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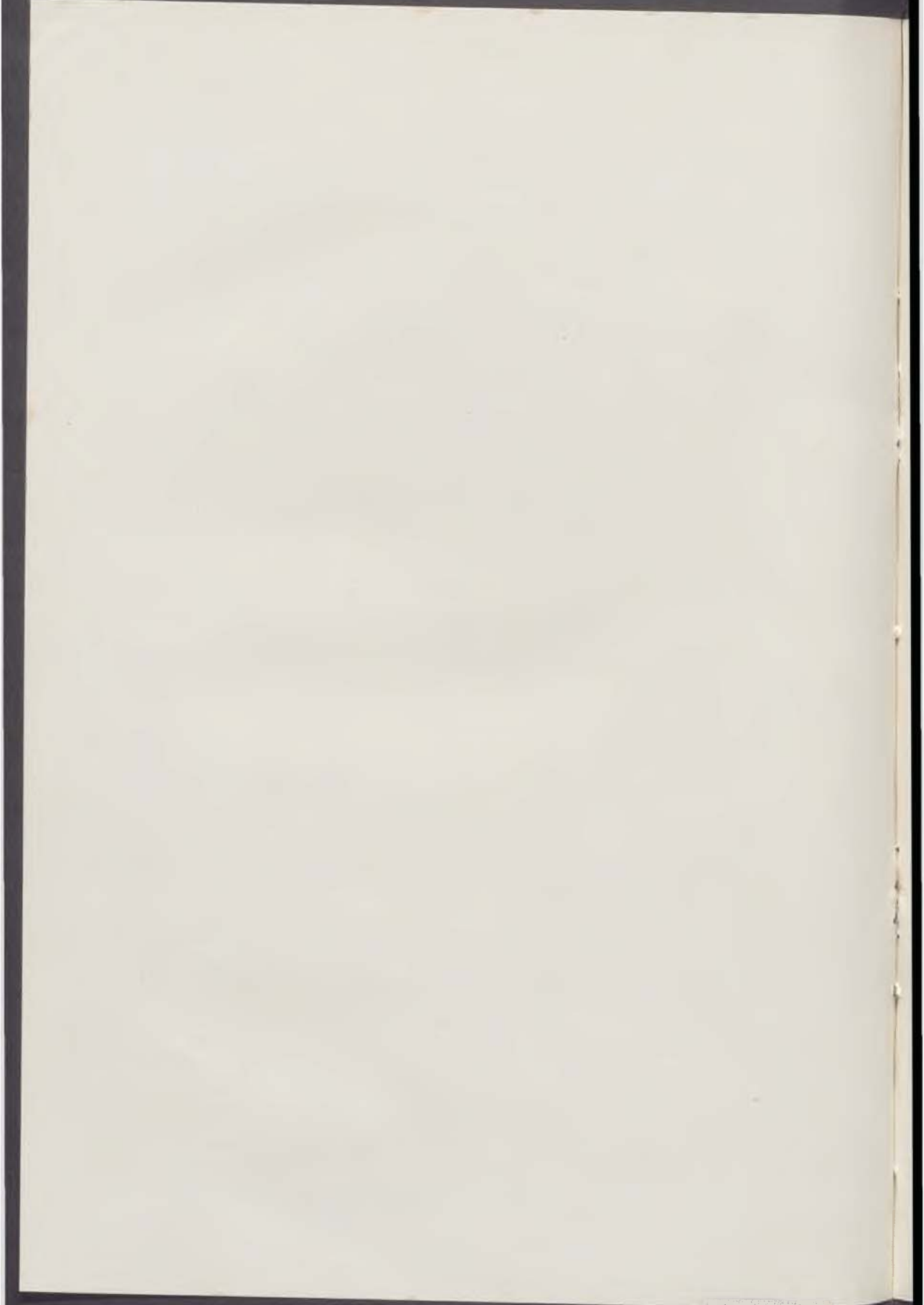
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ACADEMICIAN FRANTISEK BURIAN

* Sept. 17, 1881

+ Oct. 15, 1965



Each chapter from the history of the active and eventful lives of our predecessor is a tribute to and an expression of gratitude for the work done. Their heritage sets an example for successors, and makes us contemplate things past and future encouraging not only justified national pride but also self-criticism and modesty at work.

Prof. Dr. František Burian, DrSc, stands first among those who deserve our fondness and gratitude. He was the founder and architect of plastic surgery not only in Czechoslovakia but, through the efforts of his disciples, in several countries of Europe as well. He is rightly included among the pioneers of the specialization all over the world.

On September 17, 1981, exactly one hundred years will have elapsed since František Burian was born.

Having taken his degree at the Medical Faculty of Charles University and completed a year's assignment at the Institute of Pathology in Prague, the city of his birth, young Burian started working at the 1st Department of Surgery in 1907. Hard-working, patient, endowed with remarkable dexterity, admirable imagination and the talent of an artist, the young surgeon was attracted by the first attempts made there at reconstructive surgery. He was able to see immediately the significance of such attempts for the physical and mental well-being of patients suffering from deformation or defects. This made his study the bits and pieces on reconstructive methods that were available scattered in literature. His approach to each such bit of information was critical and, at the same time, full of creative imagination.

It was during the 1912—1913 period of the Balkan wars that he started putting into practice conventional surgical approaches as well as his new ideas. After the outbreak of World War 1, Burian, already an accomplished surgeon, was made head of the Timisoara hospital. With his concept firmly established in his mind, he founded a station of plastic and reconstructive surgery there paying special attention to heart, vessel, nerve, and hand injuries, to amputation stump care, pseudoarthroses, etc. He also developed new types of splints and plates for different types of fracture, stressing the need for and significance of rehabilitation. After the war had ended, he collected his patients, Czech soldiers, whom he had been treating for surgical reconstruction, and had them transported on a special train to Prague for after-treatment. The excellent results he had achieved soon made a number of civilian patients with post-accident or congenital defects ask the successful surgeon for help.

However, there were a number of obstacles and much mistrust and misunderstanding to be overcome. Many surgeons claimed that what Dr. Burian was doing was mere art, not science. Burian had to leave his post in the

military hospital and move his patients twice to smaller and poorly equipped places. Soon after the war he extended the scope of his work to cover congenital defects of the face, hands and external genitals as well. He frequently went out to operate on children in children's homes all over the country. Full of sympathy for the psychic condition of people with conspicuous cosmetic defects, he started correcting these, too. He was fully justified in demanding that such operations should be performed by plastic surgeons well trained in the whole of the specialization and skilled in general surgery. He kept stressing the need for using the methods of plastic surgery already at the time of primary treatment as well as in other surgical disciplines. In order to show that only fine and sparing surgical techniques taking into account the biological and physiological properties of tissues could ensure satisfactory healing and success, he published a remarkable book called "Physiological Operating Techniques".

However, there were compensations, too, in response to Burian's excellent results no less than to his unflinching combativeness. By 1932, plastic surgery in Czechoslovakia had received official recognition as a surgical superspecialization, thus allowing Burian to have permanent assistants and to found a school of his own. His idea of a wide scope for the specialization aroused interest among specialists abroad winning him increasingly more useful contacts. Burian went to international congresses to demonstrate the results of his efforts, to take part in lively discussions, and to publish a great deal at home and abroad. In 1935—1936, he organized at his poorly equipped clinic 10-day courses complete with lectures and demonstrations of surgical procedures with several dozen foreign guests taking part.

His tenacity, fighting spirit and achievements brought him a major reward in 1937 when his ward was eventually moved to the premises of a large hospital. This is, where at long last he was able to develop comprehensive clinical and scientific teamwork, to start a special children's ward and another one for surgery of the hand, and to put his reconstructive methods to good use in acute traumatology. He kept training more disciples and assistants, many of them foreigners, and lecturing to students and doctors of different specializations. He was made adjunct professor of plastic surgery, and his clinic was proposed to become part of Charles University. The 2nd world war, the occupation of Czechoslovakia and the closing down of universities by the Nazis caused a great deal of undesired delay, and it was not until 1948 that Dr. Burian was made full professor and head of a university department.

Admirably full of life and energy, Prof. Burian helped to found more plastic surgery wards putting his assistants in charge of them. He was instrumental in introducing compulsory nation-wide registration of congenital defects as well as a whole conception of surgical burn treatment. At his own clinic he established a special station for burned patients complete with the necessary laboratories and surgical facilities for the treatment of not only acute cases but also for the performance of all the reconstructive operations involved.

In 1956, Prof. Burian was given a welcome opportunity to start a scientific research centre aimed specifically at the exploration of congenital anomalies,

particularly clefts, and at skin transplantation research. In 1954, he published a remarkable book "Surgery of Cheilopalatal Clefts", and in 1957 he added his "Rare Congenital Defects of the Face and Skull and Their Treatment".

Fully aware of the dangers of isolation and complacency in one's own work, Prof. Burian wasted little time in the immediate post-war period to renew and extend contacts with foreign countries in Europe and overseas. At home, he took credit for initiating three symposia with international participation. At the 1957 1st International Congress of Plastic Surgery in Stockholm he called on plastic surgeons all over the world to take up all-round research of congenital clefts and to promote international co-operation.

Having retired as head of the university department, Prof. Burian stayed on as director of a research centre incorporated in the Czechoslovak Academy of Sciences, giving his younger colleagues new ideas for research work, enjoying the good results of their and his own efforts.

At the same time, he was preparing for publication an abundantly illustrated three-volume "Atlas of Plastic Surgery". Most unfortunately, he never lived to see the day of its appearance. As busy as ever and full of new ideas he died suddenly on Oct. 15, 1965 at the age of 84, the victim of heart failure.

Even his old and seasons co-workers have often wondered where this slender shortish man took all his strength, drive and energy from. He was not only an outstanding teacher, lecturer and debater, an exceptionally talented surgeon endowed with humble patience, but also a rarely impressive personality full of compassion for human sorrows, pain and suffering. He was an engaging companion, too, a lover of fiction as well as specialized literature, an artist well versed in drawing and painting. Even in his old age he proved to be more than a match for his much younger friends and relations as regards quick thinking and reaction but also physical condition. He loved long hiking tours in the vicinity of Prague and near his beloved country cottage in the Giant Mountains. This is where he would spend his days of rest surrounded by his family, where he would write his books, but also where he would chop wood and ski — as late as a few months before he passed away unexpectedly.

Academician Burian always took a fully engaged part in public and scientific life, always siding with progress and peaceful co-operation.

The sum of the life-long work of our very dear distinguished teacher was a manifestation of an uncommon talent which was responsibly utilized for the benefit of science, mankind and world peace.

Prof. Helena Pešková, M. D., DrSc

REMINISCENCES

It is an honour to be asked to write about a man for whom I had a great admiration. Professor F. Burian was born in 1881, thus the celebration of the centenary of the birth of the Founder of Plastic Surgery in Czechoslovakia and the Founder of a School of Plastic Surgery.

While I was working with Doctor V. H. Kazanjian in Boston in 1936, I came across an article by Professor Burian, in *Revue de Chirurgie Structive*, which was edited by Doctor Coelst in Brussels, Belgium. In one of the issues of the *Revue de Chirurgie Structive*, there was a report of a case by Professor Burian which was similar to a case being treated by Doctor Kazanjian at the time. The paper was written in French. I wrote to him in French describing Doctor Kazanjian's case and received a very interesting letter from Professor Burian, which unfortunately I have not kept. After the completion of my training in Boston, I decided to go to Prague to visit Professor Burian. After spending some time with my father, who was one of the leading physicians of the American Hospital of Paris, my wife and I traveled in a third class compartment from Paris to Prague, a long, cold and tiresome journey. This event occurred in November 1938. I received a warm reception from Professor Burian. I so well remember the beautiful city of Prague, which I had the opportunity to visit a number of times later. It was particularly beautiful, as a recent snowfall had occurred.

There is no doubt that Professor Burian had the best plastic surgery service in the world at that time. He permitted me to watch him operate at the hospital in which his service was installed at the time. Also, I spoke French, at that time Doctor Burian did not speak English, and I was able to communicate with him freely despite his deafness. I recall that he could hear me so much better while we were riding in his chauffeur driven car, a characteristic of otosclerosis. I was amazed at the vitality of this small man, who suffered a double handicap of Kyphosis and deafness. He had already acquired a reputation in the Balkan Wars. He had developed many new techniques and particularly the tubed flap, which he used during the Balkan Wars prior to Filatov and Gillies. However, he had not published the technique. This was a sad period in Prague. The Germans had taken over the Sudetenland and the Czechoslovak felt betrayed by their Allies. The Germans had recently marched into Austria and the Anschluss had taken place. World War II started in 1939 and there was no opportunity to communicate with Professor Burian until after the War. Despite the forebodings of the oncoming World War II, I can remember a very pleasant evening with Professor Burian's daughter, Olga, and his son.

Doctor Blair Rogers had heard me speak often of Professor Burian. In 1957 he visited Professor Burian. In February 1959 I went to Prague, the first American lecturer at Charles University since 1948 as a guest of the government. During this visit I had the occasion to admire the organization and the remarkable work being done in his new plastic surgery center.

I invited Professor Burian and his daughter Olga to the First International Symposium of the Manhattan Eye, Ear, and Throat Hospital on Plastic Surgery of the Eye and its Adnexa in 1961. It was, of course, a great pleasure to receive Professor Burian in New York. Professor Burian was an extraordinary man and a great plastic surgeon whose name will live in the history of plastic surgery. His vitality never flagged. He maintained his activities until the day of his death. He was kind enough to nominate me for membership in the Czechoslovak Medical Society J. E. Purkyně which was a great honor. Professor Burian was not only one of the outstanding surgeons of the world but also a great human being. His solicitude and kindness towards his patient, his tenderness for the children was particularly noticeable.

† John Marquis Converse, M. D., Dr. Hon. Causa,
Member of the Czechoslovak Medical Society J. E. Purkyně, New York, USA

It is with great affection that I'm picking up my pen to write a few reminiscences of Prof. František Burian, who was to me a model to be followed, an authority and a kind-hearted teacher.

Contact with him was bound to leave an indelible and unperishing influence on anyone who came in touch with him. He was a genuine pioneer who realised his professional plans with determination and consistency — being convinced of their aptness and validity. A humanist with wide interests who loved life in all its aspects and possessed a clearly defined hierarchy of his aims. A really great personality.

Besides these, such very actual qualities of his individuality, he had a command of great knowledge, wisdom and professional experience which allowed him to create his own individual school of plastic surgery and I am proud to have been his pupil.

He was the founder of plastic surgery not only in Czechoslovakia but also in Poland. The knowledge gained under the Professor's leadership, his advice and guide-lines permitted the establishing of this specialization in our country.

Polish plastic surgeons are grateful to the Professor and He will always be treasured in our memory.

Michal Kraus, M. D., Warsaw, Poland

C'est au Congrès International de Chirurgie Plastique organisé à Prague en 1956 par F. BURIAN et ses collaborateurs que beaucoup de chirurgiens européens et d'Outre-Atlantique rencontrèrent pour la première fois cet homme extraordinaire dont nous connaissons tous la réputation mondiale, mais qui ne sortait guère de son pays.

On était saisi par le contraste entre ce petit homme de soixante quinze ans comme replié sur lui-même et l'intensité de son regard à la fois critique et toujours indulgent, sérieux mais jamais sévère. D'ailleurs il était naturellement souriant, ce qui était une manifestation de son sens de l'humour et de son goût de la vie.

Lorsqu'il parlait, il ponctuait souvent sa phrase d'un petit rire sec qui évoquait parfois un bref songlot. Plus que d'autres il avait souffert au cours de sa longue vie et l'on avait l'impression que les nouvelles infortunes qui s'abattirent sur lui ne sauraient plus l'atteindre.

C'est avec une fierté bien justifiée que BURIAN nous fit visiter l'Institut de chirurgie plastique qui fut l'oeuvre de sa vie. Il naquit d'une «unité de chirurgie plastique» créée par lui pendant la première guerre mondiale au sein de l'armée Austro-Hongroise.

La guerre finie, l'Institut fut transféré à Prague. Son recrutement devint de plus en plus civil, s'orientant notamment vers les malformations congénitales et les pertes de substance cutanée.

La réussite scientifique de BURIAN, sa renommée internationale, lui attirèrent bien des jalousies, les collègues craignant de voir la chirurgie plastique s'approprier leur propre terrain.

Ces querelles de clocher ne se turent qu'en 1932, lorsque la chirurgie plastique fut érigée pour la première fois au monde en spécialité à part entière. Elle serait enseignée dans les Facultés et des chaires seraient créées.

Ceci est sans doute l'oeuvre maîtresse de BURIAN. Prague devenait, par le courage et l'intelligence d'un homme, de centre avancé de la chirurgie plastique. Même si son rôle dans le développement de la nouvelle spécialité s'était limité à cet enfantement, BURIAN resterait sans conteste le père de la chirurgie plastique contemporaine.

Daniel Morel-Fatio, M. D., Paris, France

Professor Burian was well-known in Britain as a pioneer in modern plastic surgery and as one of the European masters contemporary with his colleagues and friends, Harold Gillies, P. T. Kilner and A. H. Mc Indoe. He was one of a small band of surgeons in Europe who established plastic surgery as a speciality through their example and dedication in spite of difficulties. It is therefore right and fitting that we should remember him in the year of the centenary of his birth. To paraphrase Horace "Exegit monumentum aere perennius".

My association with Professor Burian was in the field of burns. From his experience in two world wars, he rightly considered that burns cases should be under the care of surgeons, and putting theory into practice he pioneered the setting-up of Burn Centres in Czechoslovakia, the first in continental Europe. Through his leadership and dedication excellent younger colleagues were trained, and as a consequence the Burn Centres in Prague and Ostrava became among the best in the world, clinically and in the realm of research.

I had the privilege of meeting him several times at conferences and the personal pleasure of being his guest at his home. He was a big man contained in a small body: a man with a broad humanistic approach to medicine and life, a man of considerable intellect, a man of integrity with a natural sense of modesty, an educated European of the old school with a modern progressive approach, a friendly person, a good friend, a fine speaker and an excellent host. He bore his deafness with courage and not without humour. I remember him telling me that one advantage was the ability to turn off his deaf-aid during boring lectures and speeches.

I am honoured to have had the opportunity to pay my respects to his memory on this occasion.

Simon Sevitt, M. D., Birmingham, England

I still have a clear picture in my mind of the affable figure of Professor Burian with his unfailing smile when, in June 1957, he accepted the invitation of his great friend Professor Sanvenero-Rosselli to take part in the IX Congress of the Italian Society of Plastic Surgery.

This long-standing friendship dated from the time when, after the First World War, a small group of pioneers who foresaw the importance of reconstructive plastic surgery even in times of peace, began to spread the principles and methods of this new branch of surgery.

On a previous occasion, in far off 1938, the visit of Professor Burian to Italy to attend the III European Congress of Plastic Surgery was unfortunately prevented by the despicable Nazi invasion of Czechoslovakia and it was only after the Second World War that these two friends could once again renew their ties.

The invitation to take part in the Congress of our Society had the precise object of honouring him not only as a scientist of the highest fame and a clinician of universally recognised experience but also as one of the founders of modern Plastic Surgery.

One of the themes of the Congress was "The Pathology and Clinical Aspects of the Congenital Malformations of the Face", a subject which was so very dear to Professor Burian. His talented and brilliant lecture on the facial malformations due to the abnormalities of development of the prosencephalon was a great success and there was a consensus of opinion among the numerous foreign authorities of international fame who were present at the Congress.

At the end of the meeting, during the reception offered in honour of the foreign guests, he was constantly surrounded by many people and always replied with cordiality and smilingly, leaning on the arm of his devoted and affectionate daughter Olga, to the questions put to him, transmitting to everyone his enthusiasm for plastic surgery.

During the evening he conquered everyone and many had the chance to become his friends; on his return to Prague he wrote to Professor Sanvenero-Rosselli saying how moved he was by the warm-hearted welcome he had received and by the affectionate atmosphere in which he felt himself surrounded.

His natural modesty prevented him from realising that it was undoubtedly due to his own personality and to the esteem and respect which he had been able to rouse.

The unexpected news of his sudden death in 1965 came as a shock to many of those who had, on that occasion, come to know and appreciate his gifts as a scientist and a gentleman.

Simon Teich Alasia, M. D., Turin, Italy

I owe all my professional development, the essentials of my scientific understanding and my subsequent scientific efforts to Academician František Burian, under whose supervision I had the privilege to work and to develop my devotion to plastic surgery.

I keep thinking back of a number of stories while I was active at his clinic, three of which seem to stand out prominently.

Academician Burian's eightieth birthday was being celebrated at the clinic. I was standing in line with other of his disciples waiting for my turn to come to extend by congratulations. No sooner had I started to read out my scripted tribute, naturally in the Czech language, than Prof. Burian interrupted me asking me urgently to speak in Bulgarian. I was surprised but, I admit, relieved too. Prof. Burian was obviously enjoying all this and, thanking me afterwards, he said my tribute in the Bulgarian language had reminded him of his young days, of his service as a volunteer in Bulgaria at the time of the Balkan wars in 1912—1913. Later on, while I was working on my doctor's thesis, I found that was exactly where Prof. Burian had performed his first planned reconstruction plastic operation of a facial wound, and that he was thinking of staying on and working in Sofia. His stay in Bulgaria where he worked with his wife Dr. Anna Lankašová had left an imprint on his personal life, too. He had a fond relationship with Bulgaria and often thought of "the good Bulgarians".

When I wrote my first scientific communication on the effect of toxoplasmosis on the development of congenital cheilopalatal defects Prof. Burian gave it several perusals, each time giving it back to be with a number of comments and suggestions, each time engaging me in long conversations on the

practical and theoretical problems involved. When I gave him my third revised version of the study he thought it was good saying: "Yes, this is how I should write it myself". He was as demanding to his disciples as he was to himself, yet always ready to give us a helping hand and much of his own knowledge and experience.

The whole Laboratory of Congenital Defects of the Czechoslovak Academy of Sciences was getting ready for their first collective research programme at Náchod, where statistics showed a high rate of congenital defect incidence. Academician Burian was tireless in spite of his advanced age. All the preparations, plans, schedules, travels, organization of screening, meetings with local doctors were going on with him taking an active part. His enthusiasm for the campaign had infected the whole team. In his opinion, any research worker or clinician should take unreserved and enthusiastic advantage of all the achievements of science and technology to be a real success.

His daily unobtrusive manifestations of care and love for his disciples coupled with uncompromising demands on discipline in coping with whatever assignments were to be fulfilled have secured him a firm position in our hearts where he remains as a great scientist, surgeon and teacher.

Konstantin Trošev, M. D., Varna, Bulgaria

Almost 30 years have elapsed since I had been treating and rehabilitating soldiers wounded in the Korean war. When I returned home, my highest ambition was to study the art of plastic surgery under the guidance of Professor Burian at his Clinic of Plastic Surgery, generally recognized as the finest of its kind in the world.

What I have experienced there, however, exceeded all my expectations. I had the privilege to observe the activities of a "school", a wonderfully stimulating centre working in a uniform spirit, performing operations designed with professional exactitude, based on deep theoretical knowledge and physiological ideas inspired by the brilliantly creative mind of a genius.

I highly respect Professor Burian not only as a great scientist and teacher but as a true humanist of deep understanding, who dedicated his life and activities with the same devotion to patients, colleagues, students or visiting scientists. The overpowering superiority of his genius was mellowed by a warm human attitude and his profound sense of humour. His artistic talent found expression not only in his extraordinary skills in the operating theatre but also in his own paintings decorating the walls of his lovely home. His beautiful pictures were greatly admired by all who enjoyed the honour of an invitation to the home of this gracious host.

The heritage bequeathed by Professor Burian is greatly treasured and shared by all scholars of plastic surgery. Those, however, who were fortunate enough to immediately draw on the inexhaustible source of his great spirit may feel truly privileged.

Janos Zoltan, M. D., Budapest, Hungary

Charles University Medical Faculty of Hygiene, Prague (Czechoslovakia)
Department of Plastic Surgery
Head Prof. M. Fára, M. D., DrSc.

THE USE OF PERIOSTEAL FLAPS FOR BRIDGING MAXILLARY DEFECTS IN FACIAL CLEFTS

J. Hrivnáková, M. Fára, Ž. Müllerová

Postoperative compression of maxillary segments is a major complication in the treatment of all the more serious forms of unilateral and bilateral clefts. Efforts to prevent this involve, in particular, the creation of a free lip complete with physiologically reconstructed m. orbicularis oris, and also the use of mechanical means designed to prevent the maxillary poles from coming closer together. For this, a variety of orthodontic devices are available as well as a few surgical techniques.

One of the first researchers to explore the problem was F. Burian, who used a mucosal flap pulled in from the vestibule in order to preserve the narrow gap in the cleft alveolus. Another surgical technique of preventing postoperative compression of the maxilla is primary osteoplasty. This involves the implantation into the maxillary cleft gap of bone from the rib or tibia performed simultaneously with lip suture.

