came to my mind that the logical and reasonable solution for my patient with injured medial malleolus (Fig. 3-A) would be to reconstruct the defect with a musculocutaneous tube or a musculocutaneous flap similar to that used for penis reconstruction. The outcome of one operation, I reasoned, would be as good as in the other.

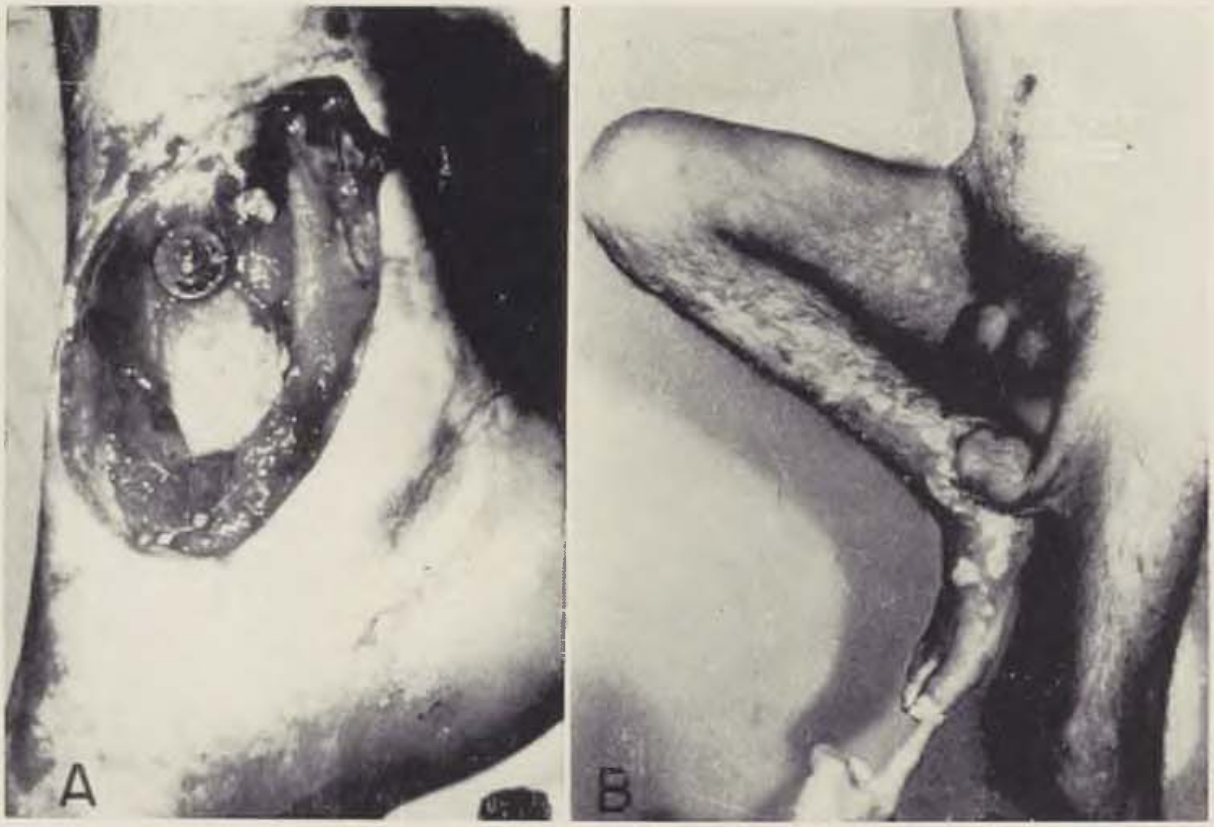

Fig. 3 A — Raw surface on the medial malleolus on the right leg. The tibia and tendons of the posterior tibial and the flexor digitorum longus are exposed. — B — Patient one month after operation. The musculocutaneous flap covers the raw surface

The day after, I raised a superiorly pedicled musculocutaneous flap from the internal side of the left thigh, using the gracilis muscle as a nourishing element for the flap (Fig. 3-B). The young patient in the Shaio Foundation had his leg saved.

This was how the musculocutaneous flap method was discovered as a new method for skin transplantations to any region of the body. In 1972, my method appeared in the British Journal of Plastic Surgery under the title of "The musculocutaneous flap method: an immediate and heroic substitute for the method of delay". Method rather than technique. A technique is a surgical act carried out on a limited and specific region of the

body whereas the word m e t h o d conveys the idea of universal action used in all regions of the body. The term m u s c u l o c u t a n e o u s f l a p is a reference to its skin and muscle components. I used the word i m m e d i a t e deliberately to stress the fact that the flap is used for immediate skin transplantation — in hours instead of months. The method was called h e r o i c to suggest that the sacrifice of one or several muscles could save a whole

Fig. 3 C — Sectioning the pedicle of the musculocutaneous flap. m. — Gracilis muscle. a. — Third vascular pedicle of the gracilis as a collateral of the superficial femoral vessels

region of the body, if not the patient's life. Similarly, the method was described as a s u b s t i t u t e f o r t h e m e t h o d o f d e l a y considering that in 1972 delay was a routine surgical necessity which took weeks and months to complete.

The musculocutaneous flap method makes for easier and quicker surgical operation with less suffering caused to the patient and a shorter period of hospitalization. J. H.

SUMMARY

Two patients' cases are reviewed, one involving reconstruction of the penis, and the other — cutaneous loss in the malleolar region. Both proved to be the guides to the discovery of the musculocutaneous flap method. The author describes how he came to the discovery.

RESUME

Description d'une découverte: méthode du lobe cutano-musculaire remplaçante la méthode de la transplantation en retardement

Orticochea, M.

Décrit le traitement opératoire de deux malades. Une reconstruction du pénis et du défaut cutané a inspiré l'auteur à la découverte de la méthode du lobe cutano-musculaire. L'auteur décrit, comment est-il arrivé à la découverte.

ZUSAMMENFASSUNG

Beschreibung einer Entdeckung: Methode des Hautmuskellappens als Ersatz für die Methode der Transplantation mit Unterbrechungen (method of delay)

Orticochea, M.

Es wurde die Operationsbehandlung von zwei Patiente beschrieben. Die Wiederherstellung des Penis und eines Hautdefektes im Bereich des Fussknochels führte zur Entdeckung der Methode des Hautmuskellappens. Der Autor schildert, wie es zu dieser Entdeckung gekommen ist.

RESUMEN

Descripción de un descubrimiento: el método a base de un lóbulo dermomuscular como sustitución del de transplantación por intermitencia (method of delay)

Orticochea, M.

Se describe el tratamiento operativo de dos pacientes. A base de la reconstrucción del pene y un defecto dérmico en la zone del tobillo se descubrió el método por lóbulo dermomuscular. El autor describe la génesis del descubrimiento.

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Head Prof. MUDr. M. Fára, DrSc.

REDUCTION MAMMAPLASTY IN GIGANTOMASTIA WITH A SINGLE SUPERIORLY PLACED FLAP

M. Fára, J. Hrivnáková

Any reconstruction or reduction mammaplasty must, in the first place, respect the preservation of unrestricted blood supply, and, consequently, the viability of the areola. For that reason, all surgical operations have to be rated not only in terms of the resulting shape but also from that particular aspect. And so the old procedures where the areola is supplied from the underlying tissue, from the mammary gland, or where the areola is transferred to the required site in the form of a free graft are gradually being replaced by plastic operations transferring the areola on corium pedicles.

This makes for a substantially safe blood supply to the areola though at the cost of considerably more difficulty in shaping the breast in its upper portions. This is, for instance, the case of the now much favoured method developed by Strömbeck using two lateral corium pedicle flaps. The severer the form of breast ptosis or hypertrophy, the longer the corium pedicles have to be and the more difficult to manipulate they are. At the same time, all rotation and folding have to be extremely considerate to avoid any vascular constriction.

Following some very satisfactory experience with our own surgical technique of mammaplasty in ptosis, in severe forms of gynaecomastia and in plastic amputation of breast in transvestism using the method of a single, superiorly placed flap, we decided to make use of the procedure as a means of reduction mammaplasty in gigantomastia.

The planned bed for the areola is created at the required distance from the middle of the clavicle with the pedicle of the distalward orientated de-epithelialized areolar flap situated in its upper circumference. Underneath it, a horizontally performed excision of superfluous cutis, subcutis and mammary gland can proceed. The areola on its folded corium pedicle is then transferred to the required site and sutured in. The operation is completed by suturing the wound edges with the resulting suture having the shape of an inverted T. Redon's drainage is introduced for a period of two days to drain away whatever wound secretion there is.

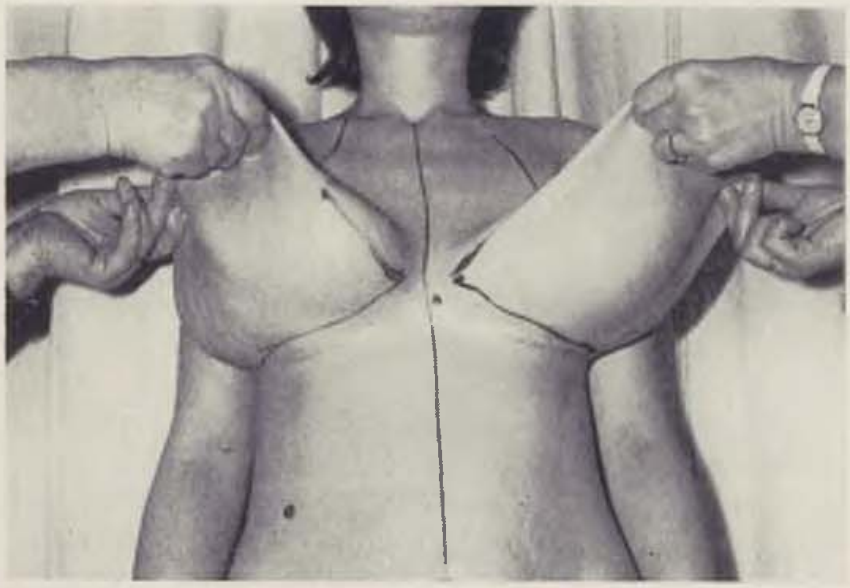

Fig. 1 a, b. Patient I. Z., operation sketch on the breast from the front and from below

The above procedure was used for reduction mammaplasty in gigantomastias where the areola had to be transferred by as much as 25 cm upwards, i.e. in cases where the only method of choice until now has been transferring the areolar in the form of a free transplant. There was never even a partial

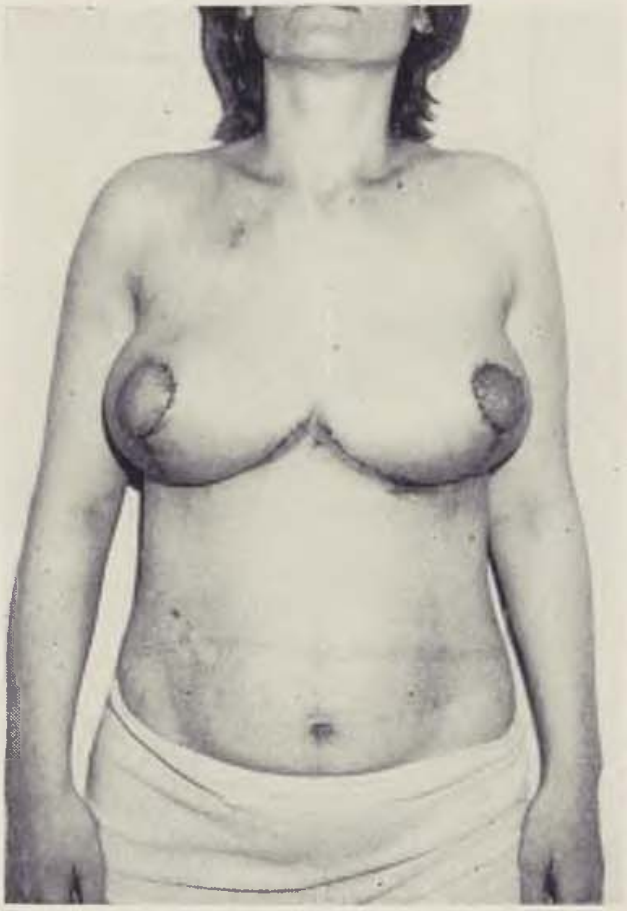

Fig. 2. Patient I. Ž., state on 8th post-operative day

reduction in blood supply to the areola, not to speak of its necrosis. Reconstruction of the breasts is facilitated, too, since the cranially situated pedicle in no way interferes with the free reshaping of the breasts as the other techniques invariably do to a greater or a lesser degree. J. H.

SUMMARY

Following very satisfactory experience with plastic operations for ptotic breasts and gynaecomastias with the areola transferred with the use of a single superiorly placed flap, the authors used the same technique for reduction mammaplasty in gigantomastia transferring the areola by as much as 25 cm upwards without a single case of blood supply impairment, albeit a partial one. The reshaping of the breasts is also facilitated as the cranially situated pedicle constitutes no obstacle for the free reconstruction of the breasts.

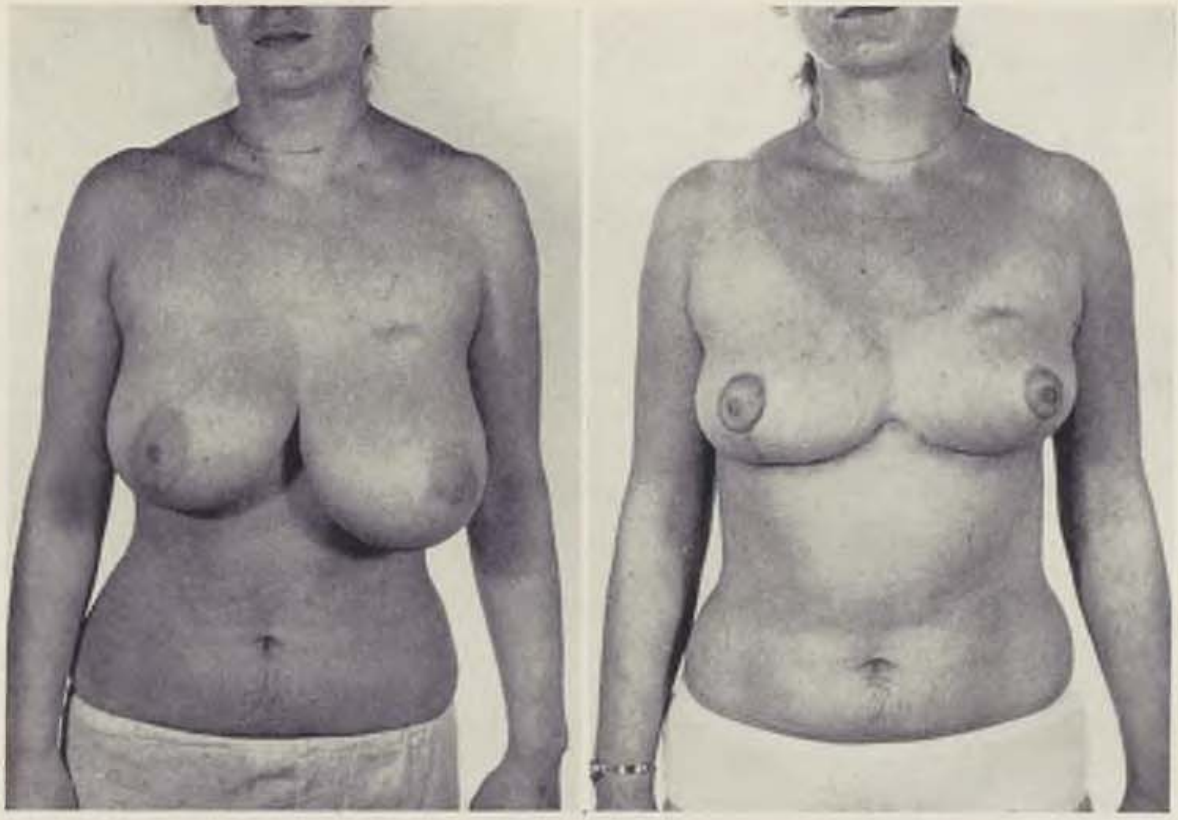

Fig. 3 a, b. Patient A. B., state prior to and 3 weeks after operation

RESUME

Diminution opératoire des gigantomasties à l'aide d'un seul lobe pédicule dessus

Fára, M., Hrivnáková, J.

