# ACTA CHIRURGIAE PLASTICAE



INTERNATIONAL JOURNAL
OF PLASTIC SURGERY

16 · 1

1974

Acta chir. plast., 16, 1974, No. 1

AVICENUM - CZECHOSLOVAK MEDICAL PRESS
PRAGUE



Exclusive Distributors for all Western Countries
KARGER-LIBRI AG, Petersgraben 15, CH-4000 Basel 11 (Switzerland)

*Published four times* (in 1959: two times) a year by Avicenum - Czechoslovak Medical *Press, Malostranské nám. 28*, Praha 1. Editor in Chief Prof. H. Pešková, M. D.; *Deputy of Editor in Chief* Prof. V. Karfík, M. D. — Address of the Editorial Office: *Acta Chirurgiae Plasticae* (R. Vrabec, M. D. — Secretary) Legerova 63, Praha 2, *Czechoslovakia*. — Press: Středočeské tiskárny, n. p., provoz 01, Hálkova 2, Praha 2

*Subscription rate* Sfr 50.— plus postage. Exclusive distributors for all countries with *the exception of* Albania, Bulgaria, China, Cuba, Czechoslovakia, German Democratic *Republic*, Hungary, North Korea, North Vietnam, Mongolia, Poland, Rumania, Union of Soviet Socialist Republics and Yugoslavia:

KARGER LIBRI AG, Petersgraben 15, CH-4000 BASEL 11 (Switzerland)

# ACTA CHIRURGIAE PLASTICAE

INTERNATIONAL JOURNAL OF PLASTIC SURGERY



VOLUME 16

1974

AVICENUM, CZECHOSLOVAK MEDICAL PRESS, PRAHA, CZECHOSLOVAKIA

# CONTENTS

*16*, 1, 1974



*16*, 2, 1974

*16*, 3, 1974



*16*, 4, 1974

CONTENTS

ACTA CHIRURGIAE PLASTICAE — *16*, 1974, No 1



Charles University, Prague (Czechoslovakia)
Department of Anthropology
Czechoslovak Academy of Sciences, Laboratory of Plastic Surgery,
Head Prof. V. Karfík, M.D., DrSc.

# CONTRIBUTION TO THE ASSESSMENT OF THE PRE-OPERATIVE CONDITION OF THE NOSE IN PATIENTS WITH PALATOSCHISIS

K. HAJNIŠ, † P. FIGALOVÁ

No attention has been paid on the whole, to the problems of the peculiarities of dimension and shape of the external nose in patients with isolated cleft of either the hard or only the soft palate. It is obviously being assumed that a mere cleft of the palate of any degree, does not influence — at any significance — the normal structure of the splanchnocranium and its soft tissues, as stated for ex. by Burian (1963), Vaughan (1940) a.o.

We may believe perhaps — in respect of purely mechanical reasons — that any changes of the external nose formed under the influence of cleft of the hard palate, should be probably chiefly expected in the sense of its widening. Surgeons, however, claim rather that the nose in clefts of the palate is typically narrow. The reason is its insufficient widening by air flow (Karfík, verbal report). This opinion also corresponds to the finding of Farkas and Lindsay (1972), who ascertained a significantly narrower type of nose in adult patients with operatively treated cleft of the palate, in comparison to the healthy adult population. Clefts of palatum molle or possibly only uvula, afford no anatomic conditions for changes of the skeleton or of the soft facial tissues.

We verified the above described assumptions in a small group cf patients with cleft of the hard palate, by controlling the main signs of the external nose, considering the standard of their respective age class.

## MATERIAL AND METHODS

The size and shape of the external nose, was controlled by means of anthropometrical records of 36 child patients with palatoschisis (13 ♂♂, 23 ♀♀) in the condition prior to operative closure of the palate. 31 of the mentioned individuals (12 ♂♂, 19 ♀♀) belong to the age class of 3½—4½ years old

Tab. 1. Nasal dimensions and indexes

| 43—54 months | Girls | | | | | |
|---|---|---|---|---|---|---|
| | n | $\bar{x} \pm 3.s_{\bar{x}}$ | s | V | min-max | standard |
| n - sn | 19 | 38.63±3.0.74 | 3.26 | 8.43 | 32—43 | 36.16 |
| al - al | 19 | 27.57±3.0.40 | 1.76 | 6.38 | 23—29 | 26.02 |
| Index nasalis | 19 | 72.00±3.1.59 | 6.92 | 9.61 | 64—89 | 72.42 |
| Index nasozygomaticus | 19 | 23.81±3.0.38 | 1.66 | 6.97 | 21—27 | 23.20 |
| Index cheilonasalis | 19 | 74.13±3.1.93 | 8.42 | 11.35 | 60—88 | 74.28 |
| Index nasobasialis | 19 | 23.76±3.0.45 | 1.98 | 8.33 | 21—28 | 24.06 |
| Index nasogonialis | 19 | 31.31±3.0.54 | 2.35 | 7.50 | 26—35 | 31.23 |
| Index nasofrontalis | 19 | 29.26±3.0.41 | 1.82 | 6.22 | 25—32 | 27.07 |

| 43—54 months | Boys | | | | | |
|---|---|---|---|---|---|---|
| | n | $\bar{x} \pm 3.s_{\bar{x}}$ | s | V | min-max | standard |
| n - sn | 12 | 39.16±3.1.19 | 4.13 | 10.54 | 31—47 | 37.08 |
| al - al | 12 | 27.16±3.0.67 | 2.33 | 8.57 | 23—29 | 26.60 |
| Index nasalis | 12 | 69.00±3.2.43 | 8.44 | 12.23 | 55—80 | 72.12 |
| Index nasozygomaticus | 12 | 23.83±3.0.84 | 2.92 | 12.25 | 20—25 | 23.31 |
| Index cheilonasalis | 12 | 73.00±3.1.43 | 4.95 | 6.78 | 63—80 | 74.99 |
| Index nasobasialis | 12 | 23.00±3.0.47 | 1.65 | 7.17 | 20—25 | 23.74 |
| Index nasogonialis | 12 | 29.83±3.0.62 | 2.17 | 7.27 | 26—33 | 31.12 |
| Index nasofrontalis | 12 | 28.00±3.0.65 | 2.25 | 8.03 | 26—32 | 27.40 |

children, 5 further children (4 ♀♀, 1 ♂) belong to other age classes. All the data were obtained in the years 1964—1970 at the Department of Plastic Surgery, Medical Faculty of Hygiene, Charles University, Prague.

The research was carried out according to our anthropological record sheet (Hajniš, Farkaš, 1969). We calculated in all probands, besides the examined nasal signs, also the same indexes (i.e. index nasalis, nasozygomaticus, cheilonasalis, nasobasialis, nasogonialis and nasofrontalis) which we used in the report on the pre-operative condition of the nose in patients with total unilateral facial cleft (Hajniš, Figalová, 1973), to which we should like to refer.

Deviation of the point pronasale (prn), was ascertained in only 28 of the probands examined by the senior author of the report, i.e. only in 23 of the age class 3½—4½ years.

## PRE-OPERATIVE CONDITION OF THE NOSE

Tab 1, demonstrates the mean values of both basic dimensions of the nose and of the index nasalis and of five further indexes relating the nasal width (al-al) to some horizontal dimensions of the face and neurocranium, as well as their further statistical characteristics. We are also submitting here the data considered to be the standard valid for 3½—4½ years old Czech children (Figalová, Šmahel, report being prepared).

Mutual comparison of the calculated mean values of cleft patients with the standard, discloses that none of the differences in boys is statistically significant even at $P_{0,05}$, although the difference ascertained by t-test in the index nasogonialis approches this limit considerably ($t = 1,86$). With girls the situation is different. Height (n-sn) as well as width (al-al) of the nose differs from standard at statistical significance ($t_{n\text{-}sn} = 2,47 > P_{0,05}$, $t_{al\text{-}al} = 2,54 > P_{0,05}$), similarly as index nasofrontalis ($t = 4,38 > P_{0,01}$). With regards to the standard, the differences of the other tested indexes, do not reach in girls too, the limits of significance even at a level of $P_{0,05}$.

The statistically significant differences of both basic nasal dimensions ascertained in girls, do not confirm the opinion that there exist no changes of the splanchnocranium and its soft tissues, in patients with palatoschisis. They rather point out that some differences in comparison with the standard, may exist. Our finding will have to be, however, confirmed by further research.

Table 2, demonstrates the mean values and further statistical characteristics of the width of the left and also of the right part of the nose, mesaured from the median plane. There exist practically no differences in either sex (t-test: ♀♀ = 0,88 $< P_{0,05}$; ♂♂ = 0,21 $< P_{0,05}$); both parts are of equal width in average.

Vertical and anteroposterior differences in the placement of points subalare (sbal) were ascertained in 11 patients (35,48 %) of the examined age

Table 2. Width of the left and right part of the nose from medium plane (m-al)

| | Width of the dx part of the nose | | | | | Width of the sin part of the nose | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | $\bar{x} \pm 3.s_{\bar{x}}$ | s | V | min-max | n | $\bar{x} \pm 3\ s_{\bar{x}}$ | s | V | min-max |
| ♀♀ | 19 | 14.07 ± 3.0.28 | 1.24 | 8.81 | 12—15 | 19 | 13.76 ± 3.0.22 | 0.97 | 7.04 | 12—15 |
| ♂♂ | 12 | 13.66 ± 3.0.32 | 1.41 | 10.32 | 12—16 | 12 | 13.75 ± 3.0.26 | 0.90 | 6.54 | 12—15 |

Table 3. Differences in the placement of points subalare (sbal) (♀♀ + ♂♂)

| | | | n | $\bar{x}$ (mm) | |
|---|---|---|---|---|---|
| sbal | sin | more in the back | 4 | 1.00 | n = 11 (35.48 %) |
| | | lower | 3 | 1.00 | |
| | dx | more in the back | 4 | 1.75 | |
| | | lower | 6 | 1.33 | |

without the differences in the placement = 20 (64.51 %)

class 3½—4½ years (tab. 3). Asymmetry of the attachment of the nasal wings is to be found not infrequently, however, even in individuals of the healthy population. Thus Brůžek (1972) ascertained for ex. in the individual age classes of the 10—19 years old healthy Czech youths and children, this irregularity in 0—38,92 % in the frontal plane with equal incidence in the horizontal plane. Farkas and Lindsay (1972) ascertained dislocation of the base of nasal wings in the frontal plane in 26,2 % of surgically treated adult patients with cleft palate.

The finding of more than one third of vertical and anteroposterior differences in the placement of the subalare points (sbal), again confirms the previously observed differences of the nose in individuals with palatoschisis from normal children.

We ascertained in 31 children with cleft of the palate, prior to its operative closure, only 4 probands (12,90 %), with nasal dorsum deviating from the median plane. Deviation to the right in three patients and to the left in one patient was, however, in all cases negligible (1—3$^0$). In 23 probands, the placement of the point pronasale (prn - apex nasi), in consideration of the central facial line, was also studied. We ascertained amongst them only 1 (4,34 %) with the nasal apex shifted to the right by 3 mm. The difference of 3 cases in comparison to the angular deviation of dorsum nasi, is due to the unequal number of examined cases with both sings and also due to the fact that negligible deviations of the apex nasi from the medium plane, need not be metrically recorded at all.

We observed deviation of the columella nasi from the median plane in 5 patients out of 31 (16,12 %). Not even here did the values reach a higher value than 3$^0$, always towards the left side. Brůžek (1972) reports in healthy Czech children a maximum incidence of deviation in the age class of 13—14 years old boys at 31,43 %. Irregularities in the shape and placement of nares nasi, are also rare.

Of five further patients of other age classes, no deviations from normal at all, were ascertained in two patients. In one of the girls, the nose (n-sn) is lower by 2,4 s (standard deviation), in the other girl the sbal point is — in comparison with the right side — lower to the left by 1 mm. The right nostril

is shorter than the left one and in the last of these probands, the nose (al-al) is — in consideration of the standard — widened by 2 s with slightly different placement of the nares nasi.

We admit that some of the observed irregularities in the nasal area, for example descent of the nasal wings, irregularities in their attachment etc., may tend to point out the existence of another type of cleft than mere palatoschisis. In effect, the front palate is affected at minimum, but it is not possible of course to differentiate them from the actual palatal clefts and for this reason they can not be excluded from the group.

## CONCLUSION

The following conclusions can be drawn from the examination of the chief dimensions and shape of the nose in 36 child patients with palatoschisis, before operative closure of the palate:

1. The relatively low variation coefficients (V) of all directly measured sings in table 1 and 2 in both sexes, prove that in spite of the rather small number of probands, the group is clearly homogenic and can be thus well evaluated.

2. The frame nor soft parts of the nose, need not be — in children with isolated cleft of the palate — in all cases quite normal. Its height as well as width (according to our findings in girls usually proportional, so that the index nasalis does not differ from standard) may differ from the standard of the corresponding age class. The types of nose in the examined age class of 3½—4½ years old girls, are mesorrhine in average, just as in the healthy population, in boys they are even leptorrhine. The shape may, of course, vary individually from narrow noses to wide noses.

3. The left and right part of the nose, mesasaured from the median line to the point (al), is practically of the same width in average and in the individual probands.

4. In 35,48 % of the probands, asymetrical attachment of the nasal wings to the upper lip in vertical and ventrodorsal direction, has been ascertained.

5. Deviation of the dorsum of the nose, apex nasi and columella nasi, although ascertained in a certain number of patients (12,90 %, 4,34 %, 16,12 %), only amounted to small values.

## SUMMARY

The pre-operative condition of the external nose, was investigated in 31 patients (12 ♂♂, 19 ♀♀) in the age class of 3½—4½ years and in 5 other children of another age (4 ♀♀, 1 ♂) with cleft of the hard palate. The comparatively low coefficients of variation of all the directly measured signs, prove in spite of the rather low number of probands that the group is homogenic and that the results ascertained, are therefore credible. They prove that the height (n-sn) and also the width (al-al) of the nose, may differ from standard, in average. Asymmetry of the nose does not manifest in a difference

of the width of its left or right part, but it shows up in a dislocation of the attachment of the nasal wings in frontal and horizontal plane. Deviation of the apex, columella and dorsum nasi, or irregularities of the shape and placement of nares nasi, were ascertained only rarely.


RÉSUMÉ

**Contribution à l'analyse de l'état préopératoire du nez des malades avec la palatoschisis**

Hajniš K., Figalová P.

Chez les malades (12 ♂♂, 19 ♀♀) de l'âge de 3½ à 4½ ans et chez 5 enfants d'un autre âge (4 ♀♀, 1 ♂) avec une fente de la voûte palatine osseuse, on a examiné l'état préopératoire du nez externe. Malgré le petit nombre de sujets examinées, les coefficients de variation relativement bas de tous les signes mesurés démontrent qu'il s'agit d'un ensemble homogène et c'est pourquoi les résultats sont authentiques. Ils démontrent que la hauteur (n-sn) et la largeur (al-al) du nez peuvent se distinguer en moyenne de la norme. L'asymétrie du nez ne se présente pas par la difference de la largeur de sa partie gauche et droite, mais elle se montre souvent dans la dislocation de l'insertion des ailes du nez dans le plan frontal et horizontal. Rarement on a trouvé une déviation de la pointe du nez, de la columelle et du dos du nez, ou des irrégularités de la forme et de la situation des narines.

