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RARE LOCATION OF RECKLINGHAUSEN'S DISEASE (CASE REPORT)

P. TEPAVICHAROVA

Von Recklinghausen's neurofibromatosis is a hereditary and dominant disease, which is characterized by multiple cutaneous neurofibromas distributed over various parts of the body, associated with skin pigmentation — the so-called "cafe-au-lait" spots, and bone deformities.

Other systems might be also affected: respiratory, alimentary, urogenital, neural, ocular (1, 4, 5, 6, 7, 8). The symptoms vary depending on the location. This requires multidisciplinary approach to diagnosis and treatment of the disease.

Tiselins (1973) (3) first reported a case with the disease, and later, R. Smit (1849) (3) contributed a new case. In 1893 Virchow described neurofibromatosis elephantica, the so called pachydermatocele. F. von Recklinghausen (1882) gave a description of the disease as a separate entity.

Plastic surgery is mainly concerned with the cutaneous stigmata of the disease. Cutaneous neurofibromas are of different size, cord-shaped or resembling a fold of great size. They occur as diffuse non-capsulated tumours that involve all layers of the underlying soft tissues and are extremely vascular. They have the colour of the surrounding skin, or they may be pale, or blue, with soft consistency. Some of them are pedunculated (molluscus pendulum), some are broadly based. The treatment of these tumours is palliative and a complete excision of a large neurofibroma is often impossible to perform (9).

CASE REPORT

A 26-year old woman complained of a deformity of the vulva. This deformity had been present from birth and increased in size gradually. The patient's mother also had the disease and a similar tumorous deformity of the vulva.

The examination disclosed multiple cutaneous neurofibromas throughout the body and extremities, as well as multiple "cafe-au-lait" spots. They were of large mass measuring 60 × 42 cm (Fig. 1. a, b) and involved left inguinal region, left labia majora, and the medial surface of the thigh. Electro-encephalogram, head scan, and EMG, gave normal results. Laboratory data including complete blood analysis, liver enzymes, and renal function tests were normal as well as the X-rays of skull, spine and thorax.

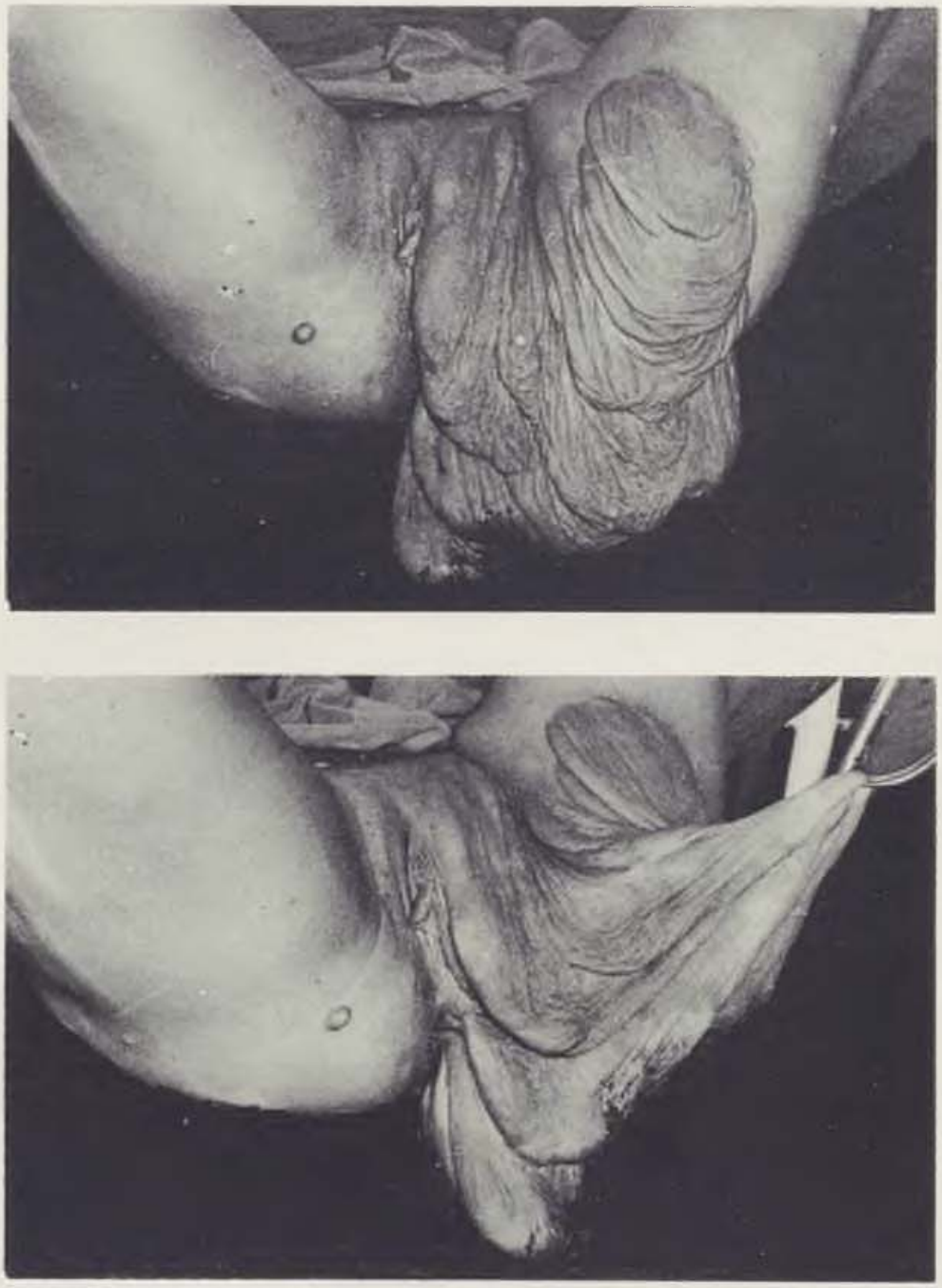

Fig. 1. a, b A 26-year old woman with giant neurofibroma of the vulva — before the operation

The patient had difficulty in the intercourse, since the introitus of the vagina was obscured by the tumour. The woman is married and has two children.

Under general endotracheal anasthesia, during the first operation, the mass was excised through two incisions. The medial incision was made over the tumour near the deformed labia majora and the anal opening. The lateral incision was made over the tumour of the thigh. The mass was non-capsulated, diffuse, highly vascularized with involvement of m. bulbospongiosus, m. sphincter ani externus and musculi adductores. Six months later, a second elliptical excision was performed and the remaining part of the tumour was removed. The weight of the excised mass was 1,690 g. Because of the muscles involvement, complete excision has not been achieved. The aim of the excision was to reshape the vulva. Slightly compressive dressing were applied for a one-week period. Sutures were removed on the tenth postoperative day. Histological examination showed angioneurofibroma.

The patient is satisfied with the result (Fig. 2).

Fig. 2 Patient after the operation

CONCLUSION

A complete surgical excision of neurofibromas of Recklinghausen's disease is virtually impossible to perform. The treatment is palliative. Amelioration rather than a complete eradication is the therapeutic goal. An unusual case of a huge angioneurofibroma involving the vulva and the surrounding structures is described. A two-stage operation was performed and a subtotal removal was achieved.

SUMMARY

The Recklinghausen disease may affect all systems of human body. This requires a multidisciplinary approach to diagnosis and treatment of the disease. Plastic surgery is mainly concerned with the cutaneous stigmata of the disease. An unusual case of a huge angioneurofibroma involving the vulva and surrounding structures, causing difficulty in the intercourse of a 26 year old woman, is presented. A two-stage operation was performed and a subtotal removal was achieved. The removed portion measured 60 × 42 cm and weighed 1,690 g. The post-operative period was uneventful. The patient is satisfied with the result.

RÉSUMÉ

Une localisation rare de la maladie de Recklinghausen

Tepavicharova P.

La maladie de Recklinghausen peut atteindre presque tous les systèmes de l'organisme humain. Ce fait impose un approche polydisciplinaire comme pour l'éclaircissement de la diagnose ainsi que pour la cure. La chirurgie plastique a pour champ d'application avant tout les manifestations de la maladie de la peau.

Nous présentons un cas d'une angéoneurofibromateuse gigantesque, d'une femme de 26 ans, qui déforme la vulve et qui crée des problèmes pendant l'act sexuel. La tumeur a été excisée en deux étapes, mesurait 60 × 42 cm et pesait 1690 gr. La période postopérative s'est découlée normalement. La patiente était contente du resultat.

ZUSAMMENFASSUNG

Seltene Lokalisierung der Recklinghausen'schen Erkrankung

Tepavicharova P.

Die Recklinghausen'sche Erkrankung kann alle Systeme des menschlichen Körpers befallen und dies erfordert daher einen multidisziplinären Zutritt sowohl zur Diagnostik als auch zur Therapie dieser Erkrankung. Gegenstand der Fürsorge der plastischen Chirurgen sind hauptsächlich die Äusserungen dieser Erkrankung auf der Haut.

Es wird ein ungewöhnlicher Fall eines ungeheuren Angioneurofibroms angeführt, das die Vulva und das umgebende Gewebe anfiel und Beschwerden beim Sexualverkehr einer 26-jährigen Frau verursachte. Er wurde eine Operation in zwei Etappen durchgeführt und die Beseitigung fast des ganzen Tumors erzielt. Der beseitigte Teil mass 60 × 42 cm und wog 1690 g.

Der Verlauf nach der Operation war ohne Komplikationen. Die Patientin ist mit dem Ergebnis zufrieden.

RESUMEN

La locación rara de la enfermedad de Recklinghausen

Tepavicharova P.

La enfermedad de Recklinghausen puede afectar todos los sistemas del cuerpo humano. Por eso, tenemos que acercar a la cuestión de la diagnosis y el tratamiento

de esta enfermedad del aspecto multidisciplinario. La cirujía plástica sa preocupa principalmente de las estigmas cutáneas de la enfermedad. Este papel presenta un caso extraordinario de un gran angioneurofibroma incluyendo la vulva y las estructuras vecinas causando un estorbo durante el coito en la mujer de 26 años. La operación de dos etapas fue efectuada resultando en el removimiento subtotal. La domensión de la parte removida fué 60 × 42 cm y su peso 1,690 gr. El período postoperativo transcurrió sin problemas. El paciente está contento con el resultado.

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APPLICATION OF COMPOSITE MICROSURGICAL TISSUE FOREARM FLAPS USING RADIAL ARTERY

K. P. PSHENISNOV, V. K. MINACHENKO, V. B. SIDOROV

Apart from numerous flaps with axial venous supply, today's plastic surgery generally employs autotransplants using the radial artery. This type of forearm graft was first known as fasciocutaneous and called the "Chinese" graft (10). The results of recent research have shown two options: either to incorporate in it a palm-length vascularized tendon, the radial flexor of the hand and also a fragment of the radial bone, or to transplant the blood-supplied fascia of the forearm (6, 9). Although there is a wider scope for radial graft application in plastic surgery, the transplantation techniques, in stomatology and hand surgery in particular (1, 7), have not yet been fully explored. The technique used for covering the donor defect requires further improvement (3, 8).

The aim of this study is to point to new possibilities of application of composite tissue autotransplants using radial artery, and to develop an optimum surgical technique for management of the donor defect in the forearm.

METHODS

An analysis of the course of treatment was performed in 13 patients following autotransplantation using the radial artery. The group included 11 men and 2 women aged 11 to 64 years. Reconstruction of the fingers and hand was performed in 6 persons, reconstruction of the lower extremity in 4 cases, and 3 patients underwent reconstruction in the cranial and cervical regions. Surgical treatment was indicated because of trauma (3 patients), sequelae resulting from tissue damage (8) including neurotrophic ulcers 1 — 25 years old (4), ulcer processes localized in the calvaria and in the oral cavity (3 cases).

Ten patients had fasciocutaneous flaps transplanted from the distal forearm zones, and there were 2 osteocutaneous and 1 tendinocutaneous grafts. The average size of the skin was 8 × 6 cm. In most cases (12), free radial

grafts were applied and solely 1 patient with hand injury had the flap transferred complete with its nutrient pedicle.

Nine patients had a sensitive nerve flap reconstruction performed (n. cutaneous antebrachii lateralis). The superficial branch of the radial nerve was not incorporated into the graft. The tendons of the m. flexor carpi radialis and m. palmaris of the donor site were covered with fibres of the flexor radialis of the hand and the superficial flexor of the fingers.

In 11 cases, the radial artery defect was replaced with a venous graft, 26 cm long, using the large subcutaneous vein of the tibia or the cephalic vein. The transplanted vein was also placed into the muscular tunnel. A combination plastic surgery was performed covering the forearm defect with local tissue and 0.4 thick split-skin meshed grafts.

In 1 patient only, the donor site was fully covered with flaps transferred according to Linberg.

The follow-up period after surgery ranged from 1 week to 1 year. The graft condition was evaluated with the aid of clinical methods, electrothermometry, liquid-crystal thermography using film thermoindicators, and ultrasound blood flow detection in the reconstructed vessels. The rate of restoration of tactile, algic and thermal sensitivity of neurovascular grafts was determined. The management of the donor defect was assessed according to the functional ability of the hand, its blood supply and innervation as well as the esthetic outcome.

RESULTS AND THEIR ASSESSMENT

Full take was observed in 10 radial artery grafts out of 13 cases. In 2 patients, the follow-up showed necrosis in the cutaneous portion of the flap without interruption of blood supply to the fascia, which in both cases was successfully repaired with split-skin graft. One patient (with cancer of the flat cells $T_3N_2M_0$ of lateral tongue surface metastasing bilaterally into submaxillary lymphatic nodes, chronic bronchitis and pneumosclerosis) underwent Crile's operation, resection of the right half of the tongue and the oral cavity base. The defect was filled with a microsurgical fasciocutaneous forearm graft. The patient died the 8th day after surgery of cerebral oedema caused by increasing pulmonary insufficiency. The graft in the oral cavity, however, preserved its full viability without signs of oedema or suture inflammation.

The application of radial transplants in the hand brought particularly good results. This graft was applied in traumatic avulsion of the thumb (3 patients), and of the middle finger (2 cases), and in 1 case to cover denuded phalanges. In our opinion, the radial graft with its skin structure and thickness of the subcutaneous adipose layer has maximum advantage with the exception of the dorsal flap of the leg. It is particularly important that the plastic cover of the phalanges should be carried out simultaneously with the coning of the graft as it is in Filatov's tubed pedicle flap. Compared to the latter, the former uses axial sources of blood supply while restoring flap innervation by means of a sensitive nerve suture.

The folowing example can serve as an illustration:

Patient G., 28 years old, referred to the department of traumatology, had a closed intercondylar fracture of the right ulnar bone, caused by avulsion of the terminal thumb phalanx of the right hand together with tendons and soft tissues of the basal phalanx (Fig. 1, a). First, ulnar bone osteosynthesis was performed, then followed correction for the soft thumb tissues using a neurovascular radial forearm graft with the aid of microsurgical technique. Complete union of the graft was achieved and the functional abilities of the finger were preserved (Fig. 1, b, c).