Après de très bons résultats obtenus par les plasties des seins ptosés ou des gynécomasties, les auteurs ont utilisé même méthode en exécutant des opérations correctives des gigantomasties. La méthode consiste à employer un lobe chorionnel pédiculé en dessus. Pendant ces interventions, l'aréole a été enlevée même 25 cm, sans obtenir une moindre altération d'alimentation d l'aréole. Cette méthode facilite aussi le modelage des seins grâce au pédicule craniennement logé qui n'empêche pas de modeler librement des seins.

ZUSAMMENFASSUNG

Verkleinerungsoperationen der Brüste bei Gigantomastien mittels der Methode eines einzigen, oben gestielten Lappens

Fára, M., Hrivnáková, J.

Nach sehr zufriedenstellenden Erfahrungen mit der Plastik der ptotischen Brüste und Gynäkomastien mittels einer Methode, bei der der Brustwarzenhof an einem einzigen, oben gestielten Koriumlappen übertragen wird, benutzten die Autoren dieses Verfahren auch bei der chirurgischen Korrektur der Gigantomastien. Bei diesen Operationen verschoben sie den Brustwarzenhof bis um 25 cm nach oben, ohne dass es jah

wenn auch nur zu einer Teilstörung der Ernährung des Brustwarzenhofes gekommen ist. Auch die Modellierung der Brüste ist bei diesem Verfahren erleichtert, da der kranial gelegene Stiel die freie Formierung der Brüste auf keine Weise behindert.

RESUMEN

Operación para reducir el tamaño de los senos en caso de gigantomastias por el método de un sólo lóbulo con pecíolo arriba

Fára, M., Hrivnáková, J.

Dadas las experiencias muy satisfactorias con operaciones plásticas de los senos ptóticos y ginecomastias mediante el método que consiste en trasladar la aréola sobre un úunico lóbulo coriáceo con pecíolo arriba, los autores decidieron aplicar este procedimiento también en la corrección de gigantomastias. En las operaciones, subían la aréola hasta unos 25 centímetros sin que jamás eso provocara ni las más mínimas alteraciones en la alimentación de la aréola. Asimismo, por este procedimiento se facilita la modelación del pecho ya que el pecíolo ubicado en forma cranial no impide una conformación libre de los senos.

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RESULTS OF PLASTIC SURGERY OF POSTTRAUMATIC DEFORMITIES AND CONGENITAL OF THE LOWER LIMBS IN CHILDREN

N. A. Ovsjankin, L. F. Karimova, I. A. Kapitanaki

The problem of restoring the ability of standing and locomotion in children with posttraumatic deformities and severe congenital defects of the lower limbs is still of current interest. In our institute conservative approach is used for surgical treatment of children suffering from severe deformities of various etiology. It enables both the form and function of the limb to be restored. The same approach is applied to severe deformities resulting from congenital defects or from traumatic or haematogenous osteomyelitis, as well as deep burns. Such deformities are considered by many experts inoperable. Although it is well known that the feet not only provide the mechanical support to the body but also form the receptive field necessary for establishing the proper stereotype for stance and walk, the amputation of the foot (and even of the leg) is recommended (Polner 1960; Chotimskaja 1966; Westin et al. 1976; Cary 1977; Achterman and Kalamchi 1979).

MATERIAL AND METHODS

The paper presents the result of operative treatment in 56 children aged from 3 to 14 years by reconstructive surgery using the skin plasty with the tubed flap (after Filatov). The patients are divided into two groups. The first one consists of 32 patients suffering from the consequences of mechanical traumas with attendant loss of skin cover, damage of muscles and/or other tissues. At the beginning of the reconstructive treatment 17 children had extensive scars in the skin of the leg and the dorsal and plantar aspect of the foot as well. In 15 children the scars occurred in the upper third of the leg and in the area of the knee-joint. Moreover, 8 patients had false joints and defects of the leg bones. In 4 patients deformities due to scars with torpid ulcers developed as a result of deep burns; the limbs lost their function entirely and their amputation was suggested elsewhere. In 3 patients deep scars developed after previous surgical treatment complicated by the deep necrosis of soft tissues.

In most children of this group the deformities originated several years before their going in for treatment. They intensified with the changes of soft tissues and secondary deformations of the leg and foot as the children grew. With view of the great extent of damage the surgical treatment was of re-

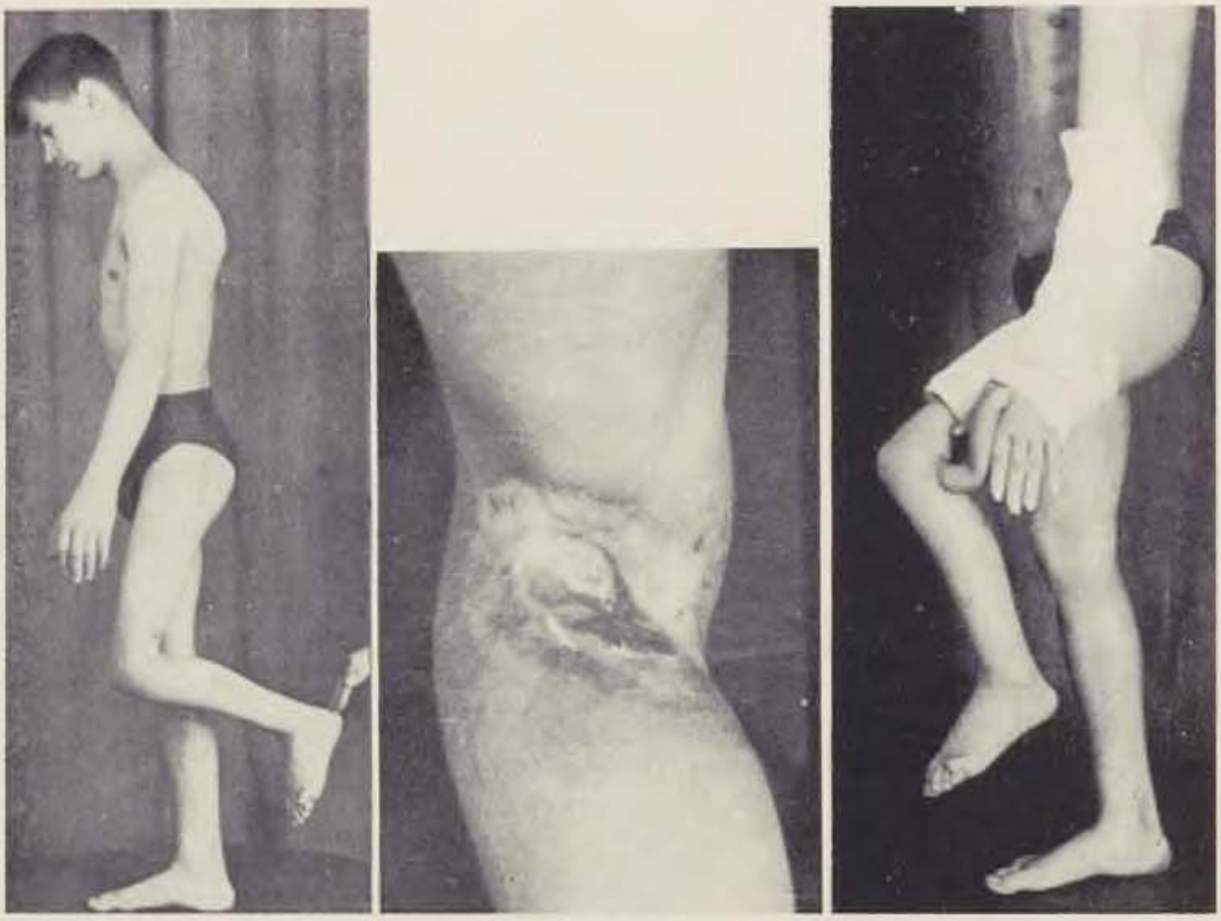

Fig. 1. Patient D., aged 13. a — fibrous ankylosis with functionally disadvantageous position of the left knee-joint; b — torpid ulcer of the heavily scarred popliteal fossa. — Fig. 2. The same patient. The flap transferred into the knee-joint region

constructive nature and in order to correct the deformities it was necessary to operate not only on soft tissues (the lengthening of tendons, capsulotomy, transfer neurovascular bundles, incision or excision of scars) but also on the skelet (osteotomy, bone plasty, resection of bones). Moreover, the large defect of soft tissues was the inevitable consequence of correcting the wrong position of the individual parts of the limb. The bottom of the defect was formed by the prolonged tendons, bones or uncovered joints. Therefore, it was necessary to cover the defect by means of the tubed flap, which appeared to be the most suitable method. The tubed flap was usually formed on the abdomen by Sheftjel's method forming the pedicle with wedge-shaped incisions at both ends

of the flap. The size of the skin strip was between 6 cm×12 cm and 10 cm×× 23 cm. If possible, the pedicle of the flap was transferred into the area of the future defect of soft tissues in single stage, otherwise the pedicle was transferred via the hand. After implantation of one or both pedicles in the

Fig. 3. The same patient. The large defect of soft tissues and stumps of the nerves can be seen in the operation field. The tubed flap is transversely divided in two parts

region of expected defect of soft tissues the corrective operation was performed in single stage. It begun by the excision of scars and correction of deformities and ended with covering the defect of soft tissues by the skin from the tubed flap.

Patient D., aged 13. Diagnosis: fibrous ankylosis with functionally disadvantageous position of the left knee-joint, torpid ulcer in the popliteal region (fig. 1, a). The injury was caused at the age of 3 years by penetration of a needle into the knee-joint. After removal of the needle from the knee, purulent arthritis and later the fibrous ankylosis developed; several therapeutical attempts were of no success. They resulted in necrosis and torpid ulcer in the popliteal region. At admission to our institute the fibrous ankylosis had fixated the knee-joint at the angle of 95 degrees. In the midst of rough scars there was a deep crater-like ulcer of the size 5 cm×4 cm with dripping pus bottom (fig. 1, b).

Our task was to level the limb axis and to remove the torpid ulcer in the popliteal fossa. Therefore, on May 11, 1974 the tubed flap from corium-fat strip of skin (size 23 cm×8 cm) was formed on the abdomen. On July 7 the

upper pedicle of the flap was inserted on the dorsal aspect of the left hand. On November 2 the lower pedicle of the flap was transferred on the lateral aspect of the knee-joint (fig. 2). On December 14 the upper pedicle was transferred from the left hand to the medial aspect of the knee-joint. A recon-

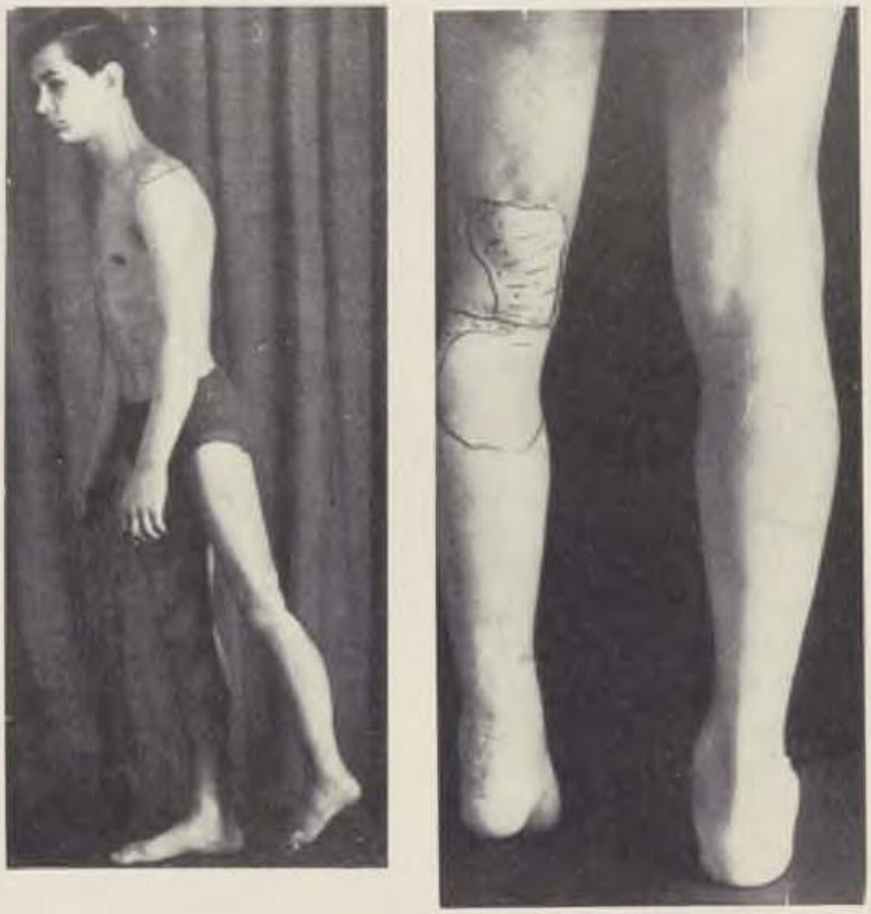

Fig. 4. The same patient. a — after the surgical treatment; b — one year after closing the defect. In the dashed areas the ability of the tactile sense and receptivity to pain has been renewed

structive operation was performed on June 17. The scars and torpid ulcer of the popliteal fossa were excised. Tendons of the flexor group of the leg muscles were released out of the scars and lenthened by Z plasty. The posterior wall of the knee-joint was incised and the leg bent at the angle of 155 degrees. The proximal ends of the popliteal and peroneal nerves were freed from the scars too, the distal ends were not found.

The defect of the skin cover that arose in the popliteal fossa was of the size 17 cm×10 cm. The tubed flap was cut transversely and spread out. By resulting flaps both the upper and lower parts of the defect in the popliteal fossa were covered. The previous transfer and accomodation of both pedicles of the flap made employment of all the skin of the flap possible (fig. 3).

Convalescence after all stages of treatment was uneventfull. After one month the patient started to walk with a stick, and was dismissed. On the second admission (October 10, 1975) the axis of the limb was corrected by the supracondylar osteotomy of the femur (fig. 4 a, b).

The second group consisted of 24 patients (aged form 4 to 14 years) suffering from severe congenital defects of the leg bones. The most frequent defect was the absence of the fibula and underdevelopment of the tibia, rarely the wrong position of the foot (total dorsal or posterior luxation), which was dislocated dorsally to the axis of the leg, so that the patient was stepping on the distal end of the leg. In 18 children the tibia was curved, with the top of the curvature positioned in the middle or at the boundary between the middle and upper part of the tibia. The contained angle was from 65 up to 90 degrees. In 3 children both the left and right tibia were affected. In 6 children the position of the tibia was normal. Reposition of the leg resulted in the defect of the skin cover of the lower third of the leg and of the foot, so that it was necessary to perform plasty using the tubed flap.