In yet another method designed for this particular purpose, the cleft gap is bridged with a periosteal flap taken from the front maxillary area.

Skoog's method of exploiting the periosteum for filling the maxillary cleft gap with newly developed bone is based on four conditions:

1. the periosteum covering the maxillary segments is endowed with normal growth potential;
2. the exposed maxillary bone is as capable of regenerating normal periosteum as any other bone;
3. the interaction induced between the growth centres of the medial and lateral sides, and the biomechanics of the whole region then determine a more advantageous growth and development of the united maxilla;
4. the full osteogenic capacity of the periosteum lasts until 5 years of age to become gradually reduced from the on.

Since we were wary of an extensive exposure of the front maxillary area in infants in order to create a large periosteal flap up to 15 mm wide according to Skoog (the flap contains most of the periosteum of the anterolateral maxillary wall), it took some time of hesitation before we decided to introduce or at least to try out the technique.

Eventually, we decided to employ this auxiliary method in primary suture of the lip, however, using a much narrower periosteal flap involving a far less extensive exposure of the maxilla since we had failed to make sure about the presupposed regeneration of the periosteum at the site of the defect. We now create periosteal flaps 5—7 mm broad and 15—20 mm long, i. e. large

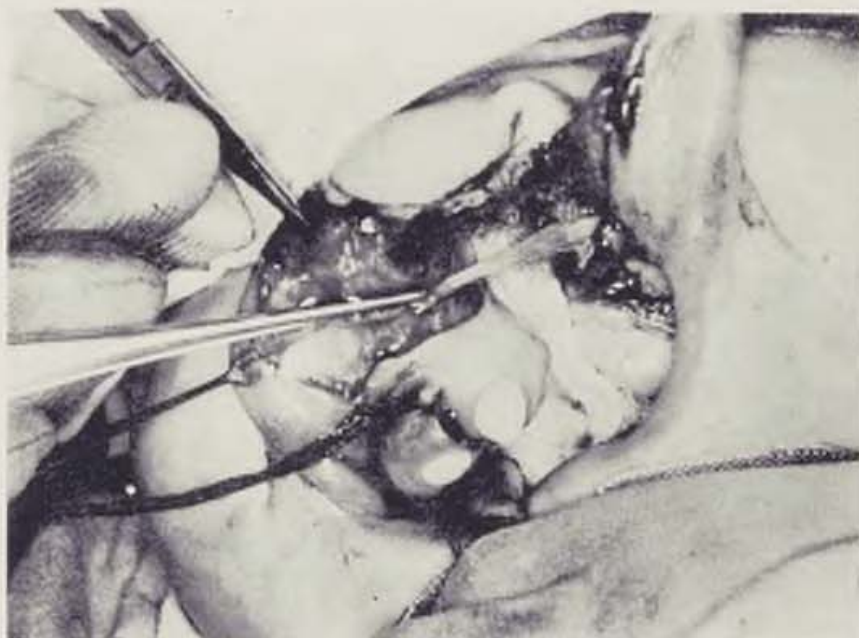


Fig. 1 Periosteal flap before being sutured to premaxilla

enough to reach over the cleft aperture. Following incisions on the sides and at the end, the flap is rotated by more than 90° round its pedicle situated at the edge of the piriform aperture, stretched over the cleft, and sutured to the premaxillary periosteum.

This narrower periosteal flap proved to be sufficient for the cleft to become bridged over by bone in the course of a few months. The newly grown bone, of course, is not big enough to fill the whole gap between the two jaw segments. In our opinion, however, and according to experience gathered by now, the periosteal flap acts favourably on maxillary development in that it joins together the cleft maxillary segments — elastically at first, later on through a narrow lamella of bone. In unilateral clefts this results in a more favourable and speedier rounding of the maxillary arch, in bilateral clefts there is a speedier correction of the interrelationship between the jaw and the lateral maxillary segments.

Operations based on this technique were used in more than 200 patients. Of these, a group of 183 patients (140 with unilateral, 43 with bilateral clefts) were followed up comprehensively for periods of 5 to 7 years. Not one of them developed either early (lip healing) or late complications of any kind.

Clinically speaking, the very first post-operative weeks showed the anterior portion of the maxillary arch rounding off rapidly both in unilateral and, in particular, in bilateral clefts with intermaxillary protrusion being checked far more favourably than in the control group.

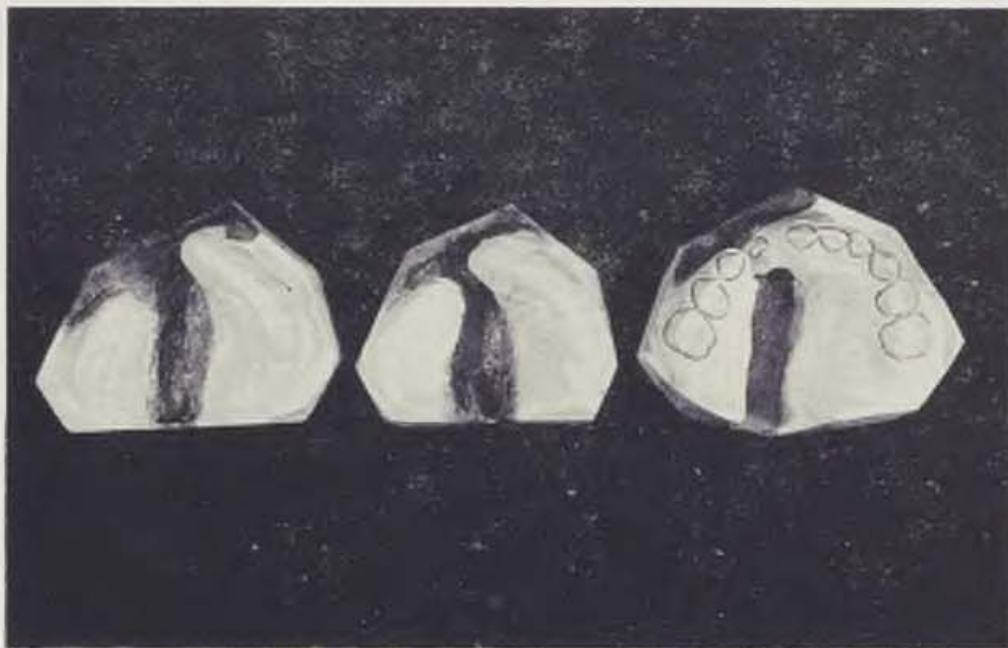


Fig. 3 Patient H. B. with right-sided cleft lip, maxilla and palate. Models of dentition: 5 months, 12 months, and 5 years

Supporting the base of the nose and the wing arising beneath with the stretched pericsteal flap permitted the correct positioning of the base of the nose at the level of the other, unaffected side.

As X-ray pictures showed, the cleft aperture had become bridged with bone in 75 % of the patients. The average thickness of bone tissue regenerated along the periosteal flap within two years of surgery ranged between 3 to 4 mm.

Using the periosteal flap to enhance the dynamic of maxillary growth proved to be demonstrably better than in the control groups of patients with primary osteoplasty and patients without the periosteal flap and without osteoplasty.

A study was undertaken of the effect of the periosteal flap technique on the arrangement of the cleft maxilla alveolar process, of the dynamics of their changes, and of opportunities for growth stimulation in the region of the cleft poles and the premaxilla.

The periosteal flap effect on maxillary development was studied in terms of analyzing models of the teeth, making clinical assessments of the relation-

ship of the two jaws, evaluating dentoalveolar malformations, and using X-ray pictures of the cleft aperture region.

Models of upper jaw teeth in patients with unilateral total clefts made before primary suture of the lip show, in all cases, an unfavourable protrusion of the inner pole, and hypoplasia and oral impression in the anterior

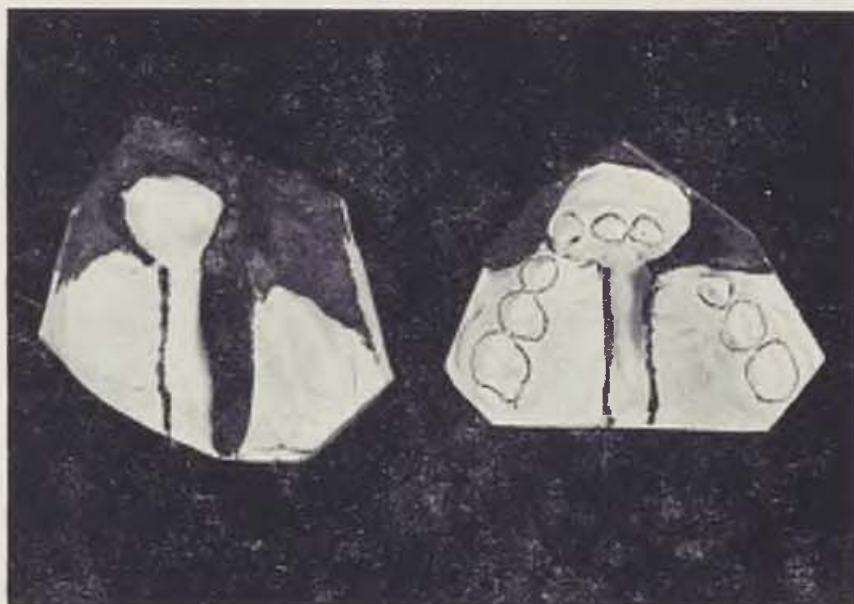


Fig. 6 Patient V. S. with bilateral cleft lip, maxilla and palate. Models of dentition: 6 months and 4 years

region of the outer pole. The gap between the two parts of the cleft maxilla, which is always present, is the most conspicuous in exactly the alveolar region. In boys, it is on average 10.6 mm wide (S. D. = 2.94), in girls 11.2 mm (S. D. = 2.81) measured directly between the two poles.

After the operation, the two segments come closer together thanks also to the action of the reconstructed m. orbicularis oris, and the alveolar arch becomes visibly rounded. These are all relatively rapid changes caused by the movement of whole maxillary segments.

As the child grows older, the upper jaw alveolus keeps assuming its rounded shape, there is evidence of the hypoplastic outer pole powerful growth to full size and of the oral impression in its anterior part diminishing or disappearing altogether. Regardless of sex, it was found in only 21.5 % of the cases of children aged 3 to 5 years. The two parts of the alveolus keep coming closer together. Close contact between them was found in 73.4 % of 5-year old boys, and in 56.2 % of girls of the same age. The resulting shape of the alveolus is an arch without any major sagittal or transverse compressions. In the cleft region the alveolus grows to full height, i. e. at the levels of both the comb and the apical base.

Compared with the dimensions of the dental arch in healthy children of equal age the arch in individuals with cleft anomalies is wider or well within the norm. The length of the dental arch is a little shorter due to dentoalveolar retrusion in the frontal part of the teeth. There is a low rate of major orthodontic anomalies. All that could be seen in that particular age group were



Fig. 7, 8 Patient I. J. — Total left-sided cleft before and after Tenssion's operation of the lip involving the simultaneous use of the periosteal flap

anomalies in the dentoalveolar component. There was no evidence of anomalous development in the distal part of the alveolus of the donor portion of the maxilla, from which the periosteal flap had been taken.

Preoperative examination of the teeth of patients with bilateral clefts will invariably reveal marked intermaxillary protrusion; half the cases will show the intermaxilla as being situated asymmetrically. This is perhaps better illustrated by figures about the alveolar gap in the cleft region measured from the anterior edge of the cleft pole to the lateral part of the intermaxilla. This gap is 5.2 mm wide (S. D. = 4.8 mm) on the right, and 8.2 mm (S. D. = 5.6 mm) on the left. The anterior region of the two cleft segments is markedly hypoplastic and shifted oralward. Following surgery of the lip, the models of teeth show the pull of the periosteal flap as having corrected the asymmetry and protrusion of the intermaxilla. By the age of 5, the gap between the alveolus and the intermaxilla had been reduced to 0.5 mm (S. D. = 1.3 mm) on the right, and to 1.8 mm (S. D. = 2.1 mm) on the left. The intermaxilla is localized in the median plane of the face with the two outer cleft poles growing to full size; the alveolus, however, fails to grow

to its full height as there is often an impression at the apical base level. Comparisons with a group of healthy children of equal age showed the appearance in 5 year old individuals with anomalies of the upper dental arch being narrowed in the canine teeth region. As patients with bilateral cleft lip, maxilla and palate grow up all the three parts of the cleft upper jaw alveolus

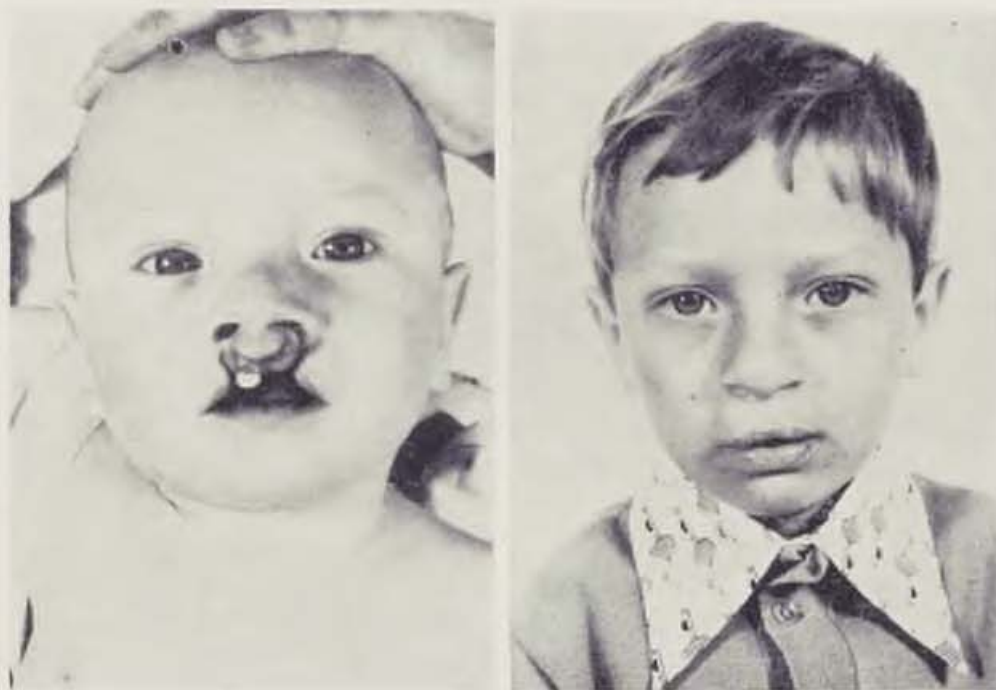


Fig. 9, 10 Patient J. H. — Total bilateral cleft with elastic bridge on the right before and after operation using a single-time modification of Veau's method with use of periosteal flaps

come into contact with one another. The alveolus can be seen growing to full size intensively in the region of the cleft poles. Orthodontic anomalies are far more frequent than in patients with unilateral involvement, but again they appear to be confined to the dentoalveolar region only. Intermaxillary protrusion, often combined with considerable overbite and oral inclination of the premaxilla, is seldom seen and can be treated conservatively. There was no evidence of any anomalous development of the distal parts of the alveolus.

CONCLUSION

183 children with cleft lip, maxilla and palate (140 unilateral and 43 bilateral cases) were followed up in a comprehensive programme for 5 to 7 years after the maxillary cleft was bridged by a pedicle periosteal flap. The following conclusions were drawn.

Unlike the control group, there was an accelerated rounding of the alveolus and disappearance of intermaxillary protrusion and outer pole oral impression.

There was no evidence of the maxillary growth capacity being impaired as a result of lifting the periosteal flap.

Bone neoplasia in the periosteal flap region was found in 75 % of the cases concerned as shown by X-ray picture evaluation. The bony bridge thus created was unevenly thick in individual cases.

Powerful bone neoplasia was found in the anterior region of the outer pole, the alveolus growing to full height and gradually establishing contact with the premaxilla. This permitted the mesial migration of teeth of permanent dentition in the outer segment. No bone build-up was found on the intermaxillary side.

The upper jaw alveolar arch showed no oropetal compression. The number of orthodontic anomalies was lower than in controls and, if so, they were confined to the dentoalveolar region.

In bilateral clefts, the periosteal flap took a share in improving the relationship of all the three segments of the cleft maxilla. In particular, it helped to reduce intermaxillary protrusion, to diminish the size of overbite, and to improve the position of the intermaxilla in relation to the median plane of the face.

Bridging maxillary cleft with the periosteal flap is an easy operation adding barely 5 minutes to the primary suture of the lip.

The periosteal flap improves the appearance of the lip and the base of the nose by creating a firm support for both.

J. H.

SUMMARY

A long-term follow-up was undertaken in 183 children with unilateral and bilateral clefts who had had the maxillary aperture bridged with pedicled periosteal flaps. The results showed some of the positive aspects of the operation. The elastic connection between the maxillary cleft segments permitted a better shaping effect on the maxilla of the reconstructed m. orbicularis oris. The alveolus became arched, intermaxillary protrusion disappeared, and the outer pole oral impression levelled up. X-ray examination showed bone neoplasia along the periosteal flap in 75% of the cases concerned. Powerful bone build-up was seen in the external pole anterior region, the alveolus growing up to full height and gradually establishing contact with the premaxilla, thus permitting in the outer segment the mesial migration of the tooth germs of permanent dentition. The number of orthodontic anomalies is lower than in cases where bone transplants were used or where nothing was done to establish union in the maxillary cleft region. Premaxillary protrusion was favourably and rapidly influenced in cases of bilateral clefts. — In uni- and bilateral clefts alike, the periosteal flap improved the appearance of the lip and the base of the nose by providing a firm support for both.

J. Hrivnáková, M. Fára, Ž. Müllerová

THE USE OF PERIOSTEAL FLAPS FOR BRIDGING MAXILARY
DEFECTS IN FACIAL CLEFTS



Fig. 2 Patient J. R. with unilateral cleft of lip and maxilla. Dental X-ray of periosteal flap region showing discernible bone neoplasia

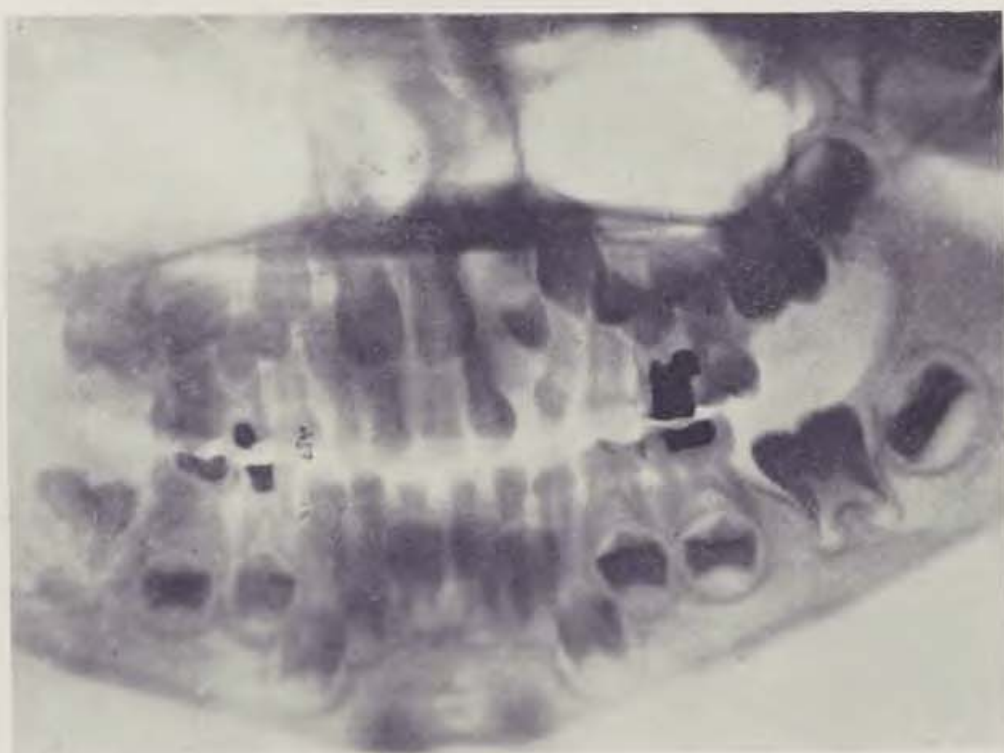


Fig. 4, 5 Patient J. K. with left-sided cleft lip and palate. Orthopantomograms at ages 4 and 5 and a half. The latter age picture shows the mesial migration of teeth within lateral segment

RESUME

Utilisation du lambeau périostal pour couvrir un défaut dans la partie maxillaire en cas des fissures faciales

Hrivnáková J., Fára M., Müllerová Ž.

L'observation à long terme des 183 enfants avec la fissure unilatérale au bilatérale chez qui on a couvert la fissure dans le maxillaire par un lambeau périostale à tige a montré plusieurs avantages de cette intervention. L'union souple entre les segments de fissures du maxillaire permet mieux modeler le muscle de lèvre reconstruit sur le maxillaire. L'alvéole devient voutée, la protrusion entre les maxillaires disparaît et l'impression orale du pôle extérieurement se règle. La nouvelle création de l'os le long du lambeau périostal fut prouvée par les rayons X dans 75 % des cas. La nouvelle création de l'os est évidente surtout dans la zone antérieure du pôle extérieur, l'alvéole se remplit dans toute sa hauteur et peu à peu prend contact avec le prémaxillaire ce qui permet la migration mésiale des alvéoles de la denture permanente dans le segment extérieur. Le nombre des anomalies orthodontaires est moindre que dans les cas où on a appliqué le transfert osseux ou les cas où on n'a rien fait pour l'union dans la zone de la fissure maxillaire. En cas des fissures bilatérales la protrusion du prémaxillaire est influencée très favorablement et rapidement.

En cas des fissures unilatérales et bilatérales le lambeau périostal améliore la vue de la lèvre et du nez par la formation d'un fond solide.

ZUSAMMENFASSUNG

Anwendung des Periostlappchens zur Überbrückung des Defektes im Kiefer bei Gesichtsspalten

Hrivnáková J., Fára M., Müllerová Ž.

Die langfristige Untersuchung von 183 Kindern mit einseitiger und beiderseitiger Spalte, bei denen die Überbrückung der Fissur im Kiefer mit einem gestielten Periostlappchen durchgeführt wurde, zeigte einige Vorteile dieser Operation. Die elastische Verbindung zwischen den Spaltensegmenten des Kiefers ermöglicht besser die modellierende Wirkung des wiederhergestellten Lippenmuskels auf die Maxilla. Der Alveolus wird gewölbt, es verschwindet die Protrusion des Zwischenkiefers und die orale Impression des äusseren Poles gleicht sich aus. Die Knochenneubildung entlang des Periostlappchens wurde röntgenologisch in 75 % aller Fälle nachgewiesen. Zur massiven Knochenneubildung kommt es in der Gegend des vorderen Bereiches des äusseren Poles, der Alveolus füllt sich in seiner gesamten Höhe und allmählich gerät er in Kontakt mit der Prämaxilla, wodurch im äusseren Segment die mesiale Migration der Zahnkeime des permanenten Gebisses ermöglicht wird. Die Zahl der orthodontischen Anomalien ist niedriger als in Fällen, wo wir die Knochenübertragung benutzt oder wo wir für die Verbindung in der Gegend der Kieferspalt nichts getan haben. Bei beiderseitigen Spalten wird die Protrusion der Prämaxilla sehr günstig und schnell beeinflusst.

Bei einseitigen sowie beiderseitigen Spalten verbessert das Periostlappchen die äussere Form der Lippe und der Nasenbasis, in dem es für beide eine feste Unterlage schafft.

RESUMEN

Utilización del lobulillo periostal para suprimir un defecto en la mandíbula en caso de scisiones faciales

Hrivnáková J., Fára M., Müllerová Ž.

Al chequear, a largo plazo, 183 niños con scisión facial uni- y bilateral en quienes se había suprimido la hendidura en la mandíbula por medio de un lóbulo

periostal con pecíolo se vieron claramente los aspectos positivos de tal operación. La unión flexible entre los segmentos de scisión de la mandíbula facilita un efecto modelador más fuerte del músculo labial sobre la maxilar. El alvéolo se pone arqueado, desaparece la protrusión de la intermaxilar nivelándose la impresión oral del polo exterior. La recreación del hueso a lo largo del lobulillo periostal ha sido probada por radiografía en un 75% de los casos. Se produce una abundante recreación del hueso en la región anterior al polo exterior, el alvéolo se llena en toda su altura y paulatinamente va entrando en contacto con la premaxilar lo que posibilita, a su vez, una migración mesial de los gérmenes dentales de la dentadura permanente. El número de anomalías ortodónticas es más bajo que en los casos donde utilizamos la transplantación del hueso o donde dejamos de proceder a la operación en absoluto. La protrusión del premaxilar en caso de scisiones bilaterales, es influida en forma muy favorable y a paso veloz.