ZUSAMMENFASSUNG

**Ein Beitrag zur Beurteilung des präoperativen Nasenzustandes bei Kranken mit Palatoschisis**

Hajniš K., Figalová P.

Bei 31 Kranken (12 ♂♂, 19 ♀♀) in der Altersgruppe von 3½—4½ Jahren und bei fünf weiteren Kindern anderen Alters (4 ♂♂, 1 ♀) mit Hartgaumenspalte wurde der Voroperationszustand der äusseren Nase untersucht. Verhältnismässig niedrige Variationskoeffizienten aller direkt gemessener Merkmale beweisen trotz der ziemlich niedrigen Zahlen der Probanden, dass es sich um eine homogene Aufstellung handelt und dass die gewonnene Ergebnisse glaubwürdig sind. Sie beweisen, dass die Höhe (n-sn) und Breite (al-al) der Nase im Durchschnitt von der Norm abweichen kann. Die Asymetrie der Nase macht sich nicht bemerkbar im Unterschied zwischen der Breite ihres linken und rechten Teils, sondern oft in der Dislokation des Ansatzes der Nasenflügel in der Frontal- und Horizontalebene. Nur selten wurden Deviationen von apex, columella und dorsum nasi oder Unregelmässigkeiten in der Form und Lokalisierung der nares nasi beobachtet.

RESUMEN

**Contribución al análisis del estado preoprativo de la nariz de los pacientes con la palatosquisis**

Hajniš K., Figalová P.

El estado de la nariz exterior fue examinado en 31 pacientes (12 ♂♂, 19 ♀♀) del grupo de edad de 3½—4½ años y en 5 más miños de otra edad (4♀♀, 1 ♂) con la fisura del paladar duro. Los coeficientes de variedad relativamente bajos de todos

los signos medidos directamente prueban, a pesar de los números no altos de los examinados, que se trata de un conjunto homogéneo y por eso los resultados comprobados son de crédito. Prueban que el alto (n-sn) y el ancho (al-al) de la nariz pueden diferirse de la norma en el promedio. La asimetria de la nariz no se manifesta en la diferencia del ancho de su parte izquierda y derecha, mas se muestra a menudo en la dislocación de la inserción de las alas nasales en el plano frontal y horizontal. Una deviación del apex, de la columella y del dorso nasi o una irregulidad en la forma y colocación de las nares nasi fue observada solo rara vez.

## REFERENCES


1. **Brůžek, J.:** Development of the nose in Czech children from 10 to 19 years (in Czech). Diploma work. Department of Anthropology, Charles University Prague, 1972.

2. **Burian, F.:** Chirurgie der Lippen- und Gaumenspalten. Berlin, Veb. Verlag Volk und Gesundheit 1963.

3. **Farkas, L. G., Lindsay, W. K.:** Morphology of Adult Face After Repair of Isolated Cleft Palate in Childhood. Cleft Palate J., 9, 2 : 132, 1972.

4. **Figalová, P., Smahel, Z.:** Growth of the face in Czech children since birth till the age of 6 years. (Report under preparation.)

5. **Hajniš, K., Farkaš, L. G.:** Anthropological Record for Congenital Developmental Defects of the Face (Especially Clefts). Acta Chir. plast., 11, 4 : 261, 1969.

6. **Hajniš, K., Figalová, P.:** Shape of the Nose in Cheilo-Gnatho-Palatoschisis Unilateralis before Operational Repair. Acta Chir. plast., 15, 1 : 11, 1972.

7. **Karfík, V.:** Verbal report.

8. **Vaughan, H. S.:** Congenital Cleft Lip, Cleft Palate and Associated Deformities. Philadelphia, Lea and Febinger 1940.

9. **Weber, E.:** Grundriss der biologischen Statistik. Jena, G. Fischer 1957.



Doc. dr. K. Hajniš, Viničná 7, 128 44 Praha 2, Czechoslovakia


---

**The International Society of Faciomaxillary Surgery hold its Third Simposium** at Baden near Vienna between June 23 and 28, 1974, under the direction of Dr. med. H.G. Bruck.

Subject: Cosmetic Surgery of the Face. Papers (slides 5×5 cm.) and films (16 mm.) can be registered. On June 27 and 28 demonstrations of operations will be carried out at the Lainz-Wien Hospital.

The program entails: Sight-seeing of Vienna, a visit of the Spanish Riding School; of the Treasury; of the Art Collection at the Albertinum, the Opera of Burgtheater; excursion through the Wiener Wald incl. visits of its castles and monasteries; an evening at the Heurigen.

The fee for active participants of the Symposium is US$ 30, for companions US$ 15. — Registration terminates in Feb., 1974.

J. E. Purkyně University, Brno (Czechoslovakia)
Department of Plastic Surgery
Head Prof. V. Kubáček, M.D., SCs.

# COMPLICATED RECONSTRUCTION AFTER MUTILATING OPERATION OF THE LIP IN BILATERAL CLEFT OF THE PRIMARY AND SECONDARY PALATE

J. PĚNKAVA

The therapy of congenital defects is organized in our country to such a degree that unoperated adults can be met only exceptionally nowadays.

From time to time, however, we have to face the problem of correcting a congenital defect which, though operated on in childhood, had been treated without success or the therapy started at one time was not completed.

The therapeutic results in primary and secondary palates closed in adult age are never perfect as far as the function is concerned. Due to chronic inflammatory nasopharyngeal and paranasal changes, the post-operative healing need not proceed per primam. It must also be remembered that defective speaking habits are centrally fixed and after the operation they can only be removed by speech therapy with great difficulty. The rather unpleasant nasal twang usually persists even after the operation.

In spite of all these shortcomings, an operation of the cleft is indicated in these patients as it makes their biting and swallowing easier and improves the conditions for speech. Thus the patient's social conditions are improved — his selfconfidence, especially in social contacts.

If the lip in bilateral total cleft of the primary and secondary palate was not closed in infant age but only in adult patients, the intermaxillary bone usually protrudes considerably from the facial profile. In the infant, the intermaxillary bone is modelled by the reconstruction of the lip, unless some other orthopedic step was taken before the operation. In adults the protrusion of the intermaxillary bone can only be corrected by surgery. If the suture of the lip is under tension, the ventral poles of the lateral segments get so close to each other that there sometimes is complete contact with the intermaxillary bone, possibly with the vomer. Unless the collapsed lateral segments are treated prior to palatoplasty, it is only rarely possible to correct this condition by means of conservative orthodontic therapy. Previously, the protruding intermaxillary bone in the infant with bilateral cleft of the primary and secondary palate induced the general surgeon to carry out resection of the intermaxillary

Fig. 1a. The patient K. M. when admitted to the department. The intermaxillary bone with the corresponding part of the lip, columella and nasal septum had been extirpated. — Fig. 1b. The upper lip in the profile strongly recedes dorsally

bone because he had difficulties with closing the cleft lip. In adults, the intermaxillary bone represents the frontal section of the alveolus of at least 3 cm width. Resection of the intermaxillary bone mutilates the upper jaw not only by formation of a large defect but also by rotation of the lateral segments by the front poles towards the central plane. David observed, however, a collapse of the lateral segments even in unoperated patients.

If only the lip is sutured till adolescence, the elastic pressure of the lip usually induces the lateral segments to get close, causes reversion of the bite and crossing of the lateral sections of the upper jaw. In contrast to the normal population, there is usually a wide mesopharynx and a short velum in bilateral clefts of the primary and secondary palate. The lateral segments are in a more dorsal position towards the cranial basis. These primary shortcomings added to atrophy of the muscle system of the velum and atrophy of the mucosa — as is the case with palates left unoperated for a long time — when starting the reconstruction, we must keep in mind, that the palatopharyngeal closure is insufficient. For this reason we must set out from the mentioned experiences when planning corrective operations.

On the example of our patient we are going to demonstrate the complexity of the operative steps which have to be taken in order to correct the operation carried out badly and incompletely in childhood.

K. M., case history Nr. 31321, born 2. 9. 1924, female, a farmhand, asthenic and decrepit. No congenital defects in the family case history. She is married and gave birth to three healthy children. In early childhood she was operated on at the Department of General Surgery for bilateral total cleft of the primary and secondary palate. When she became edentulous she called at the stomatologic out-patient department asking for a dental prosthesis. The stomatologist sent her to our department.

The patient is of simple personality and average intellect without psychopathologic symptoms. She is adapted in society, the passive type of adaptation. Her values lie in the family where she is completely satisfied. As she feels little need of self-assertion in society and gives small preference to aesthetic values, her congenital defect is of altogether small importance for her.

Local condition: condition after suture of the lip which followed after resection of the intermaxillary bone and vomer. The upper lip is low, the vermilion very narrow. Nasal axis in the central plane, alae flat and laterally placed (Fig. 1a, 1b). A rest of the columella is left below the nasal tip. The nasal septum is absent. Nasal mucosa chronically inflamed with rich secretion (Fig. 2). The upper lip tense, falling in the profile as the bony central part of the maxilla is missing owing to dissection performed during the suture of the lip. There is a slit of approx. 2 cm between the two poles of the lateral edentulous segments of maxilla (Fig. 3). The cleft of the hard

Fig. 2. Cleft of the palate not yet closed — a very wide cleft. A hypertrophic lower conch is visible. — Fig. 3. A slit of approx. 2 cm separates the poles of the lateral edentulous segment of maxilla

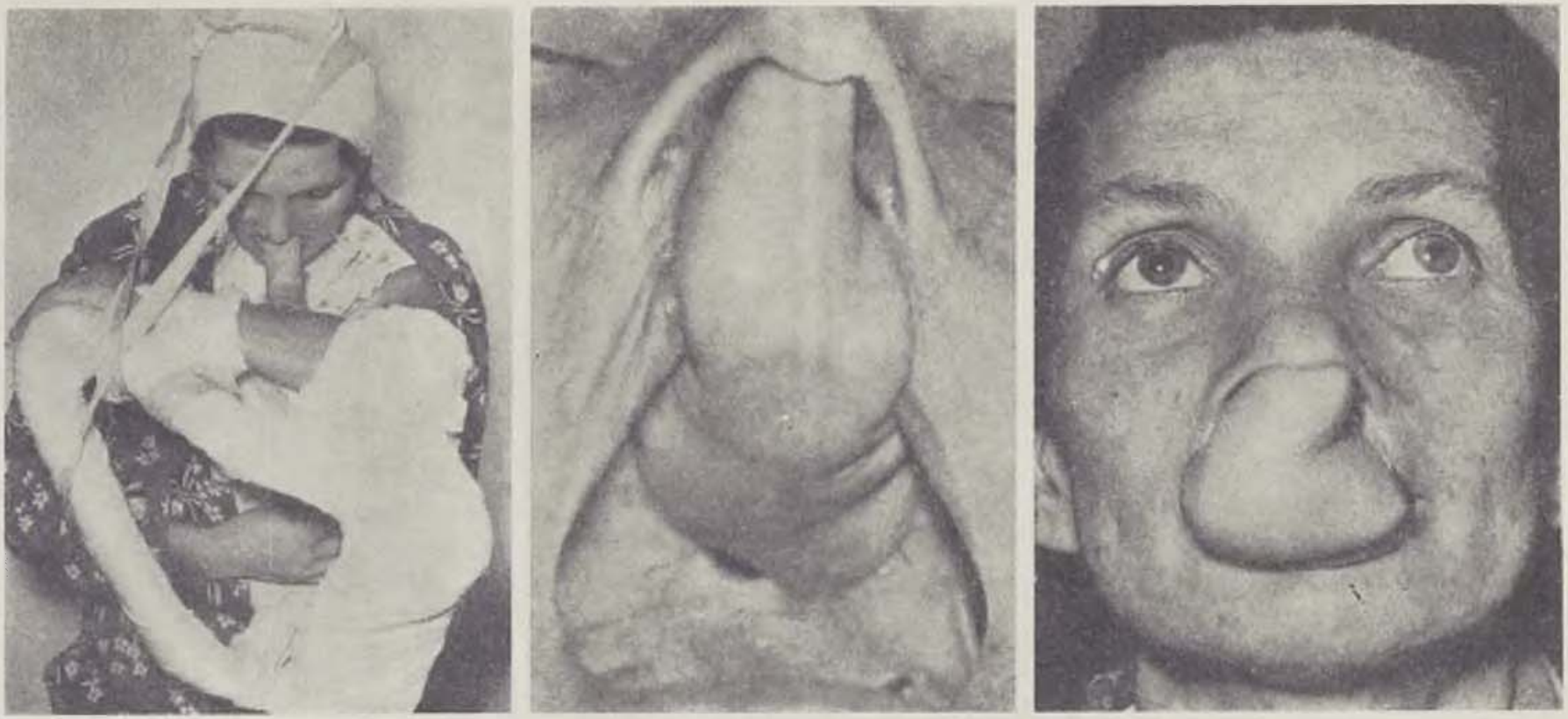


Fig. 4. A tube pedicle from the abdomen transferred into the soft palate via the left forearm. — Fig. 5, 6. The inferior end of the pedicle sutured into the lip and nasal tip

palate is very wide, the osseous protrusions of maxilla are narrow. Soft palate muscles are adequately developed, the palate is short, speech palatolalic. There only remain —3 in the lower jaw with atrophic alveolar process.

The plan of reconstruction

1) to reconstruct the hard and soft palate; simultaneously the palate has to be brought close to the posterior wall of the nasopharynx by velopharyngoplasty to improve the palatopharyngeal closure;

2) to substitute the missing part of the upper lip by local shifting or by tissue transfer from a more distant place;

3) to close the maxillar defect by inserting a bone graft, to enable the patient to use the dentures.

As the usual mucoperiosteal palatal flaps would not have closed safely the wide cleft, we decided to suture only the soft palate simultaneously with velopharyngoplasty.

This was followed by making an approx. 17 cm long abdominal tube pedicle. Then the patient was released for home. After six months the pedicle was inserted on the left forearm; three weeks later the nutritional pedicle from the abdomen was introduced into the soft palate (Fig. 4). This end failed to take in three quarters of the circumference of the suture; we could not cut off the inferior end of the pedicle without considerable danger for the blood supply. Five weeks later we decided to reinsert the pedicle in the soft palate and this time it took well. The recovery was complicated by serum hepatitis, the patient was transferred to the infectious diseases ward. After her return, grafting of the inferior end of the pedicle was continued by letting it into the divided upper lip, into the rest of the nasal septum and into the nasal tip (Fig. 5, 6).

The patient was released for home on her own request and treatment was resumed after a year's interval.

We approached the poles of the lateral segments through old scars and inserted a bone graft from crista iliaca into the cavity. Six months later the vestibulum was reconstructed by means of a skin graft on a Stent carrier, which we introduced inside the pedicle. The patient received dentures a used them with satisfaction. Seven months later, the fat tissue of the pedicle was reduced and the columella reconstructed (Fig. 7). The patient insisted on joining her family; further step followed after another seven months — correction of the nasal tip with partial extirpation of the cartilage and correction of the scars. In the following step the vermilion was reconstructed in two stages by means of shifting the vestibular mucosa of the lower lip (Fig. 8, 9).