The reposition of the foot was the first step of the reconstructive treatment. The transversal incision was made on the lateral surface of the distal third of the leg (in the cases of the sagittal bending) and carried to the top of the curvature; the second incision (5—6 cm long) was carried perpendicularly to the first one. To correct deformities and the wrong position of the foot, the Achilles tendon as well as tendons of the fibular and other muscles (if necessary) were lengthened, the leg aponeurosis was incised and the capsules of the talocrural and talocalcaneal articulations were opened at posterior and lateral aspects. These interventions and the reposition of the foot resulted in a defect of the skin cover at the laterodorsal aspect of the lower third of the leg. It was covered by the spread tubed flap, formed in advance on the abdomen and transferred by its pedicle on the lower third of the leg. On the whole 6 patients were treated in this way.

When the dislocation of the foot was combined with a malformation of the tibia, the wedge shaped osteotomy (the wedge was open to the anterior) and the intramedullary nail fixation of the tibial segments and of the foot were performed. This treatment was used in 18 patients. Within the postoperative period, the limb was immobilized in a plaster-cast till the complete consolidation of the tibia. Later on, the children were provided with prothetic devices (orthopedic shoes, etc).

The patient D., aged 13, may serve as a good example. Diagnosis: congenital absence of the left fibula, lateral dislocation of the foot. At admission the patient walks with a strong limp using as the stepping surface of the left limb the distal part of the tibia and the inner aspect of the foot. The left leg was by 10,5 cm shorter than the right one, with the normal axis, absent fibula and laterally dislocated foot (fig. 5, a). On October 2, 1978 the tubed flap was formed on the left side of the abdomen from the skin strip 14 cm long and 7 cm wide. The proximal pedicle of the flap was transferred and inserted to the dorsolateral aspect of the lower third of the leg and to the

foot on December 26. Reconstructive surgical intervention was performed on March 2, 1979. The skin defect of the dorsolateral aspect of the leg (resulting from the reposition of the foot performed by the same technique as described above) was covered by the spread tubed flap, the pedicle of which was cut

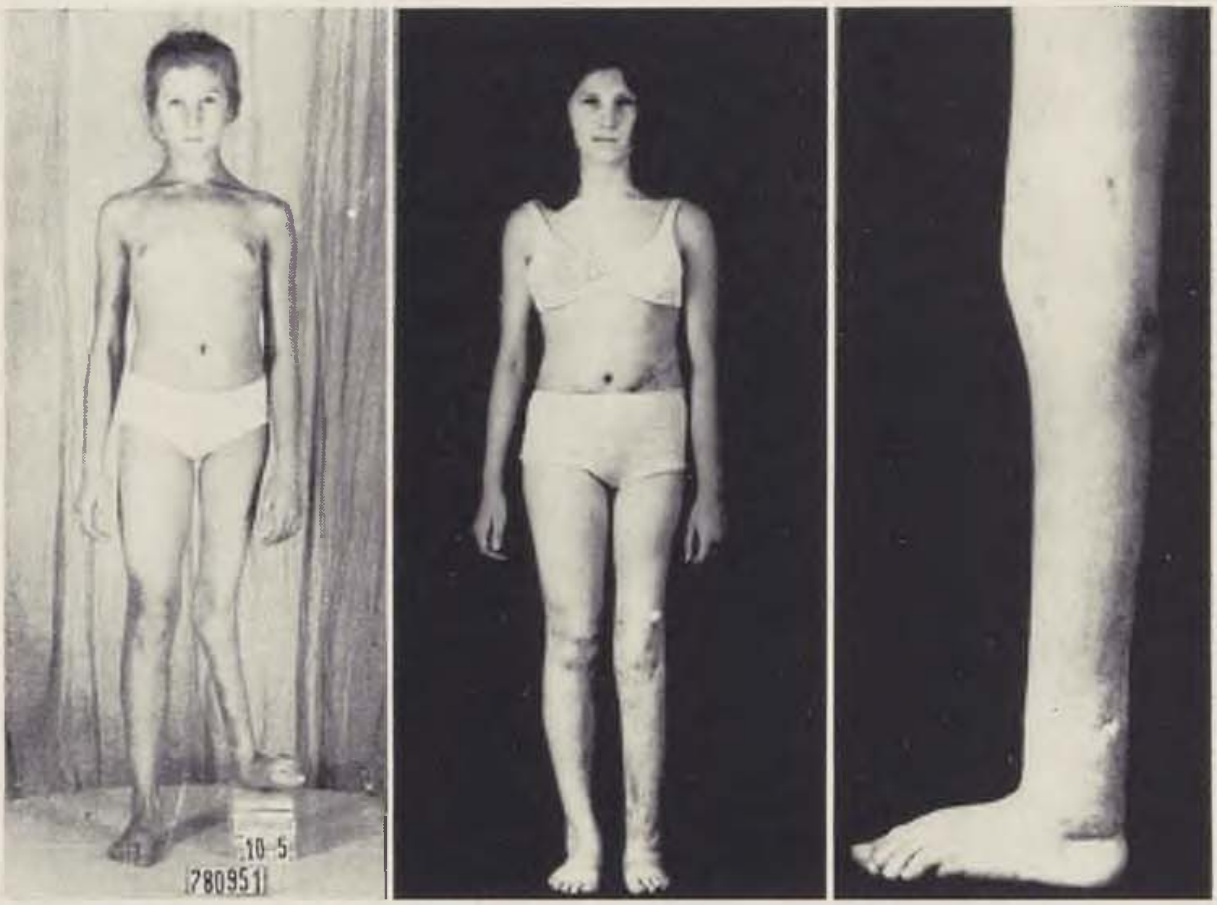

Fig. 5. Patient L., aged 13. a — congenital absence of the left fibula, dorsal dislocation of the foot; b, c — after surgical treatment

from the abdomen. There were no complications within the postoperative period. The second intervention on May 28 aimed at lengthening of the leg by the oblique osteotomy in the upper third of the leg and fixation of the tibial segments by the Ulizarov apparatus. The extension was applied for three and half months and after three additional months the newly formed bone was fixed by Ulizarov apparatus. The treatment resulted in stabilization of the foot in the middle position and in the equal length of both lower limbes (fig. 5, b).

RESULTS

The results of the reconstructive treatment were evaluated in the period from 1 to 7 years after the surgical intervention by clinical data and anatomic parameters on X-ray pictures. The treatment was considered succesfull when

the status achieved by the surgery was maintained, satisfactory when the limb kept its function but remission of some of the deformity elements occurred, and bad when the complete remission of the wrong position of the foot took place. Good results were obtained in 41 patients, satisfactory results in 15 patients (see the table).

Table 1. The results of surgical treatment using the tubed flap

Operation	Results good	satis-factory	bad	Total
Bone plasty with free bone graft	5	3	—	8
Osteotomy or bone resection, free bone grafting, surgery of soft tissues	2	3	—	5
Lengthening of tendons, ligamentotomy, capsulotomy	13	6	—	19
Reconstructive operation of the leg with the excision of the crural aponeurosis	21	3	—	24
Total	41	15		56

DISCUSSION

Reconstructive surgery of the leg bones and of the foot with simultaneous covering of the skin defects by the tubed skin flap were performed in patients with the severe congenital or acquired deformities of the lower limb. In such cases alternative surgical interventions were considered unsuitable and, in other institutes, the amputation was suggested. Surgical intervention accompanied by the skin plasty with the tubed flap (after Filatov) allows to correct the position of all the elements of a deformity and simultaneously to restore both the form and function of the limb even in severe congenital or acquired deformities.

The results presented support our believe that using the operation procedure described the status achieved by the treatment is maintained during the whole period of the skeletal growth of the organism. M. D.

SUMMARY

The paper informs of the results of plastic surgery of acquired or congenital deformities of the lower limbs in 56 children aged from 3 to 14 years. In 32 patients suffering from defects of the leg bones due to mechanical traumas a single stage surgical intervention was performed (the scar excision,

lengthening of the tendons of leg muscles, osteotomy, ligamentotomy, capsulotomy, free bone transplantation etc). These surgical interventions resulted in defects of the skin cover, which were covered by the skin flaps obtained from the spread tubed flap (after Filatov). The tubed flap was formed in advance on the abdomen and then transferred to the vicinity of the deformation. In 24 children with congenital defects of the crural bones — such as the absence of the fibula, complete dislocation of the foot, shortened and curved tibia-reconstructive interventions aiming at the correction of the position of all deformed parts were performed. The defects of the skin cover resulting from surgical interventions at the laterodorsal aspect of the leg were covered by the spread tubed flap, formed in advance and transferred to the deformed area. In all cases deformities were corrected and the function of the lower limbs restored. On the basis of the results achieved in the above described cases the authors consider the refusal of the amputation of lower limbs possible, for they believe that reconstructive operations ensure their function to a sufficient extent.

RESUME

Les résultats des opérations d'enfants atteints de déformations posttraumatiques ou d'anomalies congénitales des membres inférieurs

Ovsjankin, N. A., Karimova, L. F., Kapitanaki, I. A.

Le travail apporte des informations sur les résultats des interventions plastiques des déformations traumatiques ou congénitales, exécutées chez 56 enfants a l'age de 3—14 ans. Chez 32 malades avec les défauts des os de la jambe, conséquences des traumas méchaniques, on a effectué une seule intervention (excision des cicatrices, allongement des téguments musculaires des jambes, ostéotomie, ligamentotomie, capsulotomie, greffe osseuse libre etc.). Les défauts du tégument cutané causé par l'opération ont été couvertes d'un lambeau cutané, obtenu par déroulement du lambeau tubulé (d'après Filatov) qui a été confectionné avant son implantation à proximité de la parte de substance à combler.

Chez 24 enfants avec des défauts congénitaux des os de la jambe — absence du péroné, dislocation totale de la jambe, abrégement et déformation du tibia — on a éxécuté des opérations reconstructives permettantes corriger tous les éléments des difformités des os de la jambe. Des lésions du tégument cutané, obtenues au court d'intervention sur la surface latérodorsale de la jambe, ont été couvertes d'un lambeau tubulé, déroulé et implanté dans la région receveuse.

Dans tous les cas, les déformations ont été corrigées et la fonction du membre inférieur renouvelée.

En considération des résultats cités, les auteurs peuvent refuser l'amputation des membres inférieurs, dont le fonctionnement suffisant est assuré par les opérations reconstructives.

ZUSAMMENFASSUNG

Ergebnisse plastischer Operationen bei Kindern mit posttraumatischen Deformationen und angeborenen Anomalien der unteren Extremitäten

Owsjankin, N. A., Karimowa, L. F., Kapitanaki, I. A.

Die Arbeit informiert über die Ergebnisse plastischer Operationen der gewonnenen sowie angeborenen Deformationen der unteren Extremitäten bei 56 Kindern im Alter

von 3—4 Jahren. Bei 32 Patienten mit durch mechanisches Trauma verursachten Defekten der Unterschenkelknochen wurde ein einzeitiger Operationseingriff durchgeführt (Exzision der Narben, Verlängerung der Sehnen der Unterschenkelmuskeln, Osteotomie, Ligamentotomie, Kapsulotomie, freie Knochentransplantation, usw.). Die durch diese Operationseingriffe verursachten Defekte der Hautdecke wurden mit einem durch Entfaltung eines Rundstiellappens (nach Filatow) gewonnenen Lappen gedeckt, der vorher gebildet und in die Umgebung der Deformation übertragen wurde. Bei 24 Kindern mit angeborenen Entwicklungsdefekten der Unterschenkelknochen — Fehlen des Wadenbeines, vollständige Dislokation des Beines, Verkürzung und Krümmung des Schienbeines — wurden Wiederherstellungsoperationen durchgeführt, die es ermöglichten, alle Elemente der Deformitäten des Unterschenkels und Beines zu korrigieren. Defekte der Hautdecke, die bei der Operation an der laterodorsalen Oberfläche des Unterschenkels entstanden sind, wurden mit einem entfalteten Rundstiellappen gedeckt, der vorher gebildet und in die Umgebung der Deformation übertragen wurde. In allen Fällen wurden die Deformationen korrigiert und die Funktion der unteren Extremität wiederhergestellt. Auf Grund der demonstrierten Ergebnisse halten es die Autoren für möglich, bei den auf diese Weise betroffenen Kindern die Amputation der unteren Extremitäten abzulehnen, da durch die beschriebenen Wiederherstellungsoperationen ihre ausreichende Funktionsfähigkeit sichergestellt werden kann.

RESUMEN

Los resultados de las operaciones plásticas en lo niños con deformaciones y anomalías congénitas de las extremidades inferiores

Ovsiankin, N. A., Karimova, L. F., Kapitanaki, I. A.

El trabajo informa sobre los resultados en operaciones plásticas de anomalías tanto adquiridas como congénitas de las extremidades inferiores en 56 niños entre 3 y 14 años de edad. En 32 pacientes con defectos del hueso crural causados por traumas mecánicos, se realizaron operaciones monofásicas (excisión de las cicatrices, alargamiento de tendones de los músculos crurales, osteotomía, ligamentotomía, capsulotomía, transplantación ósea libre, etc.). Los defectos dérmicos producto de dichas operaciones fueron cubiertos con el lóbulo formado al desplegar un lóbulo tubulado (según Filatov), preparado con anterioridad y trasladado junto a la deformación. En 24 niños con defectos evolutivos congénitos de los huesos crurales — falta de la fíbula, dislocación total de la pierna, acortamiento y curvatura de la tibia — se realizaron operaciones reconstructivas que posibilitan corregir todos los elementos de las deformaciones crurales y de la pierna. Los defectos de la cubierta dérmica surgidos en las operaciones de la superficie laterodorsal de la parte crural fueron cubiertos con un desplegado lóbulo tubulado hecho con anticipación y trasladado a la zona de la deformación. En todos los casos, las deformaciones pudieron ser corregidas y la función de las extremidades inferior fue reanudada. En base a los resultados aquí demostrados, los autores creen poder negarse a amputar las extremidades inferiores de los niños así afectados ya que con operaciones descritas pueden reconstruirse garantizándose una suficiente capacidad funcional de las mismas.

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NEWS

The list of the officers of the Argentine Society of Plastic Surgery elected for the period 1982 to 1983.

President	Dr. Julio Frontera Vaca
Vice President	Dr. Adrian Spadafora
General Secretary	Dr. Jorge Herrera
Reporter Secretary	Dr. Arturo Rubinstein
Assistant Secretary	Dr. Luis Diodato
Treasurers	Dr. Juan Jose Galli
Assistant Treasurer	Dr. Paulino Morales
Members	Dr. Elena B. Bertolotto
	Dr. Horacio Garcia Igarza
	Dr. Fernando A. Funes
	Dr. Guillermo Iturraspe

The Argentine Society will also organize the **IV IBERO LATINOAMERICAN** and the **XII ARGENTINE CONGRESS OF PLASTIC SURGERY** from 12th to 17th September and from the 10th to 12th it will take place a course on Rinoplasties sponsored by the International Society of Aesthetic Plastic Surgery.

For more information white to Argentine Society of Plastic Surgery, A.M.A. Avda. Santa Fe 1171 — (1059) Buenos Aires.

Dr. Jorge Herrera,
Secretario General
Dr. Julio Frontera Vaca,
Presidente

University Medical School, Pécs (Hungary)
1st Clinical Department of Surgery
Director Prof. Dr. M. Forgon

ARTERIAL NETWORK FORMATION IN PEDICLE FLAPS

M. Kubatov, R. Laky

The pedicle flap has been a method commonly used since the beginning of this century. Nowadays, a large number of well-tried methods are in use. Many authors have studied the arterial network of the flaps formed in different ways and changing characteristically in the course of flap formation and transfer (5, 6, 7, 8, 10).