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The Austrian, Swiss, and German Societies of Plastic Surgery will be holding a joint scientific conference in Innsbruck (Austria) on September 23—26, 1981.

Subject: microsurgery, congenital defects of face and extremities, rhinoplasties.

Institute of Experimental Medicine, Czechoslovak Academy of Sciences,
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THE USE OF FETOSCOPY BY INBORN MORPHOLOGICAL ANOMALIES

M. Tolarová, A. Zwinger

An amniocentesis is the most widely and successfully used method of pre-natal diagnostics. Most often, the amniotic fluid is obtained by a transabdominal puncture. The liquid is examined biochemically and the fetal cells, cultivated or non-cultivated, are examined by cytogenetic, biochemical and histochemical methods. Using this method, a diagnosis of many inherited diseases can be ascertained, covering genetic pathology from sex-linked diseases and chromosomal aberrations to inborn errors of metabolism. The number of diseases revealed by histochemical and biochemical methods increases all the time. Nevertheless, the diagnosis of only 20 % of all the genetically determined diseases can be really settled.

A large number of morphological inborn defects that were not caused by chromosomal aberrations nor coupled with biochemical anomalies, was beyond the limits of the prenatal diagnostics. For example, it regards to inborn malformations of extremities, whose incidence is on the first place in all statistical samples analyzed and to inborn defects of the orofacial region, which are usually in the second order there. Thus, it can be seen, how large this group in fact is.

Under the term fetoscopy is meant a direct aspection of the fetus in utero using an endoscope specifically designed for this purpose. The fetoscopy enabled a prenatal diagnosis of all inborn developmental anomalies, that are expressed as morphological defects of limbs, face, ears, trunk etc., or coupled with them.

The first fetoscopy, which did not lead to interruption of the gravidity, was performed in 1973 by Scrimgeour. Following laparotomy, a telescope with fibrous optics of 2.7 mm in diameter was introduced into the amniotic cavity [15]. Before this date, another fetoscopy was accomplished by Westin using a hysteroscope, which was introduced through a dilated cervical channel [18]. The hysteroscope's diameter was 10 mm. He observed fetal limb movements and

swallowing when local anesthesia was used, but neither if a general anesthetic was used. All three of his patients subsequently underwent termination of pregnancy. In another report [19], the fetus was photographed and oxygen tensions in the umbilical vessels assessed, but the pregnancy was immediately terminated. Valenti [17] was the first, who took out a skin biopsy specimen of the fetus and withdrew a sample of fetal blood from the umbilical vessels, in addition to regular observations of the fetus in the amniotic cavity. At last, a hysterotomy was performed and all the gravidities were terminated. A large sample of fetoscopies (about 100 examinations) was evaluated by Benzie and Doran [1]. Placenta and umbilical cord were successfully observed by 2/3 of the patients, external genitalia by 1/4, some biological material was removed in 75 % of the cases. Another large sample was assembled by Rodeck and Campbell, who took the fetal blood [12] and settled a diagnosis [14] or excluded [13] external morphological defects of the fetus. Several deliveries of mature newborns, who had been examined by fetoscopy, were also described in literature. However, 1/4 of the cases still resulted in abortion. The reasons were intrauterine death of the fetus and intrauterine bleeding [2, 3, 4, 6, 7, 8, 9, 10, 11].

Thanks to unusual understanding and support given by the Institute of Mother's and Child's Care in Prague, the first fetoscopies in Czechoslovakia were performed in 1974 [20]. For this purpose, gravidities in the IInd trimester were chosen that had to be interrupted for various reasons. Finally, they were terminated by "sectio Caesarea parva" under general anesthesia. The technical skill and experience were gained during three years of preparations. Then, the first diagnostic fetoscopy was performed in October 1977 with the aim to show, whether the fetus was affected with an inborn malformation or not.

The fetoscopy is performed under general anesthesia in the time period between 13th and 15th week of gravidity. The trocar is lead through the transversal Pfannenstiell's section of the skin. The insertion point on uterus is chosen in respect to localization of the placenta, usually in the midline above the lower segment. The localization of the placenta is revealed by ultrasound examination. A circular catgut suture is prepared around the insertion point of the trocar in the wall of the uterus. It is tightened, when the examination had been finished and the fetoscope pulled out. The fetoscope WOLF with fibrous optics was used in all the examinations. Visual angle of the objectives was 170° and 100°. In the former case, a general view was enabled, in the latter case, the details could be recognized. The diameter of the trocar tubus was 3.2 mm.

As an illustration, several cases of diagnostic fetoscopies will be shown. They were indicated by the Genetic Department of the Institute of Experimental Medicine (Czechoslovak Academy of Sciences) in Prague. The fetoscopy was always preceded by a detailed genetic examination. It was complemented by laboratory, X-ray and other examinations, if necessary. The detailed gynecological and ultrasound examination, usual preoperational examinations and approval given by a particular Commission for Interruptions of Gravidities, were always required.

Case history No. P-731: Proband R. D. suffered from lobster claw hands and feet syndrome. He was born from the second gravidity. The first gravidity was ended by a spontaneous abortion. The child's father was one of identical twins. He had a minimally expressed anomaly. The autosomal

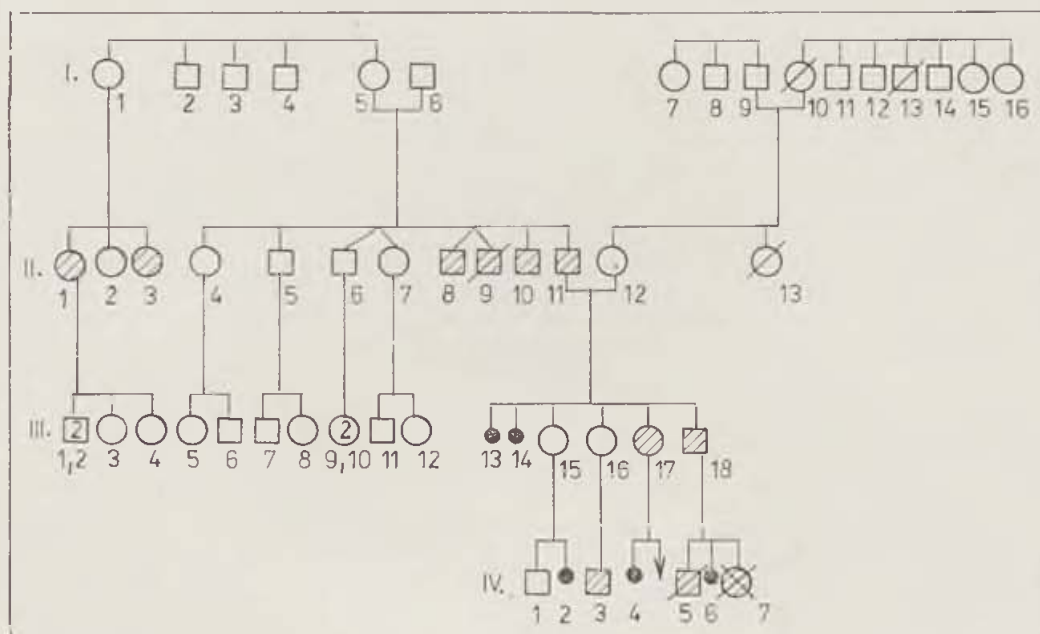


Fig. 1. A pedigree, in which an ectrodactyly of the lobster claw hands and feet type occurred. IV/7 — the gravidity was terminated, because the affected fetus was diagnosed by means of the fetoscopy.

dominant determination of this inborn malformation is known. The risk figure for another child is about 50 %. The fetoscopy was performed in the 14th week of gravidity. It was found that fetus' extremities were normal. The gravidity was continued and regularly followed in the Institute of Mother's and Child's Care. Finally, a normal girl was born. The gravidity and the delivery went on without complications. The child was repeatedly examined. Its neuropsychic and motor development has been normal.

Case history No. P-425: Proband P. B. suffered from lobster claw hands and feet syndrome. His first son had the same anomaly on upper extremities and died in the age of 2 years due to consequences of a burn injury. The proband's sister, father and further six individuals closely related to proband were also affected (Fig. 1). The fetoscopy was performed in the 15th week of the gravidity. The placenta was situated partially on the anterior wall of uterus. In respect to high genetic risk (50 %), the fetoscopy was decided to be performed. Following luxation of uterus, the insertion points were chosen on its posterior wall and on the fundus of uterus. The right hand of the fetus was affected and the gravidity was terminated "per sectionem Caesarea parva" under the same general anesthesia. The diagnosis was confirmed by direct as-

peption of the fetus (Fig. 2). Recently, the mother has been in our preconceptional care, as she has planned another gravidity.

Case history No. P-896: Proband E. P. suffered from a syndrome of fistulas on the lower lip (sy Van der Woude). It was her first gravidity. In 75 % of the cases, the syndrome of fistulas on the lower lip is combined



Fig. 2. The fetus IV/7 from the pedigree shown in Fig. 1. The right upper extremity is affected with ectrodactyly of the lobster claw type.

with some type of the orofacial clefts. The genetic risk for a child is 50 %. The fetoscopy was indicated. However, the placenta was found to cover all the anterior wall of the uterus. Therefore, the fetoscopy could not be done. A son was born affected with cleft palate and fistulas on the lower lip. A year later, the proband became gravid again. The fetoscopy was performed and lip fistulas on the lower lip were revealed. The gravidity was interrupted. On the exposed fetus, a cleft palate was recognized (Fig. 3).

Case history No. P-911: Proband P. N. suffered from a Treacher-Collins syndrome (Franceschetti-Zwahlen-Klein sy, dysostosis mandibulofacialis). The child was born from the first gravidity. From the second gravidity, a clinically normal daughter was born, but she died when she was 1 year old.

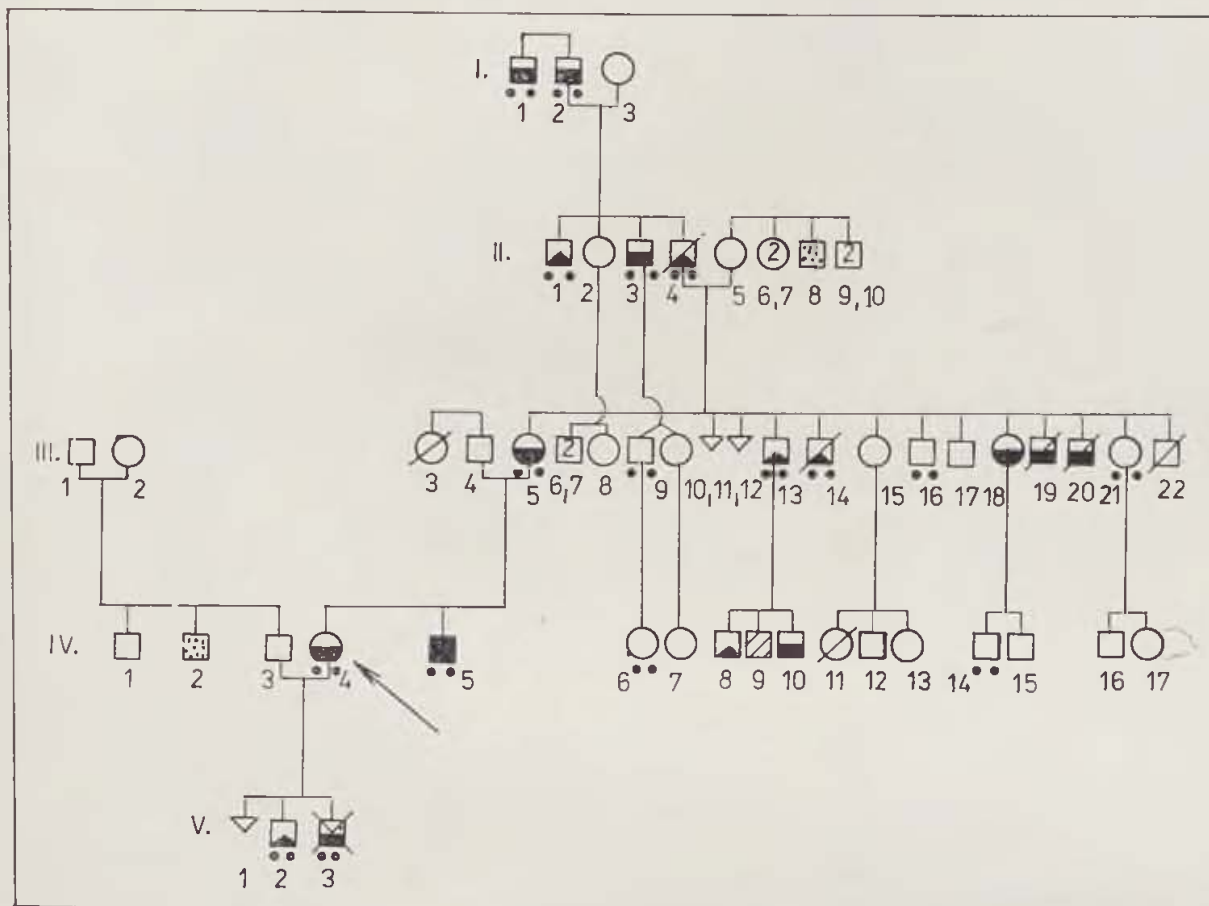


Fig. 3. A pedigree, in which Van der Woude's syndrome occurred. V/3 — the gravidity was terminated due to malformation of the fetus. — black nad white square — cleft palate, white circle + two dots — fistulas on the lower lip, black circle — celft lip, maxilla and palate, black and white square + two dots — cleft palate and fistulas.

The third gravidity was ended by a spontaneous abortion. The proband's father was affected with the same malformation, but the symptoms were minimally expressed. The fetoscopy was indicated in the fourth gravidity, as genetic risk of the anomaly is 50 %. It was performed in the 16th week of the gravidity. An abnormal appearance of the face of the fetus was seen, which was typical for the Treacher-Collins syndrome: antimongoloid position of eye fissures, malformed auricles situated in a rather low position, hypoplastic mandibula. The gravidity was terminated "per sectionem Caesaream parvam" during the same general anesthesia. The diagnosis proved to be correct when the fetus was examined directly (Figs. 4 and 5).

Case history No. P-794: Proband B. Š. suffered from bilateral total cleft lip, maxilla and palate. The proband's brother, mother and another fetus examined after interruption of the proband's gravidity were affected in the same way. All the patients in this family had cleft lip or cleft lip, maxilla



Fig. 4. The 16-week-old fetus affected with AD Treacher-Collins' syndrome diagnosed by fetoscopy. An antimongoloid position of eye fissures and low position of malformed auricles can be clearly seen in the picture. — Fig. 5. The fetus from the Fig. 4., viewed from a profile. The malformed auricle and hypoplastic mandible are clearly visible.

and palate, either unilaterally or bilaterally. No patient and no patient's relative had fistulas on the lower lip or other signs suggesting some relationship to any of the autosomal dominant syndromes possessing a facial cleft component. Although this type of malformation is determined by a polygenic genetic system, this family has shown such a high genetic risk values that are known to be valid for autosomal dominant diseases. The fetoscopy was performed in the 15th week of the gravidity. On the face of the fetus, no signs of cleft lip were seen and its appearance was normal. The gravidity was continued and a normal daughter was born in term.

Case history No. P-879: Proband V. E. suffered from Majewski syndrome. She was born from the fifth gravidity of her mother (Fig. 6). A daughter born from the first gravidity was affected with all the symptoms of this lethal syndrome, and died soon after the birth. Two subsequent gravi-

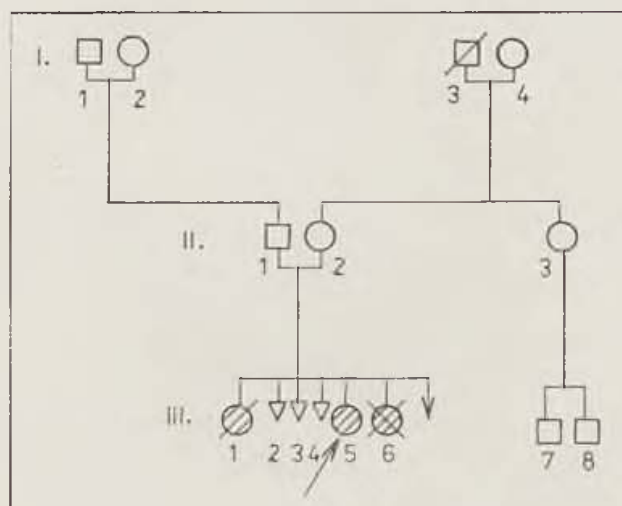


Fig. 6. A pedigree, in which the AR Majewski syndrome occurred. III/6 — the gravidity was terminated, because the fetus suffered from polydactyly and medial cleft.

dities were ended by spontaneous abortions. The proband from the fourth gravidity, who is nowadays a girl about 2 years old, is in a relatively good condition. A heart defect, one of the causes leading to death, has been missing. The risk figure based on an autosomal-recessive mode of inheritance was equal to 25 %. The fetoscopy was performed in the 17th gestational week and a polydactyly and a medial cleft were observed on the fetus (Figs. 7, 8 and 9). The gravidity was interrupted. Recently, the mother is gravid again and the fetoscopy is planned in a near future.

In addition to the described cases, a series of fetoscopies indicated for various reasons was performed in the same institution.

Based on the literature data [5, 9, 15, 16], on our experience with fetoscopies and on knowledge gained by our work on genetic diagnosis and prognosis of the morphological inborn developmental anomalies for many years, the indications of fetoscopies were tentatively classified. Six groups were suggested in respect to urgency and severity of the considered inborn developmental malformations or syndromes.

I. a) The autosomal dominant or autosomal recessive inborn developmental defects and syndromes that are lethal before birth, unable to survive, or those leading to child's death soon after the birth.

A necessary condition is an apparent morphological abnormality of extremities, face, auricles or other body parts, representing a constantly present sign of the anomaly. It should be sufficiently developed in the time period

suitable for fetoscopy, i. e. in the beginning of the IInd trimester of the gravidity (e. g. sy Majewski).

I. b) The same as indicated under the point a), but in the case of inborn malformations and syndromes not leading to immediate child's death. The



Fig. 7. The fetus III/6 from the pedigree shown in Fig. 6. A medial cleft of the upper lip is clearly visible.

child survives, but just an insufficient correction can be achieved by a surgical and following complex treatment of the anomaly. The patient cannot be healed to the extent as to become a normally situated member of the society (e. g. Treacher-Collins sy, lobster claw hands and feet sy, Apert's sy, Carpenter's sy, EEC sy etc.).

II. The autosomal dominant inborn developmental anomalies affecting only a limited region or regions of the body (extremities, face etc.) that can be rather easily corrected surgically (e. g. Van der Woude sy, syndactylies, polydactylies, oculodentodigital sy etc.).

III. The autosomal recessive inborn developmental anomalies and syndromes affecting just a limited region or regions of the body that can be rather easily corrected surgically (e. g. Mohr's sy/OFD sy. II, etc.).

IV. The inborn developmental anomalies determined by a polygenic genetic system in families characterized by a high genetic risk (if several closely

related individuals are affected with the same type of the anomaly) (e. g. facial cleft — see the case history No. P-794 in this paper).

V. If there is a justified reason to suspect teratogenic influences having caused a gross damage to the fetus, which could be observed by the fetoscope.

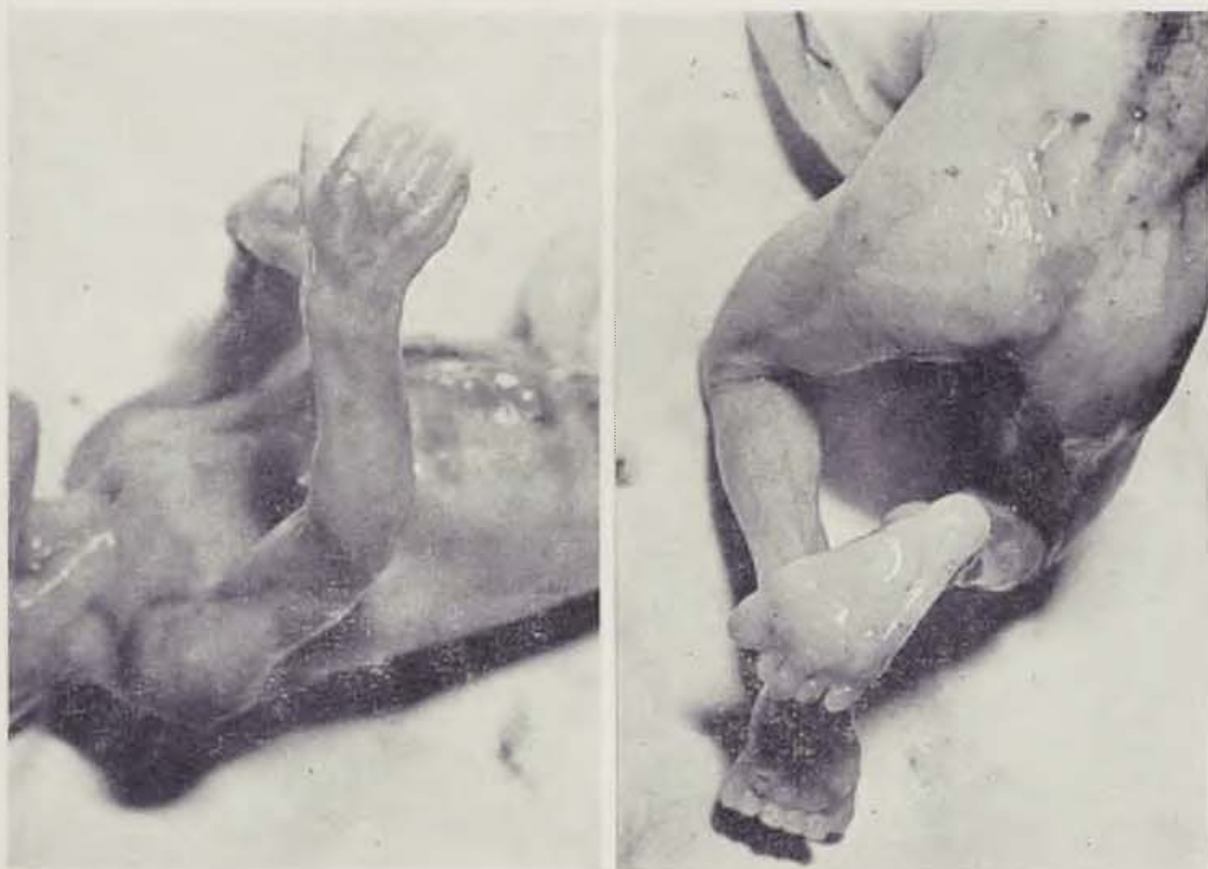


Fig. 8. The fetus III/6 from the pedigree shown in Fig. 6. A polydactyly of the upper right extremity is shown. — Fig. 9. The fetus III/6 from the pedigree shown in Fig. 6. A polydactyly of both lower extremities is clearly visible.

In such cases, a consultation of a geneticist with a qualified teratologist would be desirable (e. g. a caudal regression syndrome induced by exposures to organic solvents, etc.).

VI. If the sex of the fetus should be determined, but amniocentesis could not be performed for some reason (or if cultivation of amniotic cells was unsuccessful and the result of another examination could not be waited for by rather progressed gravidities). (It regards to all sex-linked inborn developmental anomalies that may be also lethal — e. g. OFD I, etc.).

The fetoscopy should be always indicated by an experienced geneticist, who could minimize possible errors in diagnosis of morphological inborn developmental anomalies affecting extremities, face, auricles or occurring in complexes constituting syndromes. Unfortunately, such errors are still quite frequent especially by morphological inborn developmental anomalies, by which

only X-ray examination and sometimes anthropometry may supply additional data proving or disproving the suggested diagnosis — no other laboratory tests are available. Certain degree of experience is an inevitable condition facilitating a correct diagnosis. The variability in manifestation of typical signs is so great that often the minimally expressed anomalies or symptoms of syndromes may be overlooked by an unexperienced physician and wrong diagnosis could be settled. It does not seem to be a serious mistake, if a pediatrician or surgeon describe the malformation just morphologically, as it is fully sufficient for further treatment of the patient, e. g. surgical correction of the malformation. However, the erroneous genetic diagnosis is quite inexcusable, as it may lead to consequent mistakes endangering or indirectly damaging other individuals. It is recommended to consult the diagnostically and prognostically problematic cases with two or more genetic laboratories before approaching to the fetoscopy.

The fetoscopy should be executed by an experienced surgical team. It is evident that a technically perfect surgical performance is crucially significant for normal course of gravidity and delivery following the fetoscopy.