To one of the later check-ups the patient came without the dentures. The grafted vestibulum was very shallow due to retraction of the skin graft. Obviously the pedicle fat decreased in course of time adhesion of dentures prevented. The patient had not asked in time for adjustment of her dentures and the skin graft retracted.

Fig. 7. Excessive fat tissue removed from the pedicle. — Fig. 8. On the reconstructed lip vermilion is formed by transferring the vestibular mucosa from the lower lip. The photograph was not retouched, the patient used no lipstick. — Fig. 9. Profile picture of the patient after final treatment

Due to the fact that the patient was often needed at home and in her job the treatment lasted too long; lengthy intervals in treatment are always of unfavourable effect on patients — seeing little progress, they lose interest in treatment.

## CONCLUSION

We demonstrated on the example of our adult patient that there are ways to reconstruct even an extensive defect of lip and maxilla after the primary operation had been carried out harshly and in our case one may even say it had been carried out badly. If looked upon from the aspect of time consumption and load on the patient, the secondary delayed reconstruction cannot be compared with the primary operation of lip and palate which is practically no load on the small patient and where the functional results are considerably better. It is therefore out of place to postpone the operation till later for "emotional" reasons claiming that when the child gets older he will decide about the operation himself — a viewpoint with which we still meet now and then.

H. S.


## SUMMARY

The complexity of the reconstruction of a defect in adolescence is demonstrated on the example of a female patient with bilateral cleft, incompletely and badly closed in childhood.

## RÉSUMÉ

**Reconstruction compliquée après une opération mutilante de la lèvre en cas d'une fente bilateraire du palais primaire et secondaire**

Pěnkava J.

Sur un cas d'une femme malade de la fente bilateraire totale incomplètement et mal traitée par une intervention dans son enfance, on démontre la complicité de la reconstruction d'un défaut à l'âge adulte.

## ZUSAMMENFASSUNG

**Komplizierte Wiederherstellung nach mutilierender Lippenoperation bei beiderseitiger Spalte des primären und sekundären Gaumens**

Pěnkava J.

Am Beispiel einer im Kindesalter unvollständig und schlecht operativ behandelten Kranken mit beiderseitiger Spalte wird die Kompliziertheit der Defektwiederherstellung im Erwachsenenalter dokumentiert.

## RESUMEN

**Reconstrucción complicada después de una intervención mutilante del labio en la fisura bilateral del palato primario y secundario**

Pěnkava J.

En el ejemplo de una paciente con una fisura bilateral total, a la cual le fue performada una intervención incompleta y mala, está demostrada la complejidad de la reconstrucción del defecto en la edad madura.

REFERENCES

**Clarson, P., Grossmann, W. G.**: Late repair of maxillary osteotomy with tube pedicle closure of nasobuccal fistula. Brit. J. Surg., 42, p. 206, 1954.

**Schuchardt, K.**: Neue Erfahrungen beim Verschluss von Gaumendefekten mit Rundstiellappen. Langenbeks Arch. klin. Chir., p. 299, 1961.

**Andina, F.**: Reconstruction of a complete defect of the hard and soft palate. With follow-up after 20 years. Fourth International Congress of Plastic Surgery, Rome, Oct. 1967, Excerpta med. Foundation 1969.

Dr. J. Pěnkava, Berkova 34, 612 00 Brno, Czechoslovakia

---

**The Spanish Society of Plastic and Reconstructive Surgery** will hold its next Annual Meeting in Oviedo (Asturias) upon the days 5 to 7 of June 1974.

The main subjects of this Meeting will be: Burns, Mastoplasties and Lipectomies, Facial Injuries.

For more information and inscriptions address to: Dr. Ricardo de Manual, Hospital General de Asturias, Oviedo — España.

Donetsk Scientific-Research Institute of Traumatology and Orthopaedics, Donetsk (USSR)
Director Prof. T. A. Revenko

# FREE-SKIN TRANSPLANTATION USING THE „SITO" GRAFT IN THE TREATMENT OF FAULTY STUMPS OF THE LOWER LIMB

M. G. SERENKOVA

The treatment of skin defects in stumps of the lower limb is one of the most difficult tasks of reconstructive surgery.

It is generally known that formation of a painless stump capable of weight bearing and suitable for fitting an artificial limb is the basic criterion of effective treatment of patients after amputation of a lower limb. Meanwhile after primary amputation in peace time, a large percentage of stumps is little suitable for fitting an artificial limb.

The main problem in faulty stumps of the lower limb constitutes skin defects, slow-healing of wounds, large and painful scars adherent to the underlying tissue, trophic ulcers etc.

In recent years, various methods of skin transplantation were employed on a wide scale in surgical practice. The widest use was made of free-skin grafting with the "SITO" (Soviet Institute of Traumatology and Orthopaedics) graft.

Nevertheless, the use of free "SITO" grafts on stumps of the lower limb has remained disputable.

Up to the present an important place in the literature has been allotted to free skin "SITO" grafts employed in the treatment of scar contractures after burns and of trophic ulcers on various parts of the body (Parin, 1944; Khitrov, 1944; Petrov, 1950; Sinilo, 1962, and others). However, the use of this method on the weight bearing surfaces of lowerlimb stumps was dealt with only occasionally (Godunov, 1952; Tsel, 1953; Sinilo, 1956; Minaeva, 1962, and others). Many authors (Yusevitch, 1946; Gnilorybov, 1949, and others) refer to free-skin transplantation using the "SITO" graft on the weight bearing surfaces with restraint, considering it little effective.

These differing appraisals have induced the author to investigate the possible employment of a "SITO" plasty on amputation stumps of the lower limb.

The free-skin plasty using a "SITO" graft is tempting by the simplicity of its technique, the one-stage operation, the possibility of covering large skin defects, the speed of healing, which considerably shortens the time of treatment, and the remarkable resistence of the graft to mechanical wear.

The present communication gives an analysis of the results achieved by surgical treatment of skin disorders in stumps of the lower limb by the method of free-skin plasty using a "SITO" graft in 215 patients on a total of 223 stumps between 1960 and 1970.

The chief disorders in the above patients were delayed healing of wounds (103 patients), large and painful scars with a tendency towards ulceration (85 patients) and trophic ulcers (27 patients).

An affected stump of the thigh was found in 28 patients, the leg in 101 and the foot in 86 patients.

Slow-healing wounds on stumps of the lower limb comprised the main percentage and were the most severe disorder of the stump, because they led to the development of pathological scars and trophic ulcers. With a granulating wound on the stump, the patient is unable to move and use his orthopaedic appliance. Apart from that, the protracted treatment of the stump has an adverse effect on the patient's psychology.

In patients treated for slowly healing wounds, the length of healing time varied (between one and six months or more).

Of the 103 patients suffering from slowly healing wounds, 28 had their amputations carried out at the Department of Reconstructive Surgery of the Donetsk Scientific-Research Institute of Traumatology and Orthopaedics, and had their artificial limbs made there. In these patients plastic operations were carried out at an early period (one month to six weeks after amputation).

Fig. 1. Stump of left leg with large and adherent scar, anterior aspect. — Fig. 2. Stump of right thigh with large scar, anterior aspect

The causes of slow healing of wounds were, according to the author's experience, complications during the postoperative period after amputation: necrosis of skin flaps and underlying tissue as a consequence of the original injury, suppuration in the wound with following dehiscence of wound edges.

The most frequent location of slowly healing wounds was the weight bearing surface of the stump. In most cases the wounds presented a large, badly granulating area with cicatrized edges without any sign of epithelization, measuring from 25 to 600 $cm^2$ or more.

The other group consisted of patients with pathological scars, usually with scars resulting from complications developing after primary amputation, when healing of the wounds proceeded by second intention. Not infrequently development of pathological scars was initiated by leaving the wound open after guillotine amputation. This was mainly the case in patients who were admitted to the hospital in a serious state due to the original injury and in whom amputation was carried out by simple removal of the devastated limb. In the above series of patients, the scars were of various shapes and showed a tendency towards ulceration (Figs. 1 and 2).

As can be seen from the results of this investigation, surgeons endeavour to make the wounds heal by the formation of scars in the first place, which frequently leads to the development of faulty parts of the stump. This chiefly happens when early employment of skin plasty has not been taken advantage of. The author suggests that in the era of antibiotics, plastic operations on the stump of a lower limb should be carried out as soon as possible. This permits to prevent development of pathological scars, considerably shortens the time of treatment as well as the duration of hospitalization. Apart from this, early fitting of an artificial limb promotes formation of the stump.

Of the 85 patients with pathological scars, 60 suffered from them for six months to two years. Consequently, these patients had been incapable to look after themselves for a long time, they could neither make use of their artificial limbs nor become accustomed to working, because the scars on the stump of a lower limb did not permit the full use of the stump which must carry the heavy load of the artificial limb. Another 28 patients were treated for trophic ulcers on the stump of a lower limb, which had persisted for more than two years.

The clinical picture and duration of trophic ulcers in these patients varied largely. The duration of trophic ulcers depended not only on the cause which had led to the disorder, but also and chiefly on the reactivity of the organism and the trophicity of tissues.

The trophic ulcers in these patients were characterized by their long persistence and the lack of a tendency to heal. The causes which led to trophic ulcers were unfavourable conditions of healing: bad blood supply, scar formation, neurotrophic disorders, etc. The preferable locations of trophic ulcers on stumps of leg or foot has attracted attention: these are the sites where the conditions of vascularization are least favourable.

The treatment of trophic ulcers in stumps of the lower limb is very difficult. The torpid non-healing of ulcers due to tissue disorders and their frequent recurrences were the cause of the patients being unfit for work for a long time. Attempts at conservative treatment of trophic ulcers proved unsuccessful in spite of the application of the whole complex of physiotherapy, medicamentous treatment, oxygen and vitamins, stimulating tissue therapy, blood transfusions, etc.

There is no doubt that early surgical treatment of large wound surfaces should become the principle method of treatment, because it foregoes slow healing of wounds with all its complications.

Fig. 3. Foot stump, skin defect covered with "SITO" graft

The most justified and radical method of treatment of large skin defects in stumps of the lower limb is surgery, consisting in radical excision of all non-viable tissue with subsequent coverage of the residual defect with a free-skin "SITO" graft, particularly on short stumps (Figs. 3 and 4). At the same time, the condition of wound surface should be kept in mind. If it was clean and the granulations had a rosy colour, the graft was laid on to the granulations. Flabby, oedematous granulations were excised as well as trophic ulcers.

The presence of a minimum flora (up to 50 colonies) in the wound did not constitute a contraindication to plasty. Temporary contraindications for a skin plasty using a "SITO" graft were considered the presence of a considerable amount of pus, necrotic soft tissue, flabby and oedematous granulations, a poor general condition of the patient, etc.

The preparatory treatment of patients with slowly healing wounds, trophic ulcers and large scars was complex (blood transfusions, infusions of blood substitutes, high-protein diet, administration of a complex of vitamins). Anti-

biotics (penicillin, streptomycin, tetracyclin and erythromycin) were given to combat infection, as well as bacteriophages, blood bandages, etc. Apart from that, physiotherapy (UV-irradiation, diathermy, massage, remedial exercises) was applied. For determination of the wound flora, qualitative and quantitative examinations were carried out.

The contralateral thigh was usually used as donor site. In patients with both legs amputated the graft was taken from the left half of the abdomen, the thorax or the back and was then prepared by the Parin method. As to the size of the graft, it was as long as the defect, but its width was one-third narrower. In large skin defects, two grafts were taken, sutured one to the other

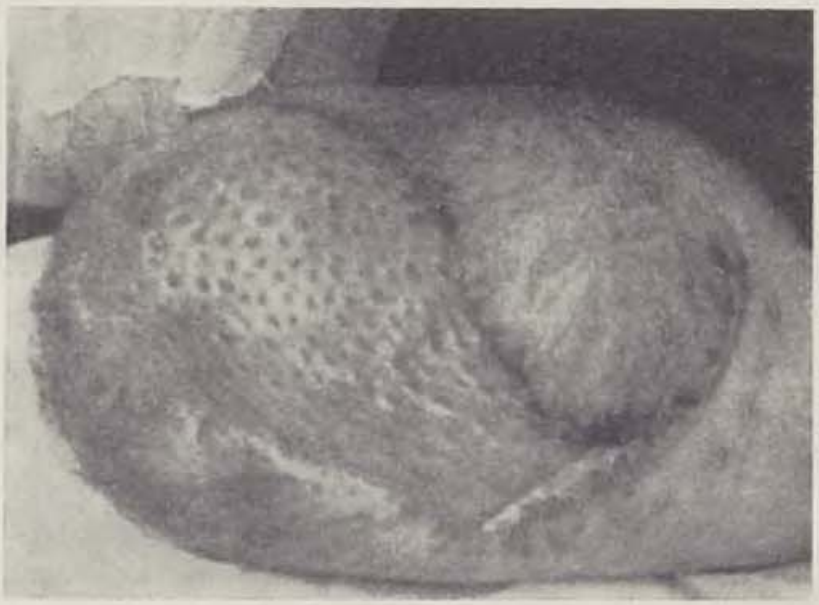


Fig. 4. Thigh stump, coverage of skin defect with "SITO" graft

and then to the defect. The transplanted graft was covered with an aseptic bandage under moderate pressure, but for immobilization a plaster cast was applied for the entire postoperative period.

First-intention healing was achieved in 80%, marginal necrosis in 16.9%, complete necrosis in 3.1% of cases. The immediate results were considered quite satisfactory.

The best time for training the transplanted "SITO" graft by means of a provisional artificial limb should be allowed four to six weeks after operation. By this time, the graft regains its elasticity and acquires some degree of sensitivity.

A permanent artificial limb was fitted eight to ten weeks after operation. Weight bearing and fitting with an artificial limb of a foot stump after a "SITO" graft transplantation was carried out by the same principles as in stumps of the thigh or leg, taking into account the size of the transplanted graft. If the graft was transplanted on to either the anterior or posterior aspect of a foot stump, weight bearing was allowed after four to five weeks, however, if the

graft was placed on to the plantar aspect, this was not permitted any earlier than after eight to ten weeks.

The late results were checked up after one to ten years. By this time, the graft had acquired the colour and character of the surrounding skin almost in all patients. Perforations and scars along the edge of the graft were observed in hardly any case, the grafts were mobile and elastic. The stumps were well hardened in patients who had worn their orthopaedic appliances.

B. K.


SUMMARY

In the treatment of patients with skin defects on stumps, various skin plasties are used on a wide scale. The skin plasty, which in recent years has been used in most cases was transplantation of a free "SITO" graft. However, employment of free "SITO" grafts on skin defects on amputation stumps of the lower limb has not yet found its proper appreciation.