The present authors studied the vascularization of twisted pedicle flaps using a direct method, microangiography.

MATERIAL AND METHODS

Adult rabbits weighing 4—5 kg were used for the experiments. Following i.m. Ketanest anaesthesia, the operation site was shaved and full-thickness pedicle flaps were raised from the animals' dorsal regions. After the incision and lifting as shown in Fig. 1, the pedicle flap was sutured back but twisted about 10° compared with its original position (Fig. 1). In accordance with the purpose of the experiment, the wound edges in the incision lines established no mutual contact, the sutures were tension-free, and the pedicle blood supply remained intact because of the relatively small twist. Thus, we were able to make a nearly ideal model of the twisted pedicle flap (10).

Metal-marked sutures were made in the corners of the flaps in order to facilitate angiographical orientation.

Between post-operative days 2 and 21, the animals were sacrificed and exsanguinated after the i.v. application of Heparin. The abdominal aorta was exposed and cannulated in both directions. The arterial system was filled with "Micropaque" barium suspension. 70—80 ml Micropaque was used till the intestinal arcades and the capillary network of the iris turned white.

Making incisions around the operation site, the skin was removed in its full thickness, stripped of all subcutaneous fat, and fixed in 3% formaldehyde solution until angiography.

The pictures were taken with soft tissue X-ray methods on a "Mammoray RP3" Agfa. Angiogram made in this way are sufficiently detailed and make for easy examination.

No vascular contacts extending beyond the flap borders could be seen in angiograms taken on post-operative days 2, 3 and 4. Angiograms taken on the 5th post-operative day revealed some dimly filled vessels which, however, did

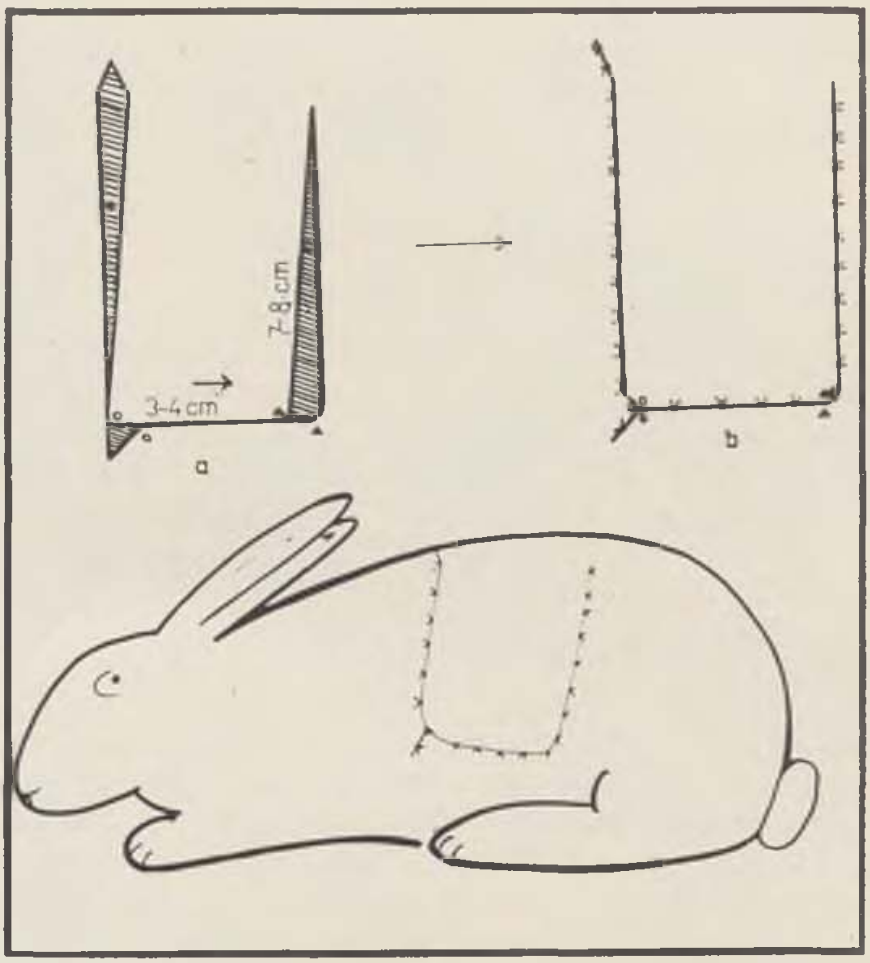
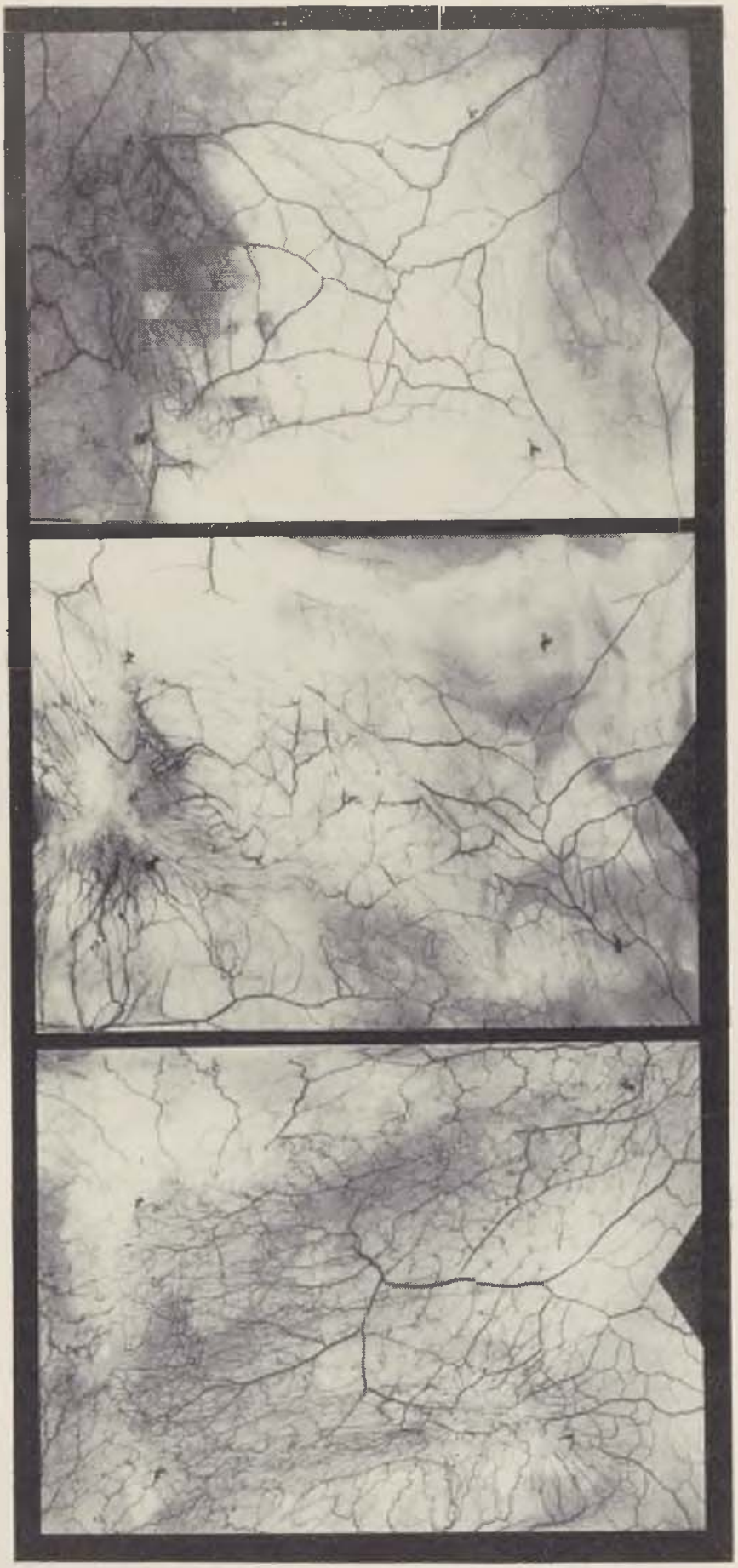


Fig. 1. Plan of operation and situation of the flap on the animal

not follow the flap margins. 2 to 3 arteries of similar calibre arising from the pedicle (arrow in Fig. 2) were seen feeding the flap, their anastomoses forming an irregular network. The arteries ended amputated at the flap margins. Their arteriolar and capillary beds were poorly developed (Fig. 2a).

Fig. 2a. 5th-day angiogram. Some capillaries cross the flap margin (metal sutures show flap corners). Blood supply via pedicle dominates. Poor capillary bed, larger vessels sharply amputated at the margins. — Fig. 2b. 9th-day angiogram. Margical vessel connections increase in number and in calibre though blood supply via the pedicle still dominates. Arborization begins in amputated, larger vessels. — Fig. 2c. 21st-day angiogram. Abundant capillary network especially in the margina zone. The zone is also supplied from the larger vessels. A central artery has developed from the pedicle



a.

b.

c. Fig. 2

Later on, the marginal anastomoses were seen growing in number and calibre, some of the larger vessels even crossing the marginal zone. The ends of those larger vessels, cut at the time of making the flap, did not exhibit any abrupt terminations, instead there were richly arborized, continually thinning vessels arising from them. The angiogram of a 9th-day specimen can be seen in Fig. 2b. The pedicle-mediated blood supply still has an important role to play, but, beside the capillary connections, some larger-lumen vessels can be seen crossing the flap margins. The pedicle shows a tendency to form some central branches.

In the subsequent 12 days, more substantial changes were noted in the circulation in the flaps. Fig. 2c shows the angiogram of vascular structure in a 21-day specimen with a marginal zone of regeneration and with a central artery arising from the pedicle. Throughout the area of the flap minute vessels have definitely multiplied, especially in the marginal zone. There are countless capillary and arteriolar connections communicating with the recipient site with some of the arterioles crossing the flap margin. A central artery from the flap has been formed, too, its branches supplying the marginal regeneration zone (Fig. 2a, b, c).

Concurrently with literary data and our own clinical experience, rotated or transferred pedicle flaps adhere safely 3 weeks after flap formation.

When evaluating the angiograms, the intact skin's great blood supply reserve capacity has to be taken into account. According to some authors, 10% of normal blood supply will do to ensure the survival of the flap provided the correct technique was used for creating the flap. Part of the considerable reserve capacity is necessary for the thermoregulatory and pressor mechanism (6, 7).

DISCUSSION

Correct evaluation of blood supply to pedicle flaps is essential in these types of plastic surgery methods since the transfer is often completed with cutting through the pedicle. For that reason, reliable in vivo data on blood circulation in the flap are of great importance. In clinical practice, not only physical signs but also other measurable parameters can be evaluated after the compression of the flap. Thus we can measure optically the amount of haemoglobin or parenterally introduced contrast medium or the elimination of drugs or radioisotopes in the area of the flap (1, 2, 3, 4, 8, 9). The aim of our experiments was to detect vascular transformations significant for the blood supply to the flap.

The formation of capillaries and arterioles was found to start early in the postoperative period, practically parallel with wound healing. By the end of the second week, the capillary network in the flap was seen proliferating abundantly with numerous peripheral vessels forming anastomoses. By the end of the third week, a suprabundant network could be seen ramifying throughout the extent of the flap, particularly in the marginal zone. This zone of regeneration formed anastomoses with numerous smaller vessels arising from the recipient site, and received blood supply from the flap central artery branches.

By that time, blood circulation in the flap can also rely on supply from the margins, and according to clinical experience and literary information, transsection or compression of the pedicle can no longer influence the viability of the flap. J. H.

SUMMARY

Pedicle flaps were created and rotated on the dorsal skin of rabbits in a follow-up study designed to monitor changes in the arterial network of the flaps with the aid of microangiography. Circulatory adaptation to the altered conditions was studied.

RESUME

La formation du réseau artériel dans un lobe pédiculé

Kubatov, M., Laky, R.

Les auteurs ont formé un lobe pédiculé de rotation sur la peau dorsale des lapins, où ils ont angioggraphiquement observé des changement dans le résau artériel. Ils ont étudié l'adaptabilité de la circulation aux conditions modifiées.

ZUSAMMENFASSUNG

Bildung des Arteriennetzes im Lappen am Stiel

Kubatov, M., Laky, R.

Die Autoren bildeten auf der Rückenhaut von Kaninchen einen umgedrehten Lappen am Stiel und untersuchten mikroangiographisch Veränderungen seines Arteriennetzes. Sie studierten die Adaptation des Kreislaufes auf veränderte Bedingungen.

RESUMEN

Conformación de la red arterial en un lóbulo sobre pezón

Kubatov, M., Laky, R.

Habiendo conformado un lóbulo sobre pecíolo en la piel de lomo del conejo, los autores observaron por método microangiográfico las alteraciones de su red arterial, estudiando, además la adaptación de la circulación en las condiciones modificadas.

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SPECIAL ASPECTS OF INJURY AND SURGICAL TREATMENT OF THE MOUTH CAVITY WALLS AND PHARYNX FOLLOWING THERMAL BURNS

F. M. Chitrov, R. B. Mumladze

The injury caused by signal rockets or other kinds of charge with strong thermal effect is of very rare occurrence. Especially rare are the cases when the factor causing injury penetrates the mouth cavity. From 1963 to 1981, 177 patients with scarred strictures of the pharynx, esophagus and stomach due to chemical burns were recorded. Out of this number only two injuries were caused by the mentioned rockets. At this type of accident the temperature reaching 1,000 °C damages not only soft tissues but also bone structures: dents, alveolar processes, hard palate, nasal septum, nasal conchae, bodies of vertebrae, etc. The walls of the larynx, trachea, pharynx and esophagus are exposed to burns as well. The lower limit of burns of the esophagus reaches up the level of its upper theracical part. This can be explained by the fact that in the injured persons reflexive vomiting movements occur with attendant dilatation of all the sections of the esophagus and pharynx so that the high temperature of charge on fire evaporates saliva and mucus and causes burns. At that the extensive damage of tissues and even their carbonization takes place. All the stages of inflammation having been over the whole process ends with massive scarring of all the affected organs. As a result of this the necessity of tracheostomy and gastrostomy arises.

Clinical conditions are characterised by ample purulent discharge in the mouth cavity, extensive maceration of the skin of the chin and neck, high fever and heavy intoxication. Sequestration of necrotized parts of bone structures is very slow. Granulating mounds develop and scarring of the soft tissues of the mouth cavity walls and of the pharynx causes serious defects of the hard and soft palate, the obturation of the pharynx and esophagus as well as of the auditus laryngis, defects of lips and firm compression of jaws.This is caused by massive scarred tissue substituting for cheeks. Upon these conditions necessary reconstructive operations lead to considerably high percentage of failures.

Therefore the plan for reconstructive operations must involve the following tasks: removal of the compression of the jaws due to scars, liquidation of lip defects, closing of the hard and soft palate defects, restoring of the patency of the middle and lower part of the pharynx, scar releasing of the larynx, restoring of the pharyngeal-esophageal connecting region with the following anastomosis either of the lower parts of the alimentary tract or of an artificially formed esophagus.