The physician performing fetoscopy should be familiar with normal morphology of the human fetus. He should know, how the atypical forms could look like. He, again, should be an experienced specialist, as partially expressed symptoms may be present by the fetus similarly as they occur by adults, but their evaluation is much more complicated when viewed through the fetoscope.

It may be concluded that the introduction of fetoscopy to medical practice significantly enlarged possibilities of prenatal diagnostics of the inborn developmental anomalies. It enables prevention of such malformations that could not be detected by the previous methods.

S U M M A R Y

Fetoscopy, a new method of prenatal diagnostics, is thoroughly dealt with in this article. The experience gained till this time abroad is summarized and several practical cases, by whom the fetoscopy was applied, are described. The first fetoscopies performed with the aim to improve the technique took place in the Institute of Mother's and Child's Care in Prague in 1974. The first diagnostic fetoscopy was done in 1977. It was indicated by a fetus with 50% risk of ectrodactyly of the lobster claw hands and feet type. Normal fetal limbs were found and gravidity proceeded without complications to the birth of a normal girl. The cases of the lobster claw syndrome, Van der Woude syndrome, Majewski syndrome and Treacher-Collins syndrome are also described, and documented. A normal child was found by fetoscopy when the risk figure for a orofacial cleft was very high — the correctness of the fetoscopic diagnosis was confirmed after its birth. The indications to fetoscopy were classified into six categories in respect to various morphological inborn developmental anomalies and some other abnormalities, that are characterized by atypical morphological features detectable by means of the fetoscopy.

RESUME

Application de la fetoscopie en cas des défauts morfologiques congénitaux

Tolarová M., Zwinger A.

On décrit en détail la nouvelle méthode du diagnostic prénatal, la fetoscopie. Après avoir apprécié les expériences de cette méthode dans le monde, les auteurs présentent quelques cas concrets de l'application de la fetoscopie. La première fetoscopie expérimentale fut réalisée à l'Institut de la protection maternelle et infantile à Prague en 1974 et la première fetoscopie diagnostique fut réalisée en 1977. Il s'agissait de l'indication d'un risque de 50 % de l'ectrodactylie du type lobster claw hands and feet. A l'aide de la fetoscopie on a pu constater des extrémités normales du fœtus et la grossesse s'est déroulée sans complication jusqu'à l'accouchement d'une fille en bonne santé.

On présente et documente aussi des cas du diagnostic in utero o lobster claw syndrome, Van der Woude syndrome, de sy Majewski et de sy Treacher-Collins. On a constaté un enfant sain en cas d'un risque élevé de la fissure orofaciale; la bonne diagnose de la fetoscopie fut prouvée après la naissance d'une fille normale.

Pour les besoins de la fetoscopie on établit les groupes des défauts d'évolution morfologiques congénitaux et d'autres défauts congénitaux qui se manifestent par les anomalies morfologiques pouvant être constatées par la fetoscopie.

ZUSAMMENFASSUNG

Anwendung der Fetoskopie bei angeborenen morphologischen Defekten

Tolarová M., Zwinger A.

Es wurde eine neue Methode der pränatalen Diagnostik, die Fetoskopie ausführlich besprochen. Nach der Auswertung der bisherigen Erfahrungen mit dieser Methode in der Welt sind einige konkrete Fälle angeführt, in denen die Fetoskopie durchgeführt wurde. Die ersten Übungsfetoskopien wurden im Institut für die Betreuung von Mutter und Kind in Prag im Jahre 1974 und die erste diagnostische Fetoskopie im Jahre 1977 durchgeführt. Es handelte sich um eine Indikation wegen des Risikos 50 %-er Ektrodaktylie des Typs lobster claw hands and feet. Mit Hilfe des Fetoskops wurden gesunde Extremitäten der Frucht festgestellt und die Schwangerschaft verlief weiter ohne Komplikationen bis zur Entbindung eines gesunden Mädchens. Ferner wurden Fälle der in-utero-Diagnostik bei dem lobster-claw-Syndrom, dem Van der Woude Syndrom und den Syndromen von Majewski und Treacher-Collins angeführt und dokumentiert. Ein gesundes Kind wurde im Falle eines hohen Risikos der Orofazialspalte festgestellt — die richtige fetoskopische Diagnostik wurde nach der Geburt des nichtbetroffenen Mädchens bestätigt. Es wurden Gruppen für die Indikation der Fetoskopie bei morphologischen angeborenen Entwicklungsfehlern und bei weiteren angeborenen Fehlern bestimmt, deren Manifestierung morphologische Atypien darstellen, die mit Hilfe des Fetoskops festgestellt werden können.

RESUMEN

Utilización de fetoscopia en defectos morfológicos congénitos

Tolarová M., Zwinger A.

Se da una explicación detallada de un nuevo método del diagnóstico prenatal por fetoscopia. Partiendo de la evaluación de las experiencias existentes con este método

se mencionan algunos casos concretos en que se habla procedido a realizar fetoscopia. Las primeras fetoscopias experimentales fueron realizadas en el Instituto de Asistencia a la Madre y el Niño en Praga (Ústav pro péči o matku a dítě) en el año 1974 y la primera fetoscopia de diagnóstico fue efectuada en 1977. Se trataba de una indicación para riesgo 50 % de electrodactilia tipo lobster claw hands and feet. Por el fetoscopia se detectaron las extremidades sanas del feto, prosiguiendo luego la gestación sin complicaciones hasta el parto de una muchachita sana. A continuación, se exponen y documentan casos de diagnósticos in utero por el lobster claw síndrome, síndrome de Van der Woude y síndromas Majewski y Treacher-Collins. Un niño sano se detectó en el caso de un alto riesgo de escisión orofacial — lo correcto del diagnóstico por fetoscopia se pudo comprobar después del nacimiento de una muchachita sana. Se ha establecido grupos para la indicación de fetoscopia en casos de defectos evolutivos morfológicos congénitos así como otros defectos congénitos que se manifiestan por atipia morfológica recuperable por el fetoscopia.

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The J. E. Purkyně Czechoslovak Medical Society for Plastic Surgery will be holding a scientific conference to commemorate the centenary of Academician F. Burian, founder of Czechoslovak plastic surgery, on October 15, 1981 at the Medical House Prague.

Subject: facial clefts.

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CLEFT PALATE — A MORPHOGENETICALLY HETEROGENEOUS CONGENITAL DEFECT

M. Peterka, R. Jelínek

Cleft malformations of the oral cavity belong among the most conspicuous and, unfortunately, also the most frequent congenital defects. According to epidemiological statistics, the rate of clefts in live born children in Bohemia is put at nearly 1:500 (Klásková, 1973), in Denmark at 1:600 (Fogh-Andersen, 1966). Hence why this inborn malformation seems to receive increasingly more attention both from clinicians who organize surgical correction, stomatological, logopaedic and psychological care, and from geneticists, whose anamnestic efforts are aimed at discovering the hereditary predisposition for the defect in the children's families. Experimenting morphologists then examine the mechanism of cleft development in utero using laboratory animals.

The participation of both genetic and external environment factors in the aetiology of cleft malformations can now be taken as beyond doubt. However, the share of the factor complexes will apparently be different in different types of defect. Thus, for instance, Fogh-Andersen (1942) makes distinction between two principal groups of cleft malformations: One made up of patients with cleft lip and palate (CLP), the other of patients with isolated cleft palate (CP). There is no genetic connection between the two groups since the affected families show a predominance of only one type. The hereditary disposition for the CLP group is 40%, whereas for the isolated CP merely 19%. The same kind of conclusion was arrived at by Leck (1972) on the basis of an extensive epidemiological study. Harelip (CL) appears to be determined more by genetic factors, while cleft palate (CP) seems mainly due to factors of external environment. These hypotheses, however, can hardly be proved directly in humans. In Leck's opinion, epidemiological studies like his may give rise to a number of fruitful hypotheses provided, of course, they will be tested on an experimental model. For the time being at any rate, the most effective way of extending our knowledge of the causes of cleft anomalies is to study normal and pathological development on experimental models at a time when the palate is being created. Equipped with such knowledge, we should find it easier to understand the process of defect formation in patients with clefts, and to make a distinction between primary changes which induced the cleft and secondary changes which are caused by its presence.

Morphogenetic System of the Palate

The past decade has seen some fundamental conceptual changes in experimental teratology which helped to create the conditions for turning the specialization gradually from an experimental into an exact science. Part of the process was the formulation of the theory of morphogenetic systems [Jelínek, Rychter, 1979] which defines the least unit of structural dysgenesis at the level of cell populations, and links morphogenetic processes at the very beginning of an individual's development with the production of new cells in adulthood. The present communication is an attempt to interpret the origin of orofacial clefts in terms of the theory of morphogenetic systems. The embryonic morphogenetic system is generally defined as a set of cell populations carrying, creating and implementing the programme of development of the given part of the embryo (embryonic component). In this particular case — a set of cell populations which take a direct or indirect share in the development of the primary and secondary palates. As will be shown, the primary and secondary palate morphogenetic system is not all that simple since neither the morphogenetic programme nor its implementation are situated in a single structure. The morphogenetic system of the palate is more complicated, made up of several components which can be referred to as its subsystems. The development of the palate in a mouse embryo can serve as an example.

The primary palate, i. e. the future lip and maxilla, is made through the fusion of facial processes. The premaxillary part of the upper jaw is made up of two median nasal processes to be joined on both sides by the maxillary processes, thus providing the groundwork for the upper jaw with the primitive oral cavity inside. Arising from the medial side of the maxillary processes are palatine processes — the groundwork for secondary palate. At that stage of development the primitive oral cavity is completely filled up by the tongue which keeps the growing palatine processes squeezed in the vertical position. Their horizontalization depends on the development of sufficient space above the tongue [Jelínek, Peterka, 1977]. As shown in mouse [Jelínek, Peterka, 1977] and rat embryos [Diewert, 1979], the impulse for the development of such space comes from the vigorously growing mandibula which retracts the tongue from the roof of the primitive oral cavity by means of the *m. genioglossus*. Cranial base growth appears to be no more than a passive factor in the process. Thus the formation of the palate is demonstrably affected by structures which are not designed to be its component parts later on.

The morphogenetic system of the primary and secondary palates in the mouse is, therefore, made up of five subsystems (Fig. 1). In humans and in the rabbit, the hyoid cartilage, too, may well have a share in the formation of the supralingual space necessary for the process of horizontalization. Sinking caudalward in connection with the growth of the cervical spine it helps to pull the tongue away from the roof of the primitive oral cavity by means of the *m. hyoglossus* [Slípka, Jelínek, Peterka, 1979].

Crucial Period in Secondary Palate Development

The period of the morphogenetic system function coincides to a great extent with its crucial period, during which it is at all possible to induce any organ malformation by outside intervention, i. e. cleft palate in our case. Interference in the morphogenetic system at a time other than the crucial

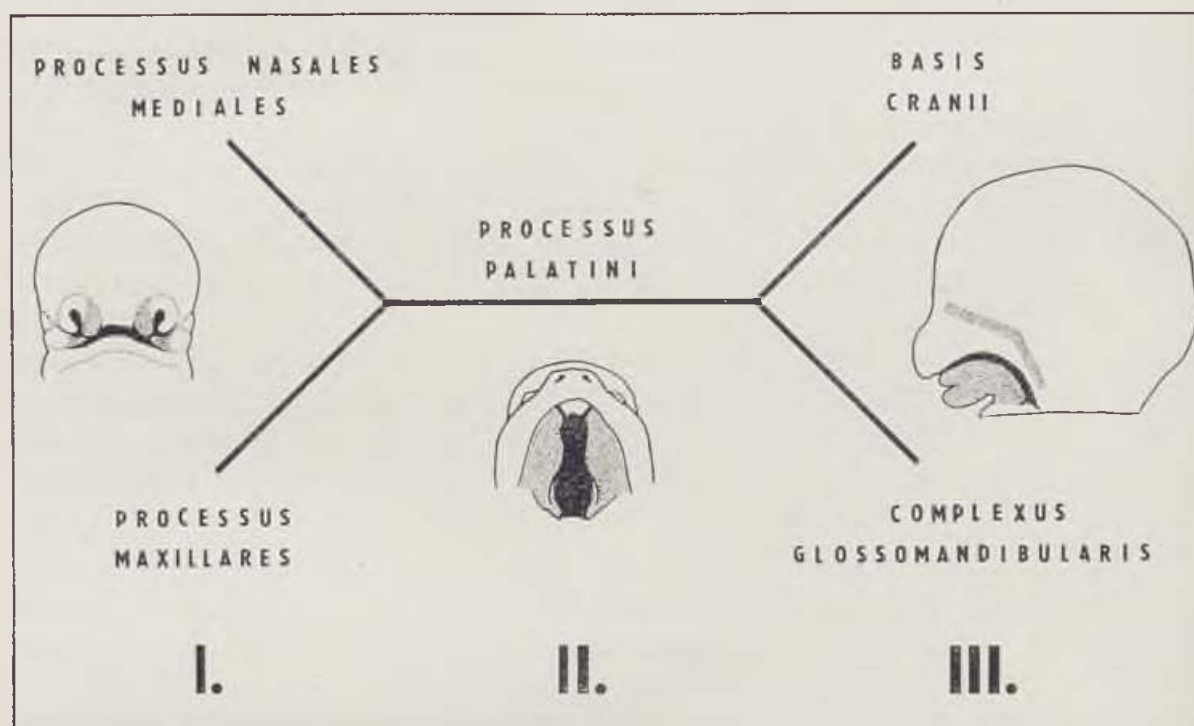


Fig. 1. Schematic representation of five basic morphogenetic subsystems operating in three different sections of cleft palate critical period.

period will not touch off an inborn defect, though there may be some other manifestation of embryotoxicity — e. g. growth retardation. In mouse embryos, the crucial period for cleft palate is between days 11 and 14 of embryonic development [Dostál, Jelínek, 1971]. During that period, isolated cleft palate can be induced by interference with two different morphogenetic subsystems, palatine processes and mandibula. As the authors were able to show, cortisone acetate given between days 11 and 13 of embryonic development can cause hypoplasia of palatine processes [Peterka, Jelínek, 1978]. After horizontalization, they are thus prevented from establishing contact along the median line and, consequently, from fusion. The reduction in the palatine process volume under the action of corticoids is due to impaired cell proliferation in the processes [Jelínek, Dostál, 1975]. On day 14, when cortisone acetate is no longer effective, cleft palate can be induced in the mouse by injections of 6-aminonicotinamide to interfere with the growth of the groundwork for the mandibula — Meckel's cartilage which forms the supralingual space. Thus the space above the tongue fails to develop in time, and palatine process horizontalization cannot be accomplished within the normal time limit.

Systematic study of the mechanism and causes of cleft palate development in conjunction with cleft lip and maxilla in the mouse is bound to run into difficulties since no technique of inducing cleft lip and maxilla in mammals on a standard basis and in sufficient quantities is as yet available. How-

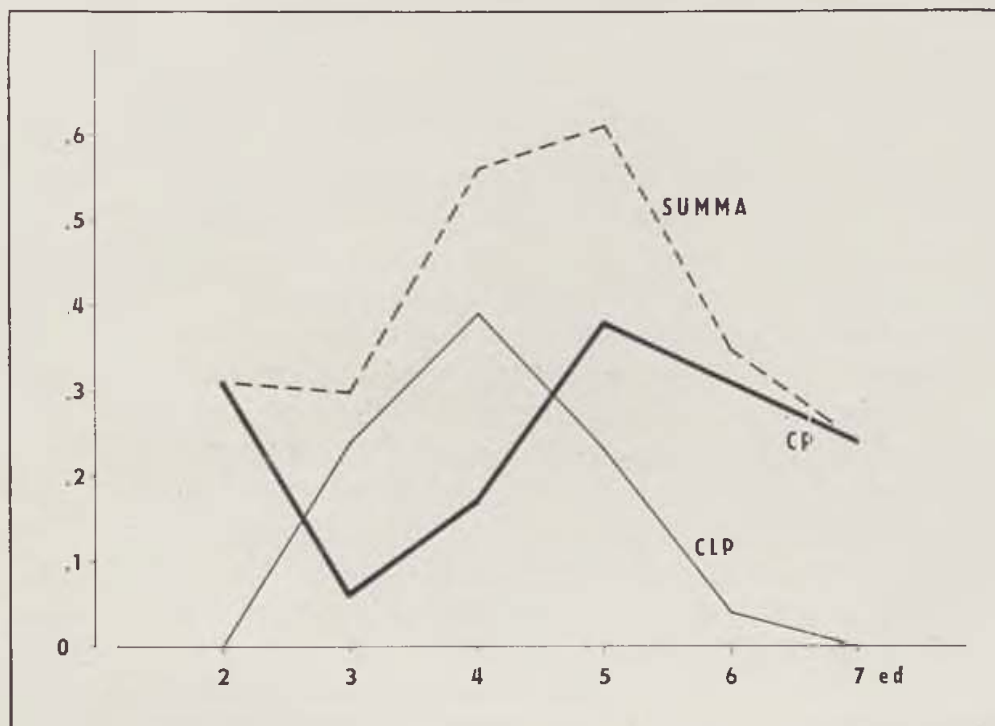


Fig. 2. The groundwork for the obviously single-peak and seemingly simple critical period in orofacial clefts as seen after the application of hydrocortisone in chicken embryo [dashed line] is the critical period of total (CLP — fine line) and isolated (CP — heavy line) cleft palate. The diagram shows the morphogenetic heterogeneity of both groups of malformation.

ever, chicken embryos appear to be of help here. Experimental intervention in the chicken embryo can interfere with the growth of facial processes in as much as 100 % cases. Moreover, all types of clefts analogous to those in man can easily be induced there [Peterka, Jelínek, 1978]. The mode of facial process formation in the chicken is essentially the same as in mammals. Major differences do not appear until the time of secondary palate formation.

1. Palatine process in the chicken develop medialward directly over the tongue as this is so small that it does not interfere with the growth of palatine processes. There is, therefore, no part for the mandibula in the process of horizontalization.

2. Palatine processes do grow far enough to touch each other along the median line on day 11 of embryonic development but they will never fuse. The term CP is used in the chicken whenever there is a gap between the processes at this particular stage. The degree of palatine process hypoplasia is estimated indirectly by measuring the area of the projection of the gap. The crucial period for the development of secondary palate cleft (CP or CLP)

Table 1. Presumed correlation between interference with secondary palate morphogenetic subsystem during critical period (+) and basic types of cleft

	Facial processes	Palatine processes	Mandibula	Cervical spine
CL	+	—	—	—
CLP	+	(+)	(+)	(+)
CP	—	(+)	(+)	(+)

lies between embryonic days 2 to 7 (Fig. 2, dashed line). It falls into two critical periods, the existence of which is conditional upon the functions of different morphogenetic subsystems of the developing palate. The facial process function period coincides with the period critical for CLP development with maximum being reached on day 4 of embryonic life (thin line); the palatine process function period is represented by the period critical for CP development with maximum on the 5th embryonic day (solid line). As we were able to demonstrate, the causes of CLP in the chicken — like those of C (L) P in mouse embryo can be traced down to the growth retardation in facial or palatine processes (Peterka, Jelínek — in press). As our experiments clearly suggest, growth retardation in any of the secondary palate morphogenetic subsystems is always the factor of essential significance of cleft development, i. e. growth inhibition affecting the facial processes, palatine processes or mandibula.

In what way can this experimental model be applied to man? The theoretical assumption is that orofacial clefts can develop as a result of damage caused to any number of the above described morphogenetic subsystems during the respective crucial periods, in extreme cases — to any one or to all of them. The presupposed relationships between interference with any of the subsystems and the basic types of clefts are represented in Tab. 1. In CLP patients it is always the facial processes that are damaged; the other subsystems need not suffer any primary damage. In CP patients the facial processes

Table 2. Presently available evidence of damage caused to secondary palate morphogenetic subsystems in patients with clefts (+)

	Facial processes (premaxilla) (Peterka 1980)	Palatine processes (maxilla) (Peterka 1980)	Mandibula (Šmahel 1980)	Cervical spine (Ross, Lindsay 1965)
CL	+	—	—	0 %
CLP	+	+	+	2.5 %
CP	+	+	+	9.0 %

suffer no damage during the crucial period but there must be damage caused to at least one of the rest of the subsystems. This hypothesis is in conformity with the findings so far available and the readings of measurements made in the postnatal period in patients with clefts (Peterka et al., 1980, Ross, Lindsay, 1965, Šmahel — in press). A summary of those with our own and other literary data can be found in Tab. 2.

J. H.

SUMMARY

An experimental model was introduced to show that the secondary palate morphogenetic system is not simple, i. e. not situated in a single structure, but that it is made up of a number of subsystems (facial processes, palatine processes, mandibula), each taking a share in the palate development. Cleft palate can be caused by outside intervention provided the growth of some of the subsystems is retarded during the crucial period. The resulting condition diagnosed as cleft palate, therefore, represents a morphogenetically heterogenous group of malformations which may develop over relatively long periods of embryogenesis. The conclusions drawn from experimental model studies are then compared with deviations and readings of orofacial structures in patients with clefts. The results do not contradict the idea derived from the experimental model.

RESUME

Fissure du palais — défaut congénital hétérogène morfogénétique

Peterka M., Jelínek R.

Nous avons prouvé sur un modèle expérimental que le système morfogénétique qui forme le palais secondaire n'est pas simple, c'est à dire n'est pas situé dans une seule structure, mais il est composé de plusieurs sous-systèmes (proéminences de la face, mandibule) qui contribuent successivement au développement du palais. La fissure du palais peut être provoquée par une intervention extérieure au cas où on incite la retardation de croissance d'un sous-système pendant la période critique. Le résultat diagnostiqué comme fissure du palais comprend donc un groupe hétérogène du point de vue morfogénétique des malformations qui peuvent se produire dans une période relativement longue de l'embryogenèse. Les conclusions faites sur la base des études du modèle expérimental ont été confrontées plus tard avec les déviations et les résultats des mesures des structures orofaciales chez les patients avec les fissures. Les résultats ne contredisent pas l'opinion acquise sur le modèle expérimental.

ZUSAMMENFASSUNG

Gaumenspalte — morphogenetisch heterogener kongenitaler Fehler

Peterka M., Jelínek R.

Am experimentellen Modell haben wir nachgewiesen, dass das morphogenetische, den sekundären Gaumen bildende System nicht einfach ist, d. h. es liegt nicht in einer einzigen Struktur, sondern besteht aus mehreren Subsystemen (Gesichtsfortsätze, Gaumenplättchen, Mandibula), die sich an der Entwicklung des Gaumens sukzessiv beteiligen. Die Gaumenspalte entsteht durch äusseren Eingriff, wenn man in der kritischen Periode eine Wachstumsverzögerung eines der Subsysteme verursacht. Der

Folgezustand, diagnostiziert als Gaumenspalte, umfasst also eine morphogenetisch heterogene Gruppe von Malformationen, die während des verhältnismässig langen Zeitraums der Embryogenese entstehen können. Die auf Grund des Studiums des experimentellen Modells gezogenen Schlussfolgerungen wurden dann mit den Befunden der Abweichungen und mit den Messergebnissen der Orofazialstrukturen bei Patienten mit Spalten konfrontiert. Die Ergebnisse stehen nicht im Gegensatz zu der aus dem experimentellen Modell gewonnenen Vorstellung.

RESUMEN

Escisión del paladar — defecto congénito morfogenéticamente heterogéneo

Peterka M., Jelínek R.

En un modelo experimental probamos que el sistema morfogenético que forma el paladar secundario no es fácil e. d. no está situado en una sola estructura, sino que se compone de varios subsistemas (salientes faciales, plaquetas del paladar, mandíbula), que sucesivamente toman parte en la evolución del paladar. La escisión del paladar se genera por intervención del exterior al provocar en el período crítico la retardación de crecimiento de uno de los subsistemas. El estado resultante, diagnosticado como la escisión del paladar, pues incluye el grupo de malformaciones morfogenéticamente heterogéneo que pueden darse en un período relativamente largo de embriogenesis. Las conclusiones sacadas a base de estudios del modelo experimental fueron luego confrontadas con las diferencias detectadas y los resultados de la medición de estructuras orofaciales en los pacientes con escisiones. Los resultados no están en contradicción con lo comprobado en el modelo experimental.

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REDUCTION MAMMAPLASTY IN SERIOUS GYNAECOMASTIAS USING A SINGLE SUPERIORLY BASED FLAP

M. Fára, J. Hrivnáková

There are different techniques of surgery for gynaecomastia, each of which having certain advantages as well as certain disadvantages. In the less serious forms, excessive tissue (gland, adipose tissue) can be removed using simple periareolar incision. In the more serious forms, excessive skin has to be removed, too, in order to give a more or less female-looking breast the appearance of the male-type of breast. In the most serious cases, areolar transposition will be necessary, too.