In the present communication, the results of surgical treatment of skin defects in amputation stumps of the lower limb using a free "SITO" skin graft in 215 patients on a total of 223 stumps are presented for ten years. In 103 patients grafting was carried out for slow-healing of wounds, in 85 for large and painful scars and in 27 for trophic ulcers. The result of free-grafting depended on the preparation of the wound surface for subsequent plasty. Rosy, clean and succulent granulations with a minimum of microflora (up to 50 colonies) ensure a good result. Healing by first intention was achieved in 80%, marginal necrosis in 16.9% and complete necrosis of the graft in 3.1% of cases. An artificial limb was fitted to the stump eight to ten weeks after operation.

The late results were checked up one to ten years after operation. At that time the stumps were well hardened provided the orthopaedic appliances had been worn.



RÉSUMÉ

**Transplantation libre de la peau à l'aide de „Sito"-greffe en traitant les moignons d'amputation défectueux de l'extrémité inférieure**

Serenkova M. G.

On applique largement de différentes plastiques de peau en traitant les malades avec les défauts de la peau. Pendant les années dernières, c'était la transplantation libre de "Sito"-greffe qui était la plus courante. Mais celle-ci ne se faisait pas encore valoir en traitant les défauts de la peau sur les moignons d'amputation de l'extrémité inférieure.

Dans ce rapport-ci, on présente les résultats du traitement chirurgical des défauts cutanés sur les moignons d'amputation de l'extrémité inférieure à l'aide de "Sito"-greffe chez 215 malades et sur 223 moignons durant 10 ans. Chez 103 malades, on a réalisé la transplantation à cause des plaies qui ont mis longtemps à se guérir, chez 85 à cause des grandes et douloureuses cicatrices et chez 27 à cause des ulcères trophiques. Le succès de la transplantation libte dépendait de la préparation de la surface de la plaie pour la plastique. Les granulations roses, propres et succulentes avec une microflore minimum (jusqu'à 50 colonies) garantissent un bon résultat.

L'adhésion primaire de la greffe a été constaté dans 80%, la necrose des bords dans 16,9% et la séparation complète de la greffe dans 3,1% de cas. Les prothèses et les autres appareils orthopédiques ont été utilisé par les malades pendant 8—10 semaines.

Les résultats tardifs ont été constaté après 1 à 10 ans après l'opération. En meme temps, les moignons se manifestaient aguerris à l'utilisation des prothèses et des appareils orthopédiques.


Zusammenfassung

**Lose Hauttransplantation mittels des „SITO"-Transplantates bei der Behandlung defekter Amputationsstümpfe der unteren Gliedmasse**

Serenkowa M. G.

Bei der Behandlung von Kranken mit Hautdefekten machen sich verschiedene Hauptplastiken in breitem Mass geltend. Als meist verbreitete Methode wurde in den letzten Jahren die lose Transplantation des „SITO"-Transplantates angewandt. Bei der Behandlung von Hautdefekten an Amputationsstümpfen der unteren Gliedmasse ist jedoch die lose Transplantation des „SITO"-Transplantates noch nicht zo voller Geltung gekommen.

In der vorliegenden Mitteilung legen die Autoren Ergebnisse vor, die mit der chirurgischen Behandlung von Hautdefekten an Amputationsstümpfen der unteren Gliedmasse mittels des „SITO"-Transplantates bei 215 Kranken und an 223 Stümpfen in der Zeitspanne von 10 Jahren gewonnen wurden. Bei 103 unter diesen Kranken ist die Transplantation wegen lange Zeit nicht heilender Wunden unternommen worden, bei 85 wegen grosser und schmerzhafter Narben und in 27 Fällen wegen trophischer Abszesse. Der Erfolg der losen Transplantation hing ab von der Vorbereitung der Wundoberfläche zur Plastik. Rosafarbige, frische und saftige Granulationen mit minimalem Gehalt an Mikroflora (bis zu 50 Kolonien) gewähren einen guten Erfolg. Primäre Anheilung des Transplantates ist in 80 % der Fälle beobachtet worden, Nekrose der Ränder in 16,9 %, und völliger Abbau des Transplantates in 3,1 % der Fälle. Prothesen und orthopädische Hilfsmittel wurden von den Kranken nach 8—10 Wochen benutzt.

Spätergebnisse wurden im Zeitabstand von 1 bis 10 Jahren nach Operation ermittelt. Hierbei erwiesen sich die Stümpfe als abgehärtet nach dem Tragen der Prothesen und orthopädischen Hilfsmittel.

RESUMEN

**Transplantación libre de la piel mediante „SITO" injerto en la terapia de los muñones defectuosos después de la amputación de la extremidad inferior**

Serenkova M. G.

En la terapia de los pacientes con defectos cutáneos varias plastias cutáneas se aplican con mucho éxito. En los últimos años el método más extendido fue la transplantación libre del „SITO" injerto. Mas la transplantación libre del „SITO" injerto no ha encontrado hasta ahora plena aplicación en la terapia de los defectos cutáneos en los muñones restantes después de la amputación de la extremidad inferior.

En el reporte sometido se presentan los resultados de la terapia quirúrgica de los defectos cutáneos en los muñones después de la amputación de la extremidad inferior mediante el „SITO" injerto en 215 pacientes y en 223 muñones durante 10 años. En 103 de ellos la tranaplantación fue realizada a consecuencia de llagas que resisten a cicatrizarse, en 85 debido a cicatrices grandes y dolientes, y en 27 debido

a úlceras tróficas. El éxito de la transplantación libre dependía en la preparación de la superficie de la herida para la plastia. Las granulaciones rosadas, limpias y jugosas con el mínimo de microflora (hasta 50 colonias) garantizan un resultado bueno. La primera adhesión del injerto fue observada en el 80%, la necrosis de los bordes en el 16,9% y la separación completa del injerto en 3,1% de los casos. Las prótesis y aparatos ortopédicos fueron usados por los enfermos después de pasadas 8—10 semanas.

Los resultados tardíos fueron constatados después de 1 hasta 10 años después de la operación. En tal caso los muñones se mostraban endurecidos después del empleo de las prótesis y aparatos ortopédicos.

## REFERENCES


1. **Gnilorybov, E. E.**: Experience with Bone Plasties. Proceedings of First Congress of Moldavian Surgeons. Kishinev, 1949.
2. **Godunov, S. F.**: Plastic Coverage of Skin Defects on Thigh Stumps. Vestn. Chir., 5 : 65, 1952.
3. **Godunov, S. F.**: Principles of Amputation and Re-amputation. Vestn. Chir., 8 : 134, 1960.
4. **Minaeva, Y. G.**: A Case of Free-Skin Transplantation on Thigh Stump. Ortop. Travm. Protez., 8 : 91, 1962.
5. **Parin, B. V.**: Immediate and Late Results after Free Transplantation of a Perforated Skin Graft (Preliminary report). Khirurgiya, 12 : 21, 1944.
6. **Petrov, B. A.**: Free-Skin Transplantation in Large Defects. Moscow, 1950.
7. **Sinilo, M. I.**: Free Transplantation of "SITO" Skin Graft in Reconstructive Surgery. Thesis of paper read at Fifth Congress of North Caucasian Surgeons. Rostov o/D, 1962, p. 67.
8. **Khitrov, F. M.**: On Free Transplantation of All-Layer Skin Grafts. Khirurgiya, 9 : 31, 1944.
9. **Tsel, V. F.**: Skin Plasty of Ulcers and Slowly Healing Wounds. Doctor's dissertation. Arkhangelsk-Leningrad, 1953.
10. **Yusevitch, M. S.**: Amputation and Fitting with Artificial Limb. Leningrad, 1946, p. 161.



M. G. Serenkova, Nikopolskaya 2, flat 3 Donetsk-3, USSR


---

**VIIth World Congres of Cardiology, September 1—7, 1974**

Organized by the Argentine Society of Cardiology with the collaboration of the Argentine Federation of Cardiology.

Secretariat: Centro de eventos nacionales e internacionales S.A. Avda. R. Sáenz Peña 1110, 2° piso. Tel. 35 —1738/1869/4973 Buenos Aires, Argentina.

The Department of Plastic Surgery
Winnipeg Children's Hospital and University of Manitoba
Winnipeg, Manitoba (Canada)

# PURPURA FULMINANS

N. I. ELSAHY

Hjort, et al. (1), 1964, descrided the following criteria for the diagnosis of purpura fulminans: "It is a disease of children preceded by a benign infection after a latent period, characterized by skin hemorrhages and severe a fibrinogenaemia; if the patient survives this critical phase, extensive skin necrosis follows; blood coagulation abnormalities are found due to intravascular thrombosis".

The purpose of this paper is to describe two cases of purpura fulminans and to discuss their different etiology and their management.

## CASE REPORTS

Case I:

A 14 month old white female was reffered to the Winnipeg Children's Hospital on March 1, 1970. The child had been born at full term with a birth weight of 5 lbs 12 ozs. The mother's pregnancy was complicated by pre-eclampsia.

Two weeks prior to admission the patient suffered first and second degree burns from hot water, estimated at 15% of the surface body area. The burns involved part of the right arm, forearm, buttock, thigh and leg.

On examination on the day of admission the distal half of the left foot, including all of its toes were gangrenous (Fig. 1). The right foot was swollen, erythematous and the tips of its toes were blue-black (Fig. 1). Her temperature was 102 degrees F., pulse 140 beats/minute and systolic blood pressure 100 mm Hg. There was frequent vomiting and diarrhoea.

The clinical picture and the initial laboratory studies (Tab. 1) were interpreted as purpura fulminans with intravascular coagulation, severe hypernatremia, hyperchloremia, acidosis and dehydration.

Treatment consisted of:

Insertion of levine tube.

Peritoneal dialysis to correct the hypernatremia (150 cc solution with 4 meq/L of potassium was used in the first day. The amount was adjusted in the subsequent days).

Tab. 1. Summary of the Laboratory Tests on Cases I and II

| Study | Case I | | Case II | |
|---|---|---|---|---|
| | values on arrival at the hospital | Average values during the next 1—2 weeks | Values on arrival at the hospital | Average values during the next 1—2 weeks |
| 1. Hemoglobin (gm/100 ml) | 8.8 | 12 | 11 | 12.5 |
| 2. W.B.C. (per cu.mm.) | 6,200 | 7,000 | 7,500 | 8,000 |
| 3. Platelet Count (per cu.mm.) | 44,000 | 101,000 | 156,000 | 200,000 |
| 4. Prothrombin Time (control 11.5 sec) | 17.2 | 12 | 80 | 15 |
| 5. Partial Thromboplastin Time (control 38.5 sec) | 47 | 45 | 70 | 39 |
| 6. Clotting Time (method of Lee-White. Normally 5—8 min.) | 11 | 30 | 11 | 35 |
| 7. Blood Constituents: | | | (but the | |
| a) Sodium (meq/Liter) | 192 | 142 | clot | |
| b) Potassium (meq/Liter) | 3.5 | 4 | completely | |
| c) Chloride (meq/Liter) | 133 | 102 | dissolved | |
| d) Calcium (meq/Liter) | 2.7 | 3 | again | |
| e) Glucose (mg.%) | 118 | 150 | after | |
| f) BUN (mg.%) | 75 | 19 | 40 minutes) | |
| 8. Blood PH | 7.38 | 7.4 | | |
| 9. $PCO_2$ (mm.Hg) | 38 | 40 | | |
| 10. $HCO_3$ (meq/Liter) | 22.5 | 25 | | |
| 11. Urine (amount in ml/hour) | 15 | 20 | | |

Paraldehyde (4% solution in a constant drip).

Cloxacillin 100 mg/Kg/day.

Dibenzyline block (15 mg. I.V./day for 2 days).

Corticosteroids (solu-cortef 100 mg I.V./day).

Heparin (150 I.U./Kg. I.V. every 4 hrs. The dose was adjusted to bring the clotting time within 30—35 mins).

Blood transfusion (300 cc of whole blood in the first day).

Platelet transfusion (20 cc in the first day).

Intravenous fluid (total of 880 cc in the first day then adjusted according to the fluid balance required).

On March 4, 1970, dialysis was discontinued, the patient gradually gained consciousness and oral fluids were given as tolerated. More red blood cells were transfused in the following days. Laboratory studies were much improved (Tab. 1).

On April 6, 1970, debridement of the necrotic areas was done and they were covered with autogenous splitthickness skin grafts.

On April 22, 1970, the lesions had healed completely (Fig. 1) and the patient was discharged.

Fig. 1a

Fig. 1b

Fig. 1c

Fig. 1. Case I: a — Necrosis of the left foot. b — Necrosis of the tips of the right toes. c — End result.

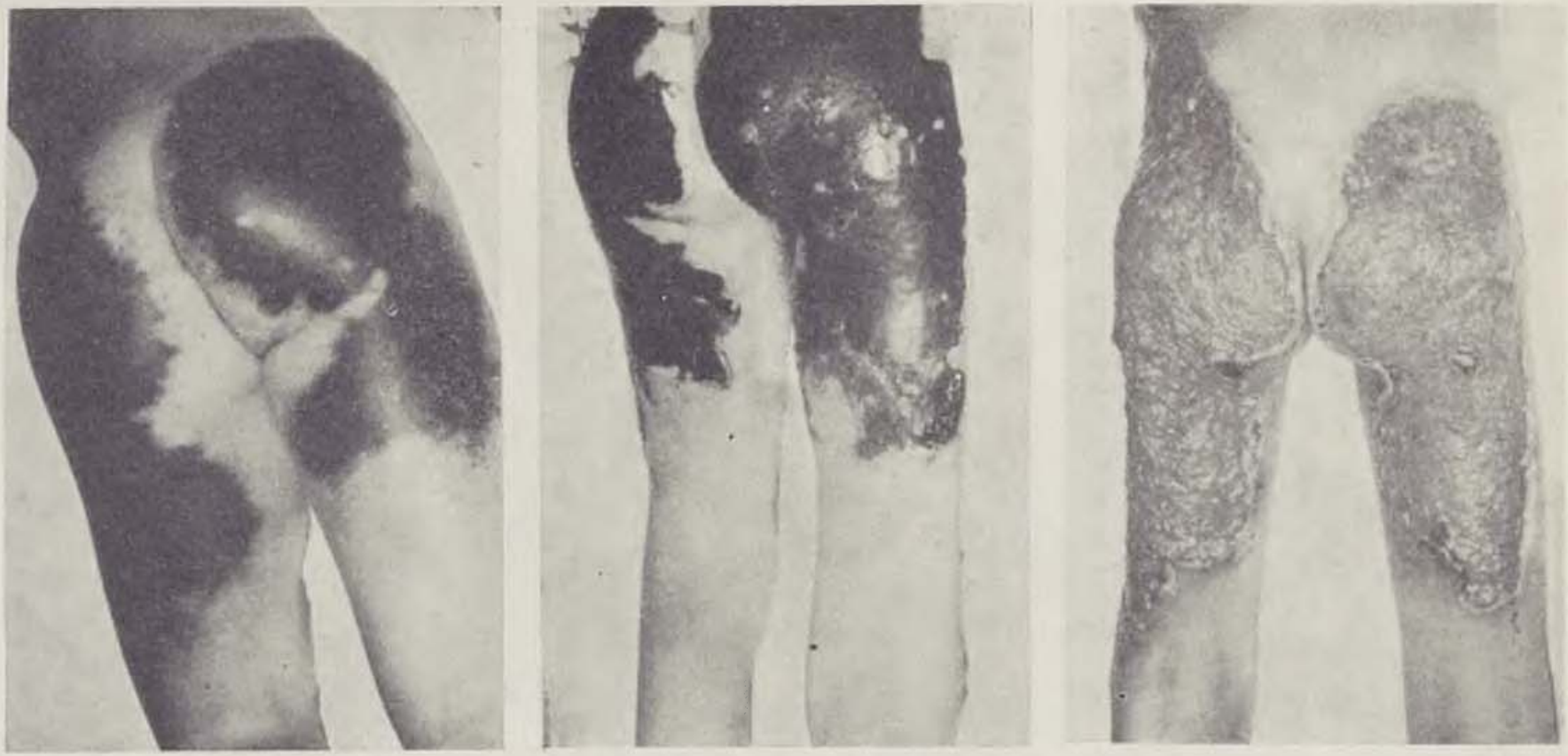


Fig. 2. Case II Left — Early stage of necrosis. Middle — Late stage of necrosis. Right — After debridement of the necrotic area.