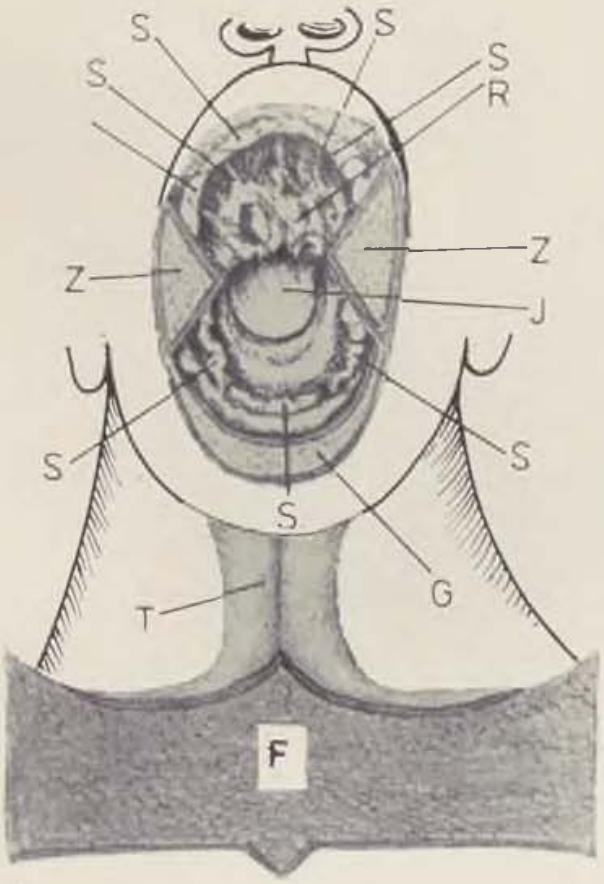


Fig. 1. Conditions after the excision of cheek scars (Z). The T-shaped tubed flap implanted to the chin; S — the scars in the place of absent alveolar processes; J — the deformed tongue; R — scars closing the auditus pharyngis; F — the transverse part of the T-shaped tubed flap spreading over the area; G — the surface of the lower lip stump passing into the cheek defects

The correction of the constriction of the jaws may appear as simple operation procedure consisting in the excision of scars at the level of the mouth slit, forced opening of the jaws and free transplantation of the skin to the damaged area. However, the skin transplants are usually rejected due to infection. It is therefore more advantageous to cover the defects of the cheek mucosa after excision of scars by the tubed flap. The defects of cheeks are thus covered not only by the skin on pedicle but also by the layer of the sub-

cutaneous fat which is without doubt better way even from functional point of view. Moreover, the tubed flap is successfully used for treatment of defects of the lips and palate. After accommodation of the flap to the chin and excision of the scars compressing the jaws the possibility of using one part of the flap for the defects of the cheek mucosa and the second part of it for

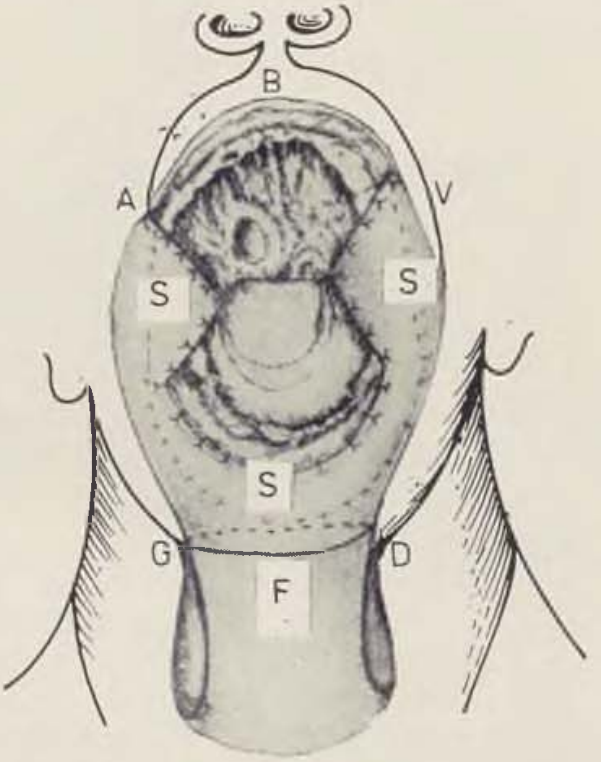


Fig. 2. Conditions after covering the defects of the cheeks and lower lip. ABV — line of the cut along the edge or the upper lip; GFD — circular line of the intersection of the flap at the next stage

the defects of the lower lip arises. Restoring of the patency of the pharynx and the cervical part of esophagus along with releasing of fixing scars of larynx are performed using the method elaborated by the authors with transfer of the myocutaneous pedicle flaps from the ventrolateral aspect of the supraclavicular region.

Patient S., aged 34, was admitted into the Institute two months after the trauma of the mouth cavity, larynx, pharynx, trachea and esophagus caused by rocket pistol shot. Immediately after the accident the tracheostomy and gastrostomy were performed. Surgical treatment started by forming T-shaped tubed flap and the pedicle of its longer part was implanted to the chin. Excision of the scars of the cheek mucosa by turns on the right and left side at the level of the mouth slit enabled us to open the mouth getting thus the access to the retromolar space and burnt pharyngeal arches. When checking

general conditions we found out the following: the middle part of the palate was absent, through the perforated palate the rests of the nasal septum and parts of the lower and middle conchae could be seen; the necrotized alveolar processes of the maxila and mandible were covered by sporadic granulations. Necrotized alveolar processes sequestrated, whereby perforating defect of the

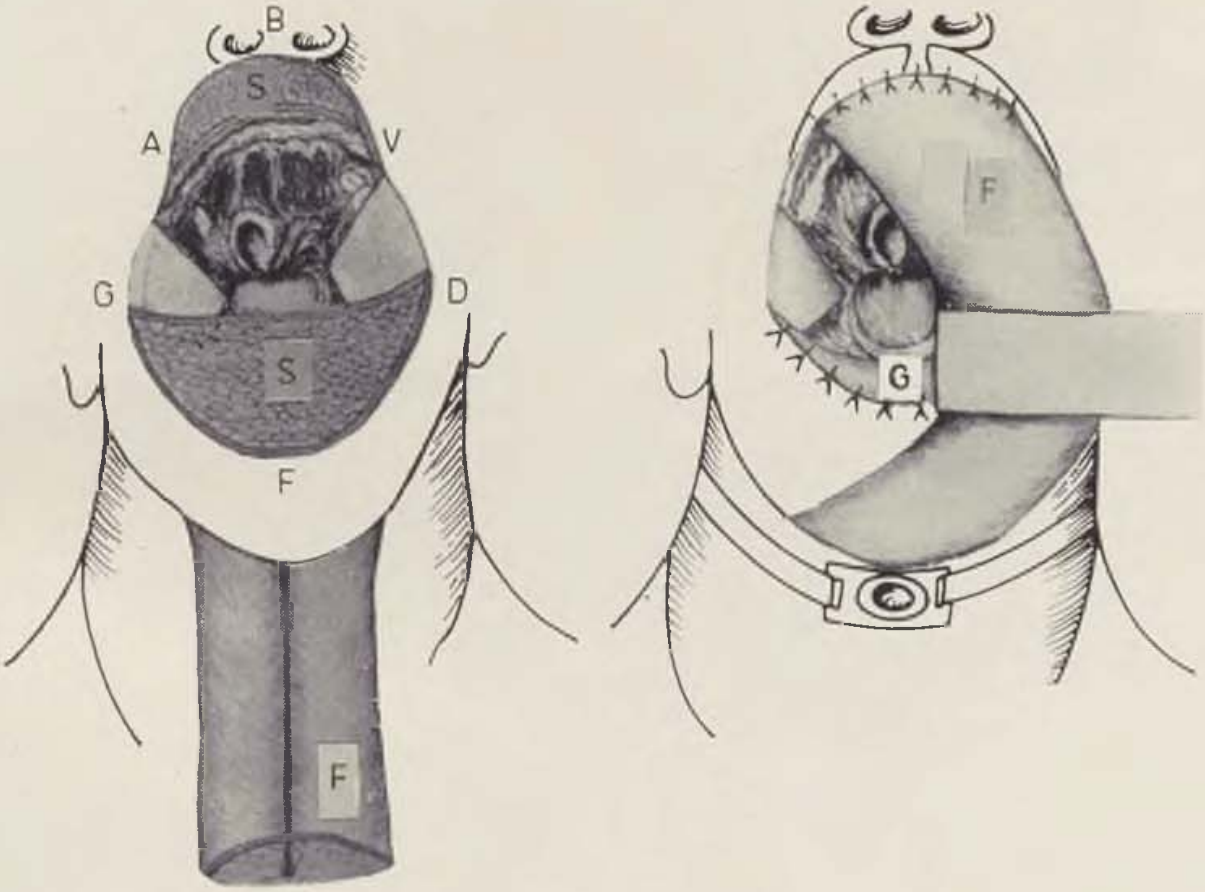


Fig. 3. Conditions after the incision of the upper lip along the line ABV and the separation of the long pedicle of the flap along the line GFD. The end of the flap has to be inserted into the margins of the incised lip. The lateral parts of the defect are covered by the suture of the margins. — Fig. 4. The appearence after the suture of the flap apex to the margins of the lower lip defect and the removal of the defect of the lower lip

palate spread considerably. Damaged to a lesser extent were only parts of the alveolar processes with loose dents *(7.6 ⊥ 6.7)*. The soft palate was quite absent, in its place there were dense scars stretching from posterolateral walls of the pharynx to lateral walls of the root of the tongue with a funnel shaped depression pointed at the hypofarynx. At its bottom the scarred epiglotis concealing the auditus laryngis could be recognized. The anterior part of the tongue as far as the frenulum was utterly absent. The bottom of the mouth cavity was covered by compact scars.

After excision of scars of the lower lip stump its margin was divided into anterior and posterior parts. Then we separated the pedicles of the transverse part of the tubed flap which enabled us to cover the defect of the cheek mucosa, retromolar region as well as the defect of the lower lip. In a similar way using the long pedicle of the tubed flap the upper lip was formed. The

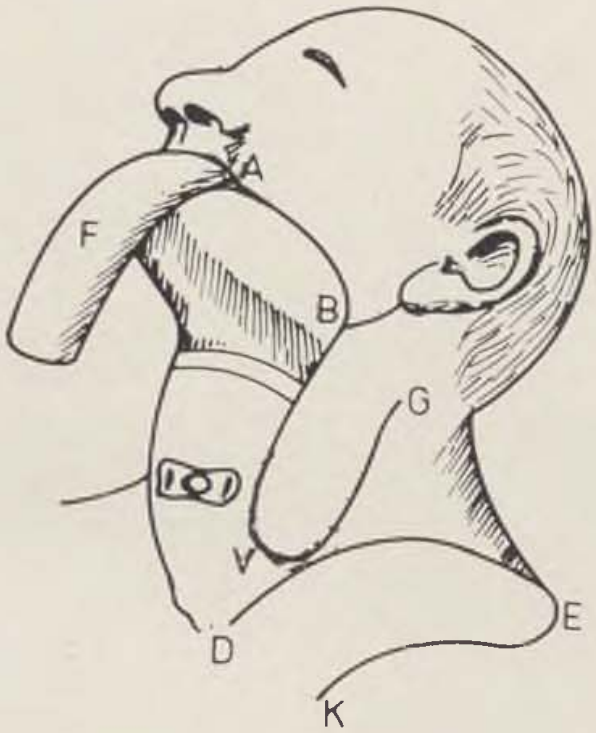


Fig. 5. The mouth cavity and pharynx are opened by the incision of the cheek and mandible (line AB). By carrying the cut along the line BVG a myocutaneous flap is formed and by its top parts the defect of the left pharyngeal wall is covered. The second myocutaneous flap is formed by an incision along the line DEK. It serves to substitute for the defect of the posterolateral wall of the pharynx and to create the recessus piriformes and hypofarynx. F — the flap transferred to the upper lip. —

tubed flap implanted to the upper lip remained after separation of its nourishing pedicle from the chin in the vertical position additional two months for it was used later to cover the defect of the hard palate.

To restore the integrity of the hard palate through the mouth cavity was very complicated and technically unfeasible. Therefore we created wide access into the mouth cavity and pharynx by the incision of the left cheek at the level of the mouth corner and excision of soft tissues along the neurovascular bundle as far as the incisura jugularis manubrii sterni. The ramus mandibulae was cut too.

We founded that the dorsolateral walls of the pharynx were firmly grown together with the tongue root so that there was only narrow oval passage near

the left lateral pharyngeal wall at the level of the pharyngeal arches. Its size was sufficient for breathing through the nose, scarred tissue prevented food from getting into nasopharynx. We succeeded in restoring the inner width of the laryngeal section of the pharynx using the transferred skin flaps on the pedicles formed on the anterior aspect of the neck and thoracico-supraclavicular

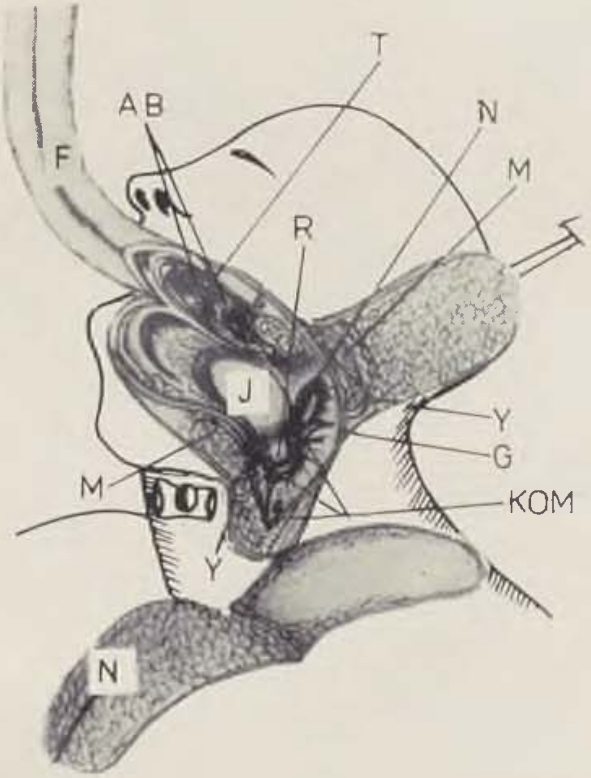


Fig. 6. Situation after the opening of the mouth cavity and pharynx and the formation of flaps in the way showed on figure 5. F — the tubed flap transferred to the upper lip; T — the defect of the hard palate; N — the aperture leading into the nasopharynx; M — the mandible incised in the place of the mandibular angle; J — the stump of the tongue; Y — the intersection of the basis of pharyngeal arches; G — Z incision used for releasing of the scars in the posterior pharyngeal wall; KOM — line of the incision releasing the larynx from fixing scars and creating of the recessus piriformis. By the cut carried along the dashed line the epiglotis and auditus laryngis are released. The apex of the flap is incised along the line LN and the resulting little flaps are used for bedding of the recessus piriformes. At the top of the rests of the alveolar arch of the maxilla a cut is carried along the line AB and the tubed flap divided into two skin strips is sutured to its margins

regions, in creating depressions corresponding to the recessus piriformes and in covering the defect in the middle and posterior part of the hard palate.