In recent years, there have been increasingly more cases requiring not only the removal of considerably large mammary gland but also skin cover resection and reshaping.

The cases involve mostly male patients who received heavy doses of androgen as part of mental aberration treatment, and also female patients suffering from transsexualism and indicated for transformation of external sexual characteristics.

Reduction mammoplasty in our patients consisted first in the simple resection of a spindle-shaped portion of the skin complete with the gland and in the subsequent free transfer of the areola; later on the operation was improved by transferring the areola complete with nutrient pedicles in order to preserve not only its better shape but also sensitivity.

As a result of satisfactory experience with this technique used for the correction of ptotic female breasts we decided to use our method of a single superiorly based flap also in serious forms of gynecomasty and in plastic breast amputation in transsexuals.

The future bed for the areola is created at the appropriate distance from the middle of the clavicle; in the upper circumference of the bed there is a pedicle of the distalward situated nutrient deepithelialized flap of the areola. Then a horizontally situated spindle-shaped excision of excessive skin, subcutis and mammary gland is performed underneath, the areola on its full-thickness pedicle is shifted on to the required site and sutured in there; the edges of the spindle-shaped excision below are sutured together layer by layer.

Eventually, Redon's drainage is introduced.

J. H.



Patient T. J. (male), cl. n. No. 118 620, suffering from serious gynecomastia following hormonal treatment for sexual aberration.

Fig. 1. State before operation. — Fig. 2. Pre-operative drawings.

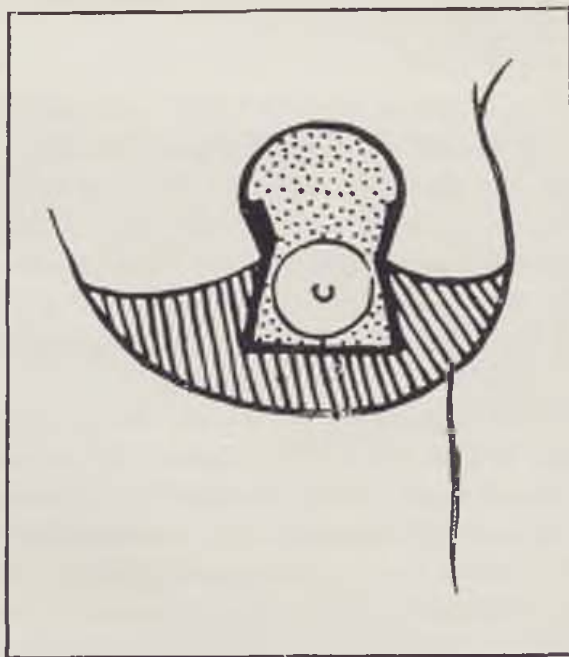


Fig. 3. Diagram of deepithelialized flap (dots) and excision (hatched)

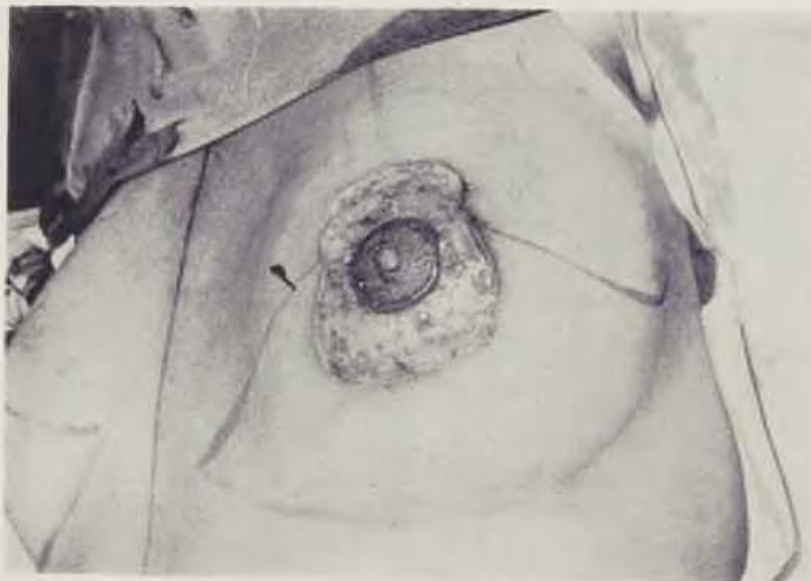


Fig. 4. State after deepithelialization of circumareolar area.



Fig. 5. State before areola is shifted upward and before surplus tissue is resected. —
Fig. 6. Resulting state on the day stitches were removed.

SUMMARY

A new technique of operation for serious gynecomastia or female transsexualism is presented. Subtotal reduction mammoplasty involves the use of a method, in which, following mammary gland extirpation and excessive skin tissue resection, the areola is shifted upwards to the require site using a single superiorly based deepithelialized skin flap.

RESUME

Opération des seins ayant pour but leur diminution en cas des gynecomasties graves par la méthode d'un seul lambeau à tige dans la partie supérieure

Fára M., Hrivnáková J.

On décrit une nouvelle méthode de l'opération en cas des gynecomasties graves ou des transvestitismes féminins. La diminution subtotal du sein est réalisée par la méthode qui consiste à extirper la glande mammaire, à réséquer la peau excédente et à soulever le sein sur un seul lambeau cutané déépitelisé à tige dans la partie supérieure.

ZUSAMMENFASSUNG

Verringerungsoperationen der Brüste bei schweren Gynäkomastien mit der Methode eines einzigen, oben gestielten Lappens

Fára M., Hrivnáková J.

Es wurde ein neues Operationsverfahren bei schweren Gynäkomastien oder weiblichen Transvestitismem beschrieben. Die subtotale Verringerung der Brust wird hier mit Hilfe einer Methode durchgeführt, bei der nach Extirpation der Brustdrüse und Resektion der überflüssigen Haut mit Unterhaut der Hof nach oben in die gewünschte Stelle auf einem einzigen, oben gestielten deepithelisierten Hautlappen hinaufgeschoben wird.

RESUMEN

Operación para disminuir los senos en caso de ginecomastias graves implementando el método de sujeción a través de un solo lóbulo con el pecíolo encima

Fára M., Hrivnáková J.

Descríbese en el artículo el método de operación en caso de graves ginecomastias o transvestitismos femeninos. El método implementado para la disminución subtotal del seno consiste en previa extirpación de glándulas mamales, resección de la dermis sobrante con su hipodermis y subsiguiente subida del campo hasta situarlo en el lugar deseado, sujeto a través de un único lóbulo de cutis desepitelizado, con su pecíolo arriba.

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AESTHETIC ASPECTS OF NOSE SHAPE EVALUATION

K. Fahoun

I am on record for saying frequently that there is no such thing as an ideally beautiful nose, that the notion of a beautiful nose is extremely subjective, and that, indeed, the very concept of beauty was a subjective notion. Whenever I said so I meant it. Today, I admit I was wrong. Beauty is no relative notion, beauty is absolute. I know now that real aesthetic ideals do exist, and in all categories, too. Nature has, indeed, created virtually ideal, perfect examples of beauty as objective phenomena independent of the subjective effects of fashion, region, race, etc. Function will compel form, and perfect function will compel perfect form. Perfection is tested by time — by history. I have more in mind now than just the shape of the human nose. A perfectly balanced function of the whole organism is tantamount to perfection of form of the individual as a whole. This assertion might, admittedly, lead to some kind of ideal uniformity in each species. We had better forget the sheer horror of the idea. Fortunately, we are too far from perfection for this ever to happen. The only point I wanted to make is that the notion of an aesthetically ideal shape of the human nose does exist as an objective category. Once we have got to know the objective laws governing the proportions we are surprised to see the striking coincidence of ideal form and function. This calls for detailed studies and knowledge of the anatomical, physiological and aesthetic aspects as an essential precondition for any planned rhinoplasty. A layman may surmise or feel that this or that form or line is or is not fine — a specialist must be quite certain about it, and to have the certainty he must have objective facts to fall back on. How much knowledge is necessary is brought out by the number of bad results in rhinoplasty. There are, of course, upper and lower limits for each dimension or angle, and this is exactly where the surgeon must be able to make the right kind of decisions to choose the right kind of shape harmonizing with the individual type. It is only within those limits that he has a certain degree of freedom, but his aesthetic feeling and professional standard can only be proved if the choice is correct.

The shape-function relationship is best seen in the nasal respiratory passage. Each change in the nasolabial angle changes the direction of the air flow

entering the nasal cavity. The following study of turbulence in the nasal cavity is merely theoretical in nature. For there is great variability not only as regards the internal nasal structures but also as regards the amount of air entering them as this varies with each moment, and depends on the external environ-

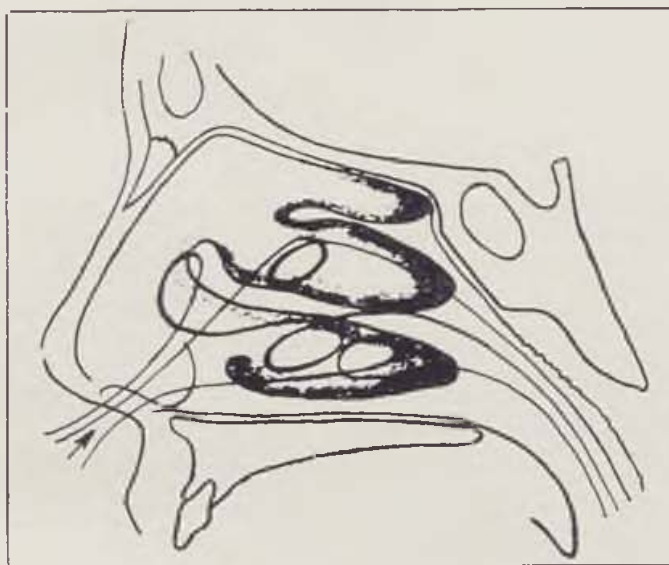


Fig. 1 Normal airway, aesthetically the best shape of nose

ment, and on the force and duration of inspiration. Nevertheless, these changes have no effect on the parameters of importance for the optimum direction of the air flow coming in. From the functional and aesthetic points of view, the nasolabial angle should be within the range of 90 to 115 degrees. It is within such limits that the vestibular part of the nose is best prepared to receive the air flow for further treatment — warming, moistening and filtration.

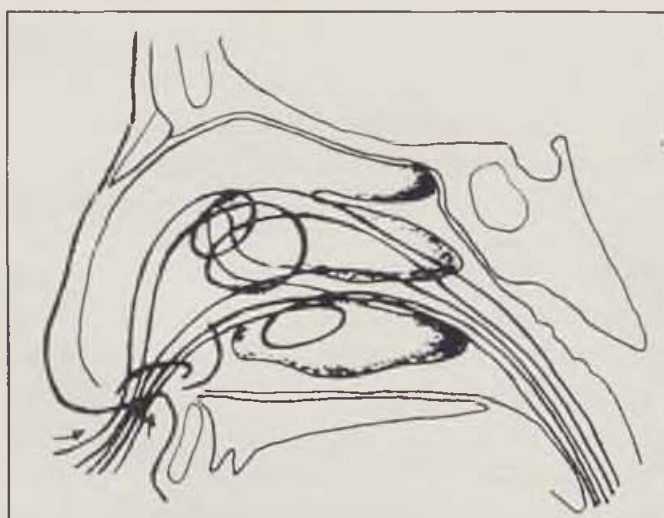


Fig. 2 Long, curved nose with protuberance, acute nasolabial angle

Diagram I — normal passage (the most aesthetic looking shape of the nose is in conformity with optimum function)

Diagram II — Long, curved nose with protuberance, acute nasolabial angle

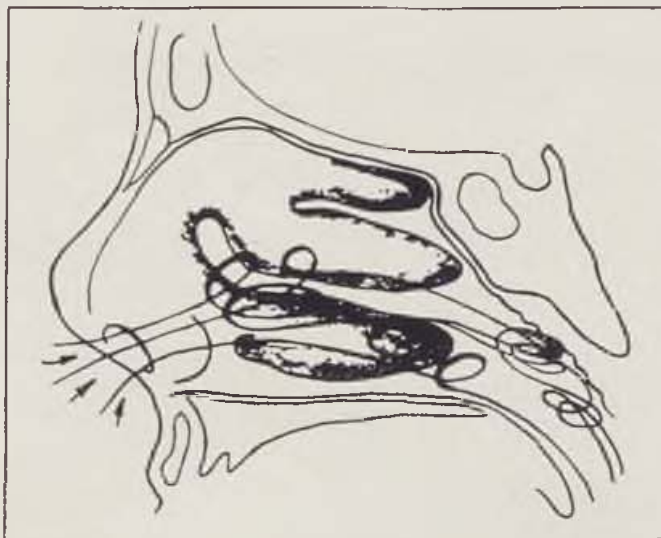


Fig. 3 Short, saddle nose, obtuse nasolabial angle

There is increased resistance in the anterior part of the nasal airway and somewhat more difficult breathing. Owing to increased turbulence the mucosa in this part of the nose is under increased strain so that it represents locus

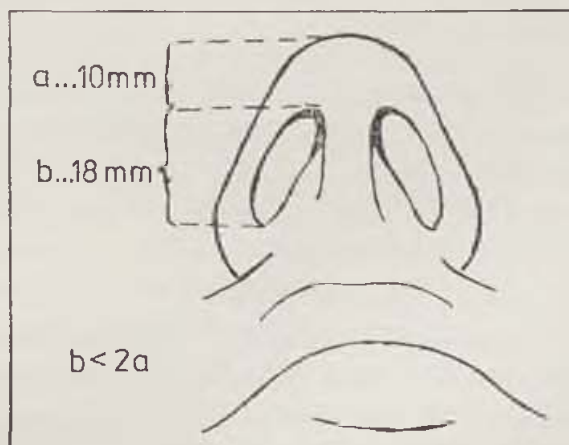
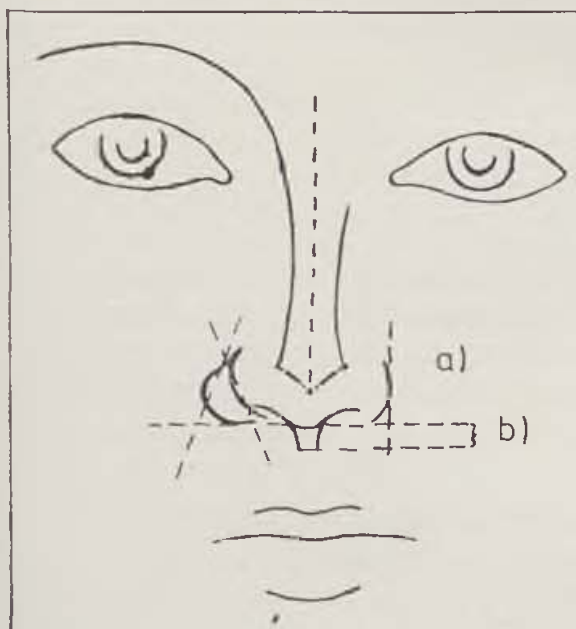


Fig. 4 Three-point light reflex — 3pLR — of tip of nose, correct lateral line of nose. Evaluation of width of nostrils, base of columella, and length of tip of nose
 $a = 3pLR$ — $b = 2-3 \text{ mm}$. — Fig. 5 Anterior nares size, shape and axis evaluation
 $a = 10 \text{ mm}$, $b = 18 \text{ mm}$, $b > 2a$

minoris resistentiae. Possible effects: local infection, offensive smell, epistaxis, headache, sinus involvement, laboured respiration.

Diagram III — short, saddle nose, obtuse nasolabial angle. Owing to the wide open vestibulum nasi there is acceleration of air flow in the anterior part

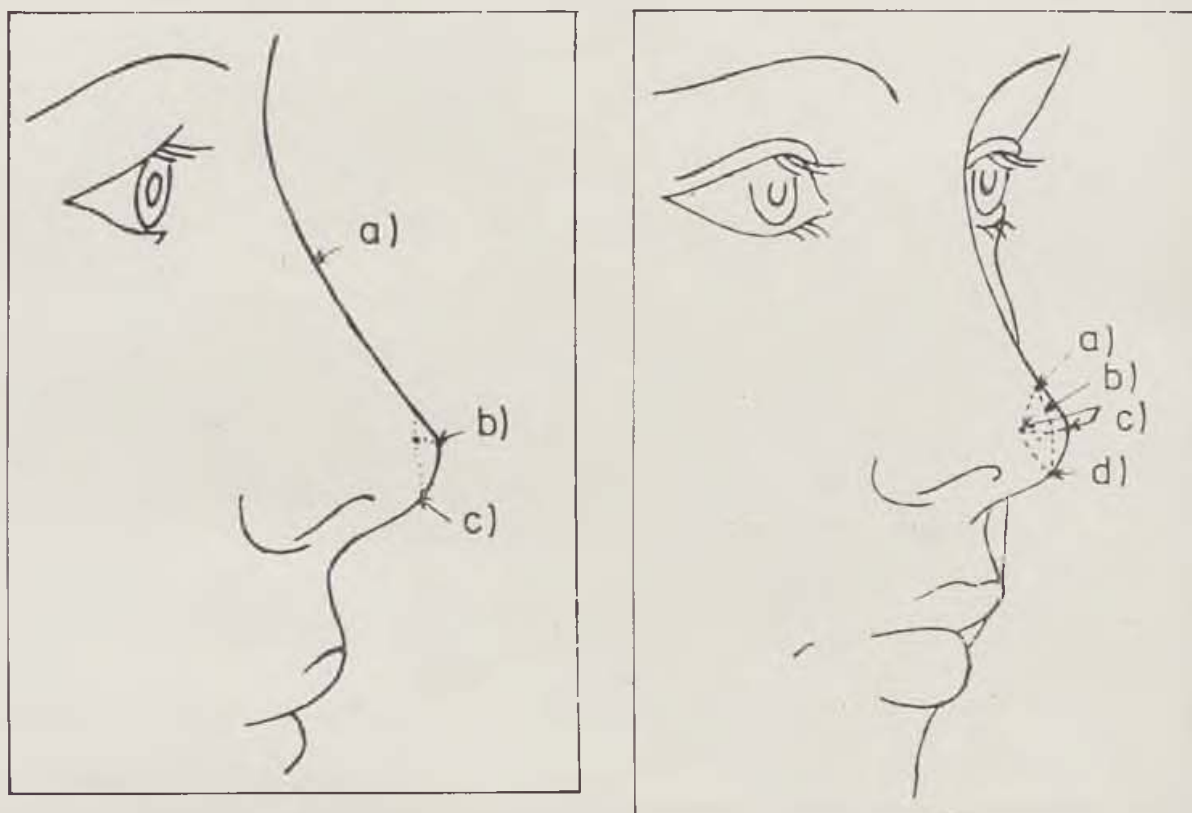


Fig. 6. Profile evaluation of nose shape, CLJ — columello-lobular junction a — ridge-axis b — apex of tip, c — columello-lobular junction [CLJ]. — Fig. 7 Semiprofile evaluation of nose shape, ICD — intercrural distance a — point of ridge-tip junction, b — axis, c — ICD, d — columello-lobular junction [CLJ]

of the airway, inadequate air warming and moistening as the air flow hits the nasopharyngeal posterior wall giving rise to turbulences there. Increased secretion in the anterior portion and the drying out of the nasopharynx may result in mucosal epithelium metaplasia. There may be hypertrophy or even atrophy of mucous membranes, dryness and irritation of throat, and susceptibility to upper respiratory tract diseases.

Closely related to this is the shape of the soft, anterior portions of the nose — tip, base, nostrils, and columella. All those relationships ought to be carefully examined since whatever deviations are found can help to determine the surgical strategy. The most important point to be borne in mind in cosmetic surgery is to realize if there is a plus or a minus in the tissues concerned, i. e. if the purpose of the operation is to have more tissue or less of it. While this may seem a simple affair at first sight, in practice the surgeon has a very delicate problem to cope with, since any wrong decision is likely to end up in

failure which, in turn, may prove extremely difficult to correct. This is where decisions on the narrowing or rounding off of the tip of the nose, on nostril correction, on the shortening or prolongation of the columella, on the narrowing of the base of the nose, or on the type of the surgical operation required are made.

In examining the nose, note should be taken of the smoothness or otherwise of the lateral and median lines seen from the front, from the side or from an angle in between. This is where examination using the light reflex is appropriate. If an intensive source of light is used for illuminating the face from the front three points of light will appear on the tip of the nose (Three-point light reflex — 3pLR) (Fig. 4). The lateral points represent the apices of the right and left hemispheres of the tip of the nose. The anatomical groundwork for this is the apex of the lower lateral cartilage. The distance between the two is called intercrural distance. The distal point is the apex of the tip. This type of examination gives information on the symmetry, width and correct shape of the tip. Of equal importance is the relationship between the lateral edge of the nostril and the connecting line is unmistakable evidence of too wide nostrils, and indication for alar resection. A line running at right angles to the base or medially convergent contraindicates alar resection. The distance between the base connecting line and the origin of the columella ought to be 2 to 3 mm. A view from below will reveal the size, shape and axis of the anterior nares (see Fig. 5). A left and right semiprofile view will show the lateral line of the nose of the opposite side. A lateral view will reveal the profile of the bridge line which ought to coincide with the nasal axis (see Fig. 6).

The tip of the nose is formed by two equally sized convex triangles sharing a common base in the middle. The extreme points of the base line indicate the intercrural distance (ICD). The apex of the triangle is the bridge-tip junction, and is situated in the axis of the nose. The apex of the lower triangle coincides with the point of the columello-lobular junction (CLJ). The point of intersection on the connecting lines of the three points is the apex of the tip of the nose visible in all projections. It is, at the same time, the lower point of the three-point light reflex.

CONCLUSION

All this suggests that the term aesthetic rhinoplasty is not justified. Each deviation from an esthetically attractive line is functionally significant; consequently, each professionally accomplished and aesthetically performed surgical operation may result in functional improvement.

J. H.

SUMMARY

The close correlation between nasal function and form is stressed. Physiological and aesthetic studies underline the need for correct preoperative evaluation of the shape of nose. A mode of nasal shape evaluation is presented not in terms of anthropometrics but from the operating surgeon's point of view.

RESUME

Appréciation esthétique de la forme du nez

Fahoun K.

L'auteur souligne la relation étroite entre la forme et la fonction du nez. Des études physiologiques et esthétiques il résulte qu'il est vraiment nécessaire d'apprécier exactement la forme du nez pour pouvoir décider de l'opération. L'auteur présente les appréciations de la forme du nez, non du point de vue anthropologique, mais du point de vue de l'opérateur.

ZUSAMMENFASSUNG

Esthetische Beurteilung der Nasenform

Fahoun K.

Der Autor hebt die enge Beziehung zwischen der Form und Funktion der Nase hervor. Aus physiologischen und esthetischen Studien ergibt sich die Notwendigkeit der richtigen Beurteilung der Nasenform für die Entscheidung zur Operation. Der Autor beschreibt die Weise der Beurteilung der Nasenform und geht dabei nicht vom anthropometrischen Gesichtspunkt, sondern vom Standpunkt des Operateurs aus.

RESUMEN

Evaluación estética de la forma de la nariz

Fahoun K.

El autor enfatiza la estrecha unión entre la forma y la función de la nariz. A base de estudios fisiológicos y estéticos se revela la necesidad de una adecuada evaluación de la forma de la nariz para tomar la decisión sobre la operación. El autor presenta la manera de evaluación de la forma de la nariz, no desde el punto de vista antropométrico sino desde el del operador.

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OUR EXPERIENCE WITH HYPOPHARYNGEAL RECONSTRUCTION USING DELTOPECTORAL FLAPS

L. Hasman, J. Rous

The difficulty of replacement for complete or partial loss of the hypopharynx and cervical oesophagus following radical surgery is generally recognized. A number of surgical techniques have already been proposed with a view to restoring the patency of the thoracic segment of the oesophagus; these, however, have mostly failed to take on as methods of reconstruction of the upper deglutitory tract partly because of the difficulties involved in the thoraco-abdominal approach in exhausted and often even cachectic patients, partly also for frequent postoperative complications due mainly to the inadequacy of vascular supply to the transposed segment of the alimentary tract or due to other adverse conditions.

This is also the reason why radiotherapy and cytostatic therapy are preferred to radical surgery in tumours of that particular localization. Such views, however, can hardly be shared now that reconstructive surgery has developed so many new opportunities. Actino- and chemotherapy as independent forms of treatment can no longer meet the requirements of radicality though they can be accepted as preparatory, palliative or supplementary methods.

Hence the tendency to cope with the defects of the hypopharynx and cervical oesophagus after radical laryngopharyngectomy by using operations which carry less risk yet still meet the requirements of radical oncosurgery. Thanks to the now widely spread knowledge of the methods and principles of plastic and reconstructive surgery we can now see skin material from the immediate or even remote vicinity of the defect increasingly used for the restoration of the patency of the upper deglutitory tract.