Case II:

A 10 year old white male was admitted to the Winnipeg Childern's Hospital in July 1968 with a history of massive bruising of both gluteal regions and the posterior aspect of both thighs.

This patient was the child of a 33 year old mother with a history of systemic Lupus Erythematosis since age 25. The disease affected the skin of her face and caused frequent episodes of fleeting migratory arthritis. Blood for L. E cells was positive.

The patient's father was normal and his two brother's and sister's were normal, however, a great aunt, of both the father and the mother had a history of ulcerative colitis.

The child had been born at full term with a birth weight of 7 lbs 4 ozs. His past illnesses were: chicken pox, measles, rubella and recurrent right middle ear infection. Frequent episodes of diarrhoea and rectal bleeding were diagnosed in 1966 as ulcerative colitis, confirmed with a sigmoidoscopy and barium swallow and he was treated with steroids.

One week prior to admission the patient developed vomiting which was treated with Gravol tablets; two days later he developed a fever. In the evening of that day he fell down and sustained a large bruise to his nose. There was no epistaxis or bleeding from the mouth, however, the bruise spread over the cheeks.

Upon examination on admission, the patient was febrile, cold and clammy with a blood pressure of 70/50 mm Hg. and a poor urinary output.

The bruises started out as a red rash which then became hemorrhagic involving both buttocks and upper thighs. This changed to blue to dark blue to black. The edges changed from red ill-defined to dark well-defined and during the next few days the local swelling gradually subsided (Fig. 1, 2, 3, 4).

The clinical picture and the initial laboratory studies (Tab. 1) were interpreted as purpura fulminans. The same basic treatment was given as in Case I.

The clotting function gradually returned to normal (Tab. 1). Twenty days after admission the heparin was reduced to 20% of the initial dose. Six hours after reduction there was a massive remorrhagic infiltration of the right hand and left elbow.

Both the left elbow and right hand passed through the same stages as the buttocks and thighs. At this time the clotting studies revealed recurrance of the intravascular coagulation. The heparin dose was increased, dibenzyline was repeated as a prophylactic measure to combat shock and the steroids were continued.

On August 12, 1968, when the patient was still on heparin, debridement of all necrotic tissue was carried out. A few days later we decided to use cadaver skin to cover the raw areas (Fig. 5); 75% of the grafts took, however, these dissolved three weeks later. Further application of homografts was tried but was complicated with pseudomonas infection and were lost.

Local treatment with Gentamycin cream, a 2% Streptomycin solution and frequent changing of the dressings was carried out.

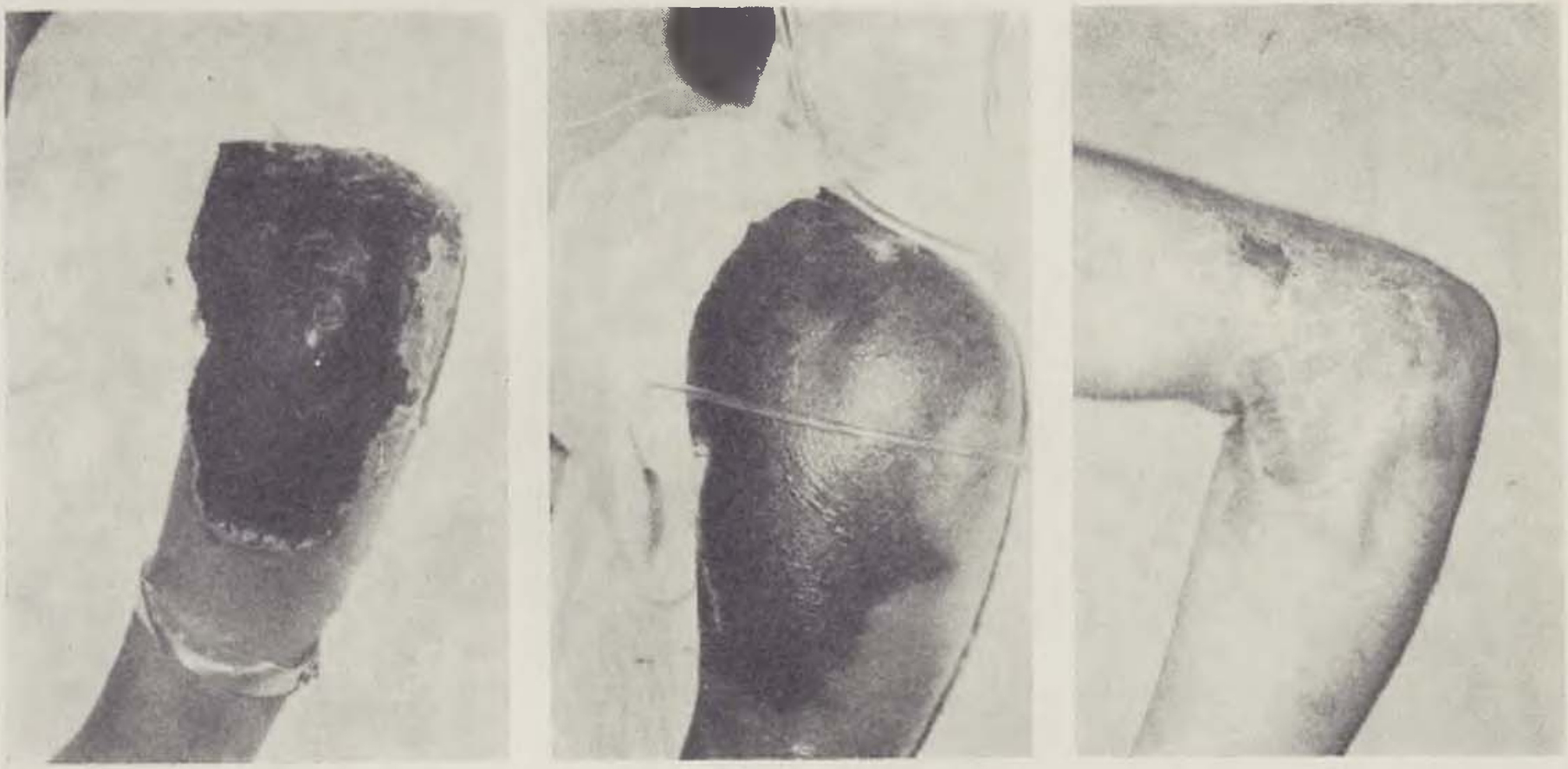


Fig. 3. Case II: Left — Left arm at an early stage. Middle — Late stage. Right — End result

On December 12, 1968 autogenous skin grafts were applied and these were taken 100% (Fig. 5) and the patient was discharged.

He was well until March 30, 190, when he developed a bruise on the right side of his back (Fig. 6) which gradually increased in size up to 10 cm in diameter. The laboratory studies indicated a relapse of purpura fulminans.

Heparin and steroids were given immediately and this resulted in complete disappearance of the lesion and improvement of the coagulation studies.

Tab. 2. Protein Electrophoresis

| Total Protein (gr.%) | The Patient | | The Mother | |
|---|---|---|---|---|
| | 7.1 | | 7.5 | |
| | % | grams | % | grams |
| Gamma Globulin | 23.4 | 1.66 | 24.9 | 1.87 |
| Beta Globulin | 16.5 | 1.17 | 11.0 | 0.83 |
| Alpha 2 Globulin | 13.9 | 0.99 | 7.2 | 0.54 |
| Alpha 1 Globulin | 3.3 | 0.23 | 4.3 | 0.32 |
| Albumin | 42.9 | 3.04 | 52.6 | 3.94 |

Four other relapses of similar condition followed: August 10, 1970; August 31, 1970; January 21, 1970; and May 25, 1971. All were treated in the same manner as before and all with complete recovery. The average hospital stay after each episode was 3 weeks. The mother noticed that every relapse was preceded with the patient's complaint of severe pain in the eyes.

Further investigations were done on the patient and his mother and the results were (Tab. 2): relatively high gamma globulin and relatively low albumen in both the patient and his mother. Immunoelectrophoresis performed with goat antihuman serum revealed that gamma A globulin in the patient was within the upper normal range (360). (Normal level is 70—400.) Gamma M and Gamma G were within normal range.

Tests for the presence of rheumatoid factor were as follows —

(a) Latex fixation test was positive for both the patient and his mother.

(b) Sheep Cell Agglutination Titre (SCAT) was positive for the patient (1/512) and strongly positive for the mother (1/1280). (The critical value in the technique used was 1/128. Less dilution indicating negative results while more dilution indicated positive results.)

In November 1971 the patient was admitted to the hospital with an attack of abdominal pain, diarrhoea (without melena) and hematuria. I.V.P. was normal. The same treatment was applied. The symptoms and hematuria disappeared completely after a few days and the patient was discharged. Since this time he is doing very well.

Fig. 4. Case II: Left — Right hand at an early stage. Middle — Late stage. Right — End result

Fig. 5. Casse II: Left — Homogenous skin graft applied in stamps. Right — End result

## DISCUSSION

The real cause of purpura fulminans is still unknown. The therapeutic successes with heparin have indicated that thrombosis is most likely to be the primary lesion, caused by an, as yet, unknown agent (2).

Most of the reported cases have followed streptococcal infection or chicken pox (3). Some authors noticed the similarities of purpura fulminans to Schwartzman's phenomenon in its clinical effects, pathology and the development of coagulation defects. Fredericks and Huffstadt (2) in 1970 noticed the similarity in the onset of the disease (occurring after a latent period following recovery of a begin infection) to the hypersensivity reaction that occurs in Schwartzman's phenomenon. Glanzmann accepted the anaphylactoid genesis of purpura fulminans and looked upon it as a form of Henoch-Schönlein purpura with a severe course. Investigators postulated an autoimmune origin for the ulcerative colitis, and circulating antibodies to colonic antigen have been demonstrated in an appreciable percentage of patients with chronic ulcerative colitis (4). Systemic Lupus Erythematosis is also placed under the category of autoimmune diseases (5). Antibodies have been noted against the antigen of skin in burns (5). Autoantibodies can be formed as a result of some infections (viral, mycoplasmal, bacterial or spirochetal) and may lead to autoimmune hemolytic anemia (5).

With these points in mind and thinking about the association of purpura fulminans to:

— infection in the previous reports

— burns in Case I

— the following in Case II:

1. Demonstration of rheumatoid factor in both the patient and the mother.

2. High gamma globulin in the patient and in his mother.

3. The signs and symptoms of ulcerative colitis in the patient and his great aunt.

4. The signs and symptoms of Systemic Lupus Erythematous in the mother.

5. The dramatic response to corticosteroids (this response also noticed in most of the reported cases).

— The relation between purpura fulminans and collagen and autoimmune diseases, might be feasible . . .

Fig. 6. Case II: Very early stage of recurrence on the back

The constant complaint of the pain in the eyes that preceded each relapse in Case II is interesting, however, the explanation is unknown.

Heparin has been found benifical to prevent progression of gangrene (6). I believe that heparin should be given immediately if progress of the disease is to be avoided (when it was given early in the relapsing condition of Case II it prevented the progress of the disease). Also it should be continued for at least one month (when we tried to discontinue heparin after 20 days, immediate relapse of the condition occurred).

Dibenzyline Block is essential to protect the kidneys from the continuing coagulopathy in severe cases and peritoneal dialysis in cases complicated with hypernatremia.

Early debridement after the stage of well demarcation of the necrotic tissue is important, even while the patient is still on heparin. This does not seem to cause much bleeding and on the contrary it may prevent the progress of the disease.

Dextran (7, 8, 9) and hyperbaric oxygen (10) have been reported to be useful, however, further studies are required.


SUMMARY

Two cases of purpura fulminans are described. The etiology and treatment are discussed.

RÉSUMÉ

**Purpura fulminans**

Elsahy N. I.

On décrit deux cas de purpura fulminans et on traite son étiologie et son traitement.

ZUSAMMENFASSUNG

**Fulminante Purpura**

Elsahy N. I.

Es wurde über zwei Falle der fulminanten Purpura berichtet. Die Ätiologie und Behandlung dieser Erkrankung wurden besprochen.

RESUMEN

**Púrpura fulminante**

Elsahy N. I.

Fueron descritos dos casos de la púrpura fulminante. Fue tratada la etiología de esta enfermedad y el tratamiento de la misma.


REFERENCES


1. **Hjort, P. F., Rapaport, S. I., Jorgenson, L.**: Scand. F. Hemat., 1 : 169, 1964.
2. **Fredericks, E., Huffstadt, A.**: Two Cases of Purpura Fulminans. Brit. J. plast. Surg., 23 : 90, 1970.
3. **Bouhasin, J. D.**: Purpura Fulminans. Pediatrics, 34 : 264, 1964.
4. **Mendeloff, A. I.**: Diseases of The Small Intestine. In "Principles of Internal Medicine". N. Y., McGraw-Hill Book Co., p. 1023, 1966.
5. **Walter, J. B., Israel, M. S.**: "General Pathology", London, J. & A., Churchill, p. 343, 1970.
6. **Allen, D. M.**: Heparin Therapy of Purpura Fulminans. Paediatrics, 38 : 211, 1966.
7. **Moncrief, J. A., Darin, J. C., Canizaro, P. C., Sawyer, R. B.**: Ann. Surg., 158 : 553, 1963.
8. **Patterson, J. H., Pierce, R. B., Amerson, J. R., et al.**: New Engl. J. Med., 273 : 734, 1965.
9. **Gruler, U. F., Bergentz, S. E.**: J. Surg. Res., 6 : 379, 1961.
10. **Waddell, W. B., Saltzman, H. A., Furon, R. L., Harris, J.**: Purpura Gangrenosa Treated with Hyperbaric Oxygenation. J. Amer. med. Ass., 191 : 971, 1965.



N. I. Elsahy, M.D., 2589 Assiniboine Crescent, Winnipeg, Manitoba, R3JOB6, Canada


---


Acknowledgement: The author is grateful to Dr. D.A. Kernahan for his help in making this paper possible.