Fibroscopy (via the gastrostomy) was performed and X-rays taken to find out conditions of the esophagus. Inside, considerable scarred stricture proceeded

as far as the first thoracical vertebra. When analyzing the results of the endoscopic and X-ray examinations we came to the conclusion that the esophagus was absolutely incapable of performing its function. Therefore, as we had wide pharyngeal-esophageal connection at our disposal we started to consider creating an artificial esophagus that would make oral feeding possible. By

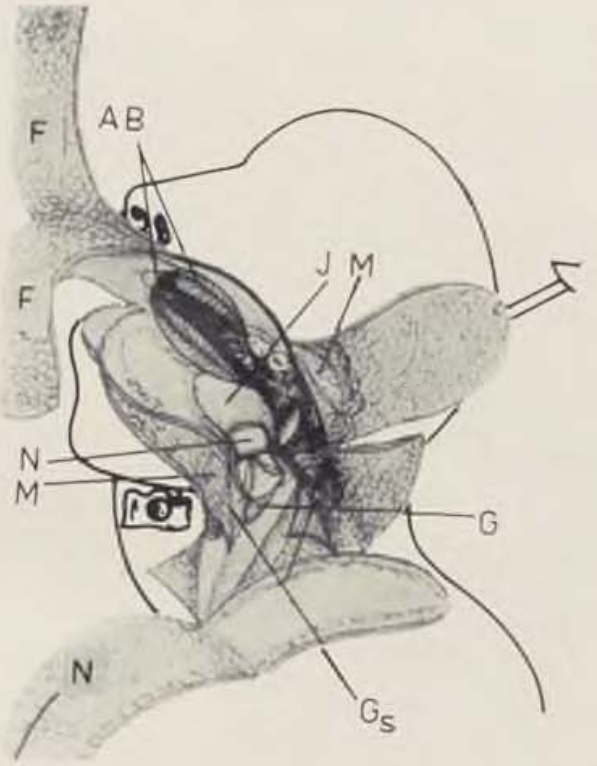


Fig. 7. Conditions after incisions: FF — the tubed flap divided into two skin strips that are to be sutured to the margins of incisions at the rests of the alveolar arch (AB); J — the stump of the tongue; MM — the cut mandible; N — the released epiglotis, underneath the auditus laryngis with visible vocal cords; G — the inner aspect of the posterior laryngeal wall released of scars, laterally to it the recessus piriformes (Gs) and at the bottom a part of the exposed esophagus.

means of irrigoscopy of the large intestine its suitability for creating an artificial esophagus was verified. Laparotomy showed that the vascular architecture of the right part of the large intestine with the terminal part of the small intestine ensures full-value blood supply to the transplant of the artificial esophagus. Therefore the section chosen was mobilized and transferred subcutaneously. At the next stage the transplant was inserted into the pharyngea-esophageal connection. After this stage of treatment the possibility of the oral feeding was restored.

The similar situation occurred with the patient C., aged 21. As a result of the explosion of a mine detonator in his mouth cavity thermic burns caused necrosis of the alveolar processes of the upper jaw, scarred constriction of the pharynx, nasopharynx and cervical part of the esophagus. In the emergency

health unit (at the patient's permanent address) tracheostomy and gastrostomy were performed. After removing of the contraction of the mandible and restoring of the integrity of the pharyngeal walls and after the epiglotis plasty we proceeded to forming an artificial esophagus. On January 2, 1973 an artificial esophagus was made in front of the sternum from the right part of the parge

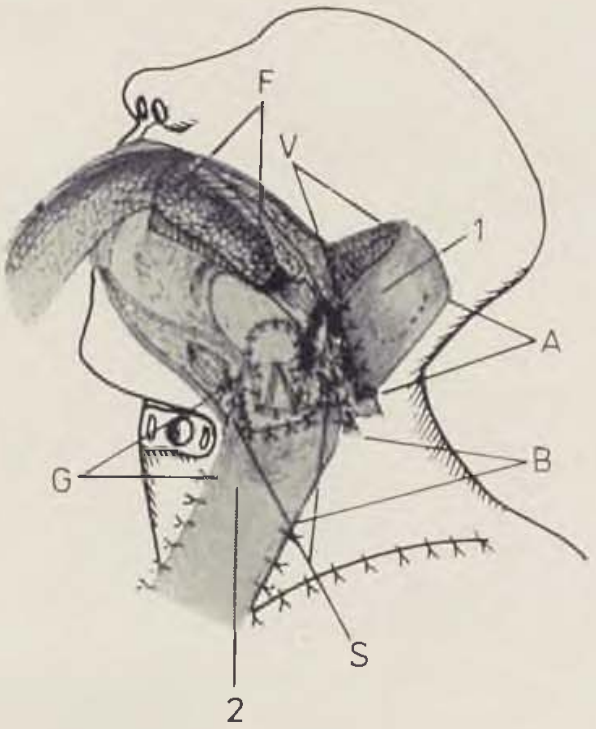
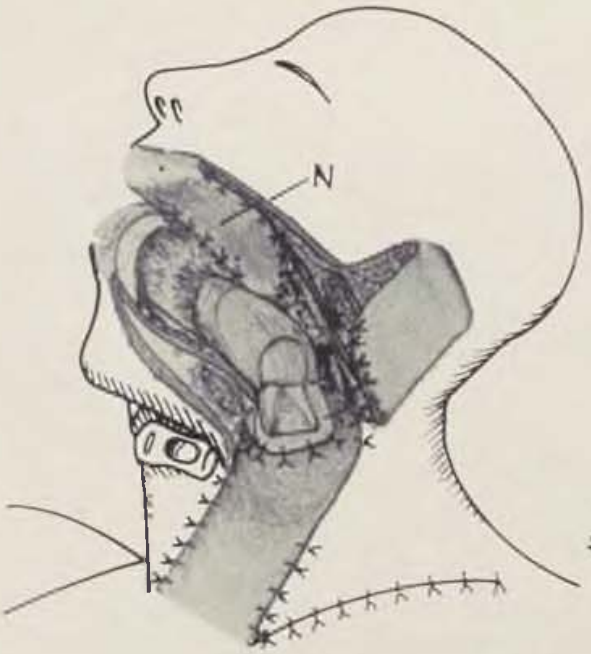


Fig. 8. Creating of the nasal mucosa in the place of the hard palate defect (F). 1 — the skin flap the anterior aspect of the neck inserted by its apex into the margins of the craniolateral pharyngeal wall. 2 — the skin flap formed in the supraclavicular region covered the defects of the esophageal walls, posterolateral walls of the larynx, posterior wall of the pharynx and of recessus piriformes (S). The margins of this flap (G and B) are fixed to the skin (V, A) creating thus a tunnel for the esophagus

intestine and the terminal part of the small intestine and it was immediately inserted into the stomach. On February 22 the wide pharyngeal-esophageal connection was formed using the method of F. M. Chitrov and the esophagus was connnected with the pharynx in the above described manner (see also the figures). Postoperative period was without complications, swallowing process was fully restored and the patient resumed oral feeding.

The results presented demonstrate the immense destructive potential of charges developing high temperatures. Above all very rare location of damages is of interest here, as well as their extent and the special features of reconstructive operations enabling the patients to breath and receive nourishment in a natural way. M. D.



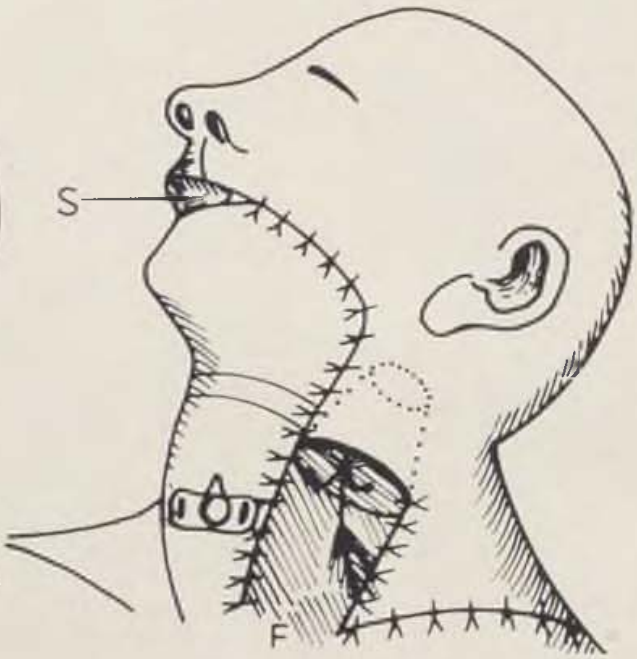


Fig. 9. The formed secondary palate (N). — Fig. 10. The outer orifice of the pharynx in the cervical region (F)

SUMMARY

The authors treated 177 patients with scarred constriction of the pharynx, esophagus and stomach after chemical thermal burns. In two cases the scarred constriction was caused by burns suffered at the explosion of the charge developing high temperature in the mouth cavity. The first patient was hit by a signal rocket, the second one injured by the explosion of a mine detonator. In both cases the treatment began tracheostomy and gastrostomy. In reconstructive operations the tubed flaps, skin flaps on pedicles and mucosal pharyngeal flaps were used. With the aid of these flaps mutual relations of anatomical structures of the mouth cavity and pharynx were regained. The release of the scarred constriction of the pharynx made renewal of the breathing and swallowing functions possible. After restoring the wide pharyngeal-esophageal connection the anastomosis of an artificial esophagus was performed enabling the patient oral feeding.

RESUME

Les spécialités du traitement chirurgical des traumas thermiques dans la cavité buccale et dans le pharynx chez les brûlés

Chitrov, F. M., Mumladze, R. B.

Les auteurs ont traité 177 malades avec un rétrécissement ulcératif du pharynx, de l'oesophage et de l'estomac, comme conséquences des brûlures thermochimiques. Dans deux cas, le rétrécissement ulcératif a été causé par la détonation d'une cartouche ce qui avait pour résultat le dégagement de chaleur dans la cavité buccale. Un malade

a été atteint d'une fusée éclairante, chez l'autre malade la détérioration similaire été occasionnée par l'explosion du détonateur d'une mine. Dans les deux cas, le traitement a été commencé par la trachéotomie et par le gastrotomie. Pour les opérations reconstructives on a utilisé lambeaux tubulés, lambeaux pédiculés cutanés et lambeaux du muqueuse pharyngiens. A l'aide de ces lambeaux on est arrivé à renouveler des relations réciproques des structures anatomiques de la cavité buccale et du pharynx. Le dégagement du rétrécissement ulcératif du pharynx a restitué ses fonctions respiratoires et d'avalement. Après la constitution d'un vaste passage pharyngo-oesophagien, il a fallu exécuter une anastomose de l'oesophage artificiel ce qui a permis l'accueil normal des aliments.

ZUSAMMENFASSUNG

Besonderheiten der Verletzung und chirurgischen Behandlung der Wände der Mundhöhle und des Pharynx bei thermischer Verbrennung

Chitrow, F. M., Mumladze, R. B.

Die Autoren behandelten 177 Patienten mit narbiger Verengung des Pharynx, Ösophagus und Magens als Folge chemischer thermischer Verbrennungen. In zwei Fällen wurde die narbige Verengung durch Verletzung bei der Explosion eines Projektils hervorgerufen, das eine hohe Temperatur in der Mundhöhle auslöst. Bei einem Patienten kam es zum Einschlag einer Beleuchtungsrakete, bei dem anderen wurde ähnliche Schädigung durch die Explosion der Minensprengkapsel verursacht. In beiden Fällen begann die Behandlung mit der Tracheotomie und Gastrostomie. Zu Wiederherstellungsoperationen benutzte man Rundstiellappen, Hautstiellappen und Pharyngealschleimhautlappen. Mit ihrer Hilfe gelang es, die gegenseitigen Beziehungen der anatomischen Strukturen der Mundhöhle und des Pharynx wiederherzustellen. Durch die Freilegung der narbigen Verengungen des Pharynx wurde seine Atem- und Schluckfunktion wiederhergestellt. Nach der Bildung eines breiten pharyngoösophagealen Überganges wurde Anastomose des künstlichen Pharynx durchgeführt, wodurch eine normale Nahrungsmittelaufnahme ermöglicht wurde.

RESUMEN

Características de la lesión y el tratamiento quirúrgico de la cavidad bucal y el faringe en consecuencia de quemadura térmica

Chitrov, F. M., Mumladze, R. B.

Los autores dieron tratamiento a 177 pacientes con estrechura cicatrizal del faringe, esófago y estómago como consecuencia de quemaduras térmicas químicas. En dos casos, el estrechamiento fue producto de quemaduras por altas temperaturas originadas por la explosión de un cartucho en la cavidad bucal. Uno de los pacientes fue herido por un cohete alumbrador, el otro sufrió la misma herida al explotar el fulminante de una mina. En ambos casos, el tratamiento fue iniciado por traquetomía y gastrotomía. Para las operaciones reconstructivas fueron utilizados lóbulos tubulados, lóbulos de piel con pecíolo y lóbulos faríngeos de mucosa, mediante los cuales se logró renovar las mutuas relaciones entre las estructuras anatómicas de la cavidad bucal y el faringe. Al desobstruirse los estrechamientos del faringe se reanudaron su función respiratoria y deglutiva. Una vez conformada una ancha transición faringo-esofágea, se hizo la anastomosis del esófago artificial y se normalizó así la recepción de alimentos.

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LYMPHOCYTE ACTIVATION IN BURNED PATIENTS

Z. Koníčková, L. Pávková, B. Hejcmanová, J. Kuderová, L. Brož

INTRODUCTION

One of the pitfalls likely to be encountered in the use of skin allografts as temporary cover in the severely burned is a certain degree of risk involved in the course of graft rejection (1). What the patients suffer from in such cases is not systemic reaction, a relatively rare occurrence, but mainly the consequences of local reaction. Necrotic or necrotizing allografts on the patient's body create favourable conditions for the development of infection driving the patient in a state which the surgeon would like to prevent by performing an early necrectomy.

The onset of skin allograft rejection cannot as yet be safely determined except on the basis of macroscopic changes in the graft. These are, however, a sure sign of an already fully developed rejection reaction. As for laboratory tests, the onset of rejection is also heralded by the level of humoral antibodies (6). This, however, is technically too involved to be of any practical use. Hence why we tried to find out whether or not this particular purpose could be served by monitoring the activation of lymphocytes using the nucleolar test as a rapid and simple method for nucleolar RNA synthesis detection (7) The activation of lymphocytes prior to the onset of rejection has already been demonstrated both in animal experiments involving skin allotransplantation (3) and in clinical kidney allotransplant operations (4).

MATERIAL AND METHODS

The control group consisted of 15 blood donor volunteers.

Patients. A total of 30 adult burned patients were monitored, thereof 10 with burns covering up to 20 % of total body surface, and 20 with burns of over 20 % of the body surface. 6 of the latter group died as a result of the burn injuries substained.

9 of the patients had skin allotransplantation repeatedly performed during the course of treatment. Skin xenografts (porcine skin) were used in 25 patients.

Blood for laboratory tests was taken from peripheral veins roughly at intervals of one week, the patient's condition permitting.

Nucleolar tests. Smears from peripheral blood were stained within 24 hours of sample taking, using toluidine blue at pH 5 for a period of 10 minutes without previous fixation. 50 lymphocytes were evaluated in each smear. Lymphocytes with compact nucleoli and nucleoli with nucleolonemas were rated as activated, those with ring-shaped nucleoli as activable — reversibly resting lymphocytes. The results were expressed in per cent; absolute values could not be determined except in certain cases. The t-test was used for the determination of statistical significance, the level of significance equal to 0.05.