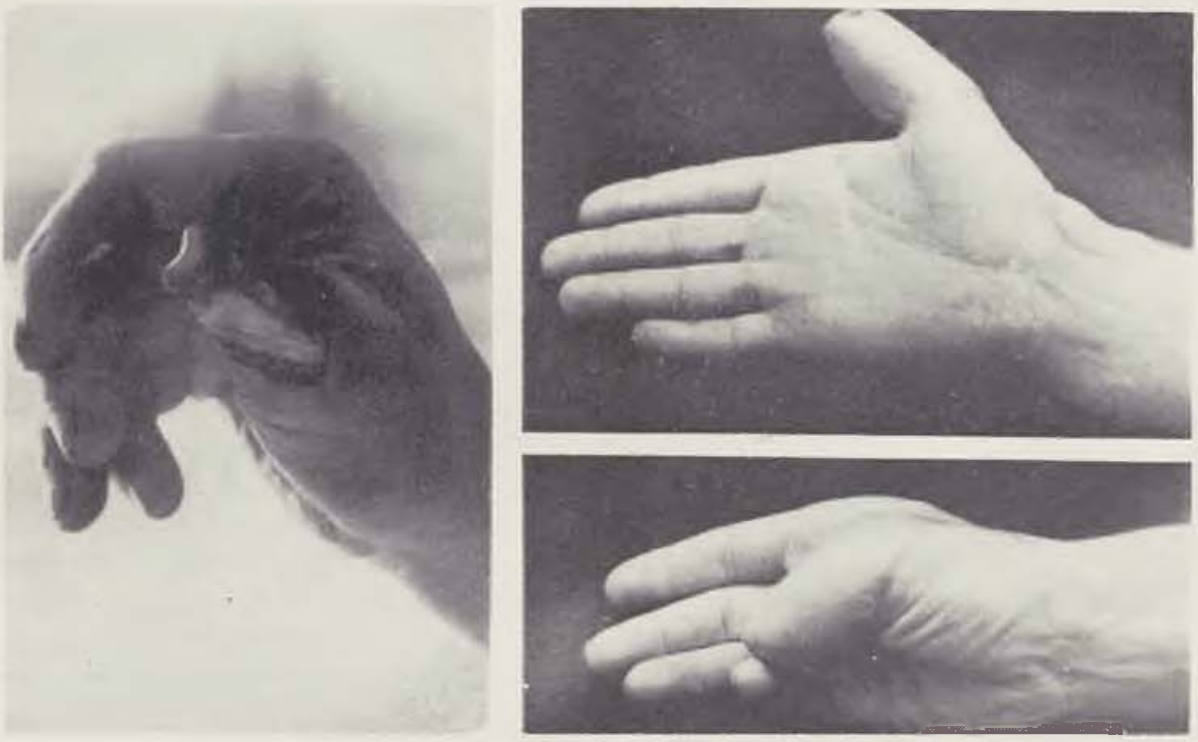

Fig. 1 Patient G. — reconstruction of the thumb of the right hand
a) prior to surgery, b) and c) 4 months after microsurgical radial graft transfer

If we consider the specificities of blood supply and radial graft innervation in correcting defects of the fingers and hand, we give preference to microsurgical forearm flaps. The application of arterial pedicle grafts, whose vascularization is provided by a retrograde blood flow across the arterial arches of the palm, impairs blood supply to the hand. The veins accompanying the radial artery do not always guarantee sufficient venous drainage, which, in one patient of this group, led to the rejection of superficial graft layers while its deeper layers were preserved. To provide supplementary passageways for venous drainage, some specialists have a well-founded reason for proposing the use of the microsurgical technique (1, 9) which prolongs the surgery time only insignificantly.

Experience acquired from the application of free neurovascular fasciocutaneous radial grafts to repair post-traumatic defects of palmar surface of the hand showed their advantage in 2 patients when compared to latissimus dorsi and parascapular flaps without sensitive innervation used by other specialists under similar conditions.

It should be stressed that the application of microsurgical forearm grafts is very effective not only for the reconstruction of fingers and hand but also in operations in lower extremities. Despite the thinness of this particular graft, the reconstruction of its adequate blood supply and innervation enables to repair the limb and prevent stump scarring. The application of forearm flaps is fully justified especially in regions with inadequate vascularization, where the radial grafts play a positive role in supplying the neighbouring tissues. Two cases may serve as examples: in an 11-year old boy and a 33-year old man, both with a post-traumatic burn etiology lasting 4 years in the former case and 25 years in the latter, these grafts helped to cover neurotrophic ulcers in the patellar zone. Numerous plastic operations had been unsuccessful in these patients, but there was a full take of the radial grafts supplied with blood from the popliteal veins and innervated from a portion of n. saphenus.

Surgeons are well aware of the difficulties they encounter when operating in the leg, especially in cases of osteomyelitis of the calcaneus. Prior to the application of radial grafts, our attempts to repair trophic ulcers had usually failed. After application of latissimus dorsi flap in 3 patients, the surgical strategy had to be altered in 2 cases, and 1 patient suffered from total suppurative colliquation of the graft. Partial union was achieved only in 1 case, where a 20-year old trophic ulcer was repaired with a flap taken from the dorsal part of the leg.

Patient Z., 35 years old, was referred to the department of traumatology with "post-traumatic osteomyelitis of the left calcaneus". There was a trophic ulcer in the region of medial ankle on the left. He had sustained the injury 3 years before, and he had been treated for an open fracture of the left calcaneus, which became complicated due to osteomyelitis. He had undergone 12 operations, the osteomyelitic focus was treated and the defect was corrected with free split-skin transplants, Italian flaps. Each time there followed a relapse, the grafts dissolved.

Objectively, in the left heel region, on the medial surface there appeared a 3 × 4 cm ulcer covered with fibrin, the edges of the neighbouring skin inflammed (Fig. 2, a).

The patient was operated on. The trophic ulcer was totally excised leaving a defect of 4 × 6 cm. Resection (2.5 × 2.5 × 2 cm) of a part of the heel bone affected by osteomyelitis was made. The free sequestrum and granulation tissue were removed. The resulting cavity and skin defect were immediately filled with a fasciocutaneous forearm bone graft on the left. Its blood supply was restored with the aid of end-to-end microanastomoses between the radial artery and the posterior tibial artery. Sufficient venous drainage was achieved by suturing the veins accompanying the radial artery

central to the point of their union into one branch by anastomosis of the posterior tibial vein and cubital vein receiving 2 medial antebrachial veins from the flap with the large subcutaneous vein. Using the epineural knot suture, the lateral cutaneous forearm nerve was joined with the hidden nerve. No complications occurred in the post-operative period. A full take of the graft was achieved (Fig. 2, b). Beginning with the 20th post-operative day, the patient started to walk using the leg.

Fig. 2 Patient Z. — post-traumatic defect surgery of the heel zone
a) prior to surgery, b) 1 month after free transplantation of fasciocutaneous bone graft

In our opinion, the reconstruction of 2 veins of the radial graft from the superficial and deep vascular net in this particular case should be considered an important condition of a successful surgery; this practice was observed in 9 of our patients. Another specific feature of this operation consisted in the outward shaping of the graft to protect its nerve pedicle from compression when suturing the defect.

We believe that the application of vascularized tendon grafts using radial artery will play a greater part in the future. The taking of such transplants jointly with the forearm fascia proper enables to preserve and reconstruct the locomotor apparatus of the tendons, which prevents the transferred tissue from scarring, and determine the patient's rehabilitation. A blood-supplied

fascio-tendinous complex taken from the m. palmaris longus tendon using radial artery was transplanted in the region of the flexor dig. V profundus of the right hand in a 25-year old man after failing to reconstruct it with non-vascular tendon autograft. Good functional results were achieved.

The follow-up of 9 neurovascular radial grafts showed that the tactile sensitivity of the flap started to regenerate in the 3rd month following surgery. Algic and thermal sensitivity was first observed along the vascular

Fig. 3 Appearance of the donor site of the forearm after split-skin autoplasty a) 11-year old boy — after 5 months, b) 33-year old man — after 4 months, c) 54-year old man — after 4½ months

nerve plexus by the 6th month on most of the graft surface. In principle, reinnervation was completed within 10th—12th months of transplantation. This is to be taken into consideration from the aspect of a possible injury to the flap as well as from the aspect of neurotrophic disorder prevention.

Special effort was made to repair the donor site in the forearm. Split-skin grafts placed on the denuded flexor tendons are prone to scarring. The wounds heal longer giving rise to contractures or secondary defects [8]. Therefore, according to Fenton and Roberts [4], our surgical technique concentrated on covering these tendons with parts of the m. flexor carpi radialis and m. flexor digitorum superficialis. Besides, the combination plastic surgery achieves full tendon coverage of the brachioradial muscle using local forearm tissues. The extremity should not be immobilized in the flexion position [4] but in a suitable extension position [8]. This prevents flexor tendon dislocation and facilitates better split-skin graft contact with tissues well

supplied with blood. In the operations performed, all grafts healed in well; only in 2 cases necrosis was found at the edges, but no supplementary plastic surgery was needed (Fig. 3).

In our opinion, reconstruction of the radial artery defect using autovenous plastic technique is essential. This procedure is based on our past experience drawn from surgery of forearm vessels (more than 200 reconstructive operations) and also on other specialists' experience showing a 50% reduction in the functional ability of the hand when ligated (2). Jones and O'Brien (5) observed acute ischaemia of the hand developed already at the time of the elevation of the radial artery flap. Therefore, we prepare the venous graft simultaneously with the forearm flap. When suturing the vein into the radial artery defect, we have had a good experience in using simultaneously 2 devices for vessel suture — ASC-4 (USSR), which significantly reduces surgery time. Based on the obtained data, the venous graft coverage in the muscle tunnel from the superficial finger flexor leads to reliable prevention of scarring and/or purulent processes. According to the data of ultrasound flowmetry, all transferred veins were patent, no disorders in the blood supply or in the hand function on the donor site were observed.

SUMMARY

The authors analyze the results of microsurgical autotransplantation of 13 composite forearm tissue flaps using radial artery. They show that these can be successfully used in the surgery of the hand in a single-time reconstructions of the fingers, in the removal of neurotrophic ulcers in regions deficient in blood supply, especially in the leg, and also in plastic operations in the cranial and cervical regions, and in stomatological practice. The application of vascularized tendon grafts is advantageous for restoring the locomotor apparatus of the hand. Reconstruction of 2 veins of the flap improved the results. The paper shows the advantage of covering the donor site in the forearm with the aid of combination plastic surgery which covers the flexor tendons with muscular fascicles as well as local tissue and split-skin grafts. Simultaneously, it is necessary to reconstruct the radial artery with the aid of venous autografts.

Key words: plastic surgery, tissue transplantation, microsurgical technique.

RÉSUMÉ

Possibilités d'utilisation d'autogreffes microchirurgicales du tissu composé de l'avant-bras, basées sur l'artère radiale

Psenisnov, K. P., Minacenko, V. K., Sidorov, V. B.

Les résultats des autogreffes microchirurgicales de 13 lambeaux tissulaires composés de l'avant-bras, à la base de l'artère radiale, sont analysés. On prouve que ces interventions puissent être employées dans la chirurgie de la main pour la reconstruction des doigs à un temps, l'excérèse d'ulcères neurotrophiques dans les sites de vascularisation insuffisante, surtout sur le membre inférieur, et également pour les opé-

rations plastiques à la tête et au cou, dans la pratique stomatologique. Les perspectives d'application des greffes tendineuses vascularisées pour le renouvellement de l'appareil de la main sont spécifiées. L'amélioration des résultats de la greffe est assurée par la reconstruction de deux veines du lambeau. La rationalité du recouvrement du site donneur sur l'avant-bras par une plastie combinée, consistant en recouvrement des tendons fléchisseurs par les faisceaux musculaires, glissement local et en application de greffons cutanés perforés, est mise en évidence. Parallèlement, il est nécessaire de reconstruire l'artère radiale, à l'aide de greffons autoveineux.

ZUSAMMENFASSUNG

Die Möglichkeiten einer Ausnutzung zusammengesetzter mikrochirurgischer Gewebeautotransplantate aus dem Vorderarm auf die Grundlage der arteria radialis

Psenisnov, K. P., Minacenko, V. K., Sidorov, V. B.

Es werden die Ergebnisse einer mikrochirurgischen Autotransplantation von dreizehn zusammengesetzten Gewebelappen aus dem Vorderarm auf die Grundlage der arteria radialis analysiert. Es wird gezeigt, dass man sie bei der Chirurgie des Arms zu einer einmaligen Rekonstruierung der Finger erfolgrech verwenden kann, ebenso wie zu einer Beseitigung neurotroper Geschwüre in Zonen mit unzureichender Blutversorgung, besonders in den Beinen, sowie auch bei plastischen Operationen des Kopfes und Halses in der stomatologischen Praxis. Es wird festgestellt, wie perspektiv die Anwendung vaskularisierter Sehnenpfropfen bei einer Erneuerung des Apparates der Hand ist. Zur Verbesserung der Ergebnisse einer Transplantation verhilft die Rekonstruierung zweier Venen des Lappens. Die Zweckmässigkeit einer Überdeckung der liefernden Wunde am Vorderarm durch eine kombinierte Plastik unter Überdekkung der Beugesehnen mit Muskelbündeln durch lokale Verschiebung mit perforierten Hautpfropfen wird bewiesen. Dabei muss die arteria radialis unbedingt mit Hilfe von autovenösen Pfropfen rekonstruiert werden.

RESUMEN

La applicación de los autotransplantates tisulares compuestos del entebrazo usando la arteria radial

Psenisnov, K. P., Minacenko, V. K., Sidorov, V. B.

Los autores analizan los resultados de la autotransplantación microquirúrgica de 13 colgajos tisulares compuestos del antebrazo con ayuda de la arteria radial. Muestran que éstos pueden ser usados con éxito en la cirujía de la mano para la reconstrucción de un tiempo de los dedos, en el removimiento de las úlceras neurotróficas localizadas en las zonas insuficientemente abastecidas de sangre, especialmente en la región de la pierna, en caso de las plásticas en las zonas craniales y cervicales y también en la práctica estomatológica. La aplicación de los transplantes vascularizados del tendón es ventajosa porque éstos restauran el aparato locomotor de la mano. La reconstrucción de dos venas del colgajo ayudan a conseguir un mejor resultado. El papel muestra la ventaja de usar la cubierta de la zona donadora del antebrazo mediante la plastía combinada que cubre los tendones de los flexores con fasciculos musculares, por medio de la transferencia local y los transplantes cutáneos perforados. Al mismo tiempo es necesario reconstruir la arteria radial con ayuda de los injertos autovenosos.

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RESTORATION OF THE FUNCTION OF THE CUBITAL JOINT IN EXTENSIVE DEFECTS OF BONES AND SOFT TISSUES USING ENDOPROSTHESIS AND FREE SKIN GRAFTS

I. G. GRISHIN, I. V. GONCHARENKO, N. P. KOZHIN, A. G. SARKISYAN, A. G. GOBULEV, A. E. DEVIS

INTRODUCTION

Defects of the bones of the cubital joint most frequently result from a serious injury and are usually accompanied by considerable damage to the neighbouring soft tissues leading to scarring. They may also be the consequence of suppurative arthritis or osteomyelitis whose liquidation often requires surgical intervention in some patients. Subsequently, the so-called "dangling elbow joint" developes which, in addition to marked cosmetic changes, conditions gross disturbances of the functions of the upper limb.

Reconstructive treatment of such deformities presents a difficult problem. The difficulty increases when coarse skin scars or defects of subcutaneous soft-tissue formations surrounding the elbow joint are present. In these cases, there are three basic methods of improving the function of the affected limb: using an orthopedic aid, arthrodesis of the "elbow joint" in a functionally advantageous position and, finally endoprosthesis. The shortcomings of the first two methods are notorious while the use of endoprosthesis can only be successful when the endoprosthesis itself is covered by a reliable skin cover without tension. Even a small deviation from this rule leads to skin necrosis, to suppuration at varying stages of the postoperative period and, in the end, the endoprosthesis must be removed.

For the restoration of skin covers before applying the endoprosthesis of the elbow joint, the multistage pedicle grafting is usually restored to, which also has its shortcomings.

METHODS

In the last few years a new method, developed by us, has been therefore used in our institute in patients with post-traumatic "dangling elbow joints" and poor condition of the skin cover, namely the application of endoprosthe-

sis of the joint with simultaneous free skin grafting using the microsurgical technique. This method shortens the time of rehabilitation of the patients 3—4 times in comparison with the multistage method of restoration of the elbow-joint function.

We used a metal collapsible hinge endoprosthesis of the K. M. Sivash type. After their pivots had been inserted into the humerus and one of the bones of the forearm, respectively, the humeral and the forearm components of the endoprosthesis (Fig. 1) were joined to each other by means of a stop screw. Cement is not required to fasten the elements of the endoprosthesis.

A free, vascularized skin graft is used to cover the defect of the skin and the underlying tissues after excision of the scars and the installation of the endoprosthesis. Thoracodorsal skin-muscle graft is preferred in this case because its blood supply is ensured by a fairly stable vascular bundle of adequate length and size. According to its features, such a graft resembles the skin covers of the cubital joint; it can be cut out in a considerable size and the donor wound can be sutured without much trouble. On the example of one of the four patients operated on according to this method, we describe in brief the result of installation of the endoprosthesis with simultaneous free skin grafting.