The choice of skin flaps for reconstruction depends not only on the extent and localization of the envisaged or already created defect but mainly on the type and usefulness of the skin cover of the neck and its neighbourhood.

Reconstructive surgery in the region of the hypopharynx and cervical oesophagus can be guaranteed only provided the diameter of the restored part of the deglutitory tract amounts to at least 1.5 to 2 cm. This makes it essential to plan the mobilization of skin flaps sufficiently long and at least 10 to 12 cm

wide particularly in view of corrections at the point of the neopharynx junction with the oropharynx where the restored lumen must be substantially wider with only its distal end being conically narrowed to the required diameter of 2 cm. Provision of a skin flap of that size in the cervical region poses some difficulty, and, considering the simultaneous postoperative scarring, should be seen as unfeasible.

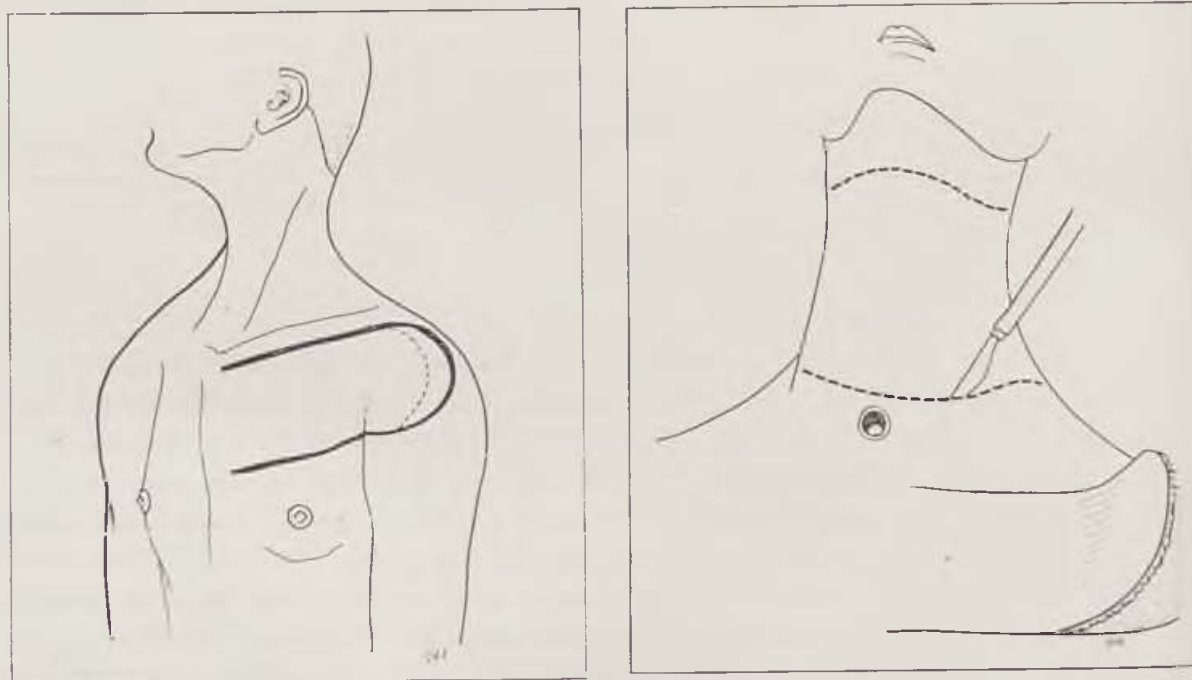


Fig. 1 Deltopectoral flap based parasternally; upper incision follows the lower edge of clavicle, lower incision reaching 2—3 fingerbreadths above nipple. Flap apex is situated on shoulder joint front area. — Fig. 2 Broad cervical bridge flap and deltopectoral flap mobilization on the left. Tracheostoma was made to the right of the median line

The need for satisfactory, well-supplied and ample reconstructive material can, however best and safely be satisfied by the deltopectoral flap as described and used by Bakamjian in 1965.

This type of flap (Fig. 1), now widely used in reconstructive surgery of the head and neck, is planned and mobilized in the upper half of the chest. Its base is situated parasternally with the apex lying subacromially in the shoulder joint region. Well supplied from branches of the internal mammary artery, it permits a length-width ratio of more than 3:1, something that other types of flap hardly ever allow.

The deltopectoral flap represents useful reconstructive material for the lower half of the face and the whole of the anterior portion of the neck. As replacement for defects of the hypopharynx and cervical oesophagus resulting from radical operations it can be described as a method of choice.

In the present author's group, the deltopectoral flap was used in 4 patients with primary carcinoma of the hypopharynx propagating into the neighbouring

structures, and in 1 patient with late tumour duplicity in the cervical oesophageal region which reappeared 15 years after total laryngectomy.

A 67-year old female patient with hypopharyngeal carcinoma invading circularly the upper portion of the oesophagus and larynx had the hypopharynx and the cervical part of the oesophagus reconstructed immediately after radical surgery. Two horizontal incisions were made on the anterior sur-

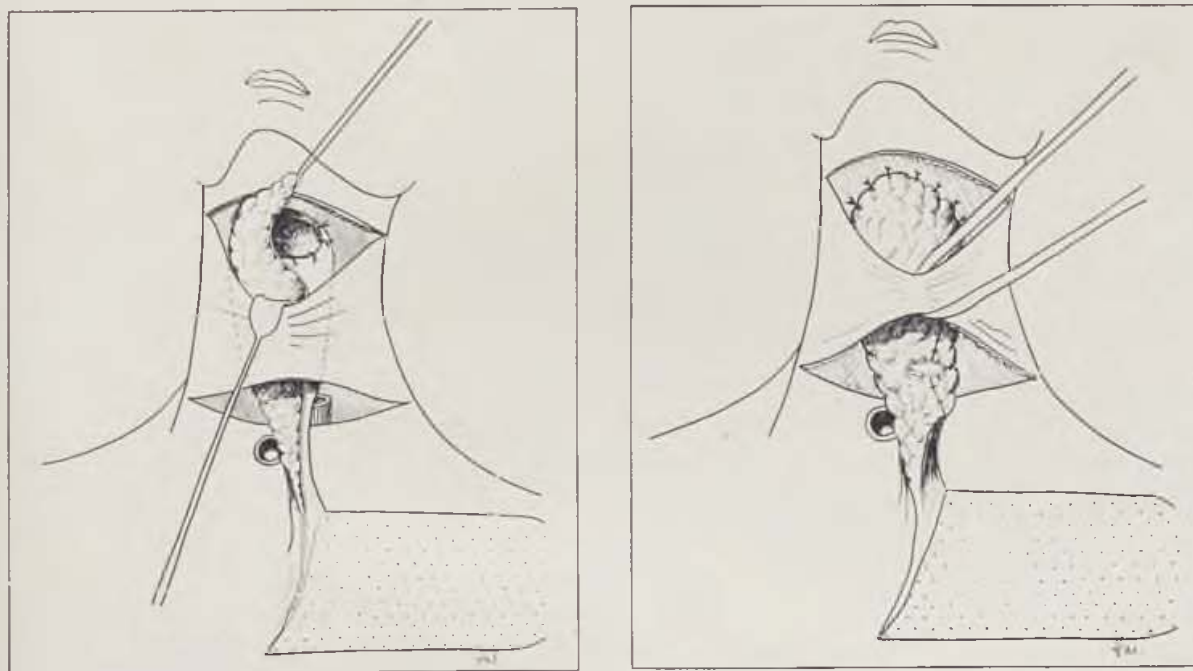


Fig. 3 Sliding the edges of the bridge flap permitted total laryngectomy and resection of hypopharynx. Deltopectoral flap was slipped underneath, sutured to the oropharynx, and tubulized distalward. — Fig. 4 Inside-epithelialized tube constitutes the neopharynx, and is connected end-to-side with lower segment of cervical oesophagus. Pedicle was cut off, anastomosis implanted, and final shaping performed in 8 weeks

face of the neck (Fig. 2) to mobilize a wide bridge cervical flap. After the upper edge had been shifted down and the lower edge had been shifted up, this approach permitted both total laryngectomy and radical resection of the affected portions of the hypopharynx and cervical oesophagus. With regard to the planned reconstruction the tracheostoma was started a little lateral to the midline, thus lifting the lower cervical oesophagus away from the trachea in order to facilitate its suturing to the neohypopharynx.

The deltopectoral flap, prepared a week before radical surgery, was lifted, slipped under the bridge flap, and cranially sutured to the oropharynx (Fig. 3). It was then gradually tubulized over a wide oesophageal probe to create, in the distal direction, a tube sufficiently long to replace the resected hypopharynx and oesophagus. The oesophageal stump, isolated and separated from the trachea, was sutured tension-free end-to-side into the flap suture (Fig. 4). The union was subsequently secured with adaptation stitches, and the bridge flap



Fig. 5 44-year old woman after secondary reconstruction of hypopharynx and cervical oesophagus using a deltopectoral flap. A wide fistula at the tracheostoma-oesophagus junction following suture dehiscence. — Fig. 6 State after fistula closure and pedicle modelling 5 months after primary operation. Patient can swallow well and make good use oesophageal speech

of the neck skin cover was then pulled over the reconstructed portion of the deglutitory tract. 8 weeks after this operation, the deltopectoral flap pedicle was cut off and shaped to fit the lower oesophageal suture, thus completing the planned reconstruction.

The deltopectoral flap proved its worth as reconstructive material also in secondary correction of post-operative defects of the hypopharynx and the cervical oesophagus.

Similar secondary reconstructions of resected hypopharynges and oesophagi were performed in two other patients — a 69-year old man with carcinoma of the cervical oesophagus which developed 15 years after total laryngectomy, and a woman of 44 with primary carcinoma of the hypopharynx and cervical oesophagus invading the larynx and thyroid gland.

In the female patient (Fig. 5) a fistula had developed at the site of the deltopectoral flap union with the oesophagus, which, in our opinion, is the weakest point of the whole reconstruction. The fistula was due to the suture irritation by infected secretion coming from the adjacent and previously untransposition tracheostoma. Five months after the primary operation and after

the disappearance of skin reaction, the fistula was closed using excess flap tissue. At the same time, the flap pedicle was liquidated (Fi. 6). An interesting feature in this particular patient was good-quality substitution oesophageal speech made possible by a fistula canal persisting between the upper segment of the trachea and neohypopharynx.

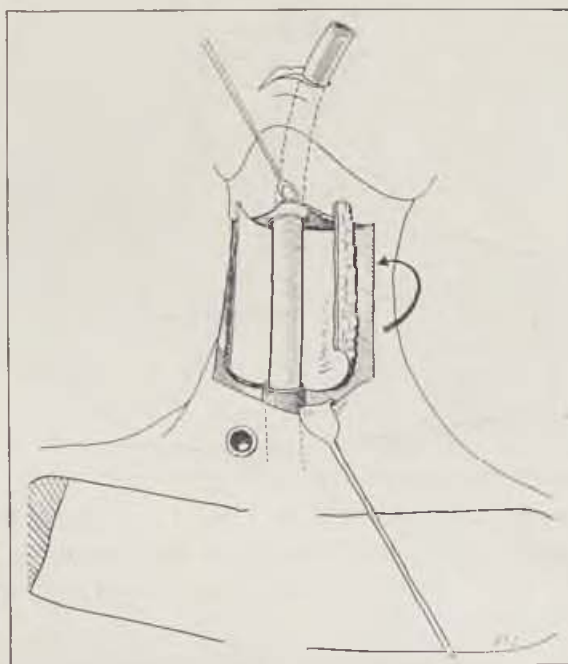


Fig. 7 62-year old man with 6 cm obliteration of hypopharynx and cervical oesophagus. Necrosis of the tip of the right-side deltopectoral flap after too daring mobilization prevented planned reconstruction using two flaps. — Fig. 8 Exposure of oropharynx (proximally) and cervical oesophagus (distally). Mobilization of two skin flaps from the neck

The other patient, however, died as a result of metastatic dissemination 4 months after the operation before the whole planned reconstruction could be completed.

Another of the group was a 62-year old patient with carcinoma of the right-hand-side piriform pit spreading towards the posterior hypopharyngeal wall and invading the ipsilateral half of the larynx. In this case, total laryngectomy, subtotal pharyngectomy and right-sided block cervical dissection combined with post-operative irradiation were followed by obliteration of the hypopharynx and cervical oesophagus over a distance of 6 cm. One and a half years after radical surgery, an attempt was made to operate on this already cachectic patient in an effort to reconstruct the obliterated part of the deglutitory tract using local material and covering the outer defect with a deltopectoral flap (Fig. 7).

This particular procedure was chosen because the planned correction using two deltopectoral flaps had to be abandoned for necrosis in the apex of one of the flaps and for the presence of scars on the skin cover of the neck, which prevented the creation of a cervical bridge flap.

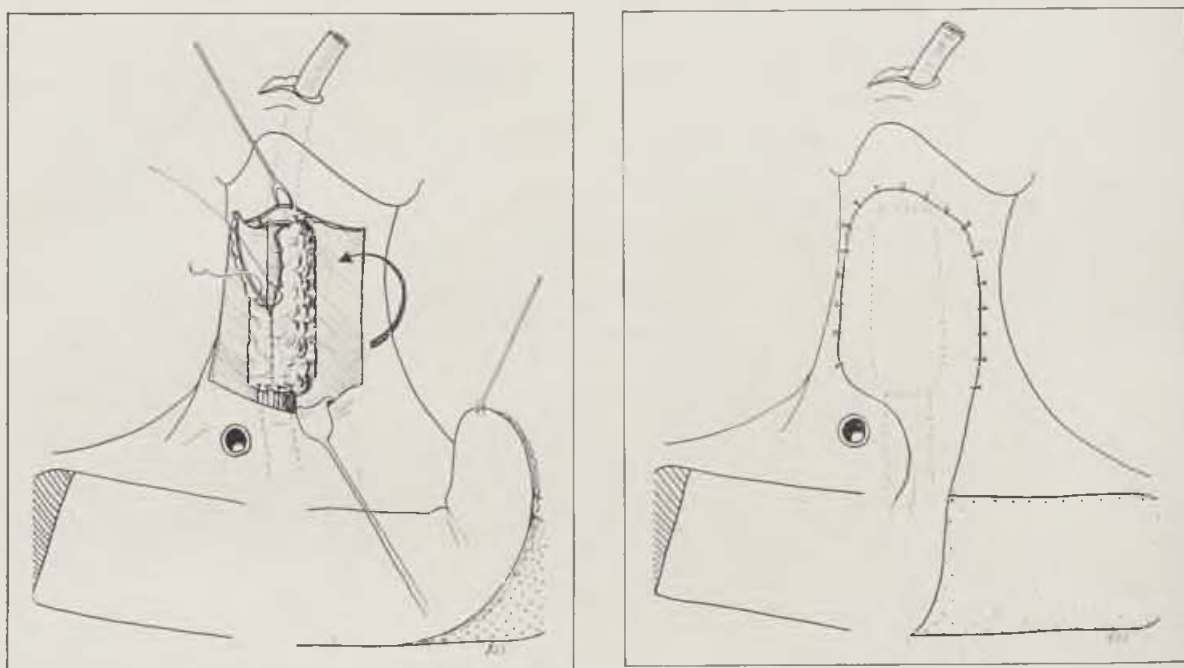


Fig. 9. Tubulization of skin flaps and their attachment to oropharynx and cervical oesophagus. Mobilization of deltopectoral flap on the left. — Fig. 10 Covering the reconstructed neohypopharynx with deltopectoral flap

Transverse skin incisions above and below the site of obliteration were made in order to expose the oropharyngeal lumen proximally and the lumen of the intact cervical oesophagus distally (Fig. 8). The broad pedicles of the flaps and their relatively short-distance mobilization guaranteed ample blood supply even in a field damaged by actinotherapy. First, the posterior circumference of the oropharynx at the top and the cervical oesophagus at the bottom were sutured (Fig. 9) in order to complete the tubulization of the two flaps, thus creating a rather spacious hypopharynx. The skin defect at the front of the neck — extended by the excision of scarry and other unsuitable tissue — was covered by the deltopectoral flap, the pedicular part of which remained tubulized (Fig. 10, 11). In the process of healing, dehiscence developed in the irradiated tissue at the lower pole of the suture. This, however, kept diminishing spontaneously thanks to the application of packs, and after 3 months it proved possible to close it by shifting the skin a little with the flap pedicle cut off and accommodated in the process.

Correcting the pharyngostoma when the defect is confined mostly to merely the anterior wall of the deglutitory tract and is, as a rule, situated above the tracheostoma, is usually a simpler affair than operations designed for the reconstruction of major losses of tissue.

A 40-year old male diabetic patient with carcinoma of the piriform sinus extending to the homolateral half of the larynx and root of the tongue had total laryngectomy performed with partial resection of the hypopharynx and block cervical dissection. Healing was slow and difficult until a wide pharyngo-

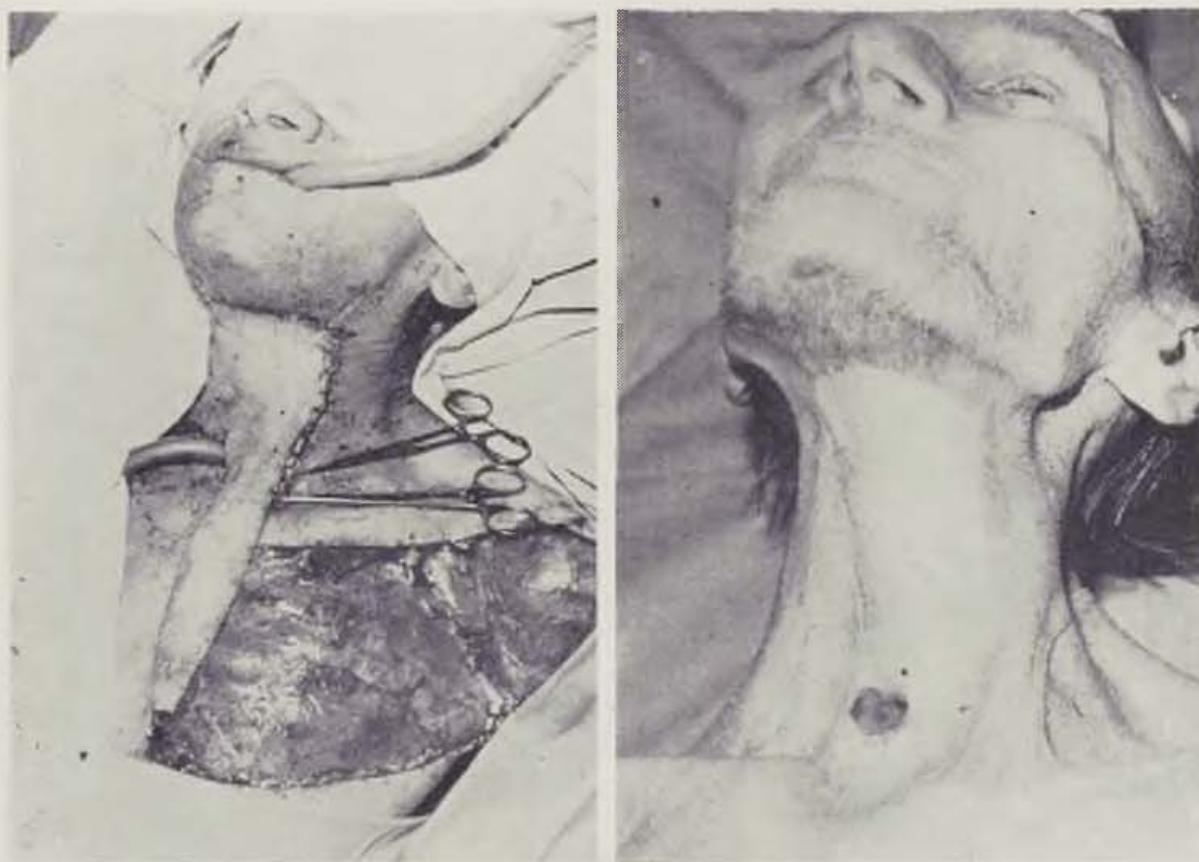


Fig. 11 Deltopectoral flap safely covering the whole area. Donor site covered with free skin graft. — Fig. 12 State after healing and final shaping. Deglutition capability fully restored

stoma 2.5 X 5 cm in size developed. Correction of the defect was started 5 months after radical surgery (Fig. 13), using a flap from the neck skin in the immediate vicinity of the defect. The flap was mobilized just large enough to cover the area of tissue lost. The tissue thus obtained was advanced into the defect above the inserted probe, its epithelial surface down. The suture was secured in position using adaptation stitches, and the whole area of the defect including the skin flap donor site was covered with a deltopectoral flap (Fig. 14) so as to have the covering suture situated outside the reconstructed area and thus to prevent the possible development of post-operative fistula. The broad and well supplied end of the deltopectoral flap covered the defect, thus facilitating the development of an ample and definitive skin cover (Fig. 15).

By way of conclusion, the authors, drawing on their experience, albeit limited as yet, would like to stress the significance of using the deltopectoral flap

for the reconstruction of defects and tissue losses in the region of the hypopharynx and cervical oesophagus. The simplicity of mobilization, ample blood supply in the reconstructive material, and little total stress for the patient — all these are considerable advantages over the risk of thoraco-abdominal reconstructions designed to restore patency in the upper deglutitory tract.



Fig. 13 Wide pharyngostoma in a 40-year old diabetic 5 months after radical surgery

As for the surgical technique, the following points deserve stressing as they have a good effect on the outcome of the reconstruction apart from facilitating the process to no small degree:

1. Prior to any reconstruction of the upper deglutitory tract, the cervical portion of the oesophagus should be well isolated from the trachea, and the tracheostoma should be started a little lateral to the right of the midline to avoid the problem of their intimate union. At the time of secondary reconstruction, separation of the two organs involves some difficulty as dehiscences and fistulae may easily develop at the site of the oesophagus union with the neohypopharynx. In the group under study, too, this particular site proved to be locus minoris resistentiae necessitating secondary correction.

2. It is advisable to start reconstructive surgery before actinotherapy to avoid loss of biological value of the neck skin usable for replacement.

3. Neck skin incisions should be decided upon already at the time of planning the radical operation to allow for more corrections if necessary.

4. Reconstructive operations on the upper deglutitory tract should be performed as secondary measures for the simultaneous resection and reconstruction are too time consuming, too much of a burden for the patient, and too much of a risk of failure to observe the principle of sterility and physiological surgery.

J. H.



Fig 14 State after pharyngostoma closure with skin flap and after the whole defect has been covered with deltopectoral flap



Fig. 15 State after healing and after flap pedicle has been cut off. The cover is firm and deglutition unimpeded

SUMMARY

References are made to the difficulties involved in the reconstruction of the hypopharynx and cervical oesophagus following radical surgery. Taking a critical view of reconstructive operations the authors confirm the increasingly widely held view that such defects are better coped with using skin flaps from the near or even remote vicinity as they involve less risk and, in terms of radicality, meet all the requirements of oncosurgery in the area. Observing the principles and methods of plastic and reconstructive surgery the authors prefer restoration of upper deglutitory tract patency by means of the deltopectoral flap, the advantages of opportunities for application are demonstrated. Some practical rules are proposed with a view to facilitating the technical part of reconstruction.

RESUME

Nos expériences de la reconstruction du hypopharynx par un lambeau deltopectoral

Hasman L., Rous J.

Les auteurs montrent dans leur article les difficultés de la reconstruction du hypopharynx et de la partie jugulaire de l'oesophage après les opérations radicales. Appréhendant critiquement les opérations reconstructives, les auteurs confirment la vue, de plus répandue aujourd'hui, qu'il faut résoudre ces défauts par les opérations qui représentent moins de risque, c'est à dire à l'aide des lambeaux cutanés des environs plus ou moins proches qui contentent pleinement les besoins de l'oncochirurgie de cette zone du point de vue de la radicalité.

S'appuyant sur les principes et les méthodes de la chirurgie plastique et reconstructive, les auteurs choisissent pour reconstruire le passage libre de la partie supérieure des voies d'avalement le lambeau deltopectoral dont ils montrent les avantages et les possibilités de l'application. Ils proposent aussi des mesures qui puissent rendre la réalisation technique de l'opération plus facile.

ZUSAMMENFASSUNG

Unsere Erfahrungen mit der Wiederherstellung des Hypopharynx mit dem Deltapektorallappen

Hasman L., Rous J.

Die Autoren weisen in ihrer Arbeit auf die Schwierigkeit der Wiederherstellung des Hypopharynx und des Halsabschnittes der Speiseröhre bei radikalen Operationen hin. Bei kritischer Beurteilung der Wiederherstellungseingriffe bestätigen die Autoren die heute zunehmend mehr verbreitete Auffassung, diese Defekte durch mit Risiko weniger belastete Hautlappen aus der nahen oder entfernteren Umgebung zu lösen, die die Anforderungen der Onkochirurgie dieser Gegend vom Gesichtspunkt der Radikalität völlig zufriedenstellen.