RESULTS

In the control group of healthy blood donors, the average percentage of lymphocytes with "activated nucleoli" amounted to 5.3 ± 1.4. All groups of burned patients were found to have a statistically significant increase in the number of lymphocytes with "activated nucleoli" as distinct from the controls. The activation which set in during the very first post-operative days persisted

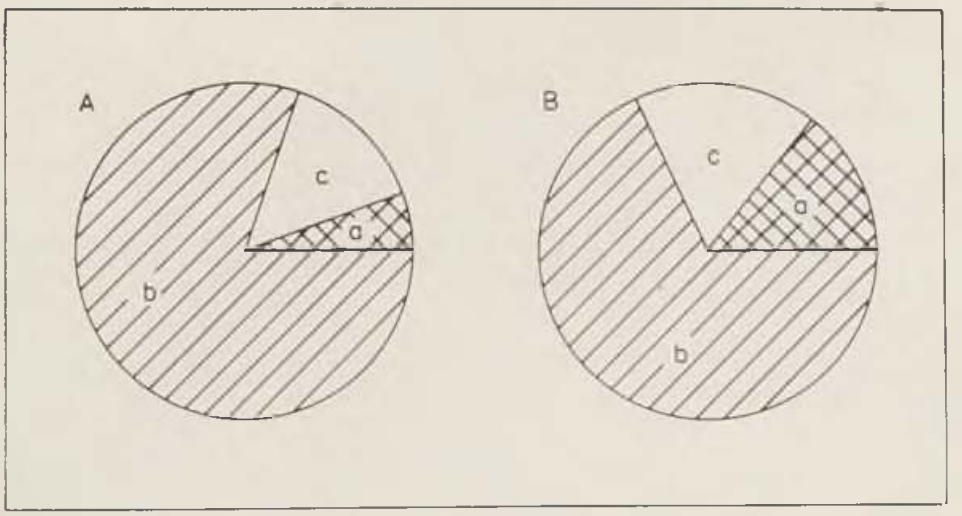

Fig. 1. Percentage of nucleolar types of lymphocytes in healthy and burned individuals 5 days after thermal injury

A. Healthy controls
   a) lymphocytes with "activated nucleoli" . . . . . 5.3 ± 1.4
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 80.5 ± 3,5
   c) lymphocytes with "inactive nucleoli" . . . . . 14.1 ± 3.7

B. Burned patients
   a) lymphocytes with "activated nucleoli" . . . . . 13.9 ± 3.0
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 68.4 ± 5.5
   c) lymphocytes with "inactive nucleoli" . . . . . 17.9 ± 5.5

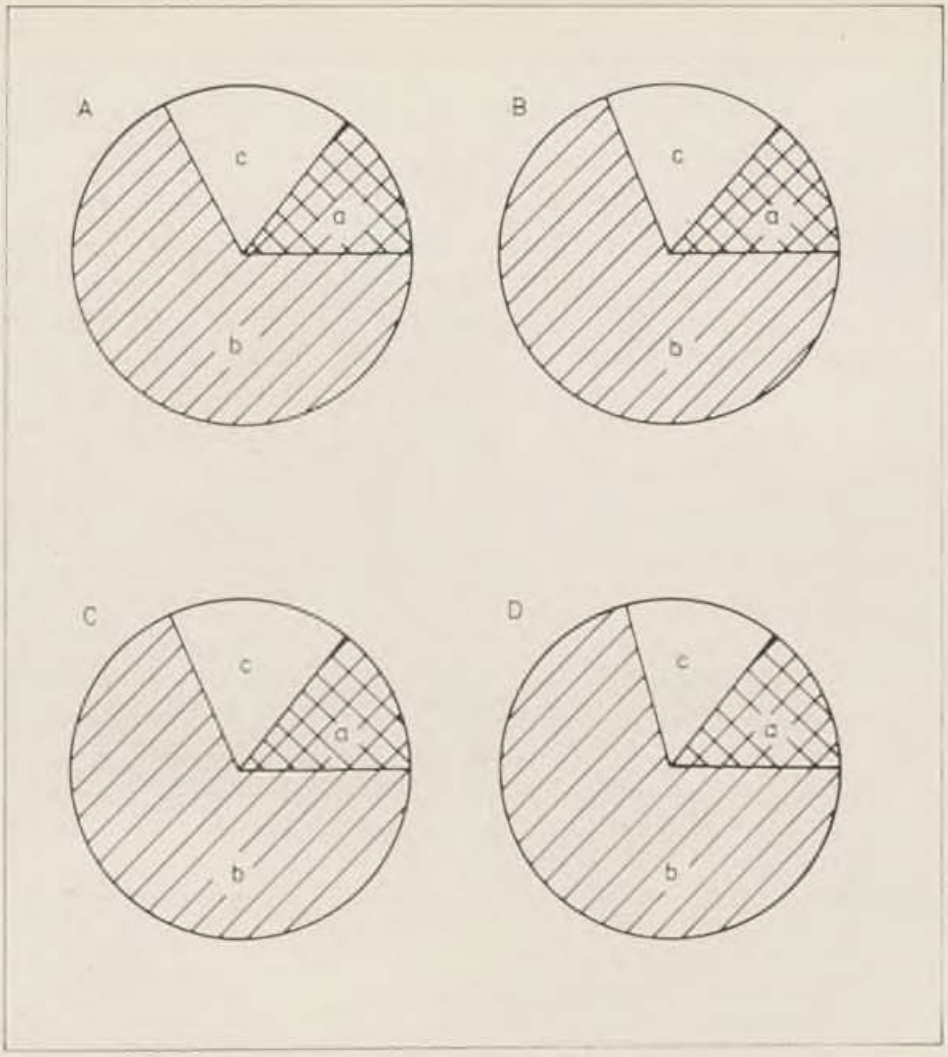

Fig. 2. Percentage of nucleolar types of lymphocytes in patients with burns covering up to and over 20 % of total body surface within 5 days of thermal injury and in the subsequent course of hospitalization

A. Patients with burns up to 20 % of body surface during the first five post-injury days
   a) lymphocytes with "activated nucleoli" . . . . . 14.1 ± 3.4
   b) lymhocytes with "reversibly resting nucleoli" . . . . . 67.7 ± 5.1
   c) lymphocytes with "inactive nucleoli" . . . . . 18.4 ± 4.0
B. Patients with burns up to 20 % of body surface during subsequent hospitalization
   a) lymphocytes with "activated nucleoli" . . . . . 14.1 ± 3.4
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 68.4 ± 5.0
   c) lymphocytes with "inactive nucleoli" . . . . . 17.5 ± 2.8
C. Patients with burns over 20 % of body surface during the first five post-injury days
   a) lymphocytes with "activated nucleoli" . . . . . 13.7 ± 3.4
   b) lymphocytes with „reversibly resting nucleoli" . . . . . 68.8 ± 5.9
   c) lymphocytes with "inactive nucleoli" . . . . . 17.5 ± 6.3
D. Patients with burns over 20 % of body surface during subsequent hospitalization
   a) lymphocytes with "activated nucleoli" . . . . . 13.9 ± 3.1
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 70.9 ± 3.3
   c) lymphocytes with "inactive nucleoli" . . . . . 15.2 ± 2.6

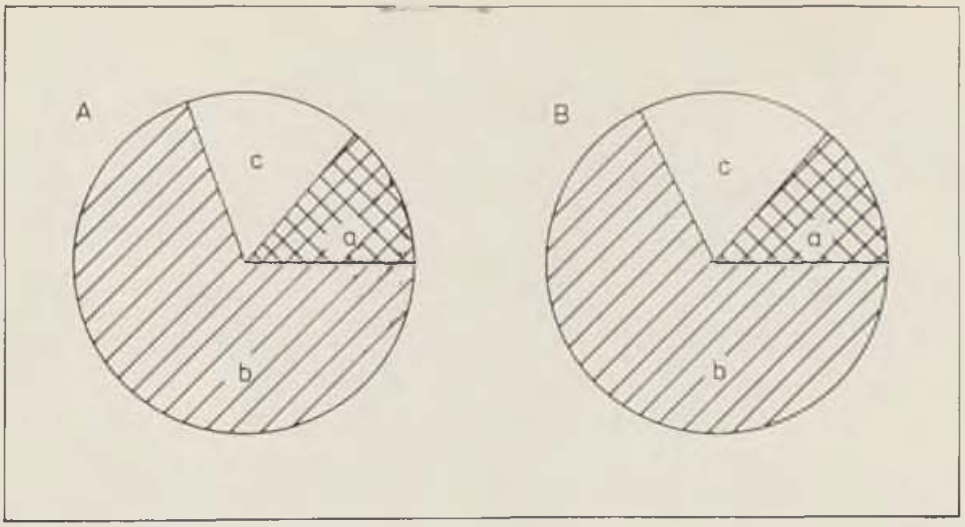

Fig. 3. Percentage of nucleolar types of lymphocytes in deceased patients with burns covering over 20 % of total body surface and in equally affected survivors

A. Survivors
   a) lymphocytes with "activated nucleoli" . . . . . 13.7 ± 3.3
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 69.6 ± 5.9
   c) lymphocytes with "inactive nucleoli" . . . . . 16.7 ± 6.2

B. Decreased patients
   a) lymphocytes with "activated nucleoli" . . . . . 13.7 ± 3.9
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 67.8 ± 6.3
   c) lymphocytes with "inactive nucleoli" . . . . . 18.5 ± 7.0

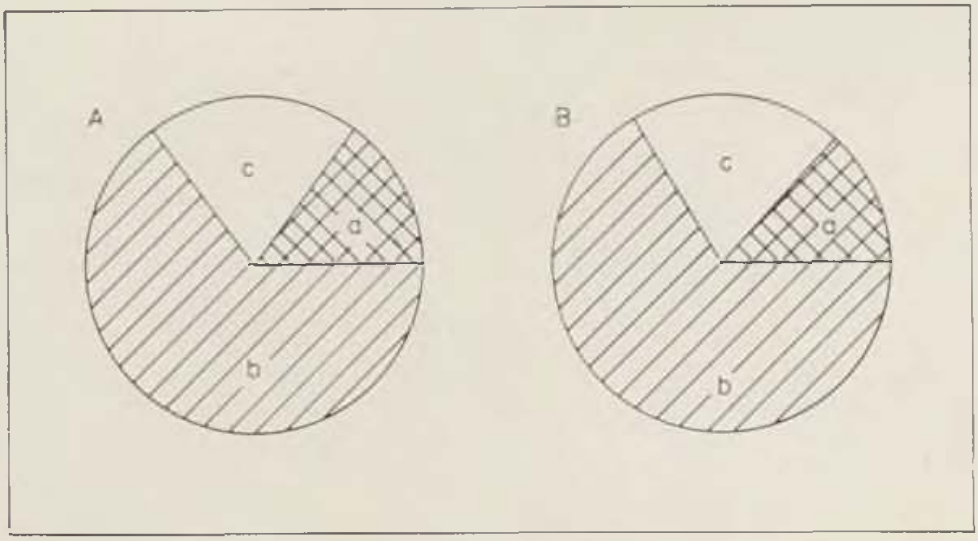

Fig. 4. Percentage of nucleolar types of lymphocytes in burned patients before and after skin allotransplantation

A. Burned patients before allotransplanptation
   a) lymphocytes with "activated nucleoli" . . . . . 14.8 ± 2.3
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 64.8 ± 7.7
   c) lymphocytes with "inactive nucleoli" . . . . . 20.4 ± 7.9

B. Burned patients after allotransplantation
   a) lymphocytes with "activated nucleoli" . . . . . 13.0 ± 2.7
   b) lymphocytes with "reversibly resting nucleoli" . . . . . 66.4 ± 8.0
   c) lymphocytes with "inactive nucleoli" . . . . . 20.6 ± 6.0

throughout the period of hospitalization. There was no significant difference between the particular groups of burned patients or between burns of different stages, not even in lethal cases. Following xenotransplantation, there was no increase in the percentage of "activated nucleoli" lymphocytes; similarly, neither skin allotransplantation nor incipient rejection came to be reflected in the final results.

DISCUSSION

The results confirmed the complexity of processes going on in the organism during the burn disease. It appeared that a statistically significant increase in the percentage of "activated nucleoli" lymphocytes in the peripheral blood could be noted already in the very first days following thermal injury. As for the variation in the number of those lymphocytes in the further course of the disease, a phenomenon of no statistical significance, we were unable to identify any objective law governing it either in relation to the patients' general condition, or in relation to medication or type of surgical operation. Thus, for instance, there was no apparent difference between values obtained by the 5th postoperative day while there is as yet no reason to expect the development of generalized infection (1) such as could influence the state of lymphocytes (9), and values obtained later on. Nor did we note any difference between slightly burned patients and those with severe burns in spite of the fact that generalized infection is rather an exception in the former while it is a rule in the latter. Besides, in severe burns one would expect the state of the lymphocytes to be influenced by frequent blood transfusions. Yet the results remained unaffected by transfusions of blood or blood derivatives, but also by the application of antibiotics and other medication similarly as by all sorts of internal complications.

Nor was there any statistically significant difference between severely burned patients who survived the trauma and equally affected patients who did not survive; for that reason, the test is of no prognostic use.

The results of the nucleolar test remained equally unaffected by skin xenotransplantation, although in that particular case no changes were likely to take place since in skin xenografts there is no graft-wound bed vascular connection. Moreover, it is established clinical practice to leave xenografts in situ for only a brief period of time, 3 to 5 days at the longest (2). Contrary to our expectation, however, the values of lymphocytes with "active nucleoli" in burned patients failed to show any increase even after skin allotransplantation when allografts were left adhering in place for prolonged periods of time and when rejection was allowed to take a free course.

Our results then are in stark contradiction to literary information referring to a statistically significant increase in the percentage of "activated nucleolus" lymphocytes prior to the onset of allograft rejection. Such observations were described both in experimental skin allotransplantations (3) and in clinical allotransplantations of organs (kidney) (4). However, none of the cases reported on there involved transplantation in a burned organism. It appears

that burned patients exhibit of whole complex of factors which may influence the condition of lymphocytes, and that the effect of any of those factors cannot be isolated from the general outcome. Marked lymphocyte activation setting in immediately after the burn is apparently potent enough to obscure all other changes which take place in the further course of the burn disease and its treatment. This can serve as evidence of the burn trauma constituting profound interference in the immunity processes going on in the body. The build-up of antibodies against the burned skin starting immediately after the burn is one of the manifestations of the interference (5). The problem as a whole deserves more exploration. The nucleolar test, however, can under no circumstances be used for an early determination of the onset of rejection in burned patients. J. H.

Acknowledgement

The authors wish to thank Dr. Z. Líkovský of the Institute of Experimental Medicine, Czechoslovak Academy of Sciences, for his valuable advice.

SUMMARY

Using the nucleolar test, the authors examined peripheral blood lymphocytes in burned patients to find that immediately after the thermal injury there was a statistically significant activation of lymphocytes, a phenomenon persisting in the subsequent course of the disease. Contrary to expectation, however, the relative values of "activated" lymphocytes showed no marked changes in skin allotransplantation patients. Therefore, the nucleolar test cannot be used for determining the onset of rejection in the burned.

RESUME

L'activation des lymphocytes chez les brûlés

Koníčková, Z., Pávková, L., Hejcmanová, B., Kuderová, J., Brož, L.

A l'aide d'examen nucléolaire, les auteurs ont examiné une population des lymphocytes du sang périphérique des malades brûlés. Ils ont constaté que immédiatement après une brûlure survient une activation lymphocytaire statistiquement importante, quelle survit au cours de la maladie. Après l'application d'une autogreffe cutanée, la valeur relative des lymphocytes «actives» ne se change pas efficacement, ce qui est en contradiction avec les suppositions des auteurs. On ne peut pas alors utiliser l'examen nucléolaire à prévoir l'apparition de la rejection.

ZUSAMMENFASSUNG

Aktivierung der Lymphozyten bei verbrannten Kranken

Koníčková, Z., Pávková, L., Hejcmanová, B., Kuderová, J., Brož, L.