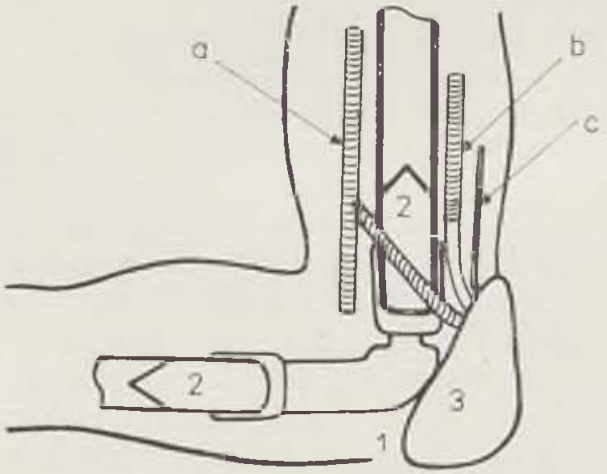

Fig. 1 Outline of operation
1 — region of defect, 2 — endoprosthesis according to K. M. Sivash, 3 — thoracodorsal graft; a — a. brachialis, b — v. cephalica, c — n. cutaneus antebrachii lateralis

CASUISTRY

Patient M., man, 31, blacksmith, was admitted to our institute for an extensive posttraumatic defect of bones and soft tissues of the left cubital joint, instability of the left forearm and expressed disturbance of the function of the whole left upper limb. A massive, retracted postoperative scar 8 × 6 cm in size was situated on the posterior surface of the joint. The muscles of the forearm and the hand were slightly atrophic. No neurological or vascular disturbances were found on the forearm or the hand.

A year earlier, the patient crossing a railway track fell under the wheels of a rolling truck and suffered amputation of the right leg at the level of the upper third of the shin and an extensive lacerated wound in the region of the left cubital joint. The stump of the shin was shaped and the free bone fragments and non-viable tissues were removed on the primary surgical treatment of the wound of the elbow joint. The wound healed by second intention and only closed after free dermoplasty. When the right lower extremity was provided with a prosthesis, the patient was able to move without additional support.

On April 23, 1985, installation of endoprosthesis of the left cubital joint was performed simultaneously with plastic operation of the wound defect using a 7 X 14 cm skin-muscle transplant from the lateral surface of the thoraco-dorsal region on a vascular innervated pedicle. The postoperative

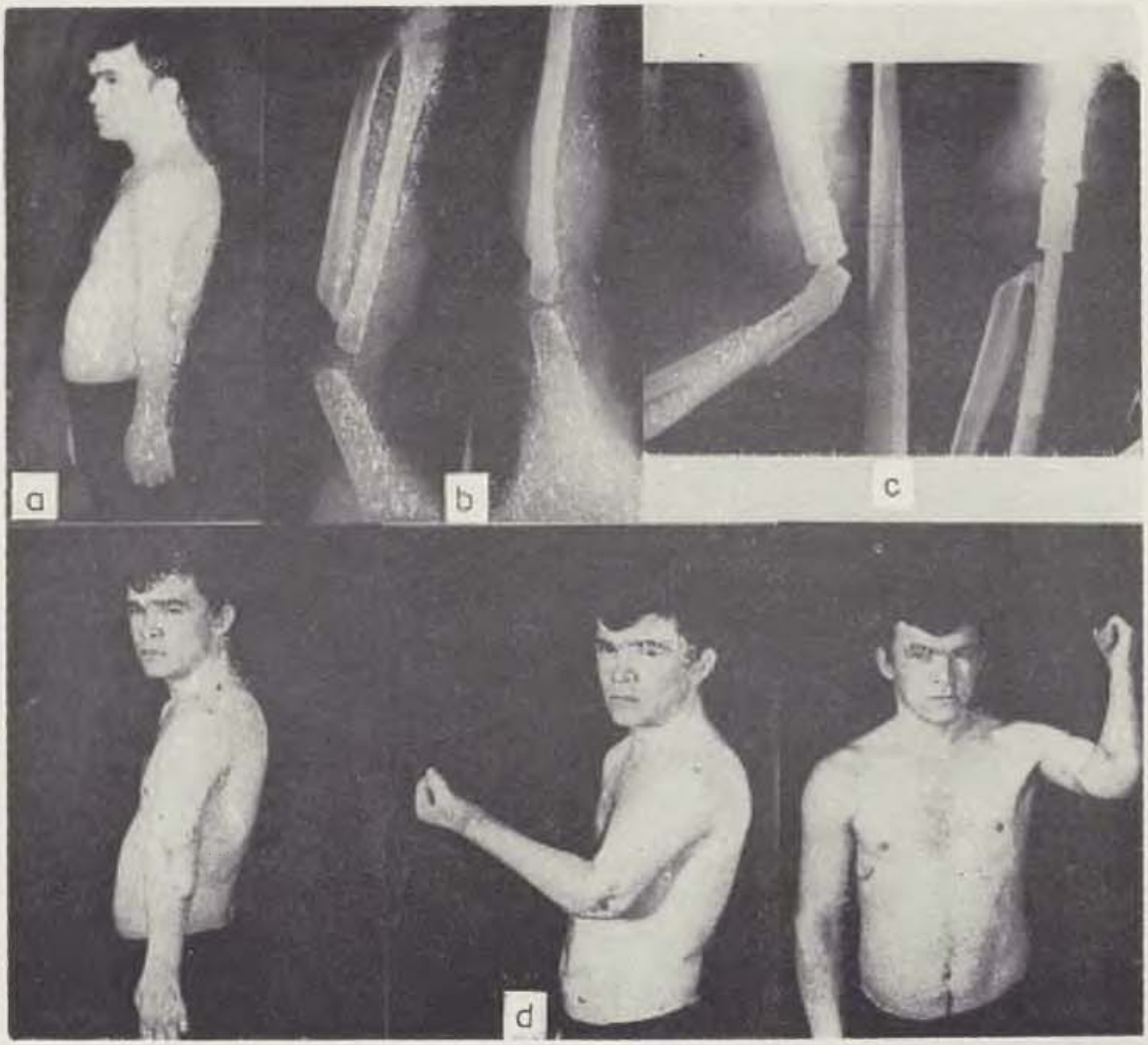

Fig. 2 Patient M., man, aged 31, at various stages of treatment
a — before treatment, b — X-rays of the cubital joint before implantation of endoprosthesis, c — after operation, d — functional possibilities of the cubital joint 2 month after operation

period was without complications. Fig. 2 shows the essential stages of treatment of the patient.

RESULTS

The treatment resulted in a good cosmetic effect and, what is more, a very favourable functional effect: active flexion to 15°, extension — active to 130°, passive to 170°, pronation-supination 70° — 0° — 70°.

CONCLUSIONS

The elaborated method of restoration of the function of the cubital joint thus permits us to widen the indications to using its endoprosthesis in extensive defects of bones and soft tissues of the periarticular region by means of a vascularized skin-muscle transplant. The duration of treatment is 2 — 2½ months in the mean, the time of hospital treatment becomes considerably shorter. In addition, a more complete and stable restoration of the function of the elbow joint is achieved.

SUMMARY

A new method of restoration of the function of the upper limb in extensive posttraumatic defects of bones and soft tissues of the cubital joint has been elaborated. The method is based on the excision of scar tissues with simultaneous implantation of the endoprosthesis of the K. M. Sivash type. The produced defect is covered by a free vascularized thoracodorsal skin-muscle transplant using the microstructural technique. Four operations have been performed so far. Clinical observations are reported. The method is efficient as it ensures reliable covering of the hinge part of the endoprosthesis by full-thickness skin, shortening the time of rehabilitation treatment 3—4 times and achieving more complete restoration of the function of the upper limb.

Key words: endoprosthesis; microsurgical technique; vascular bundle; vascularization of tissue; skin-muscle graft; cubital joint; one-stage method.

RÉSUMÉ

Renouvellement de la fonction de l'articulation du coude chez les lésions étendues de l'os et des tissus mous, avec l'utilisation de l'endoprothèse et du greffon cutané libre

Grishin, I. G., Goncharenko, I. V., Kozhin, N. P., Sarkisyan, A. G., Golubev, V. G., Davis, A. E.

On a élaboré une nouvelle méthode de renouvellement de la fonction du membre supérieur, chez de vastes défauts post-traumatiques des os et des tissus mous de l'articulation du coude. La méthode consiste dans l'excision des tissus transformés par les processus d'ulcération, avec l'implantation de l'endoprothèse de système K. M. Sivache, effectuée simultanément. Le défaut apparu est recouvert d'un greffon musculocutané thoracodorsal vascularisé, avec l'utilisation de la technique microchirurgi-

cale. Quatre interventions ont été effectuées. Les observations cliniques sont alléguées La méthode est efficace — elle assure un recouvrement fiable de la partie de poulie de l'endoprothèse par un greffon cutané d'épaisseur complète, la diminution de la durée de reéducation et le renouvellement fonctionnel du membre supérieur le plus parfait possible.

ZUSAMMENFASSUNG

Die Erneuerung der Funktion des Elbogengelenks bei ausgedehnten Knochendefekten und Defekten der weichen Gewebe unter Anwendung von Endoprothesen und freien Hautpfropfen

Grishin, I. G., Goncharenko, I. V., Kozhin, N. P., Sarkisyan, A. G., Golubev, V. G., Davis, A. E.

Es wurde eine neue Methode der Erneurung der Funktion des oberen Gliedmasses bei ausgedehnten Defekten der Knochen und weichen Gewebe des Elbogengelenks ausgearbeitet. Diese Methode besteht in einer Exzision der vernarbten und veränderten Gewebe unter gleichzeitiger Implantation einer Endoprothese des Systems von K. M. Sivash. Der sich dabei bildende Defekt wird mit einem freien vaskularisierten thorakodorsalen Transplantat aus Haut und Muskeln unter Anwendung der mikrochirurgischen Technik überdeckt. Es wurden insgesamt 4 Operationen durchgeführt, die klinisch miteinander verglichen werden. Die Methode ist effektvoll und sichert eine zuverlässige Überdeckung des rollenförmigen Teils der Endoprothese durch einen Hautpfropfen in voller Stärke, eine Verkürzung der Dauer der Rehabilitation sowie eine vollkommenere Erneuerung der Funktion des oberen Gliedmasses.

RESUMEN

La regeneración de la función de la articulación del codo en grandes defectos de los huesos y de los tejidos blandos con la ayuda de la endoprótesis y el injerto de piel libre

Grishin, I. G., Goncharenko, I. V., Kozhin, N. P., Sarkisyan, A. G., Golubev, V. G., Davis, A. E.

Los autores elaboraron un nuevo método de la regeneración de la función del mimebro superior en los defectos extensos de lo huesos y de los tejidos blandos de la articulación del codo, los que fueron causados por un accidente. El método consiste en la excisión de los tejidos cicatrizados simultáneamente con la implantación de la endoprótesis del sistema de K. M. Sivas. Ese defecto está cubierto por el injerto vascularizado, toracodorsal, tendino-cutáneo libre con la ayuda de la técnica microquirúrgica. Se ejecutaron cuatro operaciones. El papel presenta las observaciones clínicas. La técnica es eficaz asegurando la cubierza segura de la parte de polea de la endoprótesis mediante el injerto cutáneo en pleno espesor, la reducción del período de la rehabiliación y una mejor regeneración de la función del miembro superior.

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RUPTURE OF MAMMARY SILICONE PROSTHESIS AFTER RAPE ATTEMPT

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INTRODUCTION

Augmentation mammaplasty has become a common surgical procedure during the last decades. Unacceptable firmness of the breast caused by fibrous capsular contraction surrounding the prosthesis, however, is one of the major problems associated with this procedure.

Closed compression capsulotomy, I. E. external manipulation of the prosthesis, with the intent of rupturing the surrounding fibrous capsule, is an acceptable solution to this complication. Perforation of the prosthesis itself during this maneuvre has been reported at approx. 0.93 % (1). In this report, we describe the rupture of a mammary prosthesis following a rape attempt. This unusual etiology to prosthesis rupture, has to our knowledge not yet been described.

CASE REPORT

A 46 year old woman underwent bilateral augmentation mammaplasty after excision of fibroadenoma in 1976. 150-cc silicone gel prostheses were placed in the retromammary space. The result was satisfactory, although the patient during the following 10 years underwent closed capsulotomy several times to prevent fibrous capsular contraction.

In 1986 she was raped; a subsequent hospital examination revealed distorsion of the right breast. She was then offered immediate operative removal of the right mammary prosthesis and declined. During the following year, the patient noticed progressive pain in the right chest along with swollen and sore axillary lymph nodes. On examination, the previous suspicion of mammary prothesis rupture was now confirmed and amotio prostheosis mammae dex. was performed. The operation revealed great amounts of fibrosis and prosthesis rupture with silicone — gel migration into m. pec-

toralis major dxt. and subcutaneously to the right clavicle. The postoperative course was complicated with a small haemetoma, which was evacuated. At discharge from the hospital a future secondary right mammaplasty was scheduled.

DISCUSSION

The incidence of mammary silicone prosthesis rupture following closed capsulotomy is estimated to be less than I per cent (1, 2). It has been postulated by Argenta (2) that if rupture of mammary silicone prosthesis occurs secondary to closed capsulotomy or excessive mammary massage, the cohesiveness of the gel and fibrous capsule will contain the extruded gel. In the described case the gel had migrated widely throughout the breast into the subcutaneous tissue and the pectoralis muscle. We believe that the patient during the rape experienced an extreme squeezing of the right breast, resulting in the above mentioned findings. It is possible that this squeezing can be compared to a vigorous form of closed capsulotomy. Involvement of the axillary lymph nodes support the theory of removal of migrated silicone gel by the lymphoreticular system (3). We recommend that women with mammary silicone prostheses who have been exposed to violent trauma must always be examined with the possibility in mind of prosthesis rupture.

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FUNCTIONAL RECONSTRUCTION OF THE PALMAR SURFACE OF THE THUMB USING THE NEUROVASCULAR FLAP FROM THE INDEX

M. MOLSKI, W. PISAREK

Several routine methods of covering defects of the palmar surface of the thumb have been used (i. e. skin grafts, local or distant skin flaps). We present our experiences in the use of the neurovascular flap from the dorsal surface of the index finger for this purpose.

ANATOMICAL CONSIDERATIONS

The flap is raised from the dorsal surface of the proximal phalanx of the index. Its dimensions can be up to 4,5 × 3,5 cm. The pedicle consists of the first dorsal metacarpal artery (I DMCA), running to the radial surface of the index finger (2, 3, 8), the superficial metacarpal vein (9) and the cutaneous branch of the radial nerve (Fig. 1A). All of these structures run in the loose connective tissue above the fascia of the first dorsal interosseous muscle (I DIOM). They are easily visible in the proximal part of the pedicle during the surgery. In c. 10% I DMCA runs deeper, between the heads of the I DIOM ("muscular type") (4) and may be divided during the flap elevation. However this should not damage the flap, as it may survive as a venous one (1).

SURGICAL TECHNIQUE

The pedicle is best visualized along the vein, which should be precisely marked before the tourniquet ischemia is done. The flap elevation begins at its distal margin and proceeds along the layer of the loose connective tissue above the dorsal aponeurosis. It can be raised with its neurovascular pedicle as a true "island" flap (5, 6), or with a strip of the skin as a "flag" flap (7) (Fig. 1B). Fascia of the I DIOM should be included in the pedicle. The flap should be transferred to the defect without tension and sutured before tourniquet release (Fig. 1C). If the true island flap is raised, the thumb

skin sutured above the transferred vascular pedicle should be previously widely undermined, to prevent any pressure on the vessels. Dorsal aponeurosis of the index in the donor site is skin grafted (Fig. 1D).