Auf Grund der Grundsätze und der Methoden der plastischen und Wiederherstellungschirurgie wählen die Autoren zur Wiederherstellung des freien Durchganges durch den oberen Abschnitt der Schluckwege den Deltapektorallappen, sie demonstrieren seine Vorteile und Applikationsmöglichkeiten und auf Grund der gewonnenen Erfahrungen empfehlen sie Massnahmen, die die technische Durchführung der Wiederherstellung erleichtern können.

RESUMEN

Nuestras experiencias con la reconstrucción del hipofaringe con ayuda del lóbulo deltopectoral

Hasman L., Rous J.

En su trabajo, los autores señalan lo difícil de la reconstrucción del hipofaringe así como de la sección yugular del esófago después de operaciones radicales. Al evaluar críticamente las reconstrucciones hechas los autores confirman la opinión actualmente cada vez más extendida de que estos defectos deben ser tratados con intervenciones de menos riesgo posible con ayuda de lóbulos procedentes de la area cercana o más o menos lejana que por el grado de radicalidad correspondan plenamente a los requisitos de la oncoquirugía en dicha area.

Conforme a los principios y métodos de la cirugía plástica y de reconstrucción los autores deciden utilizar para renovar el pasaje de la parte superior del tragadero un lóbulo deltopectoral demostrando sus ventajas y posibilidades de aplicación y a base de experiencias adquiridas recomiendan cuáles medidas se deben tomar para facilitar la realización técnica de la reconstrucción.

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FINGER TENDON RUPTURE FOLLOWING LOCAL APPLICATION OF TRIAMCINOLONE-ACETONIDE (Kenalog A-40)

J. Jakubík

Synthetic corticosteroids with their powerful, selective anti-inflammatory effect may prove to have some adverse side effects, too. Tendon ruptures associated with corticoid treatment were described in world literature many years ago (Malmed 1965, Ismail 1969, Bedi 1970, Cowan 1961, etc.). In Czechoslovak authors' reports available to us we have failed to find any reference to finger tendon rupture directly associated with the application of a synthetic anti-inflammatory corticoid such as, e. g., Kenalog. Therefore, we wish to present a report on a case of serious hand flexor tendon involvement diagnosed as being in connection with repeated local application of Kenalog A-40.

J. V., a 26-year old worker, clin. n. No. 57402, was treated at the neurological dept. of his local district hospital in 1976—1977 for sy. canalis carpi manus l. dx. Following unsuccessful conservative therapy, the patient was given 0.5 ml. Kenalog A-40 which was applied at the site of lig. carpi volare l. dx in June 1977. Signs of syndrome can. carpi thereafter receded. Remission lasted until November 1977; in December 1977 Kenalog A-40 was again instilled in the right carpal region. There was another brief spell of remission and abatement of symptoms. In April 1978, the patient was admitted at the district hospital department of orthopaedic surgery to have discission of the lig. carpi performed for persistent complaints. Following the operation, the patient felt well and relieved. In July 1978, lifting a heavy burden, he suddenly felt a snap in the distal part of his right forearm where a large subcutaneous bulge immediately appeared. From then on, the patient was unable actively to bend his right hand digits II—V in the interphalangeal joints (Fig. 1).

He was then referred to our clinical department where he was admitted in the spring of 1979 and, following examination, operated on. During the surgical operation which took place on March 5, 1979, a surprising discovery was made: eight tendons of the right hand finger flexors had disappeared over a distance of more than 20 cm, namely right from the palmar crease up to the level of the proximal third of the forearm! (Fig. 2). The lig. carpi was thickened, scarred, and oppressing the median nerve which showed signs

of this oppression accordingly. Other pathological findings included heterogenous lysis of part of the art. carpi capsule at the site of the carpal tunnel, and a fissure in the same place, about 2 cm long opening into the carpal articulation. Through that fissure the joint was found communicating with an empty space which used to accommodate the tendons of the finger flexors.



Fig. 1. State before surgery after subcutaneous pathological rupture of all flexor tendons of right hand digits II to V. Loss of active flexion in interphalangeal joints of triphalangeal digits of right hand.

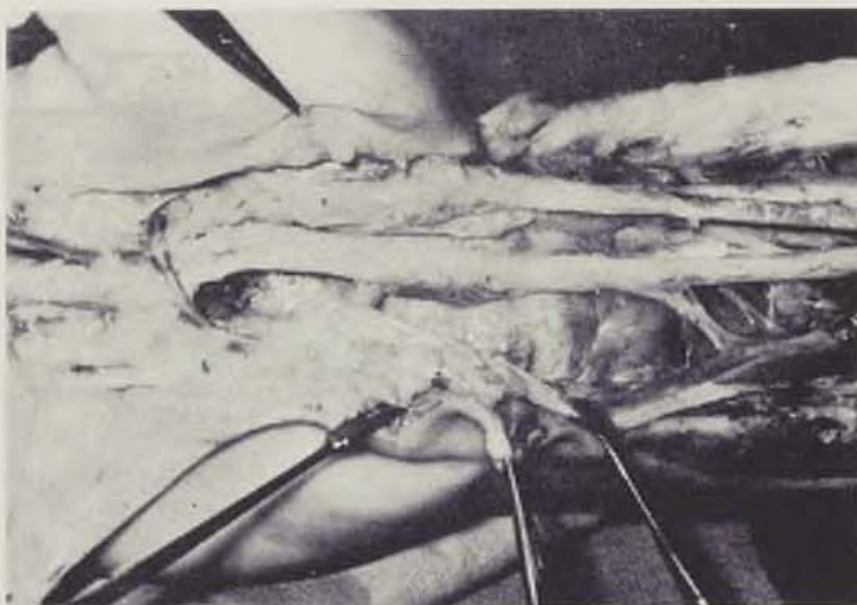


Fig. 2. Same patient during surgery. Only n. medianus is found lying in the carpal canal on the right. Top — thumb flexor tendons and rad. flexor of wrist; bottom — tendons of ulnar flexor of carpus and palmaris.

The only tendons left intact were those of the wrist flexors, the long flexor of the thumb and palmaris. The stumps of finger flexors in the palm were terminated with granulation tissue (Fig. 3), specimens of which were sent for histological examination (As. Prof. Habanec, 2nd Institute of Pathological Anatomy, Brno). The findings: bundles of hyaline connective tissue arranged



Fig. 3. Granulation tissue (held in forceps) as palmar termination of peripheral stumps of flexor tendons of digits II to V.



Fig. 4. Reconstruction of finger flexion by means of carpal tendon flexor transposition and prolongation (m. palmaris tendon, resected pieces of superficial flexors).

in a lamellar fashion and very much like tendon tissue with foci of fibrinoid and myxoid transformation and replacement by granulation tissue with the presence of chronic inflammatory infiltrates and deposits of haemosiderin. Conclusion: dystrophic, degenerative changes with subsequent reparative reaction. The histologist added that nowhere in world literature had he come across a similar pathological reaction as a response to the use of Kenalog.

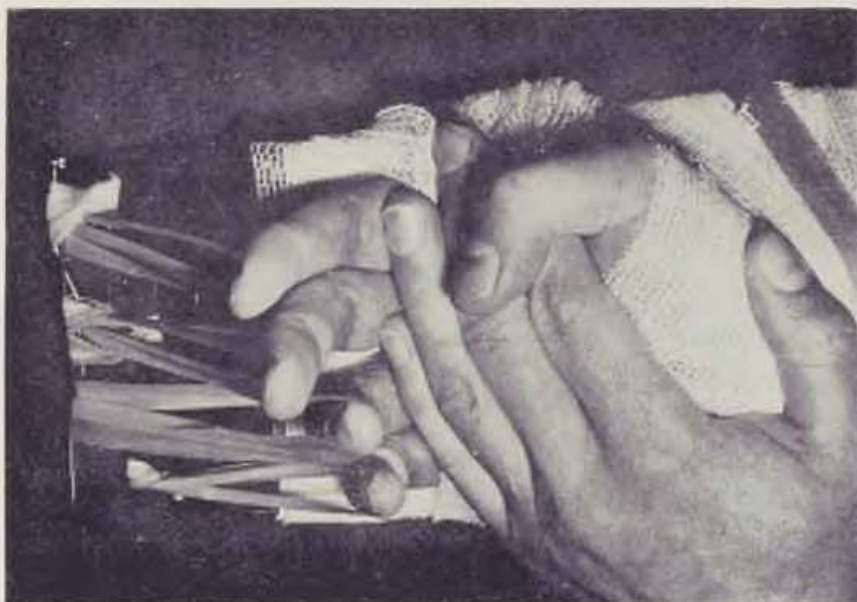


Fig. 5. State during rehabilitation treatment; transposed carpal flexors flex triphalangeal digits acting simultaneously against the pull of rubber traction (conditioning exercise).



Fig. 6. State after rehabilitation exercise and after patient resumed work. Flexion of digits IV and V is complete, in digits III and II flexion can go down to about 1.5—2 cm from the palm.

This unforeseen situation and, in particular, the enormous loss of flexor tendons made us face the difficult task of restoring the flexion capability of the fingers. A somewhat unorthodox strategy was embarked upon. The insertion of the two carpal flexors was detached, the flexors were placed into the carpal canal, and the radial flexor was prolonged using resected pieces of the ten-



Fig. 7.

dons of the superficial flexor of digits II and III. The resected pieces were used as bridges and sutured between the carpal flexor tendon and the peripheral stumps of the deep flexors of digits II and III. The ulnar flexor was prolonged by inserting a palmaris tendon graft and by suturing in to the deep flexors of digits IV and V following resection of the short stumps of the superficial flexors of those fingers (Fig. 4). After the operation, the hand was kept immobilized for three weeks before rehabilitation was commenced (Fig. 5).

It proved to be a highly demanding procedure both for the rehabilitation worker and for the patient as he had to retrain finger flexion using carpal flexor action, thus considerably interfering with the physiological inborn stabilization mechanisms in the carpal joint. However, the patient was intelligent and tried hard so that all the combined effort was met with success. Four months after the operation he was able to flex digits V and IV right into the palm of his hand, digits II and III down to 1.5 cm from the palm. He has been able to resume his original job as a road worker (Fig. 6, 7).

DISCUSSION

In their study, Halpern et al. (1977) examined 14 patients of different groups of authors, all of them with subcutaneous pathological tendon rup-

tures associated with corticotherapy, and covering the period from 1958 to 1975. Five more of their own patients were also included. In each case the ruptures involved strong tendons such as the Achilles tendon, the patellar and quadriceps tendons, but there was only one case of digit IV extensor tendon. The patients had been treated with prednisone, triamcinolone, beta-methazone for systemic lupus erythematoses, rheumatic arthritis, asthma, and once also for tendinitis. Halpern's own patients received corticosteroid injections for synovitis, arthralgia, and lupus erythematoses.

Analysing the cases of his own four rheumatic patients with tendon rupture following corticotherapy, Tarr (1974) describes necrosis of tendons resulting from secondary ischaemia caused either by hypertrophic tissue or by vasculitis (quot. Halpern).

Ismail (1969) reports on a case of patellar tendon rupture in a high jumper following previous local infiltrations of corticosteroids with lidocaine (quot. Halpern).

Bedi and Ellis (1970) describe the case of a 48-year old female patient with rheumatoid arthritis who suffered Achilles tendon rupture following local application of corticosteroids for acute exacerbated rheumatoid arthritis (quot. Halpern).

We do not know exactly through what pathogenetic mechanism corticosteroid can cause tendon rupture though some observations do seem to contribute to our understanding of that process. Thus, e. g., Wrenn et al. (1954) brought experimental evidence of cortisone causing a reduction of fibrous tissue production, and reducing the strength of repaired tendon by 40 %.

Balasubramaniam et al. (1972) injected hydrocortisone into rabbit calcaneal tendons only to find areas of necrotic collagen there 24 to 72 hours afterwards (quot. Halpern).

The striking feature in our own patient is that all eight flexor tendons snapped suddenly at a single moment of acute muscular action by flexors of the triphalangeal fingers of the right hand. This fact confirmed clinically and surgically is, indeed, amazing. Consider only the strength of flexor tendons, or the weight (in kg) a healthy tendon will withstand without damage. Even if we admit the unaccounted for off-chance that Kenalog A-40 had been used by mistake and in heavier doses, or perhaps even intratendinously, that, too, could hardly help us to understand the mechanism of eight tendons rupturing simultaneously (though admittedly the aggregate cross section of the Achilles tendon may be approximately as large as that of the eight flexor tendons). We may even admit the effect of some other, as yet unknown, pathological factor contributing to the development of the carpal canal syndrome. Even then, we are at a loss trying to explain the actual disappearance of 8 pieces of flexor tendon of the total length of 160 cm.

The above quoted cases of pathological tendon rupture in connection with corticoid therapy, however, clearly point to the possible undesirable effect corticosteroids may have on strong tendons, eventually causing their rupture. This may happen, as already referred to, even if the drugs are administered systematically and not just locally. However, since corticosteroids are used

in large numbers of individuals, and since only very few of these suffer from this kind of undesirable complication, the fair assumption seems to be that those few are, in fact, particularly predisposed individuals. In the course of the following year, we were able to treat two more such patients with similar affections. One of them had received Kenalog A-40 locally for stenosing tendovaginitis of the long extensor of the thumb (DeQuervain's disease) with rupture of the tendon. The other patient, a ballet dancer, who had received Kenalog A-40 injections into the articular capsule of the 1st metatarsophalangeal joint for persistent pain, suffered big toe subluxation as a result of articular capsule rupture.

Kenalog is a synthetic hormonal drug of the depot type with very strong anti-inflammatory effects. Some Czechoslovak authors such as Lavička point out that the clinical action of Kenalog may persist for about 3 months — in 20 % of the cases involved even more than 6 months. For that reason, Kenalog should not be injected at intervals of less than 3—4 weeks (A-10) or 2—3 months (A-40). Unless an articular cavity is involved, the tissue depot of Kenalog cannot be expected to have been absorbed in a mere week's time; a subsequent dose will create another depot in close vicinity to the previous one, thus dangerously increasing the total amount of the locally stored drug.

There had been no mistake of Kenalog dosage in any one of our three patients. All had received the safe dose of 20 mg per injection.

In their more than 8200 local applications of glucocorticoids for the treatment of the carpal canal syndrome, and some 300 injections in the cubital canal syndrome, Pechan and Štelcová report no serious complications. It appears then, that the previously mentioned patients were in fact individuals suffering from quite extraordinary susceptibility to the effects of synthetic corticosteroids.

J. H.

SUMMARY

Tendon ruptures are among the undesirable side effects of synthetic corticosteroids described in world literature. A case report is presented as corroborative evidence of this. A 26-year old man was given a series of 20 mg doses of Kenalog A-40 injected in the region of lig. carpi volare man. l dx for the carpal canal syndrome. 6 months afterwards, he suffered the simultaneous rupture of all eight tendons of his right-hand finger flexors instantaneously manifested as loss of active flexion in the interphalangeal articulations involved. Surgery revealed the disappearance of 8 pieces of finger flexor tendons, each more than 20 cm long. The function of the flexors lost was successfully substituted by transporting the mm. flex. carpi rad. et uln. to act as finger flexors. The patient was able to resume his former employment. Treatment was also given to two more patients, one with complaints involving one of the thumb extensor tendons, the other with rupture of the articular capsule of the metatarsophalangeal joint of the big toe following local application of Kenalog A-40.

RESUME

Ruptures des tendons des doigts après l'application locale de triamcinolonacetonide (Kenalog A-40)

Jakubík J.

Dans la littérature on constate parmi les effets secondaires négatifs des corticostéroïdes synthétiques aussi les ruptures des tendons. Nous présentons, pour attester cette constatation, la casuistique d'un de nos patients. Il s'agit d'un homme de 26 ans qui fut traité par les doses de 20 mg de Kenalog A-40, appliqué à plusieurs reprises et injecté dans la région de lig. carpi volare man. l. dx pour le syndrome de canal carpien. 6 mois après la dernière application de Kenalog, il a subi, pendant un travail dur, la rupture pathologique de tous les 8 tendons fléchisseurs des doigts à 3 phalanges sur la main droite ce qui s'est manifesté immédiatement par la manque de la capacité de la flexion active dans les articulations interphalangeales de ces doigts. Pendant l'opération on a constaté la disparition de 8 morceaux des tendons fléchisseurs dont la longueur fut un peu plus de 20 cm, des doigts à 3 phalanges. L'activité des fléchisseurs disparus fut substituée avec succès par la transposition de mm. flex. carpi rad et uln dans la fonction des fléchisseurs des doigts. Le patient a pu reprendre sa profession.

Plus tard on a traité 2 autres patients avec un endommagement du tendon fléchisseur d'un doigt de la main et avec une rupture de l'écui articulaire de l'articulation metatarsophalangéale d'un doigt du pied après l'application locale de Kenalog A-40.

ZUSAMMENFASSUNG

Rupturen der Fingersehnen nach lokaler Applikation von Triamcinolonazetonid (Kenalog A-40)

Jakubík J.

In der Weltliteratur werden unter den ungewünschten Nebenwirkungen der synthetischen Kortikosteroide auch Sehnenrupturen beschrieben. Als Beleg dieser Feststellung führen wir die Kasuistik unseres Patienten an. Es handelte sich um einen 26 Jahre alten Mann, der durch wiederholte Verabreichung von Kenalog A-40 behandelt wurde, das in einer Einzeldosis von 20 mg in die Gegend des lig. carpi volare man. l. dx. wegen des Syndroms des Karpalkanals eingespritzt wurde. Ein halbes Jahr nach der letzten Gabe kam es bei ihm während schwerer Arbeit zu einer einfachen Ruptur aller acht Sehnen der Flexoren der dreigliedrigen Finger an der rechten Hand, die sich unmittelbar durch Ausfall der Fähigkeit der aktiven Flexion in den Interphalangealgelenken dieser Finger manifestiert hat. Bei Operation wurde das Verschwinden von acht ~~Stücken~~ der Sehnen der Flexoren der dreigliedrigen Finger in einer Länge von mehr als 20 cm festgestellt. Die Tätigkeit der vernichteten Flexoren wurde durch Transposition der mm. flex. carpi rad. et uln. in die Funktion der Fingerflexoren erfolgreich substituiert. Der Patient kehrte in seinen ursprünglichen Beruf zurück.

In späterer Zeit wurden zwei weitere Patienten mit einer Störung der Sehne des Extensoren des Daumens und mit einer Ruptur der Gelenkkapsel des Metatarsophalangealgelenks der grossen Zehe nach lokaler Applikation von Kenalog A-40 behandelt.

RESUMEN

Rupturas de los tendones de los dedos de la mano después de la aplicación local de triamcinolonacetónida (Kenalog A-40)

Jakubík J.

En la literatura mundial, entre los efectos secundarios nocivos de la aplicación de corticoesteroides sintéticos se describen también las rupturas de tendones. Como ejemplo de esta constatación exponemos la casuística de un paciente nuestro. Se trataba de un hombre de 26 años sometido a la cura por administración repetida de Kenalog A-40 inyectado por dosis individuales de 20 mg en la región del lig. carpi volare man. l. dx a causa del síndrome del canal carpal. Al medio año de haber sido administrado la última dosis de Kenalog, cuando el paciente se dedicaba a un dificultoso trabajo físico, se produjo una simultánea ruptura patológica de los ocho tendones de los flexores de los dedos trifalangeales de la mano derecha que tuvo por consecuencia una desaparición inmediata de la capacidad de flexión en las articulaciones interfalangeales de estos dedos. En la operación se detectó la desaparición de ocho trozos de tendones de los flexores de los dedos trifalangeales, de un largo de 20 cms. La función de los flexores destruidos se pudo sustituir satisfactoriamente por la transposición de mm. flex. carpi rad. et uln. al lugar de los flexores de los dedos. El paciente pudo volver a su profesión original.

Más tarde se dió tratamiento a otros dos pacientes con defecto del tendón del extensor del dedo pulgar de la mano y, la ruptura de la envoltura de la articulación metatarso-falangeal del pulgar del pie como consecuencia de la aplicación local de Kenalog A-40.

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FLUID SUPPLY TO BURNED CHILDREN DURING THE PERIOD OF SHOCK

I. Novák, R. Königová, + F. Dorňák

Major burn trauma is an emergency requiring intensive care with the aim of preventing hypovolemia and adapting the body's adrenergic response to the burn injury.

Unlike adults', children's organism keeps growing, thus accounting for a number of physiological and pathophysiological specificities to be borne in mind when organizing burned children's intensive care.

The main problem of intensive care in the emergency period is to maintain adequate supply of fluids necessary for the maintenance of a sufficient, effectively circulating volume in view of a whole series of alterations in the total amount of body fluids, their qualitative composition, and also in view of their distribution among the particular components of total body fluid.

The following study is a sum of experience built up partly in 1971, partly in 1979 as a basis for the identification and substantiation of optimum fluid supply to burned children during the first post-accident 24 hours in terms of infusion solution quantity and composition.

OBSERVATIONS PROPER

A total of 52 children were admitted at the intensive care unit of the Department of Plastic Surgery burns ward, Prague in 1979. Characteristic of the group are in Tab. 1.

With a view to finding out about the mode of treatment the children had received during the first post-accident 24 hours, the authors chose a group of children admitted to our intensive care unit within 4 hours of injury, thus ensuring the treatment and internal environment monitoring within the first 24 hours to take place at the unit itself. Characteristics of this particular group can be found in Tab. 2.

The quantity and type of fluid supplied within the first 24 hours as specified in Tab. 2 can be gleaned from Tab. 3.

Table 1. Children Admitted in 1979

Number of children	Age range	Ø age	Burned area	Ø burned area	Degree	Deaths
52	1 yr 9 m. to 13 yrs 6 m.	4 yrs 9 m.	8—80 %	24.9 %	2nd—3rd	2 (3.8 %)

Given the amount and composition of the fluids thus supplied, diuresis was on average 1.8 ml/kg/hour. 24 hours after treatment was started, none of the 16 burned children showed any signs of burn shock, diuresis was adequate, the amount of Na in the urine being higher than that of potassium in all the

Table 2. Children Admitted Within 4 Hours of Injury (1979)

Number of children	Age range	Ø age	Burned area	Ø burned area	Degree	Therapy	Deaths
16	2 yrs 4 m. to 9 yrs 2 m.	4 yrs 4 m.	8—80 %	22.8 %	2nd 3rd	infusions, alphablock., pethidin, prothazin, calcium, diazepam	1 (5.1 %)

patients, total natriuria showing physiological values, i. e. at least 2—3 mmol Na/kg/24 hours. The same kind of characteristics were also identified in the only death that had occurred in this particular group, a boy aged 9 years and 2 months with 3rd-degree burns covering 80 % of the body surface. In spite of intensive complex treatment the boy died three weeks after admission showing signs of gram-negative microorganism induced sepsis and immunity process failure.

Table 3. Quantity and Type of Fluids Supplied (1979)

Total amount	Crystalloids (Hartmann, exceptionally NaCl 0.9 %)	Colloids (plasma, exceptionally albumin)	Other fluids (exc. G 5—10 %, intake per os: tea, milk, mineral water)
2 527 ml	1775 ml	257 ml	495 ml

Total amount: 142 ml/kg/day

Another point was to analyze the mode of treatment provided at the ICU and compare this with the situation in 1971. The characteristics of this particular group of children can be found in Tab. 4.

Table 4. Children Admitted in 1971

Number of children	Age range	Ø age	Burned area	Ø burned area	Degree	Deaths
22	3 yrs 1 m. to 14 yrs 1 m.	7 yrs 8 m.	7-50 %	17.9 %	2nd-3rd	1 (4.5 %)

Shortlisted from this group were children who started a course of therapy within 4 hours of injury after they were transferred to our unit. Details are available in Tab. 5.

This group received, during the first 24 hours, amounts of fluids listed in Tab. 6 together with their composition.

Table 5. Children Admitted Within 4 Hours of Injury (1971)

Number of children	Age range	Ø age	Burned area	Ø burned area	Degree	Treatment	Deaths
14	3 yrs 1 m. to 14 yrs 1m	7 yrs 2 m.	8-50 %	21.4 %	2nd 3rd	infusion	1 (7.1 %)

The total amount of fluids supplied reached 81 ml/kg/day. In spite of the fact that diuresis was found adequate, 8 children of this group still showed signs of burn shock 24 hours after treatment was started. Natriuria was low, and only 5 children showed urine Na preponderance over urine K.