Die Autoren untersuchten die Papulation der Lymphozyten des peripheren Blutes bei Verbrannten mittels des Nukleolartests. Sie stellten fest, dass unmittelbar nach Verbrennung eine statistisch signifikante Aktivierung der Lymphozyten eintritt, die im

weiteren Krankheitsverlauf erhalten bleibt. Nach Hautallotransplantation verändern sich die relativen Werte der „aktiven" Lymphozyten gegenüber der ursprünglichen Voraussetzung nicht signifikant, man kann also nicht bei den Verbrannten den Nukleolartest zur Voraussage des Antritts der Abstossung benutzen.

RESUMEN

Activación de linfocitos en los quemados

Koníčková, Z., Pávková, L., Hejcmanová, B., Kuderová, J., Brož, L.

Los autores examinaron la población de linfocitos de la sangre periférica de los quemados mediante el testo nucleolar. Constataron que inmediatamente después de la quemadura se produce una activación de linfocitos, estadísticamente importante, que se mantiene durante la evolución de la enfermedad. Pese a lo esperado, el nivel de los linfocitos "activos" no ha cambiado en forma importante ni siquiera hecha una alotransplantación dérmica. Por tanto no se puede aplicar en los quemados, para la previsión del inicio de la reyección el testo nucleolar.

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THE POSSIBLE ROLE OF BLISTERS IN DERMAL BURNS

J. Moserová, M. Runtová, L. Brož

The problem of whether or not to remove blisters in superficial 2nd-degree burns continues to attract undiminished attention. The present authors, therefore, decided to test thermally damaged, blistered epidermis for its ability to prevent evaporative water loss from the wound bed.

They elaborated a simple in vitro method making use of of weight loss in decorticated samples of epidermis incubated at +37 °C (Moserová J., Běhounková-Houšková E., 1979) with a view to evaluating different skin substitutes as to their efficacy in preventing water loss and consequent secondary pathological invasion of the deeper layers of the denuded skin. So far, a number of synthetic and biological materials have been tested (Epigard, Lyofoam, SYS-pur-derm, Opsite, Synkryt, fresh, freeze-dried and deep-frozen xenografts and fresh allografts) (Moserová J., 1980).

MATERIAL AND METHODS

Decorticated procine skin was used for the experiment. Strips of dermis, approximately 0.8 mm thick, were cut with a Humby knife from slaughterhouse pig hides. One group of samples was placed in Petri dishes (air bubbled under the sample were evacuated) and left uncovered. Another group of specimens were covered with blisters, i.e. with thermally damaged epidermis obtained from patients treated at the burns department for 2nd-degree burns. Six controls and six experimental samples (covered with blisters) were placed in a thermostat for 1, 2 and 4 hours respectively, at +37 °C. The weight of the samples was ascertained before and immediately after incubation. The results, i.e. weight loss in each sample in absolute and relative values, were processed with statistical method.

RESULTS

Table 1 demonstrates absolute and relative mean values (and standard deviation) for weight loss in the controls and inblister-covered samples (with thermally damaged epidermis) after 1, 2 and 4 hours incubation at +37 °C.

Table 1. Weight loss in uncovered controls and in blister-covered samples after 1, 2 and 4 hours incubation at +37 °C (n = 6)

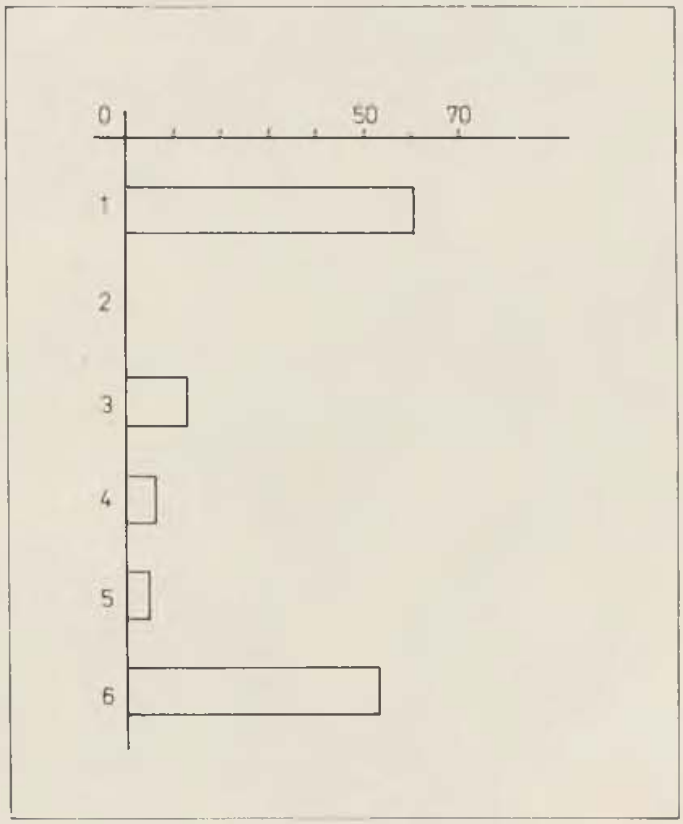
	(uncovered dermis) Controls		Blister-covered samples	
	mg	%	mg	%
1 hour				
initial weight	299.83 ± 7.28	100	302.17 ± 5.49	100
weight loss	109.83 ± 8.37	36.60 ± 2.50	16.34 ± 5.85	5.40 ± 2.40
2 hours				
initial weight	300.00 ± 5.48	100	301.33 ± 5.35	100
weight loss	148.33 ± 5.48	49.40 ± 0.70	11.00 ± 4.56	3.10 ± 0.76
4 hours				
initial weight	300.33 ± 4.36	100	301.17 ± 3.12	100
weight loss	180.00 ± 3.74	60.03 ± 1.72	13.00 ± 5.40	4.33 ± 1.84

Graph 1 shows the relative values of weight loss after 4 hours incubation in the controls and in samples covered with thermally altered epidermis. For comparison, the results obtained previous for fresh xenografts, allografts and for synthetic skin substitutes manufactured in Czechoslovakia are also included.

DISCUSSION

As the results show, blisters removed from 2nd-degree burns have practically the same effect as fresh xenografts or allografts as far as the prevention of evaporative water loss from decorticated skin is concerned although the blisters represent thermally damaged epidermis. (The paradoxical difference in the results after 1, 2 and 4 hours incubation of samples covered with blisters was no doubt due to differences in blister thickness). This made us wonder of those authors who recommend leaving the blisters on the wound might not have a point there after all. According to clinical experience, if the blisters are left on the wound without débridement epithelialization is often delayed. On the other hand, if the blisters are removed, the wound bed properly cleansed, and the blisters then returned in place, the results are very favourable. It is necessary to stress, however, that blistered epidermis is not entirely sterile. Nevertheless, in a more extensive 2nd-degree burn or scald with clean, untorn blisters the above method could be applied, i.e., the blisters could be peeled off under sterile conditions, the wound bed débrided and washed, and the

blisters spread on the wound bed (after bathing them possibly in a mild disinfectant or antibiotic solution). The fact that thermally damaged epidermis retains its ability to prevent evaporative water loss from the dermis is definitely worth consideration; it might be taken into account in the choice of local treatment, especially in cases where no suitable temporary skin substitutes are available. The prevention of secondary penetration of pathological changes is, no doubt, one of the main principles of local treatment for thermal injuries.



Graph 1. Weight loss in specimens of decorticated dermis covered with different materials after 4 hours incubation at +37 °C (in %)

1 — uncovered specimens (controls)
2 — dermis covered with different materials
3 — blisters
4 — fresh xenografts
5 — fresh allografts
6 — Synkryt

SUMMARY

An in vitro method of weight loss determination in samples of decorticated dermis incubated in a thermostat at +37 °C was evolved to test thermally damaged, blistered epidermis for its ability to prevent evaporative water loss. As for this protective function, the epidermis thus damaged was found to match fresh allo- and xenografts. Weight loss ascertained in samples covered with blistered epidermis was found highly significantly different from that in controls and in samples covered with synthetic skin substitutes.

RESUME

Le rôle possible de l'épiderme détachée chez la brûlure cutanée

Moserová, J., Runtová, M., Brož, L.

Suivant les méthodiques in vitro, les auteurs ont examiné l'épiderme détachée du tissu sous-jacent, endommagée par la chaleur (les ampoules en général), du point de vue de son aptitude d'empêcher la fuite des liquides par évaporation. L'examen a consisté en observation des changements du poids du derme décortiqué, incubé au thermostat en 37 °C. Quant à la fonction d'empêcher la fuite des liquides, l'épiderme détachée est aussi convenable que les autogreffes immédiatement appliquées, d'après les auteurs. La perte du poids des spécimens couverts par les matériaux synthétiques se distingue significativement de celle qui a été constatée chez les spécimens couverts de l'épiderme détachée, endommagée thermiquement.

ZUSAMMENFASSUNG

Die mögliche Rolle der abgelösten Epidermis bei der dermalen Verbrennung

Moserová, J., Runtová, M., Brož, L.

Mittels einer in-vitro Methode, beruhend auf den Gewichtsabnahmen von Proben einer durch Dekortikation behandelten Dermis, die im Thermostat bei 37 °C inkubiert wurde, untersuchten die Autoren die Fähigkeit der thermisch abgelösten und geschädigten Epidermis (Blasen), Wasserverluste durch Verdunstung zu verhindern. Es wurde festgestellt, dass hinsichtlich dieser Funktion die abgelöste Epidermis frischen Allo- und Xenotransplantaten gleich ist. Von den Gewichtsabnahmen bei Kontrollen und Proben, die mit synthetischen Decken gedeckt wurden, unterscheiden sich die Gewichtsabnahmen, die bei Proben beobachtet wurden, die mit thermisch geschädigter abgelöster Epidermis gedeckt wurden, hoch signifikant.

RESUMEN

Un posible papel de la epidermis separada en la quemadura dermal

Moserová, J., Runtová, M., Brož, L.

Por método "in vitro", basado en la reducción de la materialidad de las muestras de dermis descorticada, incubada en el termóstato con +37 °C, los autores observaban la capacidad de la epidermis separada térmicamente (vejigas) y defectuosa de impedir pérdidas de agua por evaporación. Se comprobó que, en cuanto a esta su función, la epidermis separada es equivalente en su calidad a los injertos frescos. Comparando la reducción de la materialidad de las muestras protegidas con cubiertas sintéticas, con la reducción observada en las muestras protegidas por la epidermis separada y deteriorada por via térmica, se ve una enorme diferencia.

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NEW BOOKS

CIRURGIA PLÁSTICA by Jorge Foneseca Ely.

The book, first published in 1965, was re-edited and extended by the author, and appeared again in Rio de Jainero in 1980.

Featuring a large format, the book runs into nearly 700 pages. The text is well documented with easy-to-review drawings, graphs and numerous photographs. Each chapter is followed by a wide-ranging list of references.

In his introductory remarks, the author pays tribute to the personality and work of the late Prof. Tord Skoog, well known to plastic surgeons all over the world.

The book falls into five parts with a special part attached to inform the reader on the latest experimental knowledge and on clinical options for the use of microsurgical methods.

Five chapters of Part I are devoted to the basic methodology of plastic surgery ranging from the instrumentarium, via operation planning, free transplantation of different tissues up to the principles of operative techniques using flaps for plastic operations from near and remote donor sites.

Eight chapters of Part II are devoted to plastic surgery in traumatic cases, in tissue loss, bedsores and burns. Part III is concerned with reconstructions in congenital malformations and benign tumours, while Part IV is devoted to the same subject in malignant tumours. Part V covers the field of surgical operations for cosmetic defects in the face and in other parts of the body, with due attention devoted to complications in plastic surgery. A large number of carefully chosen colour illustrations are attached at the end of the book.

The book includes also certain minor errors. Not always do we find it possible to agree with the author as to the surgical approaches proposed. Thus, for instance, Fig. 2.2 on page 14 is inconsistent with the lines as published by Langer in 1861. The illustration shows the course of wrinkles resulting from the effect of the many facial muscles, and now used as guides for making incisions. In several regions, particularly in the forehead, the wrinkles follow a course substantially different from Langer's lines drawn experimentally on a dead face. Another example, experience of the Prague school makes it impossible to accept the author's complicated procedure in facial haemangioma in a child as shown in Fig. 5—24 on page 97. We were able to achieve repeatedly perfect results in those and even larger tumours using the simple method of gradual partial excision.

None of this, however, detracts from the value of this well conceived bookt, the result of rich experience accumulated by an author practising plastic surgery in its full extent the way Academician Prof. F. Burian, the founder of the specialty, conceived it in Czechoslovakia already in the period following the 1st World War.

The book has a great deal to say to surgeons and traumatologists, and is bound to serve as a basis for thorough-going study and as a source of knowledge particularly for young plastic surgeons in Portuguese-speaking countries.

Prof. Dr. H. Pešková, DrSc.

SURGERY OF THE HAND by V. Kubáček et al.

Twelve specialists working under the guidance and with the active participation of Prof. Dr. V. Kubáček, DrSc. have summed up thirty years of experience of the Brno Department of Plastic Surgery in a book which in 1982 appeared as volume 74 of a series of Brno J. E. Purkyně University Press.

To quote Prof. Kubáček's introductory remarks, the book is intended "to serve young surgeons and medical students with a view to rousing their interest in the exacting, complex but also attractive and immeasurably useful field of surgery". This is also an outline of the contents giving a rather general account of the difficulties involved in the complicated and often prolonged reconstructions of the consequences of injuries of the hand which remain the domain of specialized surgical units. As for reconstructive operations, more attention is devoted to those which every surgeon is expected to be skilled in.

The book with its 700 pages and numerous clear drawings and black-and-white photographs consists of the general and special parts.

In the former, the surgical and functional anatomy of the hand is followed by importatnt chapters on the physiology and pathophysiology of connective tissue and on wound healing. Chapter 5 of the general part deals with the principles of atraumatic surgical techniques, and with the basic techniques of tissue replacement. Well-deserved attention is devoted to the diagnosis and examination of the injured hand including ultrasound flow-meter tests routinely used with good results at the Brno department, too. The first part is closed with a chapter on first aid.

The opening chapter of the special part deals with congenital developmental defects of the hand. This is followed by 10 chapters in which the authors deal with different types of fresh injuries ranging from superficial, to deep, complicated wounds resulting in defects, from burns, hot-press injuries up to scope for replantation of fingers. There is also an independent, well-devised chapter on those reconstructive operations which are likely to remain included in the list of routine surgical operation even in a period marked by the gradual establishment of special units for surgery of the hand. These units keep developing and putting to practical use microsurgical techniques, and are turned into scientific-research and methodological training centres.

Due attention is also devoted to all stages of rehabilitation. The reader will also find chapters on treatment for the frequent cases of Dupuytren's contracture and rheumatic hand.

The book is a fine contribution for all those called to treat injuries of the hand as a complex and important organ of the human body. It serves as evidence of the amount of purposeful and honest research and clinical work done by the Brno school of plastic surgery, by people who in this particular field, too, follow in the footsteps of the founder of the school, Prof. Dr. V. Karfík, DrSc., who unfortunately died too early to see its publication.

Prof. Dr. H. Pešková, DrSc.

CONTENTS

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,
QUIET AND INSPIRATION

KARLOVY VARY — FRANTIŠKOVY LÁZNĚ — MARIÁNSKÉ LÁZNĚ — JÁCHYMOV — TEPLICE V ČECHÁCH — PODĚBRADY — JANSKÉ LÁZNĚ — TŘEBOŇ — JESENÍK LUHAČOVICE — TEPLICE NAD BEČVOU

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