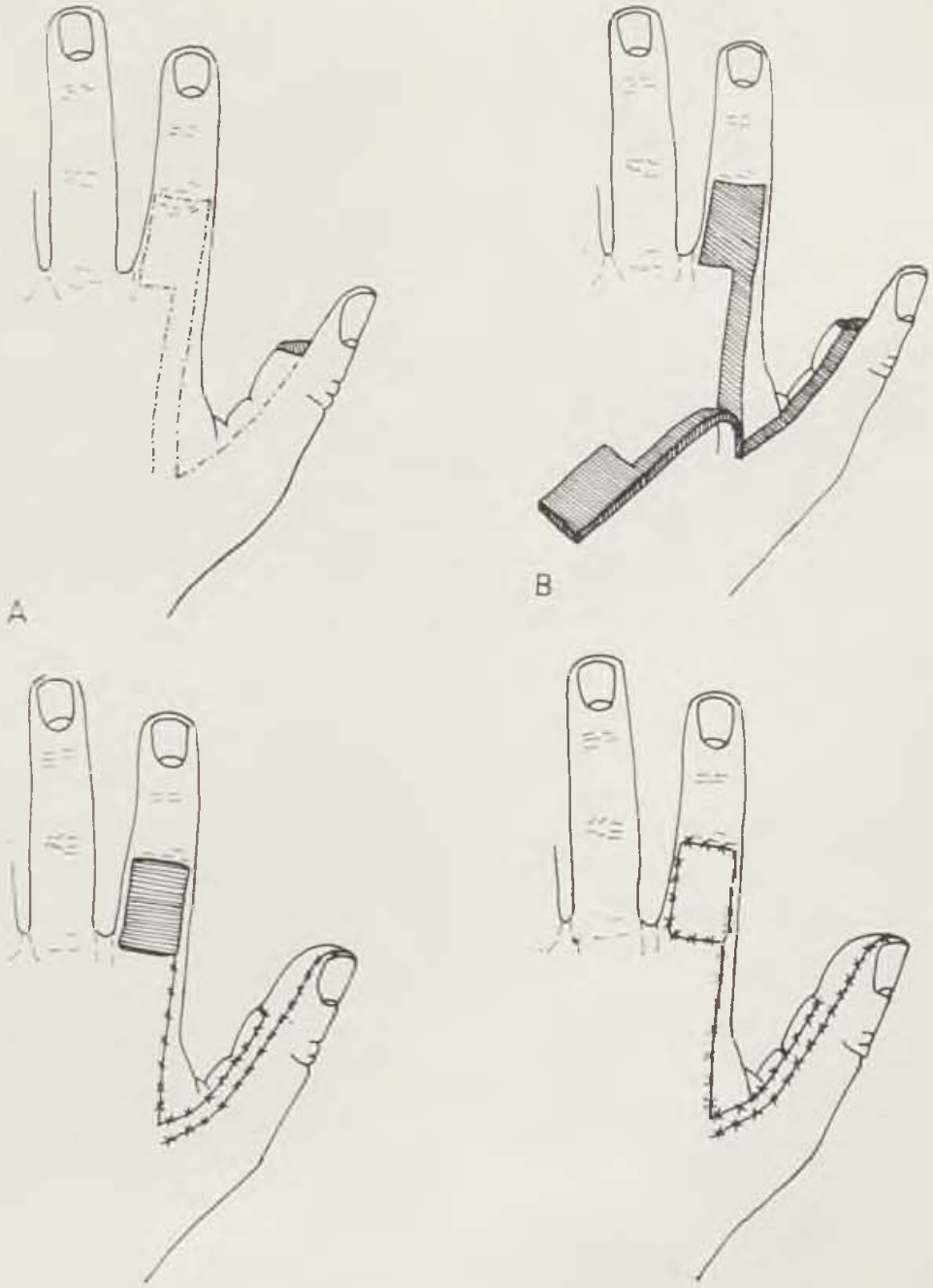

Fig. 1. Operative technique
A. Flap design, B. Elevation of the flap, C. Transposition of the flap, D. Skin grafting to the donor site

RESULTS

8 patients were operated on. Five of them had emergency surgery after an injury and the other three underwent planned secondary reconstructions.

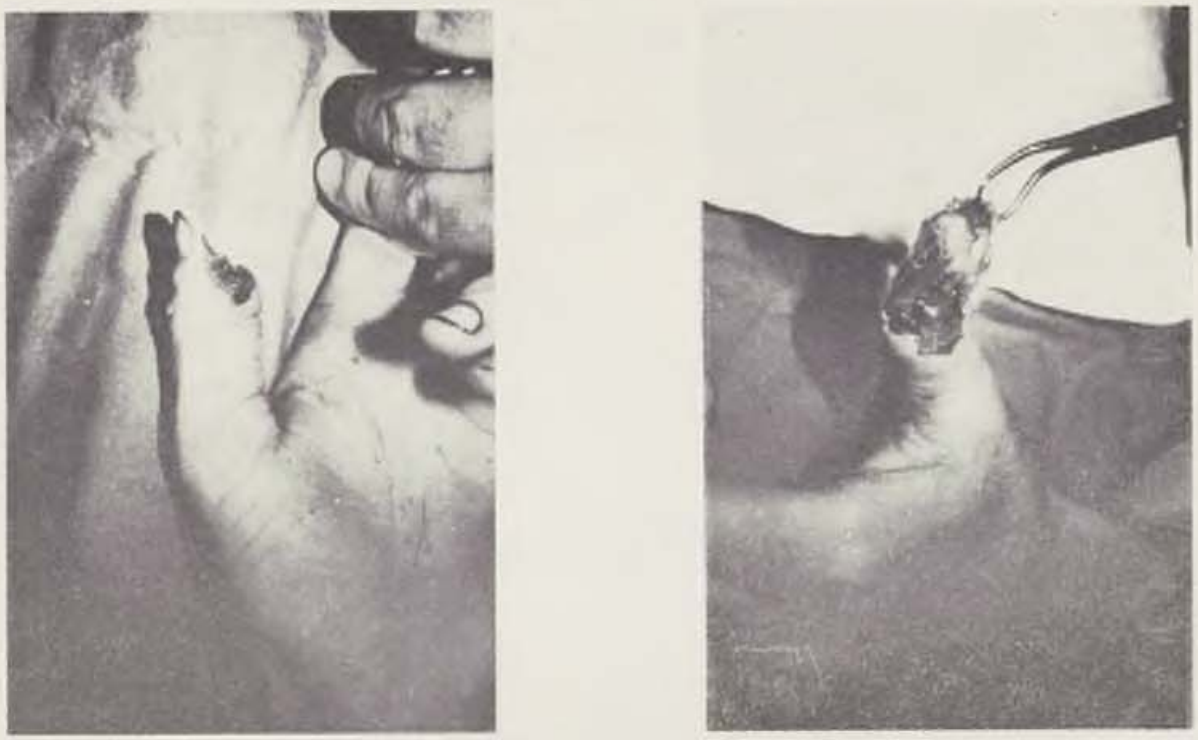

Fig. 2. Patient 1
A. Preoperative appearance — lateral view, B. Preoperative appearance — palmar view

C. Six months postoperatively — lateral view, D. Six months postoperatively — palmar view

Fig. 3. Patient 2. Result 6 months after reconstruction

Fig. 4. Patient 3. Result 3 months after reconstruction

Fig. 5. Patient 4. Result 6 months after covering of the distal phalanx using an island flap

The functional results were very good in six cases. Sensation of pain, touch and temperature were present. 2PD test was 6—8 mm in four instances. All of the patients returned to their work. One of the initial flaps underwent partial and an other total necrosis. In all, the final aesthetic appearance was satisfactory (Fig. 2—5).

DISCUSSION

Our experience indicates that the neurovascular flap from the index can be successfully used in functional reconstruction of the palmar surface of the thumb. It can cover a relatively large area including cases with bare phalangeal bone or opened IP joint. Sensation of the reconstructed surface is restored, allowing normal function of the hand. The donor site defect is practically non-existent. In our experience two flap failures were caused by venous congestion due to technical errors.

SUMMARY

We have achieved favorable results in reconstruction of the palmar surface of the thumb using the neurovascular flap from the index. The technique was applied in several patients with defects of the palmar surface and the tip of the thumb. Satisfactory functional and aesthetic results were obtained. It seems to be a very useful method to restore the sensory area of the thumb.

RÉSUMÉ

Reconstruction fonctionnelle de la surface palmaire du pouce à l'aide du lambeau neurovasculaire, prélevé sur l'index

Molski, M., Pisarek, W.

Les résultats satisfaisants ont été obtenus par la reconstruction de la surface palmaire du pouce à l'aide du lambeau neurovasculaire, prélevé sur l'index. Cette technique a été effectuée chez quelques malades avec des lésions de la surface palmaire du pouce et du bout de pouce. Les résultats acquis étaient satisfaisants du point de vue foncionnel et esthétique. La méthode porrait être très advantageuse pour le renouvellement de la région sensorielle du pouce.

ZUSAMMENFASSUNG

Die Erneuerung der Funktion der Oberfläche des Daumens unter Anwendung eines neurovaskulären Lappens aus dem Zeigefinger

Molski, M., Pisarek, W.

Es wurden günstige Ergebnisse einer Erneuerung der Oberfläche des Daumens unter Anwendung eines neurovaskulären Lappens aus dem Zeigefinger gewonnen. Diese Technik wurde bei mehreren Patienten mit Defekten der Oberfläche und der Spitzen der Daumen angewandt, wobei zufriedenstellende Funktions- und ästhetische

Ergebnisse gewonnen wurden. Die Methode scheint bei einer Erneuerung der sensorischen Gebiets des Daumens sehr vorteilhaft zu sein.

RESUMEN

La reconstrucción funcional de la superficie palmar del pulgar con ayuda del colgajo neurovascular del índice

Molski, M., Pisarek, W.

Los autores presentan buenos resultados obtenidos con la reconstrucción de la superficie palmar del pulgar usando el colgajo neurovascular del índice. Esta técnica fue aplicada en algunos pacientes con defectos de la superficie palmar y los de la punta del pulgar. Se obtuvieron buenos resultados funcionales y estéticos. El método parece ser muy ventajosa para la reconstrucción de la zona sensoria del pulgar.

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CLASSIFICATION OF INHALATION INJURIES

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INTRODUCTION

The survival of patients with thermal injury has increased during the last 50 years, however, the inhalation injuries mortality still remains very high. In reviewing the articles about inhalation injuries we have found very different figures concerning the incidence, severity, and treatment results of these injuries (Chu, C. S., 1981, Moylan, J. A., 1981). It seems that practically each burn facility has its own criteria of classification and this might lead to these differences. In order to enable comparison of experience and results in inhalation injuries assessment and treatment (Ambiavagar, M. et al., 1974, Guilbaud, J. et al., 1984, Horovitz, J. H., 1981, Marichy, J. et al., 1982, Murazian, P. I., 1974), we need a more precise classification than the usual types — "mild", "medium" and "severe", or sometimes simply only "present" or "absent".

MATERIAL AND METHODS

Our observations were based on experience with a group of 177 patients with inhalation injuries treated during a 15-year period at the Centre of Burns and Reconstructive Surgery in Košice-Šaca (previous place of work of the first author). In assessing the severity of inhalation injuries, the following three factors play an important role:

— anatomical localization of the inhalation injury
— the degree of pathological changes of the respiratory tract mucosa
— presence and severity of associated cutaneous burns

In determining the anatomical localization of the inhalation injury, we accepted Moylan's classification (Fig. 1). Damage to the upper airways may be diagnosed by simple inspection, rhinoscopy, pharyngo- and laryngoscopy. Damage to the major airways can be diagnosed by flexible bronchoscopy which can be performed in acute cases as a bedside procedure.

Injury to the lower airways is more difficult to diagnose. In these cases mostly indirect diagnostic methods such as ^{133}xenon lung scanning, pulmonary function studies, and, recently, computerized tomography of the lungs can be used (Agee, R. N. et al., 1976, Clark, W. R. et al., 1982).

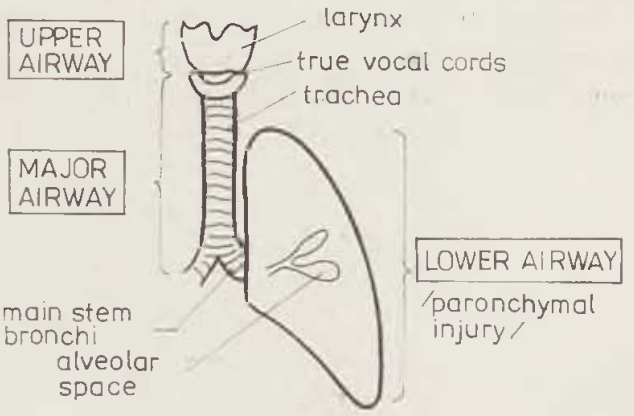

Fig. 1. Anatomical classification of inhalation injuries (Moylan).

The degree of pathological changes in the respiratory tract mucosa can be assessed both clinically and histologically. The principal diagnostic tool for this purpose is the flexible bronchoscope. During bronchoscopy, direct observations of mucosal changes in the upper and major airways are performed (Marichy, J. et al., 1982) along with biopsy specimen taking, if needed. Dynamics of pathological changes and progress of the healing processes are followed by repeated bronchoscopic examinations at the interval of several days. The flexible bronchoscope can be used for therapeutic purposes (bronchial toilette, lavage, suction, etc.) as well.

The presence and severity of associated cutaneous burns are determined by generally accepted criteria of the classification of burns. In this way, the cutaneous burn injury is classified as major, moderate, minor, and/or critical, taking into account the cause, extent and depth of the injury, age of the patient, injured body areas, associated diseases, and associated injuries.

RESULTS

The inhalation injury can involve different levels of the respiratory tract (Fig. 1). Injuries to the upper airways can cause problems in the first hours following injury, but the prognosis is usually good. Action on the problem of injuries to the major airways, which are often associated with those to the upper airways, is mostly delayed and the prognosis is closely related to the degree of damage to the mucosa, as will be explained further. The most severe type of injury is the involvement of the lower airways. In thermal injuries this occurs usually in inhalation of hot steam where all

levels of the respiratory tract are involved. An isolated injury of the lower airways rarely occurs in chemical types of injury (toxic, irritant, fumes).

The degree of pathological changes in the respiratory tract mucosa (Table 1) may vary, beginning with minimal changes such as erythema and slight oedema, then more severe changes, such as severe oedema and blister formation, up to total necrosis of the mucosal and submucosal layers along with the destruction of the respiratory tract walls. These changes are later superimposed with inflammatory changes of various degrees due to reparatory processes and/or infection.

Table 1. Pulmonary Pathology

Changes	Early	Late
Minimal	erythema mild oedema	inflamatory changes
	erosions of the mucosa blisters	sloughing of the mucosa
	severe oedema ischemia	total destruction of tracheal and/or bronchial walls
Severe	necrosis	

Table 2. Classification of Burns

Minor Burns	— 2° of less than 15 % of the BSA — 3° of less than 2 %, no burns to the face, hands, feet and genital area
Moderate Burns	— 2° of 12—25 % — 3° of less than 10 %, except face, hands etc.
Severe And Critical Burns	— 2° of over 25 % — 3° of face, hands. feet, genitalia or over 10 % — burns complicated by severe systemic illness or associated with other types of injuries — electrical burns — patient is younger than 2 years and older than 60

The presence and severity of associated cutaneous burns are in the course, treatment and prognosis of inhalation injuries very important (Table 2). Now it is well-known that the more severe the burn injury is, the worse is the prognosis of these patients.

Considering the factors mentioned above, we propose a new system of inhalation injury classification which we call "APB classification".

Symbol "A" means the anatomical level of the inhalation injury and it is followed by digits from 1 to 3 (Table 3). "A 1" is the code for upper

airway injury, "A 2" for major airway involvement, and "A 3" for lower airway damage.

Symbol "P" means the degree of pathological changes in the respiratory tract walls and is followed by digits from 1 to 4 (Table 4). "P 1" is the code for erythema and/or mild oedema, "P 2" for blisters, erosions and/or severe oedema, "P 3" for ischaemia and resulting necrosis. "P 4" is reserved for non-identified pathological changes, for example, when bronchoscopy could not be performed, or for isolated lower airway injuries where the changes are beyond the reach of the bronchoscope.

Table 3. A = Anatomical Level
(dg tools: history, bronchoscopy, xenon^{123} lung scan, C T)

A 1	Upper Airways
A 2	Major Airways
A 3	Lower Airways

Table 4. P = Pathological Findings
(dg tools: fibrobronchoscopy)

P 1	erythema, mild oedema, damage to the cilia
P 2	blisters, mucosal erosions, severe oedema
P 3	severe ischemia, necrosis
P 4	non - identified (in parenchymal injury)

Table 5. B = Cutaneous Burn Severity

B 0	no cutaneous burns
B 1	m i n o r cutaneous burns
B 2	m o d e r a t e cutaneous burns
B 3	severe/critical cutaneous burns

Symbol "B" denotes the severity of the cutaneous burn injury according to the generally accepted criteria. "B 0" is the code for non-associated cutaneous burns, "B 1" for minor burns, "B 2" for moderate burns and "B 3" for extensive and/or critical burns (Table 5).

The final classification code is thus composed of 3 symbols and 3 figures, for example, "A2 P2 B3", which means major airway injury with blisters on the mucosa associated with extensive and/or critical cutaneous burns.

DISCUSSION

Early and accurate diagnosis of inhalation injuries is of utmost importance. Criteria of involvement at various levels of the respiratory tract with some objective and/or quantitative references for the degree of the injury need to be established. These criteria need to be correlated with the extent and severity of associated burns or other injuries since this can determine the overall severity of this complex injury. A diagnosis of inhalation injury has been difficult to make with the sole use of clinical criteria (Stone, H. H. et al., 1969). With the development of objective diagnostic techniques, the true incidence of this complication has become more obvious (Moylan, J. A., 1981). Several classifications of inhalation injuries have been suggested. We can mention, for example, Stone's classification (Stone, H. H. et al., 1969), anatomical classification (Moylan, J. A., 1981), classification based on aetiology, Chinese classification (Chu, C. S., 1981), Russian classification (Murazian, P. I., 1974). All of these classification systems are based upon qualitative references and for this reason are not comparable. In our system we have tried to avoid these shortcomings and we proposed a simple system based on up-to-date diagnostic tools with coding including quantitative references as well (degree of pathological changes in the respiratory tract mucosa, extent of associated cutaneous injury). We are aware that our criteria cannot cover the full scope of inhalation injury problems but our system is not yet completed and additional criteria may be added, if necessary. We hope that we have devised a simple tool which can contribute to categorizing and evaluationg these injuries.