Leningrad Post-Graduate Medical School, Leningrad (USSR)
Rector Prof. Y. V. Maystrakh
Department of Obstetrics and Gynaecology,
Head Prof. S. N. Davydov

# FORMATION OF VAGINA (COLPOPOIESIS) FROM PERITONEUM OF DOUGLAS POUCH

S. N. DAVYDOV, O. D. ZHVITIASHVILI

Already in 1933 did the Tula surgeon M. I. Ksido, when met with testicular feminization, usually considered to be a case of vaginal aplasia, carry out transposition of the pelvic peritoneum between the rectum and the urinary bladder and suture its transposed end to the mucous membrane of the vaginal vestibule, proximally, however, he closed the wound in the peritoneum by a purse-string suture. The result was formation of a spacious vagina.

In 1937 Glowinski and in 1957 Jenen carried out a similar operation in women with aplasia of vagina and uterus. 1960 Kocherginsky reported on six, 1963 Arist on 16 and 1968 Verbenko et Kiparisov on two such operations.

1969 Davydov reported on 30 casses of colpopoiesis carried out by a modified Ksido method (1933).

All authors found the operation relatively easy from a technical point of view, and its late results favourable.

Since 1965, the authors of this communication have carried out 67 colpopoieses using the peritoneum of the Douglas pouch; in 46 of these patients the operation was performed in three stages, but in 21 in one stage only.

The age of the patients was from 18 to 30 years. Forty-seven patients had led a sexual life before admission and the rest prepared themselves to be married. Married women had complained of painful sensations on sexual intercourse and the absence of orgasm. Three women had undergone surgical treatment and in two of them colpopoiesis using alloplastic material (Lavsan) had been carried out at the Department, but six months later the reconstructed vagina had become completely obliterated. The third patient had been operated on two years prior to admission to the Department after colpopoiesis in which amnion had been used, but the result was also unsatisfactory.

On clinical examination it was found that all these patients had well developed secondary sexual signs. When carrying out gas gynaecography, absence of the uterus was found in all of them, but the ovaries were well developed. In one woman, apart from defective development of the sexual organs, dystopic kidneys were found. In two patients one kidney was missing (aplasia).

Investigation for sex chromatin disclosed femal genotype in all patients.

The operation consisted of three stages:

First Stage: Entrance to the tissues was obtained by partly sharp and partly blunt dissection between the rectum, the urethre and the urinary bladder. In order to forego a possible narrowing of the vestibule, the ischiocavernosi muscles were divided. Dissection of tissues in the depth of the wound was carried out up to the peritoneum of the Douglas pouch and afterwards the peritoneum was separated from the rectum for mobilization. It is recommended to carry out such mobilization of the peritoneum in lateral directions. This facilitates bringing the edges of the peritoneum down to the divided parts of mucous membrane of the vestibule during the following stage of the operation. The first stage was concluded by firm packing of the tunnel thus formed. Here the packing had a double function: it helped to control bleeding and facilitated exposure of the site where the peritoneum would be divided in the second stage.

Second Stage: Through a transverse suprapubic incision, the anterior abdominal wall was dissected by layers. The rudimentary uterus was caught in a thread and pulled foreward, which permitted exposure of the Douglas pouch and examination of the peritoneum bulging under the packing. The bulging peritoneum was opened by a 4 cm transverse incision. The packing was extracted through the vagina and a spoon-shaped speculum introduced. Catgut stitches were laid from the abdominal cavity into the anterior, posterior

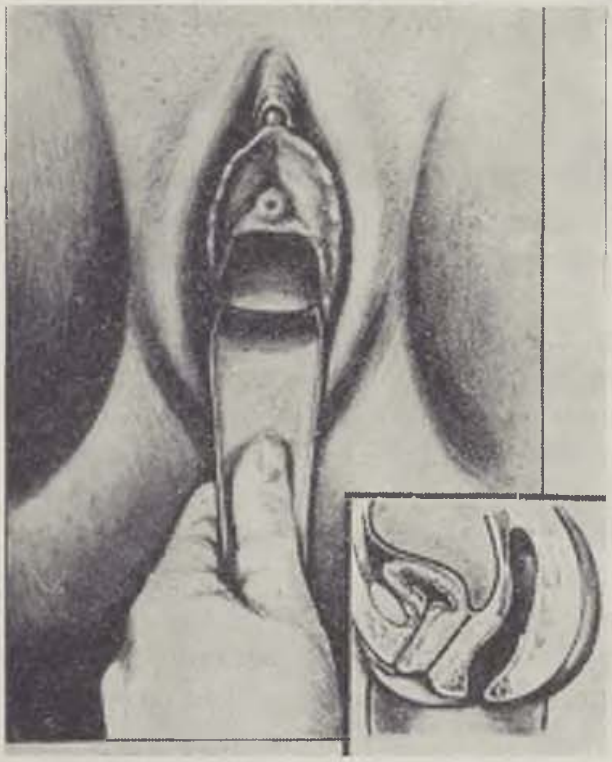


Fig. 1. Tissue between urethra, urinary bladder and rectum is dissected. At right bottom, in inset, dotted line marks direction of dissection. — Fig. 2. Opening peritoneum of Douglas pouch over gauze packing

and both lateral edges of the incised peritoneum and their ends caught from inside the vagina with artery forceps and led outside. The bottom of the abdominal cavity (the fundus of the vagina) was formed by suturing the staff-shaped broadened parts of the uterus to the peritoneum covering the sacro-uterine ligaments. While suturing, attention had to be paid to the ovaries and

Fig. 3. Wound edges of peritoneum are sutured with catgut

fallopian tubes to remain in the abdominal cavity and prevent them to come to lie in the vagina, but the distance between the last suture in the peritoneum and the sacrum was not allowed to be less than two inches. This is necessary for ensuring free movements of the rectum and prevent its strangulation. In order to prevent intestinal loops from falling between the rectum and the peritoneum, the last suture in peritoneum was laid so that it became anchored to the anterior wall of the rectum. In this way, complete separation of the abdominal cavity from the vagina was achieved. The second stage of the operation was concluded by suture of the anterior abdominal wall by layers.

T h i r d  S t a g e: The four catgut stitches laid into the peritoneal edges and led out through the vagina were tied to the wound edges of mucosa of the vaginal vestibule and then an adequate number of stitches was laid all around the vestibular margin so that not a single free space remained between the pulled down peritoneum and the mucous membrane of the vestibule. This fully controlled bleeding and made complete apposition of wound edges of peritoneum and vestibular mucosa possible. The vagina thus formed was again packed with gauze soaked in a synthomycin emulsion.

During the postoperative period the vaginal pack was first changed after four days, but the following packs were changed every other day right up to complete epithelization of the union between peritoneum and mucous membrane.

In order to speed up this process, it is recommended to add some oily solution of oestrogens to the synthomycin emulsion.

With regard to postoperative complications, mention should be made of thrombophlebitis of the deep femoral vein (in one patient) and cystitis (in two patients).

In the first three or four days after operation, the serous surface of peritoneum lining the newly formed vagina appeared bright red, succulent and bled easily. Afterwards it gradually acquired a pink colour.

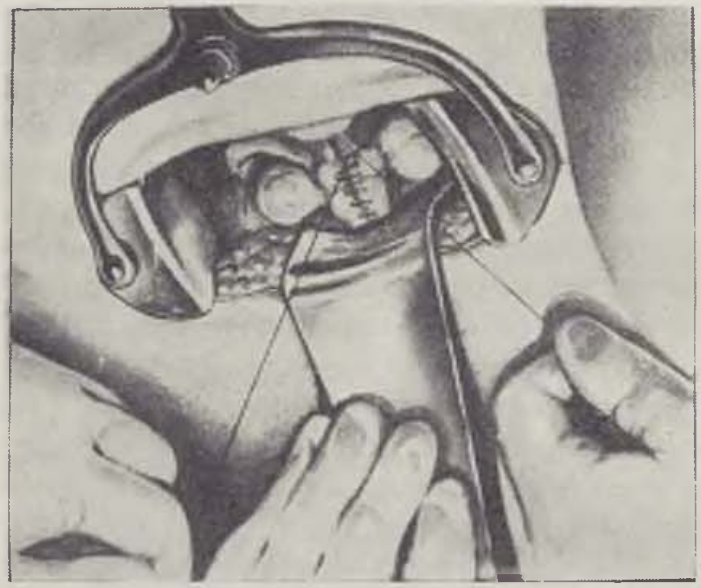
The late results in 46 patients operated on by this method were checked up in 35 of them (six months to 3.5 years after operation) and in 19 of these more than once.

Al patients, except one, started to lead a regular sexual life seven to 15 days after discharge from hospital. Painful sensations which worried them in the first days, gradually disappeared. Two women observed a haemorrhagic discharge from the vagina after intercourse during the first two months of sexual life, 40 women observed normal sexual excitement and satisfaction.

On check-up a long time after operation, in all women after colpopoiesis the vagina was found to be 3—4 cm wide and 8—11 cm deep. When pressing against the fundus of the vagina, it could easily be deepened by another 2—3 cm. Considerable shifting of the labia minora to inside the vagina was also observed, evidently due to pulling the mucous membrane of the vestibule into the vaginal canal. In all women it was possible to detect the site of union between peritoneum and mucosa by its whitish colour.

Not a single patient complained of a dry vagina. Moistening of the vaginal walls was evidently effected by secretions of the greater vestibular glands.

Since 1970 the authors have modified the operation in 21 women with aplasia of vagina and carried out a one-stage procedure, bringing down the peritoneum of the Douglas pouch from a perineal approach only.



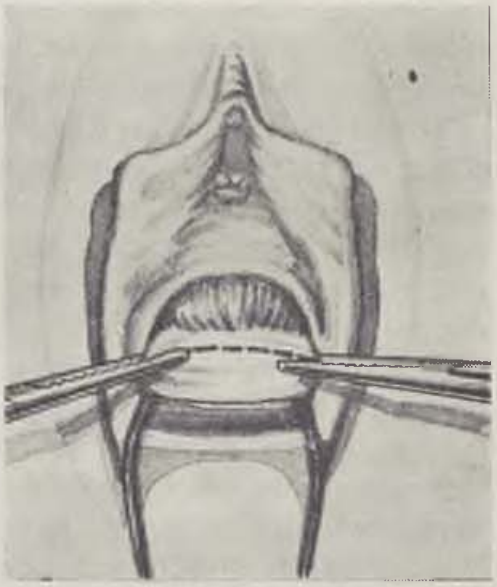
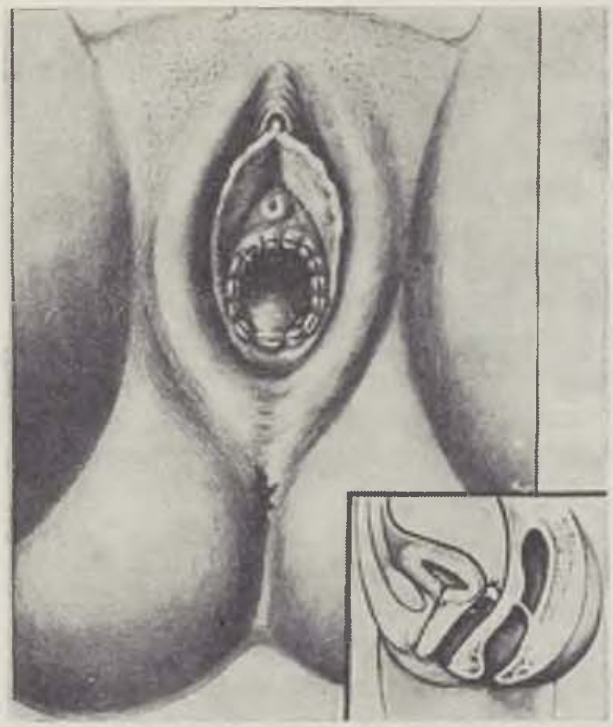


Fig. 4. Formation of vaginal fundus. — Fig. 5. Peritoneum caught with forceps, dotted line indicates incision to be made



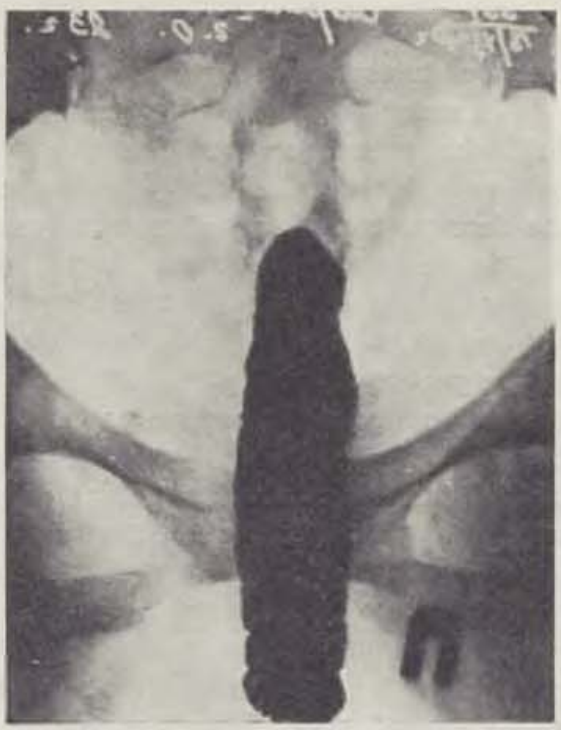


Fig. 6. View of genitals after conclusion of operation. In right bottom inset, indicated site of purse-string suture. — Fig. 7. Colpogram six months after operation

In order to facilitate finding the peritoneum, the abdominal cavity was filled with 1000—1500 ml gas on the day of operation or the day before, and the operation was carried out in Trendelenburg's position. The gas, thus transferred to the pelvis minor, stretched the tissues and made the border between the urinary bladder and the rectum become clearer.

The operation was started by dissecting the tissues between the urethra, the urinary bladder and the rectum. During this operation it was particularly important to separate the peritoneum from the rectum.

Introduction of a metal catheter permitted determination of the bladder fundus, back of which the peritoneum of the Douglas pouch was caught with forceps and pulled forward together with a thin layer of connective tissue which had remained on it. Provided dissection of tissue had been carried out sufficiently, the peritoneum was bulging into the canal thus formed like a bladder of thin walls, due to the pneumoperitoneum effected beforehand.

The peritoneum was pulled down with forceps caught to the top of the peritoneal bulge and punctured with a thick needle. The air escaping from the needle convinces the surgeon that the dissected part of peritoneum belongs to the Douglas pouch.

The peritoneum was then incised at this point in a transverse direction and its edges pulled down to the wound edges of the vestibule, in order to be sutured with catgut all around the circumference. In this way a canal, lined with peritoneum and running from the vestibule into the peritoneal cavity was formed. Pulling down the peritoneum is an easy procedure and

does not require any force. In the depth of the canal, the surgeon may observe loops of intestine, sometimes also the omentum and the ovaries.