Table 6. Quantity and Type of Fluids Supplied (1971)

Total amount	Crystalloids (Hartmann, 0.9 % NaCl)	Colloids (plasma, albumin)	Other fluids (5-10 % G, i. v., per os: tea, milk, mineral water)
2 361 ml	642 ml	521 ml	1 198 ml

Total amount: 81 ml/kg/day

DISCUSSION

First, some facts concerning the total amount of fluids supplied. To calculate the required quantity of fluids in ml necessary for burned adults within 24 hours of the accident our clinical team employs the so called Brock formula update:

$$3-4 \times \% \text{ burned area} \times \text{body weight in kg.}$$

In children the situation is complicated by the relatively large area of the body surface in comparison with body weight (thus, for instance, a four-year old child's body weight amount to a fifth of an adult's whereas the body surface ratio is 1 : 3). A relatively large proportions of total body water is taken up by extracellular fluid (in adults the ECF : ICF ratio is 1 : 2, whereas in infants the ratio is reversed, and practically throughout the period of childhood extracellular fluid is somewhat more than intracellular fluid). A healthy child has a great physiological water requirement among other things also for reasons of a greater calory turnover per unit of body weight (while an adult needs 30—40 ml water/kg/day, a 6-year old child requires 100 ml/kg/day).

This also accounts for the high degree of children's sensitivity to dehydration and to burn-induced changes in water metabolism (ECF volume expansion, ECF sequestration, protein escape from circulation, sodium escape from extracellular space into cells, etc.). For that reason, it is essential to add to the burn-induced water requirement the extra physiological daily fluid requirement related to the child's age. This physiological fluid requirement (in ml) can be calculated according to a simple formula:

$$140 - [a \times 10]$$

where 140 stands for water requirement in infants/kg/day, and *a* for child's age (in years). Using the routine calculation for adults, the formula for the amount of fluid in ml required for the first post-injury 24 hours should be as follows:

$$3-4 \times \% \text{ burned area} \times \text{b. w. in kg} + \text{physiol. daily water requirement.}$$

According to our own experience of intensive care for severely burned children the amount thus calculated is near the upper limit of the quantity actually required, and may be found excessive in children over 6 years of age. The following formula appears to be safer and more appropriate:

$$2 \times \% \text{ burned area} \times \text{b. w. in kg} + \text{physiol. daily water requirement.}$$

However, considering children's metabolic specificities, it appears essential to calculate the fluid supply to burned children according to their body surface area. For it has turned out that as from the age of one year the turnover of fluids, ions, nutrients, drugs, etc. is far more related to body surface than to body weight. Hence why we propose a new formula for fluid supply to burned children during the first post-accidents hours, a formula which we tried out and which definitely proved useful:

$$75 \times \% \text{ burned surface area} \times \text{body surface in m}^2 \text{ related to the child's age} + \text{physiological water requirement related to body surface at the given age}$$

75 is the coefficient resulting from the geometrical correlation involving weight, height and body surface. Physiological daily water requirement is calculated as 1500—1800 ml \times body surface in m^2 related to age (1500 ml being

good for children aged 10–15 years, 1800 ml for younger children and for adults). For orientation's sake, body surface can be calculated according to Costeff's formula:

$$\frac{4 \times v + 7}{v + 90} \quad v = \text{body weight in kg}$$

or according to the formula

$$\frac{7 \times a + 35}{100} \quad a = \text{child's age in years}$$

The first volume of experience with this formula shows that the children are provided with an amount of fluids big enough to maintain an effectively circulating volume but not too excessive (and likely to cause circulatory failure, cerebral oedema, renal overloading, etc.). This body surface based formula will have to be further tested using CVT, PAP, and PWP measurements.

For very rapid orientation about the required amount of fluids for adults this formula open up some interesting opportunities provided a uniform body surface for all adults is presupposed, e. g. 1.75 m². If so, our formula would be as follows:

$$75 \times 1.75 \times \% \text{ burned area} + 1800 \times 1.75$$

Following the calculation of the constant values a very simple formula is obtained

$$130 \times \% \text{ burned area} + 3200$$

with only one variable left, i. e. the % burned area value. However, even this exploratory formula requires more practical testing and verification.

As for the composition of the fluids supplied, it is a moot point whether or not children need colloid solutions during the first 24 hours after injury. Some authors refer to better results if a larger volume of colloids is supplied — both in terms of shock period survival and as regards further complications (BOCANEGRA, 1978). While we seem unable to confirm such experience, our own experience suggests that the decisive factor — quite apart from the right amount of fluids — is to have a sufficient quantity of sodium ions in the fluids supplied, the composition of which ought to be like that of extracellular fluid. As far as we were able to see, colloids did not appear to be decisive for the maintenance of an adequate, effectively circulating volume of blood. Here we can refer to our group of 16 children treated in 1979 (see Tab. 2 and 3). Considering the gravity of the burn injuries concerned, the emergency period and the subsequent period took, on the whole, a favourable course. On the other hand, having examined the situation of children treated in 1971 (see Tab. 4, 5 and 6), we can see that although these were older children with larger body area and more body weight they received less fluid than the 1979 group. There was substantially crystalloids, and although there was double the amount of colloids and diuresis was satisfactory, low natriuria and signs of shock persisted after 24 hours of treatment. As suggested by urine and serum levels, sodium remained in the intracellular fluid due to inadequate supplies of sodium. The theoretical substantiation for our conclusions is in that the

proteins supplied tend to escape from circulation during the critical first 24 hours (Königová, 1978). Besides, even in healthy individuals, the osmotic force of sodium represents more than 90 % of all the osmotic forces in blood circulation, and, in addition, sodium, is crucially important for the maintenance of volume ratios. Another of our findings is that to calculate the required amount of sodium ions in children over the age of one year the following formula applies: $0.5-0.7 \text{ mmol} \times \text{kg} \times \% \text{ burned area}$. The upper limit of the range should always be calculated.

Colloids do belong among the fluids supplied during the first 24 hours, but mainly as a source of immunoglobulins. Under the conditions prevailing here, frozen plasma is the best way of supplying immunoglobulins to children, its volume ranging between 1/5 to 1/10 of the total amount of fluids supplied. An adequate amount of immunoglobulins may prove to be a significant factor in combatting infection, the gravest danger for the child throughout the whole of the acute period.

CONCLUSION

With regard to the physiological specificities of childhood and with reference to their own experience of intensive care for children with major burn injuries, the authors propose the following formula for the calculation of the amount of fluids (in ml) supplied during the first 24-hour emergency period:

$$75 \times \text{body surface in m}^2 \times \text{burned area in \%} + 1500-1800 \times \text{body surface in m}^2$$

The sodium ion has a decisive role to play for the maintenance of volume and osmotic balance and for the preservation of a sufficient, effectively circulating volume of blood. For that reason, fluids supplied during the first 24 hours of post-injury emergency should have a composition similar to that extracellular fluid. According to the author's experience, colloids are not a factor of decisive significance for burn shock management, except as suppliers of immunoglobulins provided they are supplied in the form of frozen plasma.

The above conclusions require more testing in routine therapeutical practice and in theoretical models.

J. H.

SUMMARY

52 severely burned children aged 1.9-13.6 (average age 4.9 years) with 2nd and 3rd degree burns affecting 8-80 % (average 24.9 %) of body surface were treated in 1979. Proceeding from experience involving children whose treatment and monitoring started already 4 hours after the accident, from their own previous experience (the treatment of this particular group of 1971), and from pathophysiological considerations, the authors discuss the required amount and composition of fluids supplied during the first 24 hours after injury to propose a new formula which takes into account the burned child's body surface area, and recommend its use in adults as well. An adequate supply of solutions, the composition of which corresponds to that of ECF with a sufficient quantity of the sodium ion, is regarded as crucial for correct infusion treatment during the period of shock. The significance of colloids is in

that during the first 24 emergency hours they can represent a desirable early supply of immunoglobulins provided they are given in the form of frozen plasma.

RESUME

Administration des boissons aux enfants brûlés pendant le période de choc

Novák I., Königová R., Dorňák F.

En 1979, les auteurs ont traité 52 enfants grièvement brûlés, âgés de 1,9—13,6 ans (l'âge moyen fut 4,9 ans) dont les brûlures représentaient 8—80 % de la surface du corp (24,9 % en moyenne). Il s'agissait dans tous les cas des brûlures du 2.e ou du 3.e degrés. Sur la base des expériences des enfants qui ont commencé à être traités 4 heures après l'accident déjà, sur la base des expériences précédentes (on compare le traitement du groupe nommé ci dessus avec un autre groupe similaire d'enfants, traités en 1971) et sur la base des réflexions concernant la patophysiologie, les auteurs discutent la quantité et la composition nécessaire des boissons administrées pendant les premières 24 heures après l'accident. Ils proposent un nouveau modèle de l'administration des boissons qui tient compte de la surface des brûlures des enfants et ils recommandent l'application de ce modèle de même chez les adultes. En période de choc, ils considèrent comme le facteur décisif pour le traitement d'infusion juste l'amenée suffisante des solutions correspondantes par sa composition aux ECT qui contiennent une quantité suffisante des ions de Na. D'après les auteurs, l'importance des colloïdes ne consiste que dans le fait que pendant les premières 24 heures après le brûlement ils peuvent représenter une dose opportune nécessaire des immunoglobulines, dans le cas où ils sont fournis en forme de la plasmе surgelée.

ZUSAMMENFASSUNG

Verabreichung von Flüssigkeiten bei verbrannten Kindern in der Phase des Schocks

Novák I., Königová R., Dorňák F.

Im Jahre 1979 untersuchten die Autoren 52 schwer verbrannte Kinder im Alter von 1,9—13,6 Jahren (Durchschnittsalter 4,9 Jahre) mit Verbrennungen im Umfang von 8—80 % (Durchschnittswert 24,9 %) der Körperoberfläche. Durchwegs handelte es sich um Verbrennungen des II. oder III. Grades. Auf Grund von Erfahrungen mit Kindern, bei denen die Behandlung und Überwachung bereits vier Stunden nach dem Unfall begonnen hat, ausgehend von vorhergehenden Erfahrungen (die Behandlung der erwähnten Gruppe von Kindern wird mit einer ähnlichen Zusammenstellung von Kindern verglichen, die im Jahre 1971 behandelt wurden) und auf der Basis von pathophysiologischen Erwägungen analysieren die Autoren die erforderliche Menge und Zusammensetzung von Flüssigkeiten, die binnen der ersten 24 Stunden nach dem Unfall verabreicht werden. Sie schlagen eine neue Formel für die Verabreichung von Flüssigkeiten vor, die die Grösse der Körperoberfläche der verbrannten Kinder berücksichtigt und empfehlen die Anwendung dieser Formel auch die Erwachsenen. Als entscheidend für die richtige Infusionstherapie in der Phase des Schocks betrachten sie die Zufuhr von Lösungen, die in ihrer Zusammensetzung ECT entsprechen und ausreichende Mengen von Natriumionen enthalten. Die Bedeutung der Kolloide sehen sie lediglich darin, dass sie in den ersten 24 Stunden die erforderliche frühzeitige Gabe von Immunoglobulinen darstellen können, wenn sie in Form des tiefgekühlten Plasmas zugeführt werden.

RESUMEN

Administración de líquidos a los niños con quemaduras en el estadio de choque

Novák I., Königová R., Dorňák F.

Los autores asistieron en 1972 a 52 niños con quemaduras graves entre 1. 9—13. 6. años de edad [edad promedio 4.9 años], extensión de quemaduras del 8 al 80 % (en promedio el 24.9 %) de la superficie del cuerpo. Las más eran quemaduras de segundo o de tercer grado. Reunidas las experiencias con los niños quienes recibieron el primer tratamiento ya al cabo de cuatro horas del accidente, las experiencias precedentes (se compara el tratamiento impartido a los niños de dicho grupo el que recibieron los de un grupo similar en 1971) así como reflexiones patofisiológicas los autores analizan la necesaria cantidad y composición de líquidos administrados durante las primeras 24 horas transcurridas del accidente. Asimismo recomiendan un modelo nuevo para administrar líquidos que obedece al correspondiente tamaño de quemaduras en diferentes niños, proponiendo sea implementado el mismo modelo con los adultos. Como factor decisivo para el correcto tratamiento de infusión en el período de choque los autores consideran ser un suficiente suministro de soluciones correspondientes por su composición a ECT que contienen suficientes iones de sodio. Según los autores, la importancia de coloides sólo consiste en su capacidad de constituir, en las primeras 24 horas, un temprano suministro de inmunoglobulinas, en caso de ser suministradas en forma de plasma congelado.

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The rest of the articles to the centenary of the birth of Academician F. Burian will be published in No. 4, 1981.

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REFLECTIONS ON THE ORGANIZATION OF MASS BURNS TREATMENT

Š. Šimko

Since long before the dawn of history man has been familiar with the advantages but also the dangers of fire. Consequently the incidence and treatment of burns are as old as mankind itself. Similarly we can trace back to the earliest periods of man's existence on earth the use of fire as a weapon which has to this very day retained its exclusive position among other weapons and torturing devices. Moreover, as a result of expansion in the fields of transport and technology we are now confronted not only with a rapid growth in the absolute number of burns but also with their mass incidence and with the potential danger of the use of thermic energy of unprecedented magnitude and appalling consequences.

In the course of the 1st and 2nd world wars, health services learned to cope with the traumatic effects of conventional warfare by introducing treatment by stages and uniform therapeutic doctrines. Although the number of burns had risen considerably during the 2nd world war we were unable to form at least an approximate idea of the holocaust resulting from the use of weapons of mass destruction until after we had absorbed the experience of Nagasaki and Hiroshima.

Several decades have passed since then, and thanks to our better present-day knowledge of the pathophysiology and pathomorphology of thermal injuries we now know that the treatment of burns poses of polydisciplinary problem, the solution to which is in the hands of traumatologists, surgeons, internal medicine specialists, paediatricians, anaesthesiologists, clinical laboratory workers, bacteriologists, plastic surgeons, psychiatrists, rehabilitation therapists, and a number of other specialists. By instituting specialised burns units (Prague, Ostrava, Košice) Czechoslovakia's health authorities have helped the treatment of burns make a great step forward. On the other hand, this step has helped to introduce treatment by stages as the specialized burns units and departments have been able to concentrate special technical equipment and highly specialized experts whose training and experience thus create optimum conditions for the treatment of specific types of burns.

Such a situation, however, made it imperative to introduce uniform principles and instruction familiar from the practice of military health services. Methodological instructions of the military type contain guidelines for what is known as triage, i. e. when, who, how and where to send casualties, including

directions on primary treatment. In this connection, let me mention as a good example the methodological instructions issued by the Ministry of Health of the Slovak Socialist Republic, XXVI, of August 17, 1978, paragraphs 12, 13, according to which burns are classified, treated and transported from all over the territory of the Slovak Socialist Republic. This is the only way to make sure that a maximum number of specifically singled out cases of burns will reach the place of specialized treatment in good time and in a reasonably well prepared state. This is also a good way to reaching a high degree of specialized knowledge and skills among the medical, surgical and auxiliary staff working at such specialized burns treatment centres. The result are work-places where burn treatment research and organization can reach a high standard and where the highly specialized staff can help raise the standard of burn treatment all over the catchment area. My own personal experience dating back to the 2nd world war and supported by ten years' work at the Košice department for burns treatment has convinced me of the validity of the well-known maxim of wartime surgery (Pirogov) "not a dressing is applied regardless of the combat situation". This is equally true of peacetime situations involving major accidents or disasters with a mass incidence of burns. Translated into peacetime speech the term "combat situation" implies a sum of geographical and meteorological conditions, socio-political circumstances, degree of technological development, quality and quantity of material and personnel facilities, and, last but not least, the capacity for and standard of planning and effective control.

However experienced we may be in the management of burn shock and burns treatment and whatever the degree of unanimity on this, the management of mass burns still remains a highly complex problem of organization.

To save and to cure as many of those affected as possible is the principal task and the main aim of the efforts of all the health workers concerned. To fulfil the task and to reach the aim, the following three basic problems have to be coped with: triage, treatment and transport.

Triage in such situations ought to be prognostic with a view to singling out those of the burned who are likely to survive. The rule holds good also in cases of mass burn management as the organization of salvage work is the most affected by the number of casualties, by the seriousness of their injuries, as well as by the general conditions of the disaster. For that reason triage ought to be conducted in a simple, straightforward and experienced manner.

While triage is the main link in mass burn management, yet it comes next to planning. For that reason, an emergency plan for mass burn management takes precedence over everything else as it lays down in no uncertain terms who is to do what, who is responsible and also who, when, how and where is to transport who. Since the gravity of burns can be expressed in terms of extent and age, the problem of triage can be simplified and facilitated by the flexible adaptation of certain formulas. In this country, the formula of the number 90 (sum of age and extent) has been established and empirically confirmed to represent a 50 % chance of survival. By flexibly bringing this number up or down depending on the overall situation we can extend or narrow the number of burn casualties who ought to be transported first. Other aspects

to be taken into account are age groups up to 4 and over 60, and the possible presence of poisoning with toxic products of burning, and inhalation burns. The very mass nature of mass burns accounts for the apparent discrepancy between the extent of required and technically available medical aid. A correctly designed triage should create the conditions for bridging this gap temporary as the emergency is.

Emergency treatment comes next observing the principle, according to which burns in adults involving more than 20 % of the body surface and in children more than 10 % (5 % up to the age of 4) require intravenous fluid replacement to be started within half an hour of the accident. Hartmann's solution (4 ml per %/kg/24 hrs) is indicated for the first day as the sole replacement fluid. Yet owing to the discrepancy referred to before, emergency situations require certain limitations, while fully respecting the time factor, partly in the indication of substitution therapy (if so required, raising the extent over 20, or 5 to 10 % respectively), partly in the substitution of intravenous resuscitation by enteral therapy. Problems of this kind remain open to this very day and will undoubtedly require more research and verification in practical work. As for our team, we have had no satisfactory experience breaking the above listed rules of treatment.

Last but not least, there is the problem of transport. Quite obviously, the personnel and material conditions as well as the mode of transport ought to be made part and parcel of the emergency plan. The point to be borne in mind here is that burn casualties can best tolerate transfer on the day of the accident so long as it does not take more than 60 minutes, and that any later transfer should take place by the end of the 3rd or 4th post-accident days, certainly before sepsis can fully develop. The burned casualties show a good tolerance of air transport; for that reason the employment of Czechoslovak Airlines and Slovair planes should be incorporated in the emergency plans. Finally, let me mention the role played by the specialized burn treatment units. To give a concrete example, our own department for burns treatment and reconstruction surgery has a capacity of 36 beds and serves the whole of Slovakia. Yet in terms of the need for specialized hospital beds per the total number of the population the department should have 56 beds, a difference of 20 beds. In other words, the department has no reserve for the hospitalization requirements in cases of mass burns; all the more so since in view of the 98 % bed occupancy rate only 20 %, i. e. 1 bed, could be spared. Therefore, given the planned number of hospital beds available, it would be better in cases of mass burn emergencies to plan the evacuation of existing surgical, traumatological or other specialized beds available at burns units, always, however, in concurrence with the planned simultaneous transfer of the hospitalized patients concerned. Another important aspect is that of staffing the newly developed burns departments; the deployment and specialization of burns specialists should be matched with the requirements of the burns treatment centres. Members of the staff of the specialized department for burns treatment are, in view of their specialized knowledge and skills, the obvious choice for co-operation or leading positions at those centres. In any case, they should be counted

on to provide methodological guidance. They are also the obvious choice for advisory and consultation services available at any time by telex or telephone.

This brief and certainly limited list of some of the ideas of importance for mass burn emergency management or for thermal disaster handling shows the complexity of the problem which will yet require a great deal of statistical investigation, much research work and very much organizational effort.

J. H.

SUMMARY

The author analyzes some of the aspects of mass burn emergency management stressing the problem of adequate organization and calling for the speedy implementation of organizational conditions at all levels of medical and surgical aid.

RESUME

Réflexion sur l'organisation du traitement des brûlures dans les cas des blessures en masse.

Šimko Š.

L'auteur s'occupe dans son article de quelques aspects du traitement des brûlures en cas de l'accident en masse. Il met l'accent sur la question de l'organisation et demande la réalisation prompte des conditions de l'organisation sur tous les degrés des services de la santé.

ZUSAMMENFASSUNG

Eine Betrachtung über die Organisation der Behandlung des massenhaften Vorkommens von Verbrennungen

Šimko Š.

In seiner kurzen Mitteilung befasst sich der Autor mit einigen Aspekten der Behandlung des massenhaften Vorkommens von Verbrennungen. Er hebt den organisatorischen Aspekt hervor und erfordert eine schnelle Realisierung der organisatorischen Voraussetzungen auf allen Ebenen der medizinischen Hilfe.

RESUMEN

Estudio sobre la organización del tratamiento de la presencia masiva de quemaduras

Šimko Š.

En su informe, el autor considera algunos aspectos de tratamiento de quemaduras presentadas en masa. Recalcando el problema organizativo el autor clama por la realización cuánto más rápida de adecuadas condiciones de organización a todos los niveles de asistencia médica.

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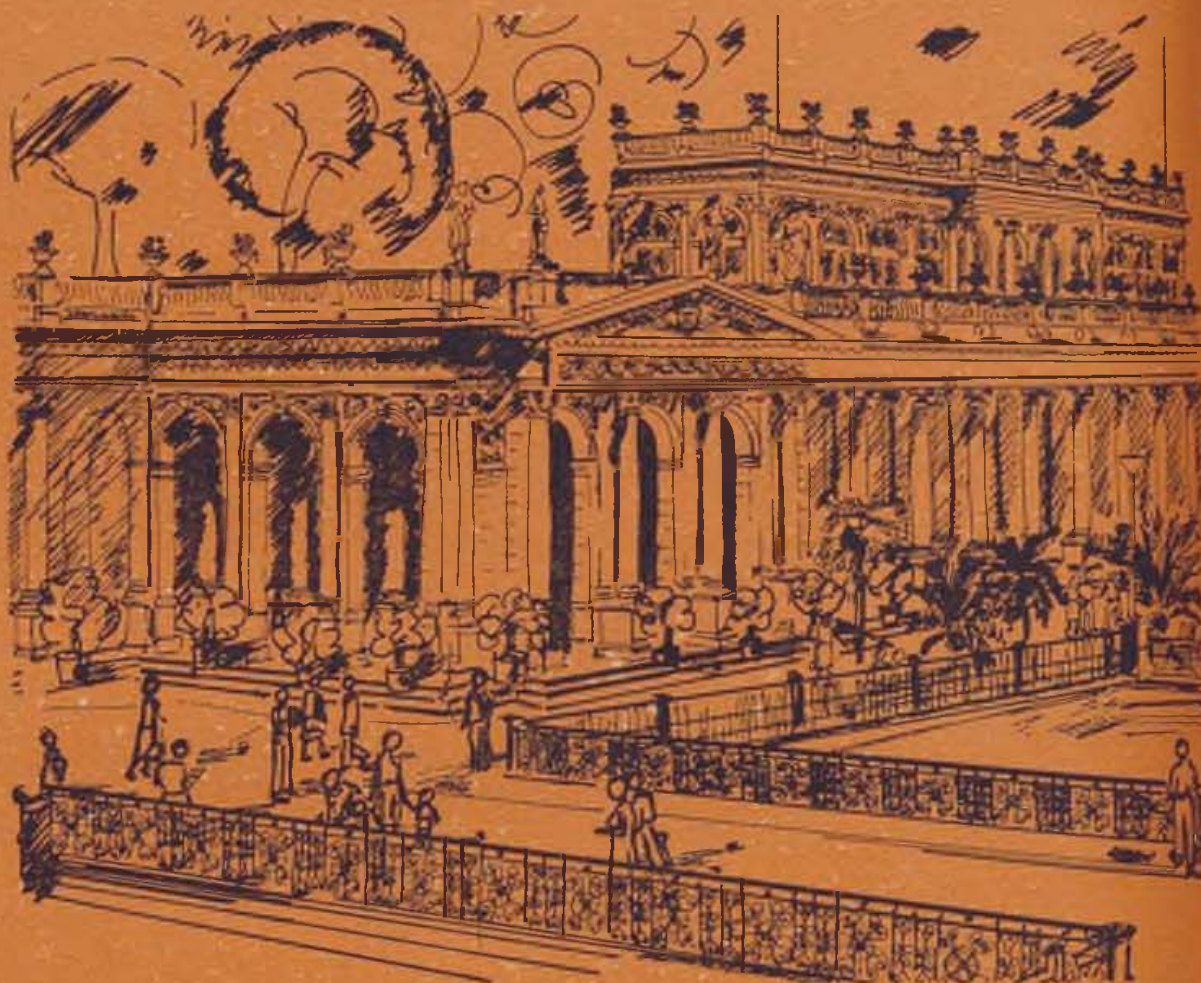
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STOP FOR A MOMENT AND CONSIDER YOUR HEALTH



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

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