CONCLUSION

A new system of inhalation injury classification including objective qualitative and quantitative references was proposed. The preliminary results suggest that this system allows a better categorization of patients in terms of severity of the injury and/or a better evaluation of treatment results. A simple coding system will enable to store and process the patients' data with the use of computer systems.

SUMMARY

A new system of classification of inhalation injuries called APB classification is proposed. The classification is based on the anatomical level of the injury (A), degree of pathological changes of the respiratory tract mucosa (P), extent and severity of associated cutaneous burns (B). The authors assume the classification would be of help in the analysis of severity, prognosis and treatment methods of inhalation injuries particularly in larger groups of burn patients.

RÉSUMÉ

Classification des traumatismes acquis par voies inhalatrices

Koller, J., Siska, P.

Propoşée une nouvelle méthode de classification des lésions inhalatrices, appelée classification APB. La méthode respecte le niveau anatomique du site d'atteinte (A), le degré des changements pathologiques de la muqueuse des voies respiratoires (P), l'étendue et l'importance des brulures cutanées associées (B). La classification proposée permettra d'évaluer l'importance d'endommagement et les méthodes thérapeutiques des traumatismes inhalateurs, surtous dans les cas de grandes brûlures de groupes.

ZUSAMMENFASSUNG

Die Klassifizierung von Inhalationstraumata

Koller, J., Siska, P.

Es wird eine neue Art und Weise der Klassifizierung von Inhalationstraumata vorgeschlagen, die sogenannte APB-Klassifizierung, die das anatomische Niveau der Betroffenheit (A), den Grad der pathologischen Veränderungen der Schleimhaut der Atmungswege (P) und den Umfang und die Bedeutsamkeit der zugehörigen Hautverbrennungen (B) in Betracht zieht. Die vorgeschlagene Klassifizierung hilft zur Bestimmung der Schwere der Beschädigungen und der Behandlungsmethoden der Inhalationstraumata, besonders in Fällen grosser Gruppenverbrennungen.

RESUMEN

La clasificación de los traumas de inhalación

Koller, J., Siska, P.

Se propone un nuevo sistema de la clasificación de los defectos de inhalación, llamada la clasificación APB, que se basa en el extenso anatómico del defecto (A), el grado de los cambios patólogicos de la mucosa de las vías respiratorias (P), en el extenso y la gravedad de las quemaduras cutáneas asociadas (B). La clasificación propuesta ayudará a determinar la gravedad del defecto y los métodos del tratamiento de los traumas de inhalación, especialmente en grandes grupos de los pacientes quemados.

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Anthony F. T. Brown: **Accident and Emergency Diagnosis and Management.** Heinemann Medical Books, Review, 1987, 1988.

The book consists of 10 chapters covering all important areas of emergency medicine.

The first chapter discusses internal medicine including infectious diseases. It includes acute cardiopulmonary failure, drowning, hyperthermia and anaphylaxis — conditions which imminently threaten life. Attention is also paid to AIDS, hepatitis B as well as to toxic conditions.

The second chapter deals with emergency cases in surgery. It comprises injuries (fractures, blunt injuries, penetrating injuries, etc.) as well as abdominal emergencies including urology. A separate section is devoted to thermal, chemical and electric burns.

The third chapter is concerned with orthopaedics. Injuries of locomotor apparatus are discussed here in great detail.

The fourth chapter deals with serious and life-threatening cases in paediatrics. This part gives a survey of normal values of children's age.

Of lesser extent are chapters 5 and 6 which are concerned with problems in otolaryngology, ophtalmology, stomatological surgery, gynaecology and psychiatry. The final chapter is devoted to administrative and legal aspects of the medical treatment of emergencies.

The book gives a clear and well-arranged account of the subject. Each nosological unit contains a discussion on diagnosis, necessary auxiliary examinations, immediate therapeutical measures as well as definitive course of treatment, drug dosage and the most frequent diagnostic and therapeutical errors. The book also gives a helpful suggestion as to where the patient should be referred to later.

The boock's unquestionable practical value is enhanced by the accompanying well-arranged table of contents.

As a whole, the book will be welcome and appreciated especially by young and less experienced colleagues working in emergency services as part of outpatient staff or in health facilities.

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TREATMENT OF FROSTBITES OF THE UPPER EXTREMITIES WITH PROLONGED BLOCKADE OF AXILLARY PLEXUS

T. Syposs, J. Novák, B. Barna, L. Nagy, A. Sücs

Congelation injuries frequently occurred in the recent past due to the extreme changes of temperature. Two mechanisms are responsible for their development. Cold trauma depends on the extent and time interval of the exposure to the cold and on other factors such as garments, wind, humidity, age, training, alcoholic intoxication, diseases etc.

In severe cases f r e e z i n g occurs meaning crystallization of the intracellular water followed by the death of the affected cells due to the differences between the extracellular and intracellular values of osmotic pressure, swelling of the cells and rupture of the cellular membranes.

In milder cases the organism decreases the temperature of the body surface thus maintaining the constant temperature of the core. The lowering of the surface temperature can approach the ambient temperature. Due to vasoconstriction the surface is excluded from circulation (physical thermoregulation). Simultaneously an increase of metabolic rate, shivering and piloerection occur (chemical thermoregulation). In course of a too long exposure to cold or the effect of the extremely low temperatures, larger and larger areas of the body would be excluded from the circulation "sacrifying" the perifery for the maintainance of the constant temperature of the core. The prolonged hypoxia elicited by microcircular changes leads to tissue damage. After a transient vasodilation of the perifery a permanent vasoconstriction develops. Due to the periferic disturbances of metabolism high concentrations of histamin are released in to the blood stream leading to a permanent capillary spasm. Data of Martin (1975) indicate that cold exposition depresses the NE reuptake by the neurons and excess amounts of mediator would pathologically affect the vascular wall. These events elicit platelet aggregation and sludge, however aggregation of the red blood cells does not occur. Microcircular shunts open and the membrane permeability increases. Large vessels are not obstructed under these conditions. According to Vichriew (1985) these mechanisms are activated in rabbits at —5 °C.

If this impairment of microcirculation is normalized in time, tissue necrosis can be markedly reduced or even overcome. Therapy of cold injuries

is based upon the relieving of arterial and capillary spasm with subsequent restoration of normal tissue perfusion.

The quick warming-up of the injured parts, application of vasodilators (novocain, nitroglycerine, reserpin, tolazolin) injected intraarterially or even intraosseally (Atjasov, 1983) would relieve the sequellae of the cold injury. Aggregation can be diminished by anticoagulants, papaverin and acetilsalicylic acid.

Early sympatectomy is suggested in case of cold injuries of the lower extremities, however bilateral sympatectomy may lead to infertility, so this surgical treatment is not accepted for routine management of congelation trauma. The same stands for transthoracal sympathectomy.

Instead of irreversible sympathectomy temporal decrease of the sympathetic tone is preferably performed. The first method has been the blockade of the stellate ganglion. Lidocain infiltration of the lumbal portion of the sympathetic trunc has been suggested for the relieve of the cold injuries of the lower extremities. Beneficial results and simplicity of this method allow to recommend it at first-aid medical attendance. Köysola (1974) injected Marcain through a catheter introduced into the paravertebral space for 12 h and reported beneficial effect. Campbell and Walker (1961) first reported an effective epidural anesthesia in treatment of cold injury of the lower extremity. In 1963 Renström (cit. Schlarb) successfully applied this method in the treatment of a patient who, by a natural disaster was trapped overnight in ice-cold water. In 1980 Schlarb reported 5 cases treated using epidural blockade. In 4 patients the author observed positive results.

In the Central Military Hospital of the Hungarian People's Army epidural anesthesia was applied in treatment of cold injuries in 3 patients in 1985 (data not published). This method also proved to be successful.

PATIENTS, METHODS

Permanent axillar plexus anesthesia has been applied first by us in 1986 in a patient with congelation trauma of all the fingers on both hands. This patient has been cured.

This result encouraged us to perform long-term axillary anesthesia in 10 patients admitted during extremely cold weather in January 1987 (Jan. 11: t° = —9.5 °C, moisture 54 %, velocity of the wind 12 m/sec; Jan. 12: t° = = —18.1, 57 %, 1 m/sec; Jan. 13: t° = —17.8 — —25 °C, 65 %, 3 m/sec). The results were compared to those of other patients later admitted to our Burn Center and treated before admission with vasodilators (Doxium, Agapurin, Nicotin Acid, Relaxyl-G, Rheomacrodex etc.).

The axillary plexus is localized at the insertion of the deltoid muscle of the abducted arm bent in the elbow, somewhat distally from the point of disappearance of the axillary artery. Insertion of a Craffword needle cut at 45° angle (Fig. 1) induces paresthesia and a sense of galvanization in the elbow and fingers. 20—40 ml of anesthetic solution is injected beneath or along the artery through a plastic catheter which is firmly fixed on the pa-

tient's body. The exact position of the needle can be observed as the needle starts pulsating or gives a characteristic sound being injected into the capsule of the nerve and the vessel. It can also be vizualized using contrast substances (filling the capsule of the nerve and vessel).

Fig. 1. Exact position of the needle introduced for plexus anesthesia

Table 1. Changes in temperature of fingertips in °C
(patient D, J, III, finger)

	Left	Right
Admission	32,2	32,6
After 16 hours	33,9	34,8
41 hours	33,9	35,4
67 hours	34,4	35,4

Anesthesia has been started by a bilateral injection of 2 × 20 ml of 0.25% Bipuvacain (Marcain) solution. This amount was further reduced to 2 × 15 and 2 × 10 ml.

The injection was followed by complete anesthesia, reddening and burning-hot of the extremity. The pulse of the radial and the ulnar artery which

could scarcely be felt prior to the anesthesia became well detectable, the skin temperature increased (Table I). The remaining limited motion capability provided a possibility for active gymnastics. The blisters were removed without leaving their edges and always after the first 48 h after injury. The injured extremity was only covered with sterile dressings never using ointments or powders.

Repeated injections were given to relieve pain, which occured more and more rarely and always distally indicating the efficacy of the treatment.

RESULTS

Amputations were performed in 2 patients. M. L. refused the offered treatment in the first 24 h (Fig. 2—3). B. J. left the hospital at his own risk early in the evening and returned at dawn asking for readmission (after sobering down).

Fig. 2. M. L., state at admission (4 h after injury)

16 operations have been performed in 7 cases (some patients admitted several days after injury from other hospitals). In some cases 2—3 fingers had to be amputated. B. J. had 9 fingers totally or partially amputated.

The overall hospital stay in our treated group versus the control group was 126 vs. 303 days. The mean hospital stay was 12.6 vs. 17.7 days. Though the hospital stay depends on several factors, we consider this difference significant.

Fig. 3. M. L., consent to treatment only after 24 h following injury: phalangectomy of the 2 fingers became inevitable

Fig. 4. F. A., admitted 48 h after injury

Fig. 5. D. J., state ad admission (4—6 h after injury)

Fig. 6. D. J., discharged by the 9th day. Effective permanent plexus anesthesia has been started in time and maintained during 5 days. Spontaneous epithelisation under the eschar

CASE HISTORY

F. A. got his fingers frozen while shoveling snow around his house on January 12. Admitted at our Unit on January 14. Both hands oedematous, livid, enlarged, covered with blisters. Treated with Prodectin, Stugeron, Agapurin, Doxim, Nicotinic Acid, Rhemomacrodex and Relaxyl-G infusion. Multiple proximal phalangectomies following the development of the demarcation (Fig. 4).

D. J. Cold trauma under alcoholic intoxication, when the patient had forgotten to close the entrance door (January 11). In the morning he had congelation injuries on both hands. At admission (January 12) both hands oedematous from the wrists white-livid, cold, enlarged, tense, with hemorrhagic blisters and thready pulse of the radial and ulnar artery. Permanent axillar blockade for 5 days. After a 9-day (!) hospital stay cured (Fig. 5—6).

DISCUSSION

Considering the results of Campbell and Walker (1961), Remström and Schlarb (1980) we introduced permanent blockade for treatment of cold injuries and relieving of vasoconstriction in the lower extremities induced by the cold trauma. Beneficial effect and cessation of pain in the early posttraumatic period observed in several patients encouraged us to continue this treatment in frostbites of the upper extremities. This method was first applied in 1986. Treatment of the patients injured during extremely cold weather in January 1987 has been performed considering the successful outcome of the previous cases.

In April 1987 Köster reported a successful treatment using blockade, though it has been combined with vasodilators. These results also encouraged us in our choice of treatment.

Our method of treatment of cold injury of the upper and lower extremities is very simple. Though it is considered as invasive, still a blockade is not surgery and thus can be performed not only at surgical (traumatologic) units. The advantage of this method — its reversible nature — does lead to enduring alterations. This quick, secure method being carried out does not cause complications.

We never observed signs of inflammation due to the treatment and never found pathogens in the catheters. Sometimes we observed a slight fall in arterial pressure due to vasodilation. We do not consider it as a complication, but as a desirable therapeutic effect which can be counterbalanced by fluid replacement.

We strongly emphasize that the therapeutic effect can be reached only if treatment is started early after injury, in the first 8 hours following cold stress. After this period the efficacy of the therapy diminishes and finally only analgesia can bring relief to the patient.

SUMMARY

Encouraged by the beneficial effect in the treatment of cold injury of the lower extremities, the authors applied permanent plexus anesthesia for

treatment of the cold injury of the upper extremities too. Of the total of 10 in-patients treated with this method, amputation had to be made only in 2 cases due to the lack of compliance of the patients retarding the commencement of therapy. 7 patients with the same severity of cold injury admitted from other hospitals where they had been treated with traditional methods have undergone multiple phalangectomies.

The method had beneficial effect only when applied within the first 8 h after trauma.

RÉSUMÉ

Traitement des engelures de membres supérieurs par le blocage prolongé du plexus axillaris

Syposs, T., Novák, J., Barna, B., Nagy, L., Szúcs, A.

Encouragés par l'effet favorable du traitement des engelures de membres inférieurs, les auteurs ont employé l'anesthésie permanente du plexus axillaris aussi pour le traitement des engelures de membres supérieurs. Du nombre total de 10 patients traités par cette méthode, l'amputation était nécessaire dans deux cas seulement, oú le commencement du traitement était attardé à cause de refus des atteints. 7 malades présentant les engelures du mème degré, admis d'autres hopitaux oú le traitement était traditionnel, ont nécessité de nombreuses phalangectomies. Le traitement par cette méthode est efficace sous condition qu'il soit entrepris dans les 8 heures suivantes le traumatisme.

ZUSAMMENFASSUNG

Die Behandlung von Erfrierungen der oberen Gliedmassen durch verzögerte Blockade des plexus axillaris

Syposs, T., Novák, J., Barna, B., Nagy, L., Szúcs, A.

Ermuntert durch die günstige Wirkung einer Behandlung von Erfrierungen der unteren Gliedmassen, haben die Autoren eine permanente Anästhesie des plexus axillaris auch bei Erfrierungen der oberen Gliedmassen angewendet. Von der Gesamtzahl von 10 mit dieser Methode behandelten Patienten war nur bei 2 Patienten eine Amputation notwendig, weil sich der Beginn der Behandlung wegen Nichtübereinstimmung seitens der Betroffenen verzogerte. Sieben Patienten mit Erfrierungen des gleichen Grades, die aus anderen Krankenhäusern überliefert wurden, wo sie in traditioneller Weise behandelt worden waren, erforderten zahlreiche Phalanxektomien. Die Behandlung mittels dieser Methode ist wirksam nur dann, wenn mit ihr binnen 8 Stunden nach dem Unfall begonnen wird.

RESUMEN

El tratamiento del sabañón de los miembros superiores mediante el bloqueo prolongado de plexus axillaris

Syposs, T., Novák, J., Barna, B., Nagy, L., Szúcs, A.

Debido a los favorables resultados precedentes con el tratamiento de los sabañones de los miembros inferiores, los autores emplearon la anestesia permanente de plexus axillaris también en el caso de los miembros superiores. Desde el número

de 10 enfermos tratados por este método solamente dos casos necesitaban la amputacion, porque su tratamiento fué ejecutado con retraso puesto que los pacientes no habían dado su permiso a este proceder. Siete pacientes con sabañones del mismo grado, transferidos de otros hospitales, donde fueron tratados de manera tradicional, tuvieron que someterse a numerosas falangectomías. Esta técnica del tratamiento es eficaz solamente cuando se comienza dentro de 8 horas después del accidente.