In order to form the vaginal fundus and close the abdominal cavity, the following procedure was carried out: A sponge holding forceps with a gauze ball was introduced througt the vagina into the peritoneal cavity, the end of the forceps being pushed to one lateral part of the pelvis minor, to the site of the rudimentary uterine horns, which were then brought down to the vaginal canal and sutured there with catgut stitches. The two rudiments were sutured to each other with one or two stitches, which was sufficient to shut of the peritoneal cavity from the vagina. Another two or three stitches suturing the rudiments to the rectum achieved complete separation of the vagina from the abdominal cavity. If finding the uterine rudiments should present any difficulties, the fundus of the vagina might be formed by a catgut purse-string suture in the upper part of the canal.

The mean duration of the operation was 30 to 40 minutes.

The vagina thus formed was packed with gauze usually soaked in an oily emulsion with some antibiotics added (Synthomycin or Furacillin). The first change of the pack was carried out three days after operation, afterwards it was changed every other day for a total of ten to 14 days. Every time this was done, the vagina was rinsed with peroxide, for the first time not earlier than the seventh or eighth day, when it was possible to assume that the developing adhesions had reliably shut off the abdomnial cavity.

The patients were discharged 14 to 20 days after operation. If possible, they immediately resumed sexual life. If this possibility did not exist, they applied a dilator overnight for two to three months. Afterwards this dilator did not have to be introduced any more, because the vagina remained unchanged.

Of the 21 patients operated on by this method, two developed complications due to injury to the rectum when the peritoneum of the Douglas pouch was opened. This happened because of insufficient mobilization of peritoneum from the rectum and the incorrect determination of the border between the urinary bladder and the rectum. In both these patients, the wounds in the rectum were closed by two layers of interrupted catgut stitches. There were no other complications in these patients after operation.

The late results were checked up in 18 patients. All of them lead a normal sexual life. On examination, the artificial vagina represented a canal, 3—4 cm wide and 9—11 cm deep, well moistened by the secretions of the greater vestibular glands in all patients one to five years after operation.

Thus no difference between the late results of peritoneal colpopoiesis carried out in three or one stage could be ascertained, however the immediate postoperative period was tolerated much better after the one-stage operation, evidently because the abdominal wall was not opened and the operation itself was of shorter duration. The fact that this operation is carried out without laparotomy is not insignificant.

The new modification permits to carry out colpopoiesis from the peritoneum of the Douglas pouch without threatening the final result.

B. K.

SUMMARY

The results of 67 constructions of an artificial vagina using the peritoneum of the Douglas pouch are reported on. Forty-six operations were carried out in three stages by both perineal and abdominal approaches, while 21 by perineal approach only. The late results are completely satisfactory.

RÉSUMÉ

**Reconstruction du vagin en utilisant le péritoine de le cavité Douglas**

Davydov S. N., Jivitiachvili O. D.

Le travail présenté offre les résultats de 67 reconstructions du vagin en utilisant la covité Douglas. 46 opérations ont été faites en 3 étapes par les voies périnéales et abdominales. 21 opérations ont été réalisées seulement par les voies périnéales. Les résultats tardifs sont en général satisfaisants.

ZUSAMMENFASSUNG

**Wiederherstellung der Scheide aus dem Peritoneum des Douglasschen Raumes**

Davydov S. N., Zhvitaschvili O. D.

Die Ergebnisse von 67 Scheidenwiederherstellungsoperationen aus dem Peritoneum des Douglasschen Raumes wurden von den Autoren in der vorliegenden Arbeit vorgelegt. 46 Operationen wurden in drei Etappen durchgeführt, und zwar mittels perinealer und abdominaler Annäherung. 21 Operationen wurden lediglich durch perineale Annäherung vorgenommen. Die Spätergebnisse sind sämtlich befriedigend.

RESUMEN

**Reconstrucción de la vagina con el peritoneo de la cavedad de Douglas**

Davydov J. N., Zvitiasvili O. D.

Los resultados de las 67 reconstrucciones de la vagina con el peritoneo de la cavedad de Douglas son presentados en éste trabajo. 46 operaciones fueron performadas en 3 etapas por acceso perineal v abdominal. 21 operaciones fueron realizadas solamente por el acceso perineal. Los resultados tardíos son enteramente satisfactorios.

REFERENCES

1. **Arist, I. D.:** Colpopoiesis in Congenital Aplasia of Vagina Using Peritoneum. Akush. Gynek., 2 : 88, 1963.

2. **Verbenko, A. A., Kiparisov, L. N.:** Formation of Artificial Vagina Using Peritoneum of Pelvis Minor and Histological Structure of Its Wall. Akush. Gynek., 12 : 39, 1968.

3. **Davydov, S. N.:** Colpopoiesis Using Peritoneum of Douglas Pouch. Akush. Gynek., 12 : 57, 1969.

4. **Davydov, S. N.:** Modification of Colpopoiesis Using Peritoneum of Douglas Pouch. Akush. Gynek., 12 : 57, 1972.

5. **Kocherginsky, A. Z.:** Colpopoiesis Using Peritoneum of Pelvis Minor in Vaginal Aplasia. Zdravookhr. (Kishinev), 6 : 22, 1960.

6. **Jenen, E.:** Chirurgische Behandlung bei Atresien und Aplasien der Vagina. Zbl. Gynäk., 79 : 1641, 1957.

S. N. Davydov, ul. Saltykova-Shchedrina 41, Leningrad, USSR

Donetsk Scientific-Research Institute of Traumatology and Orthopaedics, Donetsk (USSR)

# RECONSTRUCTIVE SURGERY FOR FAULTY SHORT AMPUTATION STUMPS OF FOOT

T. A. REVENKO, L. S. PARSHCHIKOVA

It is well known that short amputation stumps of the foot (after the operations of Chopart, Labori, Jober and Bone-Eger) are, in most cases, unfit for weight bearing due to the development of faulty parts (Albrecht; Sternberg and Godunov). The stump acquires an equinus position as a result of removal of the anterior part of the foot, due to disruption of the muscle equilibrium (Klopfer; Kofman; Sokolov; Lurye and others). The muscles of the calf, thus gaining predominance over their antagonists, gradually pull the heel upwards, and the talus is displaced downwards so that its head becomes the point of weight bearing in the stump (Vasconcelos; Revenko; Parshchikova).

Most Anglo-American authors unanimously reject preserving short foot stumps and amputate at the level of the leg according to Syme. In a series of large modern manuals on amputation technique, issued in Great Britain and the USA, Chopart's operation has not even been described. Only transmetatarsal operations and Syme's amputation are recommended (Cozen et Brockway; Luke; Campbell and others). Dale et Harris assume that all short stumps of the foot are unsuitable for fitting of an orthopaedic appliance. In the known schemes Zur-Verth, the entire regions of the proximal part of the foot are considered levels unsuitable for amputation.

The subsequently developing disorder in a short foot stump usually lead to re-amputation according to Pirogov or Syme. This contradicts one of the most important principles of surgery, that of sparing treatment. At the beginning, led by this principle, the surgeon tries to maximally save undamaged tissue in the wound toilet of unrepairable tissue damage of the anterior part of the foot, limiting himself to amputation through Chopart's joint or its modifications. Then, if the patient again calls on him, because the stump has become unfit for weight bearing in 95% of cases, he is compelled to carry out a bone-plastic re-amputation in the leg according to Pirogov. Thus the viable talus is removed, the ankle joint arthrodesed and the leg shortened. In this way the surgeon undoes everything he endeavoured to achieve with his primary amputation and is naturally forced to ask himself whether it would

not have been better to do this in the first place, in order to save the patient the second operation.

Meanwhile the patient left with a stump after Syme's amputation had been forced to use his orthopaedic appliance even at home, for instance, stepping into the bath (Dale et Harris). The patient with a Pirogov stump is in a better position from this point of view, because he can stand on his stump even without an appliance, however Pirogov's operation has a number of other

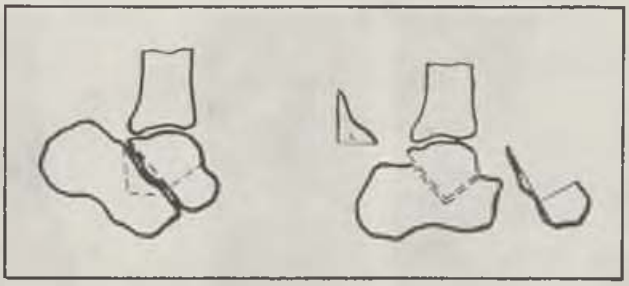


Fig. 1

disadvantages. Some authors (Berliner; Parshchikova; Vasconcelos) maintain that from recurrent bursitis in the region of the tendo Achillis insertion ulcerations and osteophytes frequently develop due to weight bearing of this part, which leads to the stump becoming unfit for it. Fitting of an orthopaedic appliance to a Pirogov stump also presents special difficulties. It is heavy, unsatisfactory from a cosmetic point of view, the patient's gait lacks elasticity because the ankle joint is missing.

A certain progress represented the recommendations of Hilgenfeldt and Davidova as to carrying out a bone-plastic correction of the faulty position of a short Chopart stump. However, their method did not prevent recurrence of equinovarus position of the stump, because arthrodesis of the talus and calcaneum is only carried out in one plane. An analogous variant of the ankle joint arthrodesis was recommended by Lyashenko.

Since 1959, Revenko's bone-plastic operation with repairs the faulty position of a short foot stump has been carried out at the Donetsk Institute of Traumatology and Orthopaedics, termed the imbeded subtalar arthrodesis. The technique of this operation is based on the principles of sparing surgery, i.e. preserving the optimal function of a limb and making use of the modern achievements of biomechanics and bone-plastic surgery. The indications for imbeded subtalar arthrodesis are chiefly faulty position of a foot stump, however this operation can be carried out even in primary amputation according to Chopart, taking into account that a faulty stump will inadvertedly develop.

Prior to operation the foot stump is X-rayed from a lateral projection in every patient. With this X-ray the wedges to be excised from the talus and calcaneum are planned (Fig. 1). The operation itself is carried out under intraosseal anaesthesia using 0.5% novocain. A curved longitudinal incision,

10—15 cm in length, skirting the lateral malleolus is made and the soft tissues are divided by layers. The tendons of the peroneal group are exposed and separated from the site of their adhesions to the foot stump. The subtalar joint is exposed and its ligaments and capsule are also divided. The foot is then dislocated so that the articular surfaces of the talus and calcaneum are presented by tilting these bones at an angle of 90 to $120^0$. The talus is put into a position of maximum plantar flexion. Its posterior process thus comes

Fig. 2

to lean against the posterior surface of the tibia, which prevents its further equinus position. From this position, the wedges to be excised are estimated. From lower posterior part of the talus, only the articular surface should be excised. The next plane of excision runs at right angles to the first plane; it starts at its lower edge and terminates at the base of the head of talus. A wedge with its base facing upwards towards the articular surface is excised from the calcaneum. This wedge should be taken near the posterior part of the bone. In order to correct the varus position of the stump an additional wedge is excised from the lateral aspect of the calcaneum with its angle opening outwards. The heel is shifted forward as far as possible, and the wedge of the talus is impacted into the excised wedge of the calcaneum. Then the peroneal muscles are transposed on to the anterior aspect of the stump. If the tendo Achillis impedes transposition of the heel, plastic achillotenotomy is carried out. The wound is closed by layers. The position of the stump is ensured by plaster immobilization. As a result of the calcaneum having been shifted forward, the stump forms a lever of equal arms with the axis of the leg, and recurrence of the faulty position becomes impossible because the posterior process of the talus leans against the posterior surface of the tibia.

The method described above ensures reliable maintenance of the stump in the correct position and prevents development of equinus displacement; it is thus possible to use the plantar surfarce of the foot for weight bearing, which has been destined for this function by nature itself; the healthy talus is not removed, the leg is not shortened, and movements in the talocrural joint are preserved.

The area of weight bearing on the plantar aspect of the heel has considerably increased as a result of this operation, which is naturally best fitted for this function. The movements of the talocrural joint have been preserved. Their amplitude — according to the author's experience — comprises 15—20$^0$ in the operated on patients. Twelve to fifteen weeks after operation the plaster cast is removed and remedial exercises, massoge and physiotherapy are started with.

The weight bearing capacity of the foot stump has greatly improved. The area of weight bearing had increased in 20 patients twice to 2.5 times as measured by plantography.

Electrophysiological examination of muscles and nerves in the limb after the reconstructive operation proved normal in the basic parameters when measured at a late date. In the first place the function of flexors and their nerves was fully restored.

The late results were checked up in 55 patients who had undergone imbeded subtalar arthrodesis; 29 of them were examined more than two and 26 more than five years after operation (Fig. 2).

Imbeded subtalar arthrodesis evidently changes the approach to the treatment of patients with faulty stumps after Chopart's amputation on both feet. It is well known that a number of surgeons have sought the solution in amputating at the middle level of the leg, in order to at least obtain a stable stump on one side. Formation of a weight bearing stump as a result of a corrective operation by the method described above allows to forego re-amputation in the leg. The patient after correction of his stump may easily be fitted with a light orthopaedic boot.

Imbeded subtalar arthrodesis has proved highly effective from a functional point of view: the results are stable, faulty positions of the stump do no recur, the conditions for fitting an orthopaedic appliance are favourable. This makes the operation the method of choice in the treatment of faulty stumps of the foot. B. K.


SUMMARY

The authors describe a method of surgical correction of faulty short stumps of the foot by the imbeded subtalar arthrodesis as recommended by Revenko.

The operation corrects a permanently faulty position of a foot stump and permits to preserve movements in the talocrural joint. The reconstructed stump

allows easy fitting with an orthopaedic boot, which has been checked up in 55 patients many years after operation.

The method described has many advantages over the amputations according to Syme and Pirogov.


RÉSUMÉ

**Plastique reconstructive en cas de moignons d'amputation courts défectuex de la jambe**

Revenko T. A., Parchtchikova L. S.

Les auteurs décrivent la méthode de la correction chirurgicale des courts moignons d'amputation de la jambe par l'arthrodèse subtalique immergée proposée par T. A. Revenko.

L'opération décrite va enlever définitivement la position défectueuse du moignon de la jambe en conservant le mouvement de l'articulation tibiotarsienne. Le moignon nouveau-creé peut être bien muni du soulier orthopédique ce qui a été démontré par des observations pendant de nombreuses années sur 55 malades avec de telles prothèses.

La méthode décrite est avantageuse en comparaison avec l'amputation de Syme et Pirogov.

ZUSAMMENFASSUNG

**Wiederherstellungsplastik bei defekten kurzen Amputationsstümpfen des Beines**

Revenko T. A., Parschtschikova L. S.

Die Autoren beschreiben die Methodik der Korrektur kurzer Amputationsstümpfe des Beines eingesänkter subtalischer Arthrodese nach dem Vorschlag von Revenko.

Die beschriebene Operation befreit den Beinstumpf definitiv von der fehlerhaften Stellung, bewahrt jedoch die Bewegung im Talokruralgelenk. Der neugebildete Stumpf kann mit einem orthopädischen Schuh gut versehen werden, wie durch langjährige Beobachtungen an 55 Kranken mit solchen Prothesen nachgewiesen wurde.

Die beschriebene Methode hat erheblichen Vorteil vor der Amputation nach Syme oder Pirog.