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FILATOV'S TUBED FLAP — ONE MORE CONTRIBUTION

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In the last 10—12 years, the free skin transplantation technique using arterial pedicle has gained wide recognition and has been playing a primary role in plastic surgery. Microsurgery has been a dominant issue discussed practically at all congresses and symposia on plastic surgery. With no intention of reducing or denying the significance or advantages of this technique, once again, we would like to turn our attention to the potentially wide use of the tubed flap and its application in major extremity damage and the resulting traumatic consequences.

The long-term of this technique has led to discussions about the rehabilitation of patients with very complicated consequences resulting from combined damage to the tissue and organs of the head, face and neck, of different aetiology. The tubed flap surgery is much less frequently performed in cases with consequences resulting from trauma and burns of extremities. Nevertheless, the tubed flap has a wide range of application in plastic surgery as it can cover any part of the body and permits to model different reliefs corresponding to various forms of the human body.

"The tubed flap is a method", V. P. Filatov wrote as early as in 1918, "and as such it provides opportunities for the surgeon's resourcefulness in determining concrete procedures in order to achieve different plastic results" (7).

At the clinic of traumatology, the development of new research methods of blood circulation and microcirculation, especially methods of gradient angiography, has also made it possible to re-assess the application of Filatov's flap in a group of patients. We followed patients suffering from the effects of grave open defects of extremities. A large number of the cases suffered from non-union fractures of the extremities, pseudoarthrosis or bone defects. Extensive cicatricial zones usually covered the region of the extremity, sometimes accompanied with soft tissue defects. The scars were often circular. A number of patients also suffered from hypertrophic scars or considerable

trophic defects and secondary lymphoedema. It is necessary to stress that the clinical manifestation of damaged blood circulation (cyanosis, reduced temperature compared to that of a healthy extremity, oedema, skin infiltration, etc.) of various degrees was observed practically in all patients. These facts made us study the regional blood supply (1, 2).

METHODS

We investigated 108 patients suffering from the effects of grave extremity damage, non-union fractures, pseudoarthrosis, bone defects, osteomyelitis with considerable cicatrization. The angiograms of the damaged region showed fairly large occlusions of the main arteries and accompanying deep veins; at the level of and proximal to the trauma, occlusion of deep superficial veins in the cicatricial region was observed. Numerous occlusions in the arterial and venous systems gave rise to chronic ischaemia of the damaged extremity tissues, especially of their distal zones (1—3, 6). Dynamics analyses of vascular changes during the healing of grave open fractures showed that the primary chronic post-traumatic vascular insufficiency was gradually increasing. Its manifestation corresponded to the time period elapsed from the occurrence of trauma and to the number of surgical operations performed. In cases of a complicated course of fracture healing, insufficient blood supply to the damaged tissues was observed in 98.5 % of the followed-up patients.

When planning surgery, we took into consideration the results of angiography and tried to improve the blood supply to the damaged extremity. Therefore we considered as useful to reconstruct first the skin cover by removing the scars, ulcers and then to cover the defect with the tubed flap.

Surgery using Filatov's tubed flap enables to reconstruct any size and shape of soft tissues of the leg, sole, forearm and hand. The tubed flap surgery, is particularly advantageous for patients with circular ulcers or cicatrization of various extent and also in cases of large granulating defects. The maximum flap dimensions which we used were of 42 × 12 cm and 32 × 11 cm. In these cases there is always a danger of necrosis of the middle part of the tubed flap. For this reason, when preparing long flaps, we form a temporary pedicle in the middle, which we remove after 4—6 weeks. Although this prolongs the treatment period, it helps to avoid grave complications. The wounds on the abdomen and chest following the excision of wide flaps are usually covered with dermoepidermal grafts which eliminate deformation of the particular part of the body, danger of tissue necrosis or wound dehiscence, while the wound is being closed and sutured. After covering the defect with the flap, we immediately spread out the cut-off pedicle and flap over one to two thirds of the wound caused by partial removal of the cicatricous mass or ulcer. After 4—6 weeks, we cut off and spread out the supplying pedicle and the remaining free flap, which is a part of the healed-in graft using it for total reconstruction of the defect.

RESULTS — DISCUSSION

The analysis of the results obtained from the period of one to two years has confirmed that after soft tissue reconstruction, the signs of disordered blood circulation abate or almost disappear: oedema, pathological discoloration of the extremities, feelings of insecurity, fatigue, sensation of cold, etc. In a number of patients, the fractures united and mobility increased. We were naturally interested in the part the tubed flap played in these processes.

Blood supply to the flap after its formation and maturation has been sufficiently well tested experimentally (4, 5). However, we have failed to find any studies concerning blood supply gradient in the extremities including the blood supply to the spread-out flap. The question is what is happening within the flap after it has been spread out?

Angiography has helped us to answer this question. Blood supply to the damaged part of the extremity prior to surgery and after a period of 1—2 years was checked using a uniform angiographic method in a group of 9 patients. The analysis of angiographic results showed that the transplanted tubed flap was well supplied with blood by means of arterial ramification of the recipient zone. A fine arterial and vascular network was formed in the flap tissue. Many veins of the flap joined to form larger ones and flew into the proximal superficial venous network. The vascular network of the flap was gradually reconstructed: the longer the period elapsed from surgery, the better were the angiographic results (Fig. 1 a, b).

In this way, blood supply to the transplanted flap is closely connected with the recipient zone. The transplanted flap improved blood supply to the whole damaged section, which was seen in an increased number of contrast arterial ramifications, 2—2.5-fold acceleration of arterial flow, development of interarterial collaterals, reduction in arteriovenous blood infiltration and venous flow acceleration.

With regard to the influence of the transplanted tubed flap on the blood supply to the extremity, we devised a two-stage plastic operation for post-traumatic lymphoedema of the lower extremity. The first stage involved removal of contracting circular scars together with the tubed flap used for the repair of the defect. This considerably improved blood supply to the extremity, especially venous drainage from distal parts. The second stage (one year after surgery) involved removal of superfluous cutaneous tissue, arteriovenous anastomosis of the superficial veins distal to cicatricious tissues. The two-stage operation guaranteed stabilization of arterial and venous blood supply to the extremity.

The following c a s e r e p o r t should serve as an example.

Patient K., 17 years old. She was hospitalized with contracting circular scars of the right leg with marked hypertrophy of the right sole and the lower third of the leg.

15 years ago, after a car accident, a large part of right shin was denuded. She was treated at the place of her residence. Necrectomy and free skin plastic operations were repeatedly performed. They resulted in large, often ulcerating keloid scars. Hypertrophy of soft tissue of the right sole and the lower third of the extremity gradually developed.

On admission: general condition satisfactory. The other organs normal. The right shin circularly from the knee joint down to the lower third of the leg was covered with large keloid scars. The circumference of the right shin was by 2 cm larger than that of the left one. Soft tissues were hypertrophic, the skin glossy, thin. The mobility of the ankle was limited accordingly.

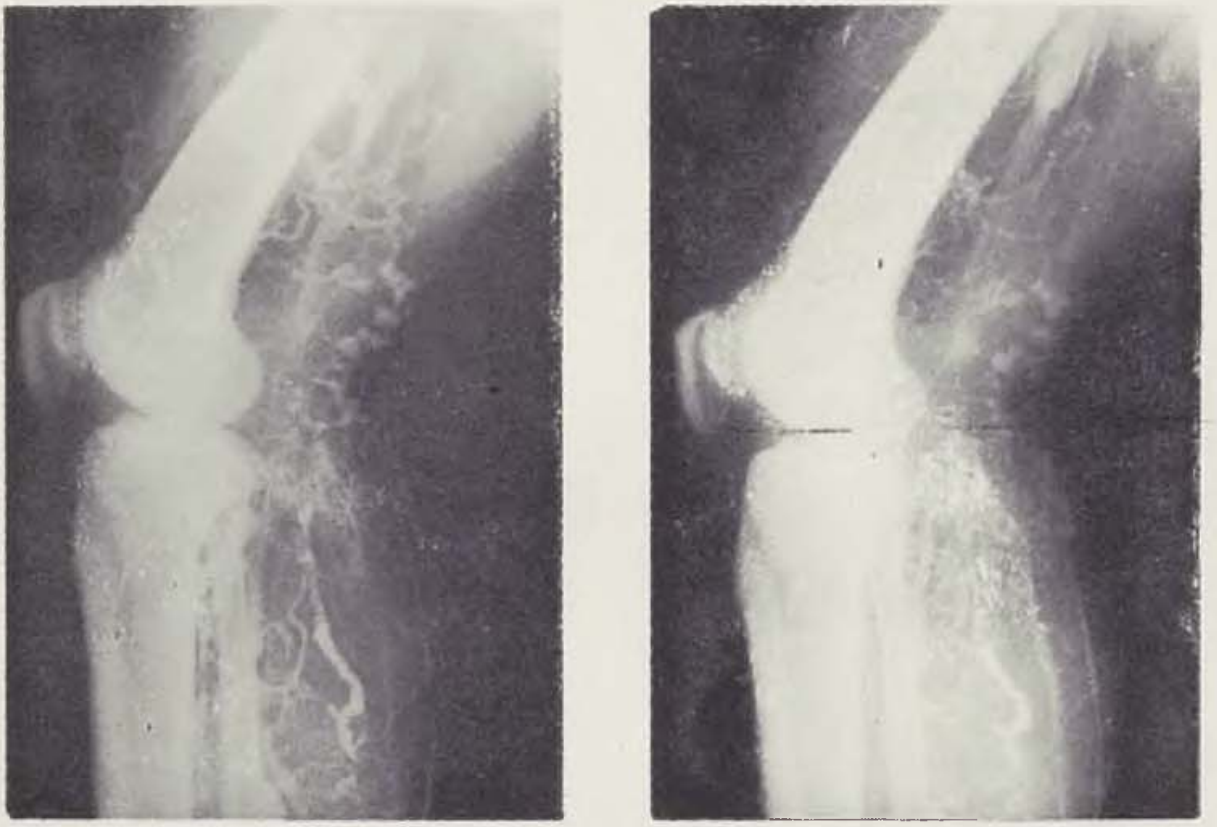

Fig. 1. Patient Sh., 38 years. Diagnosis: condition after plastic surgery for ulcer caused by irradiation of right popliteal region with the use of Filatov's tubed flap

a) Phlebography of the right knee joint, lateral view. Rubber band placed in the upper third of the thigh. Occlusion of popliteal vein, 18 cm long. Compensation of venous flow in the right leg by the superficial veins of Filatov's flap and the veins of anterior surface of the knee joint

b) Phlebography of the right knee joint after removal of the rubber band. Occlusion of the popliteal vein remains at the same distance. Basic flow passes from the leg through superficial dilated and tortuous veins of Filatov's flap

Fig. 2. Patient K., 17 years. Diagnosis: extensive contracting scars on the right shin, secondary lymphoedema of the right sole and the lower third of the shin
a) Overall view of the extremity prior to surgery

b) Angiograms of the right sole and shin, lateral view; arterial phase 8 s. Contrast is seen in all major arteries of the leg and sole, their branches of 5th—6th order including the subcutaneous branches. Arteriovenous contrast flow in the superficial veins in the posterior surface of the shin

c) Angiogram, venous phase 13 s. Contrasts are observed in communicating, superficial, minute and the smallest veins of hypertrophic soft tissues of the sole and shin

Fig. 3. Same patient
a) Overall view of the extremity after a year following two-stage surgery

b) Angiogram of the right sole and shin, lateral view. Arterial phase 13 s. Average velocity of blood flow from inguinal regions down to the sole (prior to surgery 8 s.). No arteriovenous blood flow through communications in the posterior surface of the shin

c) Venous phase, 9 s. Active venous flow from the sole up through deep crural veins

Conclusion: effects resulting from damage to soft tissues of the right shin. extensive hypertrophic scars. Secondary lymphoedema on the right sole.

Angiography was performed using transcutaneous catheterization in the right femoral artery. A series of angiograms (Fig. 2 a, c) showed contrast in all the major vessels of the shin and sole. The arterial network of hypertrophic soft tissues was enlarged, branch contrast of the 5th—6th order, including the subcutaneous veins. Arteriovenous flow of the contrast medium into the superficial vein in the posterior shin surface.

A two-stage reconstructive operation was performed according to the following method: removal of the circular hypertrophic scarring of the right shin together with a plastic operation of the defect using Filatov's tubed flap. A year after the first stage, the hypertrophic subcutaneous tissue and arteriovenous communications were removed as well as superficial veins of the lower third of the shin and sole. Healing was achieved per primam.

After the second stage, angiography was repeated according to the original methods and programme (Fig. 3 a—c).

The angiograms showed no changes in the arterial network of the sole or lower third of the leg. Blood supply from the inguinal region down to the sole was normal. Blood congestion in the posterior leg surface disappeared. Venous phase was within norm.

The two-stage operation performed, blood supply to the extremity consolidated, the signs of secondary lymphoedema disappeared.

By way of conclusion it should be stressed that the flap technique for extensive soft tissue defects, hypertrophic scars, trophic defects, cicatricious contractures in complicated grave extremity damage has retained its significance. The angiographic results showed that Filatov's flap, transplanted and spread out, joins with the damaged extremities' blood circulation, accellerates arteriovenous blood flow, increases the number of functional collaterals and helps to stabilize chronic post-traumatic vascular insufficiency, and prevents its increase. The clinical effect of blood circulation improvement is to be seen in the reduction of oedema, sensation of cold, skin cyanosis, subcutaneous tissue induration and in better mobility.

SUMMARY

The authors present their experience with the tubed flap in reconstructive operations of the sequellae of grave damage to the extremities: unhealed fractures, pseudoarthrosis, bone defects, etc. The method using a series of angiographies was applied in order to investigate blood supply of affected regions in a group of 108 patients. 98.5 % showed chronic post-traumatic vascular insufficiency. To improve blood supply to the affected extremity and achieve stabilization of its chronic insufficiency, the authors recommend to make use of Filatov's flap. Prior to and after surgery, angiography was performed in 9 patients. The angiographic results and clinical signs confirmed improvement in the blood supply to the extremity. This is closely con-

nected with the blood supply to the recipient region. A two-stage technique of plastic operation was devised for post-traumatic lymphoedema.

RÉSUMÉ

Encore une fois à propos du lambeau Filatov

Bolchovitinova, L, A., Ivanova, N. P., Beljajeva, A. A.

Présentée la somme d'expériences avec l'application de lambeau cylindrique lors des opérations des séquelles de graves lésions des membres: fractures non consolidées, articulations fausses, défauts osseux etc. Par la méthode d'angiographies en série on a examiné la vascularisation de la région lésionnelle chez 108 patients du groupe observé. Dans 98,5 % des cas, l'ischémie vasculaire posttraumatique chronique a été constatée. Afin d'améliorer la vascularisation du membre atteint et afin de stabiliser son ischémie, on recommande l'application du lambeau Filatov. Chez 9 malades, l'angiographie a été effectuée avant et après la plastie. Les résultats d'angiographie et les symptômes cliniques ont témoigné l'amélioration de vascularisation de la région receveuse. On a élaboré une méthodologie de l'opération plastique en deux temps pour le lymphoedème posttraumatique.

ZUSAMMENFASSUNG

Noch einmal über den Filatow-Lappen

Bolchovitinova, L, A., Ivanova, N. P., Beljajeva, A. A.

Es wird eine Zusammenfassung der Erfahrungen mit einem walzenförmigen Lappen bei Operationen der Folgen schwerer Beschädigungen der Gliedmassen geboten, und zwar bei nichtzusammengewachsenen Brüchen, Pseudoarthrosen, Knochendefekten u. ä. Mit Hilfe der Methode von Serien-Angiographien wurde die Blutversorgung des betreffenden Gebietes bei 108 Patienten dieser Gruppe untersucht, wobei bei 98,5 % von ihnen eine chronische posttraumatische Ischämie der Gefässe festgestelltwurde. Zur Verbesserung der Blutversorgung der beschädigten Gliedmassen und zur Stabilisierung ihrer Ischämie wird die Ausnutzung eines Filatow-Lappens empfohlen. Bei 9 Patienten wurde der Plastik und nach derselben eine Angiographie vorgenommen, und deren Ergebnisse sowie die klinischen Anzeichen bewiesen eine Besserung der Durchblutung der Gliedmassen. Eine Durchblutung des Lappens ist eng mit der Blutversorgung des enpfangenden Gebiets verbunden. Es wurde die Methodik einer plastischen Zweietappen-Operation bei einem posttraumatischen Lymphödem ausgearbeitet.

RESUMEN

Una contribución más al problema del colgajo de Filatov

Bolchovitinova, L, A., Ivanova, N. P., Beljajeva, A. A.

El papel recapitula las experiencas con la aplicación del colgajo tubular en las operaciones para los defectos graves de las extremidades: las fracturas no unidas, seudoartrosis, los defectos óseos, etc. Con ayuda de una serie de angiografías fué investigado el abastecimiento de sangre de la zona afectada en 108 enfermos de este grupo. 98.5 % de los pacientes pedecieron de una crónica isquémia vascular post -traumática. Con el fin de mejorar el abastecimiento de sangre de la extremidad

perjudicada y estabilizar la isquémia se recomienda a aplicar el colagajo de Filatov. Los resultados de la angiografia y los síntomas clínicos confirmaron el mejoramiento en el abastecimiento de sangre de la extremidad, lo que fué estrechamente relacionado con la zona recipiente. Se elaboro un método de la operación plástica de dos etapas para el linfoedema post-traumático.

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EFFECTS OF PRIMARY OSTEOPLASTY ON FACIAL GROWTH IN UNILATERAL CLEFT LIP AND PALATE AFTER TEN YEARS OF FOLLOW-UP

Ž. MÜLLEROVÁ, Z. ŠMAHEL

Numerous variants of bone graft implantation into the cleft maxilla were developed and introduced into practice in the late fifties. They were aimed at a stabilization of separated segments of the upper jaw, in order to prevent their collapse. It was anticipated that this procedure would lead to an improvement of maxillary growth and development. However, subsequent growth studies failed to confirm this assumption. Numerous studies showed an impairment of growth, while some other reports failed to demonstrate any adverse effects of bone grafting. On the basis of these observations most cleft centres abandoned the use of this technique, while after the analysis of their own results some other departments continued to use this technique throughout prolonged periods of time. It was disclosed that differences between the findings could be due to distinct techniques and sites of bone grafting.

The present study was aimed at the assessment of the effects of primary osteoplasty on the development of the jaws based on the comparison of two homogeneous series treated at the same department with the same methods, but for the implantation of a bone graft. Though at the present time the use of early bone grafting has been predominantly abandoned in the surgical repair of clefts, it is mandatory to follow-up the patients until the termination of their growth. This follow-up is the only method providing the possibility to determine the effects of bone grafting on the final therapeutic results, in particular with regard to the exactly defined individual techniques of bone grafting.

MATERIAL AND METHODS

The series examined included 32 boys and 25 girls, aged between ten and eleven years; all of them had a complete unilateral cleft lip and palate

without any other associated malformations. They were treated with a combination of simultaneous lip suture and primary osteoplasty. The bone graft obtained from a rib was implanted only into the basis of the alveolar process and it never extended as far as into the palate. The graft was covered completely with flaps of neighbouring soft tissues in order to avoid the occurrence of areas of secondary wound healing. Primary cheiloplasty was carried out according to Tennison (only occasionally according to Veau) at the mean age of 7.0 months both in boys and girls. Palatoplasty consisting of pushback and pharyngeal fixation followed at the age of four years and three months in boys and four years and four months in girls. At the time of the reported investigations the mean age was ten years and five months in both sexes. Up to this age the patients were not subjected to any additional palate surgery and only a few had some surgical repair within the region of the lip and nose. All individuals examined were born between 1966 and 1972.

As a series of controls served 30 boys and 25 girls with the same type of cleft treated with the same method, but without an implantation of a bone graft. Cheiloplasty according to Tennison (or occasionally according to Veau) was carried out at the mean age of 7.2 months in boys and 7.1 months in girls. The retroposition of the palate with pharyngeal fixation followed on the average at the age of four years and six months in boys and four years and one month in girls. These data did not differ significantly from those in individuals treated with primary osteoplasty. The patients were subjected to check-up examinations at the age of 10 years ± 3 months and thus were five months younger than individuals with osteoplasty. However, at this age the above mentioned difference could not be of great importance. The frequency of secondary operations was similar as in the former series. All individuals examined were born between 1960—1968. All patients in both series were operated upon at the Department for Plastic Surgery in Prague and then treated with removable orthodontic appliances. The two sexes were assessed separately and then jointly as a whole series.

The study was based on measurements of lateral X-ray films obtained during centric occlusion under standard conditions. The craniometric points (Fig. 1) used throughout these measurements were described in our earlier report (Šmahel and Brejcha, 1983), the reference lines (Fig. 2) are defined in the legend. From the large number of dimensions required for the construction of craniograms (Fig. 3) only the most important characteristics were included into the table. The perpendicular distance of a given point from the reference line was designated as Pmp—NSL, the angle Ss—N—Sm (ANB), or as a fraction of the pertinent reference lines (PL/VL) and the proportional characteristics N—Sp%N—Gn (N—Sp in terms of per cent of N—Gn). The overjet was measured between edges of the upper and lower incisors parallel with the occlusion plane (marked Is—Ii). The results were tested with the F-test (for variability) and with the t-test.

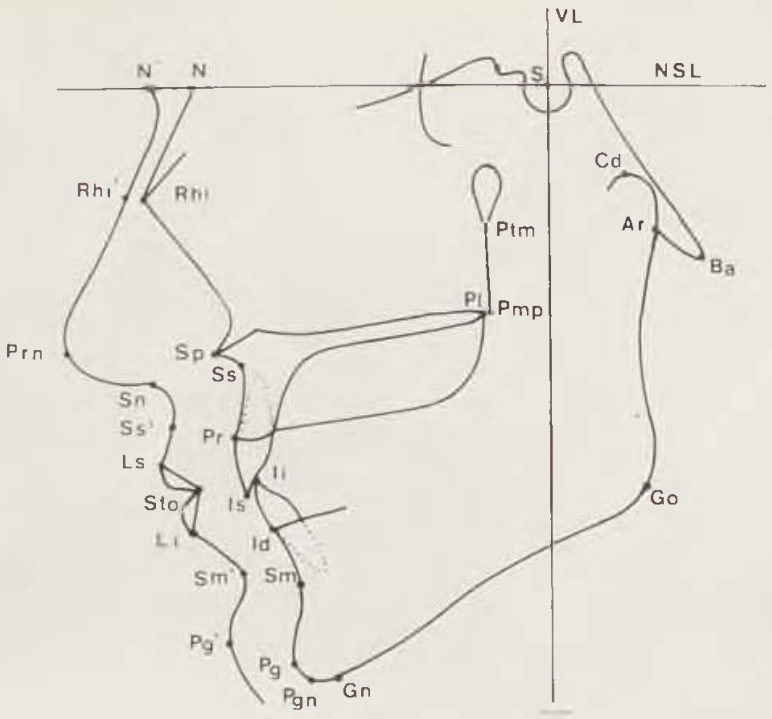

Fig. 1. Cephalometric points used in the present study

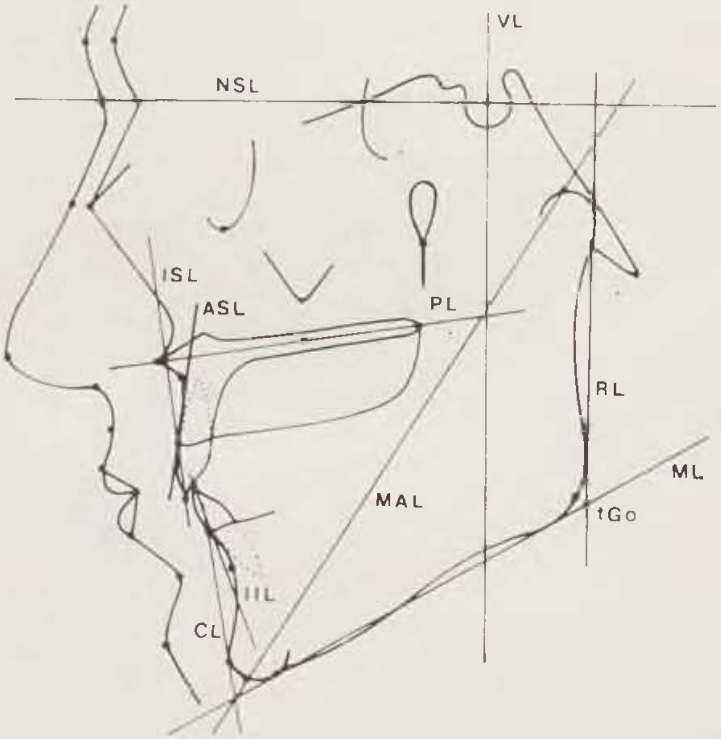

Fig. 2. Reference lines plotted on lateral X-ray films: NSL — line through N and S, VI — perpendicular to NSL through S, PL — line through Sp and Pl, ML — tangent to the mandibular body through Gn, RL — tangent to the mandibular ramus through Ar, CL — line through Id and Pg, MAL — line through Cd and Pgn, ASL — tangent to the upper alveolar process through Pr, ISL — line through Is and Pr, IIL — line through Ii and Id

RESULTS

Only a few significant differences in the development of the face were observed at the age of ten years between individuals with primary bone grafting and those without osteoplasty (Tab. 1). There were slight differences between the two sexes. Boys with bone grafts had a more marked retroposition of both jaws (S—N—Ss, S—N—Pr, S—N—Sm, S—N—Pg, S—N'—Ss', S—N'—Sm') with the maintenance of the same relation. Therefore there were no substantial differences in the sagittal jaw relations (Ss—N—Sm) between the two series of patients. The anterior crossbite was also of an identical degree (Is—Ii). There was a highly significant difference between the slope of the palate plane (PL/VL) which showed an anteinclination in individuals with bone grafts. The deviation was due to the smaller height of the upper face (N—Sp, $p < 0.1$) and was most spectacular in relation to the total facial height (N—Sp%N—Gn). Therefore the vertical jaw relations (PL/ML) were affected more markedly in patients with grafts. Of the other investigated characteristics significant differences were recorded only in two linear dimensions which were of no importance for our study (Ii—Gn and S—Go, with insignificant S—Go%N—Gn).

The retroposition of the jaws observed in boys with bone grafts was not present in girls. This could be due to the more acute angle of the cranial base (N—S—Ba, N—S—Cd), which interferred with the retroposition of the jaws. The sagittal jaw relations (Ss—N—Sm, Ss'—N'—Pg') and the occlusion of incisors (Is—Ii) were identical in both groups. But after bone grafting it was again possible to record a marked anteinclination of the palate plane

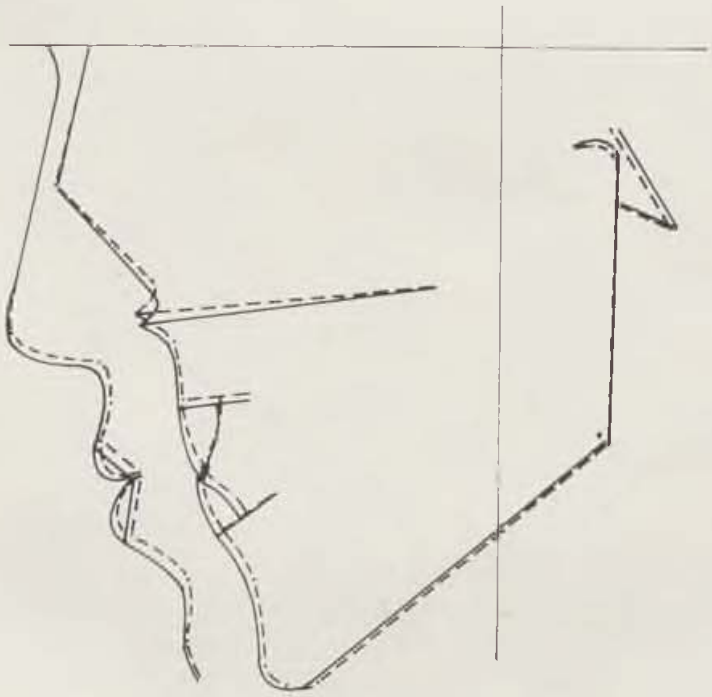

Fig. 3. Craniograms in individuals with (dashed line) and without (full line) primary bone grafting

Table 1. Mean values of X-ray cephalometric characteristics in individuals with and without bone grafts

Variable	Males		Females		Both sexes	
Linear	graft	no graft	graft	no graft	graft	no graft
N-S	67.91	67.83	66.52	66.76	67.30	67.34
N-Sp	46.25	47.60	43.92 **	46.88	45.23 ***	47.27
N-Pr	61.94	62.93	59.20 *	61.20	60.74 *	62.15
N-Gn	114.75	112.43	109.40	111.56	112.37	112.04
Ii-Gn	41.44 **	40.03	39.64	39.76	40.65	39.91
Ss-Pmp	43.88	45.37	43.60	43.16	43.75	44.36
S-Go	68.41 *	66.57	65.36	65.20	67.07	65.95
S-Pgn	112.81	112.77	109.68	110.28	111.44	111.64
Cd-Go	49.44	48.47	47.20	47.92	48.46	48.22
Pgn-Go	64.69	66.23	64.20	65.16	64.47	65.75
Pmp-NSL	40.59	40.17	38.64	39.40	39.74	39.82
N-Sp % N-Gn	40.31 **	42.34	40.14 *	42.02	40.25 ***	42.19
S-Go % N-Gn	59.61	59.21	59.74	58.44	59.69	58.86
Overjet	−0.88	−0.78	−0.92	−0.34	−0.90	−0.56
Angles						
N-S-Ba	133.03	132.60	132.52 *	135.28	132.81	133.82
N-S-Cd	133.06	133.23	130.68 *	134.48	132.02	133.80
N-S-Pgn	73.12 *	71.47	71.00	72.72	72.19	72.04
S-N-Ss	73.63 *	75.67	74.60	73.76	74.05	74.80
S-N-Pr	74.31 *	76.07	75.32	74.80	74.75	75.49
S-N-Id	73.91	75.37	75.20	74.40	74.47	74.93
S-N-Sm	72.41 *	73.97	73.76	73.04	73.00	73.55
S-N-Pg	73.06 *	74.70	74.72	73.68	73.79	74.24
Ss-N-Sm	1.22	1.70	0.84	0.72	1.05	1.25
PL/VL	95.75 **	98.23	95.28 **	98.08	95.54 ***	98.16
PL/ML	35.41 *	31.77	34.08	33.40	34.82 *	32.51
ML/VL	131.16	130.00	129.36	131.48	130.37	130.67
ML/RL	132.00	132.33	130.80	132.64	131.47	132.47
CL/ML	68.13	67.40	67.76	68.12	67.96	67.73
RL/NSL	88.69	87.63	88.40	88.72	88.56	88.13
ASL/PL	90.66	91.90	91.28	93.96	90.93	92.84
ISL/PL	75.81	79.17	77.80	80.92	76.70 *	79.96
Soft profile						
S-N′-Ss′	78.97 **	81.47	80.08	79.08	79.46	80.38
S-N′-Sm′	74.50 *	76.00	75.60	75.12	74.98	75.60
S-N′-Pg′	75.56	77.03	77.32	76.44	76.33	76.76
Ss′-N′-Pg′	3.41	4.44	2.76	2.64	3.13	3.62
N′-Prn	48.66	48.83	46.80 **	49.20	47.84 *	49.00
N′-Sn	53.94	54.77	52.76 **	54.80	53.42 **	54.78
N′-Sto	73.84	73.30	70.72	72.48	72.47	72.93
N′-Pg′	104.13	103,80	99.24	101.72	101.98	102.85

*significant differences between clefts with and without grafts at $p<0.05$ (**$p<0,01$. ***$p<0,001$)

(PL/VL), due to the smaller anterior height of the upper face (N—Sp, N—Pr, N—Sp%N—Gn, N'—Prn, N'—Sn). We failed to disclose any differences in the other characteristics between girls with and without bone grafting (Tab. 1). Thus both sexes showed an identical inhibition of the vertical growth of the upper face in individuals after osteoplasty.

Table 2. Mean values of cross-section examination in individual age groups

Males	Complete unilateral clefts			Controls	
Variable	5 years	10 years	adults	5 years	adults
S-N-Ss	77.80	75.67	74.62	79.07	80.68
S-N-Sm	73.07	73.97	75.94	74.74	78.20
S-N-Pg	73.13	74.70	77.81	74.63	79.84
Ss-N-Sm	4,73	1.70	–1.32	4.33	2.48
S-N'-Ss'	82.20	81.47	79.56	83.41	87.08
S-N'-Sm'	74.20	76.00	77.56	76.44	79.92
S-N'-Pg'	75.60	77.03	79.94	77.19	82.34
Ss'-N'-Pg'	6.60	4.44	–0.38	6.22	4.74
PL/VL	98.93	98.23	96.47	96.89	98.02
N-Sp % N-Gn	41.53	42.34	40.80	43.38	43.86
Overjet	0.14	–0.78	–1.14	1.98	2.65
N-Sp[1]	—	5.40	11.86	—	13.62
Ss-Pmp[1]	—	1.30	4.46	—	8.86

[1]differences from values at the age of five years

Differences in facial rotation (protrusion of both jaws) between boys and girls were due to the differences in the curvature of the cranial base and were most probably caused by the composition of our series. When patients of both sexes were included into a single joint group these characteristics were identical in individuals with and without bone grafts (Tab. 1). The only differences consisted in the reduced vertical growth of the upper face (N—Sp, N—Pr, N—Sp%N—Gn, PL/VL, N'—Prn, N'—Sn) with a larger alteration of vertical jaw relations (PL/ML) and a more marked retroinclination of upper incisors (ISL/PL) in patients with osteoplasty. During separate testing of individual sexes the latter characteristic did not attain the significance level, in spite of the regular occurence of differences in both sexes. The joint data are plotted on Fig. 3.

DISCUSSSION

As compared to individuals without primary osteoplasty boys and girls with bone grafts had a deficient vertical growth of the upper face and a more marked retroinclination of upper incisors. An important regulator of the vertical growth of the upper face represented the nasal septum and a certain part played also the vomero-premaxillary suture. The importance of this suture for the anteroposterior growth of the upper jaw in clefts de-

monstrated Friede (1978). Up to the age of three years this suture exerted a more marked effect on the anterior than on vertical growth. Thus an implantation of a bone graft could exert a varying degree of a locking effect on the growth within this suture (Friede and Johanson, 1982) which was related to the extent of the implantation area. This observation was consistent with the demonstrated vertical growth deficiency. However we failed to record a growth reduction in anterior direction. This could be explained by the differring growth in these two directions in clefts (Tab. 2). While in vertical direction the growth continued up to the age of ten years at a similar rate as in controls (N—Sp%N—Gn), though the absolute value of the upper face height was lower, in anterior direction there was a definite growth retardation (S—N—Ss, S—N'—Ss'). These data were based on the comparison with our findings in the same type of cleft (complete UCLP) without osteoplasty prior to palate surgery (Šmahel and Müllerová, 1986), as well as in adults (Šmahel and Brejcha, 1983) and in the corresponding groups of controls. Because of the markedly deficient anterior growth of the maxilla in clefts, both with and without osteoplasty (small increase of the dimension Ss—Pmp^1) the adverse effects of the bone graft were not so spectacular as in characteristics with a higher growth rate (increase of the dimension N—Sp^1). The comparison revealed also (Tab. 2) that the anterior growth of the mandible proceeded in clefts at the same rate as in controls (S—N—Sm, S—N—Pg, S—N'—Sm', S—N'—Pg'). This resulted in a gradually increasing alteration of the sagittal jaw relations (SS—N—Sm, Ss'—N'—Pg'), as well as of the occlusion within the frontal segment of the teeth (Is—Ii). The inclination of the palatal plane (PL/VL) showed no marked developmental changes, though some signs suggested that in cleft the anterior height of the upper face was growing at a lower rate than its posterior height. The recorded higher retroinclination of uper incisors after osteoplasty could be due to the cicatrization of tissues at the site of the bone graft, as reported by Ross and Johnston (1972).

Large numbers of authors studied the effects of primary osteoplasty on the growth of the jaws. Friede and Johanson (1974, 1982) described the least favourable results after a long-term follow-up of a series including a large number of patients. They recorded a more marked retrusion of the maxilla than in individuals without osteoplasty, as well as a deficient vertical growth of maxillary dimensions, in particular of the anterior height of the upper jaw. The high degree of developmental deficiency of the middle face induced one half of the patients to request maxillofacial surgical repair. The authors mentioned also the increased frequency of anterior and lateral crossbite. In patients from this series the bone graft was implanted as far as into the hard palate. Jolleys and Robertson (1972) reported equally unfavourabble results in a smaller homogeneous group of children aged five years. They observed a more conspicuous flattening of the facial profile and an increased frequency of overjet deterioration after bone grafting as compared to individuals without bone grafts. The authors provided evidence of a definite re-

duction of the anterior growth of the maxilla after bone grafting in children examined at the age of eleven years (Robertson and Jolleys, 1983). There was not a spontaneous teeth eruption through the graft, the largest part of which was resorbed and did not provide favourable conditions for the normal position of the teeth. The results of other studies based on an analysis of dental casts and dealing with the occurence of malocclusions equally were not in favour of the use of primary osteoplasty (Pruzansky and Aduss, 1967; Pickrell et al., 1968; Rehrmann et al., 1970).

In contrast to the above mentioned observations some other studies failed to demonstrate an unfavourable effect of primary bone grafting on the development of the upper jaw. Rosenstein et al. (1982) reported a long-term follow-up of sixteen patients. He failed to disclose any marked impairment of anterior and vertical growth of the upper jaw. The investigated parameters were consistent with those recorded in individuals without graft. Matthews et al. (1970) described a satisfactory occlusion in children aged seven years. Robinson and Wood (1969) underlined the absence of a maxillary collapse and Schmid et al. (1974) stated that the method yielded good results in large clefts. Similarly Enani (1981) failed to reveal any differences within the region of the maxilla as compared to individuals without bone grafts, but he performed cephalometric studies only in nine patients from each group at the age of thirteen years. Lynch et al. (1970) and Nylén et al. (1974) equally failed to disclose any substantial deficiencies of maxillary development after bone grafting. The drawback of these studies consisted in the predominantly small numbers of cases, or in a short-term follow-up. In the latter study a series reported in the international literature served for comparison and some parameters (a straight profile a. o.) were suggestive of less favourable results. Yet, even all quoted reports failed to provide evidence of an improved development of the upper jaw after primary bone grafting. A beneficial effect was described in a single report by Wood (1970) after a short-term follow-up of a selected group of twenty children up to the age of five years. Favourable results recorded at this age can be hardly considered of major importance. Because of the small number of cases this finding could be due to an accidental composition of the series.

Nordin et al. (1983) and Larson et al. (1983) recently devoted a comprehensive study to the problem of primary bone grafting. They followed-up children with an osteoplasty from the age of seven to thirteen years. Each age group included sufficient numbers of cases treated with or without preoperative jaw orthopedics. Both sexes were included into a single series and the results were compared with findings obtained in children without bone grafts and preoperative orthopedics, reported in the North American literature. The growth of the maxilla in children with preoperative orthopedic treatment was consistent with that reported in individuals without bone grafts. A more adequate comparison was provided in children without preoperative orthopedics and disclosed a flatter skeletal profile after osteo-

plasty. The soft profile of children with bone grafts showed always a less prominent upper lip. According to the authors this finding was due to the surgical technique (lip adhesion) which was used, however, only in individuals without preoperative orthopedic treatment. The dental findings were more consistent with those in American children without osteoplasty, rather than with another reported Swedish series with bone grafts (Friede and Johanson, 1974). The authors failed to disclose any deviations in the growth of the upper jaw after osteoplasty which would be of an equal severity as those described earlier in the same population by Friede and Johanson (1974, 1982). The authors therefore believe that the earlier unfavourable findings were due to the implantation of the bone graft into the hard palate and an area was left for secondary epithelization. Yet these studies were equally not in favour of primary osteoplasty since the expected improvement of the development of the upper jaw as compared to individuals without bone grafts, did not occur. However this improvement certainly represents the prerequisite for the justification of the introduction of a new technique into practice (Johanson and Friede, 1982).

With an exception of a reduction of the vertical growth of the upper face we failed to disclose in our series any substantial difference in facial configuration between patients with and without primary bone grafting. This document that the use of smaller bone grafts implanted into the alveolar process only and the use of an adequate surgical technique did not lead to any substantial impairment of maxillary growth in anteroposterior direction. However it is not possible to draw any definite conclusions since some adverse changes can develop during the pubertal growth spurt. It cannot be excluded that children with bone grafts were treated with a more intense orthodontic therapy. However, in principle our results, similarly as those reported in the literature, are not in favour of the use of primary bone graft implantation. If we take into consideration the procedure required for the excision and transfer of the bone graft we must admit that we are in full agreement with Pruzansky (1964) who definitely rejected the use of this procedure. Therefore this method was abandoned in the early seventies at the Department for Plastic Surgery in Prague. However the follow-up of patients treated with this procedure continues and the definite results assessed during the postpubertal period of life will be published.

SUMMARY

An assessment of X-ray cephalometric studies was carried out in 32 boys and 25 girls with complete unilateral cleft lip and palate aged ten years and operated upon with the technique of primary bone grafting, as well as in 30 boys and 25 girls with the same type of cleft treated with the same methods, but without bone grafting.

Individuals with primary osteoplasty had a deficiency of vertical growth of the upper face and a more marked retroinclination of upper incisors. We

failed to disclose any other significant differences. Both series had a markedly deficient anterior growth of the maxilla. Thus the introduction of the method of primary bone grafting did not result in an improved development of the upper jaw, just on the contrary some parameters were suggestive that it exerted an adverse effect. Therefore it was not possible to advocate the use of this surgical procedure in the treatment of clefts.

RÉSUMÉ

Influence d'ostéoplastie primaire sur la croissance du splanchocranium chez les fentes labiopalatines unilatérales totales après dix ans d'observation

Müllerová, Ž., Šmahel, Z.

Nous avons évalué résultats radiocéphalométriques de 32 garçons et 25 jeunes filles présentant une fente labiopalatine unilatérale totale, qui ont été opérés à l'âge de 10 ans, avec l'implantation d'une greffe osseuse primaire. L'autre groupe comportait 30 garçons et 25 jeunes filles du même type de fente et du même âge, qui ont été traité par les mèmes méthodes mais sans implantation de greffe osseuse.

Les sujets avec l'ostéoplastie primaire présentaient une réduction de croissance verticale du visage supérieur et une rétroinclinaison plus exprimée des incisives supérieures. Nous n'avons pas trouvé d'autres différences importantes. La croissance antérieure du maxillaire supérieur était déficitaire d'une façon importante dans les deux groupes. L'emploi de la méthode avec implantation de greffe osseuse primaire n'a pas apporté d'amélioration pour le développement du maxillaire supérieur. Par contre, quelques paramètres témoignent d'une influence défavorable. Pour ces raisons-ci, on ne peut pas recommander l'emploi de cette méthode dans le traitement des fentes.

ZUSAMMENFASSUNG

Der Einfluss einer primären Osteoplastik auf das Gesichtswachstum bei einseitigen wollkommenen Lippen-und Gaumenspalten nach zehnjährigen Beobachtung

Müllerová, Ž., Šmahel, Z.

Bewertungen der röntgenzephalometrischen Befunde bei 32 Jungen und 25 Mädchen mit vollkommener einseitigen Lippen-und Gaumenspalte, die im Alter von 10 Jahren primär durch die Einführung eines freien Knochenstückes chirurgisch behandelt wurden, und bei weiteren 30 Jungen und 25 Mädchen mit demselben Typ der Gelenkspalte ohne eine Knochenimplantation.

Bei patienten mit primärer Osteoplastik bestand eine Insuffiziens des vertikalen Wachstums des Obergesichtes und eine grössere Retroinklination der oberen Schneidezähne. Das vordere Wachstum der Oberkiefers war bei beiden Gruppen stark reduziert. Die Einführung der Technik der primären Osteoplastik führte daher nicht zu einer Besseren Entwicklung des Oberkiefers und deswegen kann die Anwendung dieses Verfahrens in der Behandlung der Gesichtsspalten nicht empfohlen werden.

RESUMEN

La influencia de la osteoplastía primaria sobre el desarrollo del esplancnocráneo en la fisura unilateral de labio y paladar después de 10 años de la observación

Müllerová, Ž., Šmahel, Z.

Los autores evaluaron los resultados radiográfico-cefalométricos obtenidos del grupo de 32 muchachos y 25 muchachas con la fisura completa de labio y paladar de la edad de 10 años. En la operación se empleó el injerto óseo primario en 30 muchachos y 25 muchachas con el idéntico tipo de la fisura y de la misma edad que fueron tratadas por el proceder mismo pero sin la implantación del injerto óseo. En los pacientes después de la osteoplastía primaria el crecimiento vertical de la parte superior de la cara fue disminuido y la retroinclinación de los dientes incisivos superiores fué alargada. El crecimiento anterior del maxilar fue notablemente deficiente en ambos grupos. El empleo de la técnica del injerto óseo primario no produjó un mejoramiento en el desarrollo del maxilar superior, por el contrario, algunos parámetros indicaron una influencia desfavorable. Por lo tanto, no se puede recomendar esta técnica, para el tratamiento de las fisuras.

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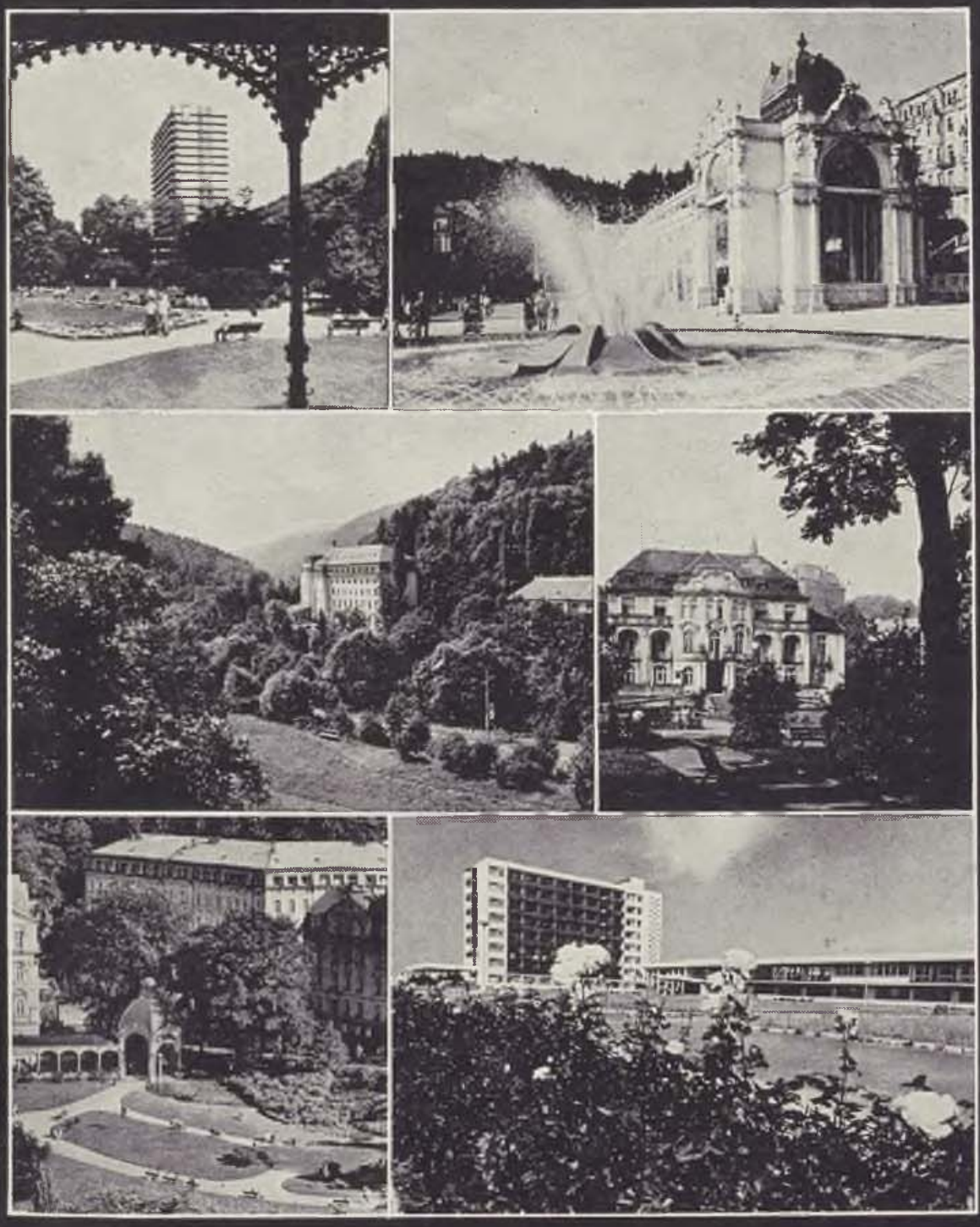

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