RESUMEN

**Plastia reconstructiva en el caso de los muñones cortos defectuosos de la pierna después de la amputación**

Revenko T. A., Parschicova L. S.

Los autores describen los métodos de la corrección quirúrgica de los muñones cortos restantes después de la amputación de la pierna capable de carga por artrodésis subtálica encajada propuesta por T. A. Revenko.

La descrita operación elimina la posición defectuosa del muñón de la pierna, mas conserva el movimiento en la articulación talocrual. El muñón neuvamente formado puede bien ser provisto de un zapato ortopédico, lo que fue demostrado por observaciones de muchos años en 55 pacientes con tales piernas artificiales.

El método descrito tiene una ventaja considerable en comparación con la amputación de Syme o Pirogov.

REFERENCES

1. **Godunov, S. F.**: Levels and Methods of Amputation in Lower and Upper Limb. Protezir. protezostr., II (IV), 1960, p. 18.

2. **Lyashenko, V. A.**: Reconstructive Operation in Foot Stump Resulting from Chopart's Amputation. Nov. khir. Arkh., 2 : 84, 1961.

3. **Parshchikova, L. S.**: Reconstructive Operations and Fitting with Orthopaedic Appliance in Short Foot Stumps. Kiev, Ortopedia, 1967, p. 73.

4. **Revenko, T. A.**: Method of Surgical Treatment of a Faulty Foot Stump after Chopart's Amputation. Ortop. Travm. Protez., 6 : 41, 1965.

5. **Dale, G.: Harris, W. B.**: Follow-up Studies on Lower Extremity Amputees. Med. Serv. J. Can., 18, 1 : 7, 1962.

6. **Luke, G. C.**: Amputations. In.: Textbook of Surgery. London, H. Mosley, 2nd ed. 1955, p. 855.

Prof. T. A. Revenko, ul. Artema 106, 340051 Donetsk, USSR

---

**IXth Course of Plastic Surgery for Postgraduates** organized by the Department of Plastic Cosmetic and Reconstructive Surgery, Barcelona Polyclinical Institute, to be held from 28 Jan. to 2 Feb., 1974, and dedicated to:

Conceptions and General Technique in Plastic Surgery (from 28 to 29 Jan.).

Plastic Surgery of Jatrogenic Sequelae (from 30 to 31 Jan.).

Surgical Treatment of Lipodystrophy (from 1 to 2 Feb.).

Director of Course: Lorenzo MIR y MIR (Service chief of Polyclinical Institute and Ex-Professor of Medical Faculty).

Polyclinical Institute, Barcelona (Spain)
Department of Plastic Surgery
Head L. Mir y Mir, M.D.
Ex-Prof. A. of the Medical School of the University of Barcelona

# FRACTURES IN RHINOPLASTY

L. MIR Y MIR

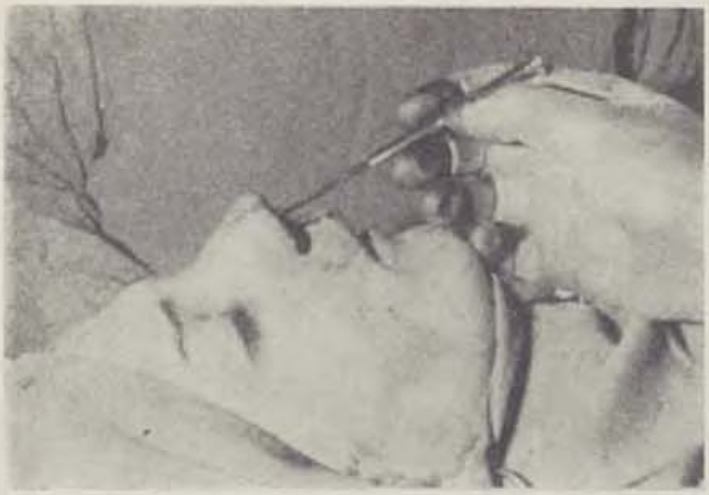
In this short paper we wish to present our (actual) procedure in regard to the fractures in aesthetic rhinoplasty.

The technique, which we use systematically, although adapting it to each particular case, resumes our experience of 25 years and 1900 rhinoplasties effected. We wish to anticipate the fact that we may be influenced by the habit of using the chisel, and explain that we have always used the chisel in our rhinoplasty fractures. We have never made use of the saw in our nasal fractures; so much so, that the set of saws we brought from the USA 25 years ago, are still brand new. We prefer the chisel for many reasons, essentially because we consider that it is more manageable in our hands, it is safer and more obedient in regard to the direction, either when extirpating the hump or when fracturing the sides of the nose walls (when effecting the lateral fractures of the nose). On the other hand, by using the chisel, the intervention is more rapid, and there are no heating, neihter detritus or residues of bone chips, which may cause variation during the formation of the callous.

We effect the factures in the following order: first, simultaneous osteo-cartilagenous extirpation of hump; second, the fracture which we call "second" and which is equivalent to Aufricht's "outfracture" in the nasal radix; and third, the lateral fracture base of the nasal walls (Fig. 1, a, b, c).

1) In regard to the first fracture, we consider that is must adapt itself in each case to the anthropometric requirements of the face of the patient and, therefore, may: a) be limited to the bony portion of the hump proper, without including any portion of the frontal glabela (Figs. 2, a and 3, a); b) or in very exagerated cases, be simultaneously extirpated in one piece, a more or less important portion of the frontal glabela (Fig. 1, a). In these cases the frontal glabela may be exstirpated, as I say, with the osteocartilagenous piece (Fig. 2, b or c) in cases in which we believe it necessary to respect the height of the nasal root (once the hump has been removed and respecting the portion

(*) Presented to the I Congress of the Intern. Soc. for Aesthetic-Plastic Surgery, Rio de Janeiro, February 1972.



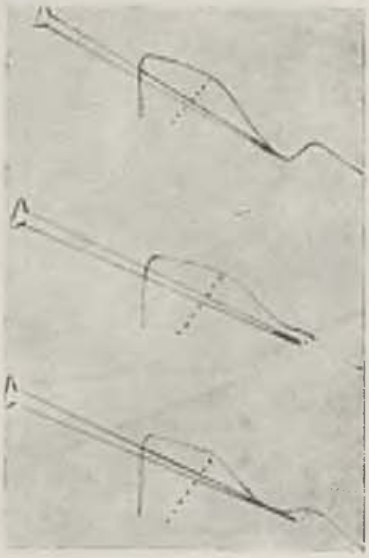


Fig. 1 - a: First fracture. Hump exstirpation. b: Second fracture. To mobilize the radix of the nose. c: Third or lateral fracture. To narrow the base of the new nose. — Fig. 2 - a: Extirpation in one piece of the osteocartilagenous hump proper. b: The piece removed includes also part of the frontal glabela. c: The piece of the frontal glabela is removed separately, after "jumping" over the bone bridge of the nasal radix

of bony bridge in the proximal region of the nasal radix), we go on with the chisel in the same direction, slipping over this bridge, and we proceed to extirpate a small triangular portion in the frontal bone proper. We call this last technique of jumping over the nasal bridge when extirpating the hump and glabela, the "jump exstirpation" (extirpation en salto) (Fig. 2, c).

2) In regard to the second fracture, following Aufricht, we believe that it is necessary, but we vary the technique somewhat: we begin "outfracturing"

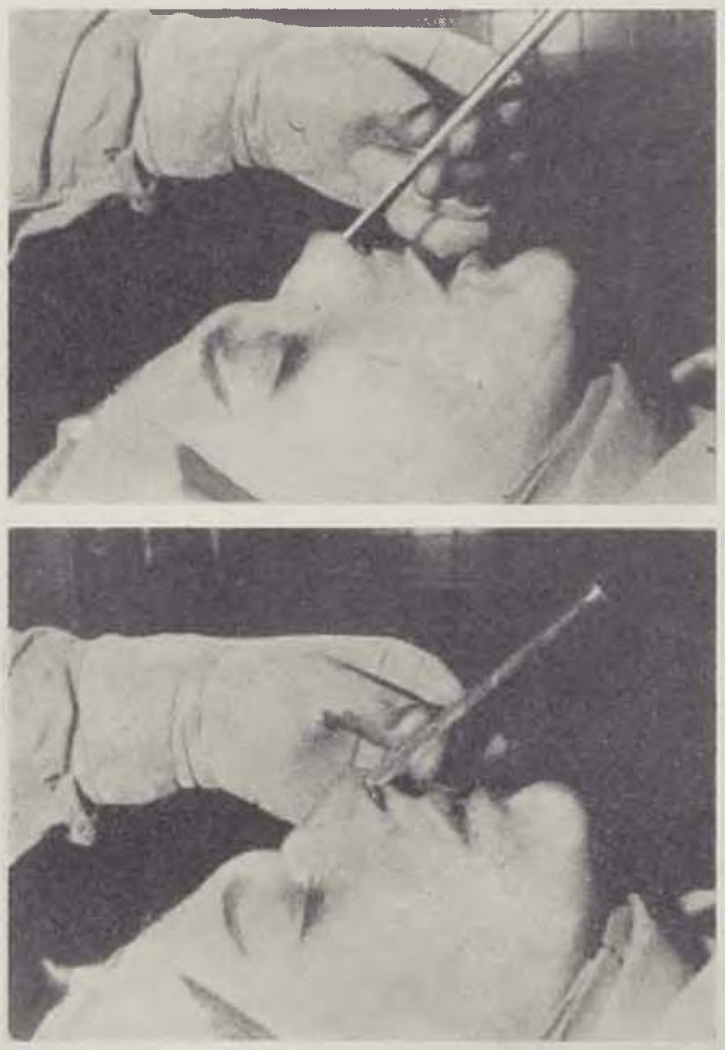
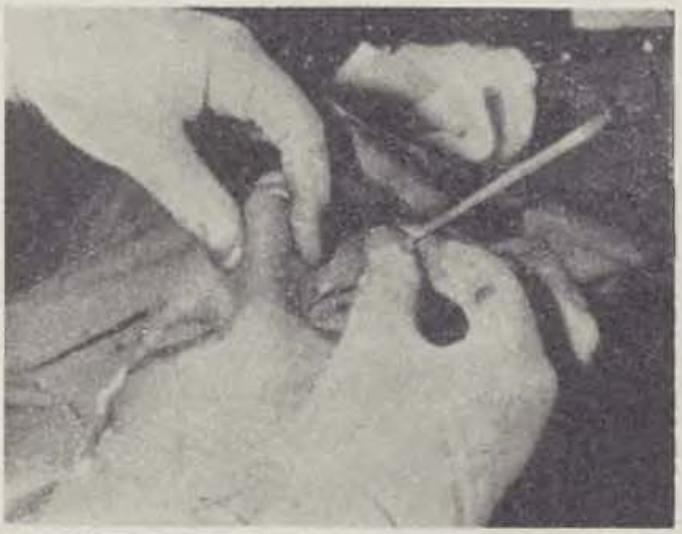


Fig. 3 - a: Chisel position to remove the hump (first fracture). b: Introducing the chisel in vertical position for the second fracture. — Fig. 4: Diagrame to demonstrate the chisel movement to obtain a better and higher radix fracture (second fracture)

with a chisel placed on a straight line in these "cul de sac" which remain after extirpating the hump (Fig. 3, b), and immediately we change the direction of the chisel and place it sagittally upwards and outwards (Fig. 4). In this way we try to liberate the nasal root laterally from its frontal continuity. This may be done with or without an empting of the bone matter if there is an excess of it at this level. It is generally not necessary to extirpate bone tissue and



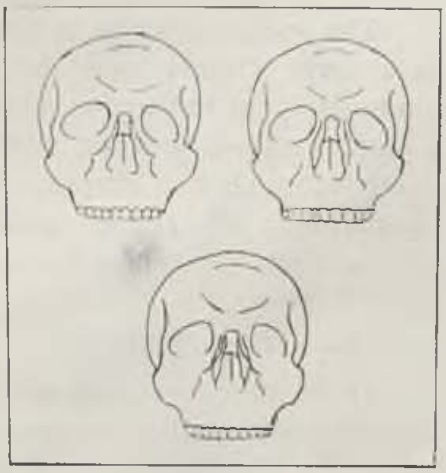


Fig. 5 - a and b: Introducing the chisel through the teguments in a $45^0$ angle. c: Showing the chisel position to practice the lateral fracture (third fracture). — Fig. 6: The resistance lines of the nasal bone architecture. a: The transversal nasal-malar line. b: The vertical nasal-maxilar line. c: The crossing point of the both "butress" lines (arbotantes)

we crack the lateral bone wall of the nose as high as possible, even over the naso-frontal suture; this, we believe, is better attained when it is practiced before the lateral osteotomy.

3) The third or lateral fracture of the nasal walls, the main object of this paper, is always effected externally by us, following Straatsma, who was our professor in 1946. This fracture, recommended in 1906 by Mosher, by means of small lateral incisions, was truly taken up and used successfully by Straatsma.

Fig. 7 - a: X-Ray projection of the nasal bone walls. b: Same after the fractures

The incision, which is brought about with the same fine chisel (Straatsma) at a level slightly over the nasogenian furrow, is placed higher by us, approximately in the upper middle part of the whole nasal wall. We effect it by means of a 2—3 or 4 mm. wide chisel, depending on the case. We believe that no other technique can surpass the achievement of the two essential and necessary requisites in all type of lateral fractures: 1st, that the fracture (practiced with any method) must be effected as laterally as possible, that is, as low as possible in respect to the height of the nasal bridge; and 2nd, it must reach, as high frontaly as possible.

These two requirements are easily and rapidly achieved with the external fracture and usually one knock with the chisel is enough to fracture the whole length of the lateral wall if the chisel is placed on the right point. And, which is the right point which affords such an ample fracture, such a complete and total fracture with only one knock of the chisel. For us, and remembering the structure of the "arbotantes" (butress) in the lines of resistence of the femur neck, there is no doubt that they also exist, in a similar form, in the bone structure of the nose; that, in its architectonic base there also exists an intercrossing of forces, given by two curvatures which form this nasal architecture on the anterior plane of the face.

Fig. 8: Before (a) and after (b) rhinoplasty practising the three fractures described

These two curvatures (curved lines of the bones) of the lateral walls of the nose, intercross precisely in one point which concentrates the firm bony resistance of the region (Fig. 6, c). These two curved lines or butresses as we call them, constitute in the point where they cross, the key to the problem. If the 3 mm. chisel, situated horizontally and paralel to the anterior plane of the face, is placed exactly on this point where the lines of resistance inter-

Fig. 9: Before (a) and after (b) rhinoplasty it may be apreciate the narrowing obtained with the external lateral fracture

cross, only one knock on the chisel is needed to break this resistance, and a linear and complete fracture is obtained along the length of the whole base of the nasal wall. Consequently we achieve a total, extensive and rapid fracture, easily accomplished with practice. The result is that a narrowing of the nasal pyramid is obtained technically with ease and excellent and definite morphological result (Figs. 8, 12).

Fig. 10: Before (a) and after (b) the rhinoplastic correction. In this case the first fracture is limited to the extirpation of the hump proper

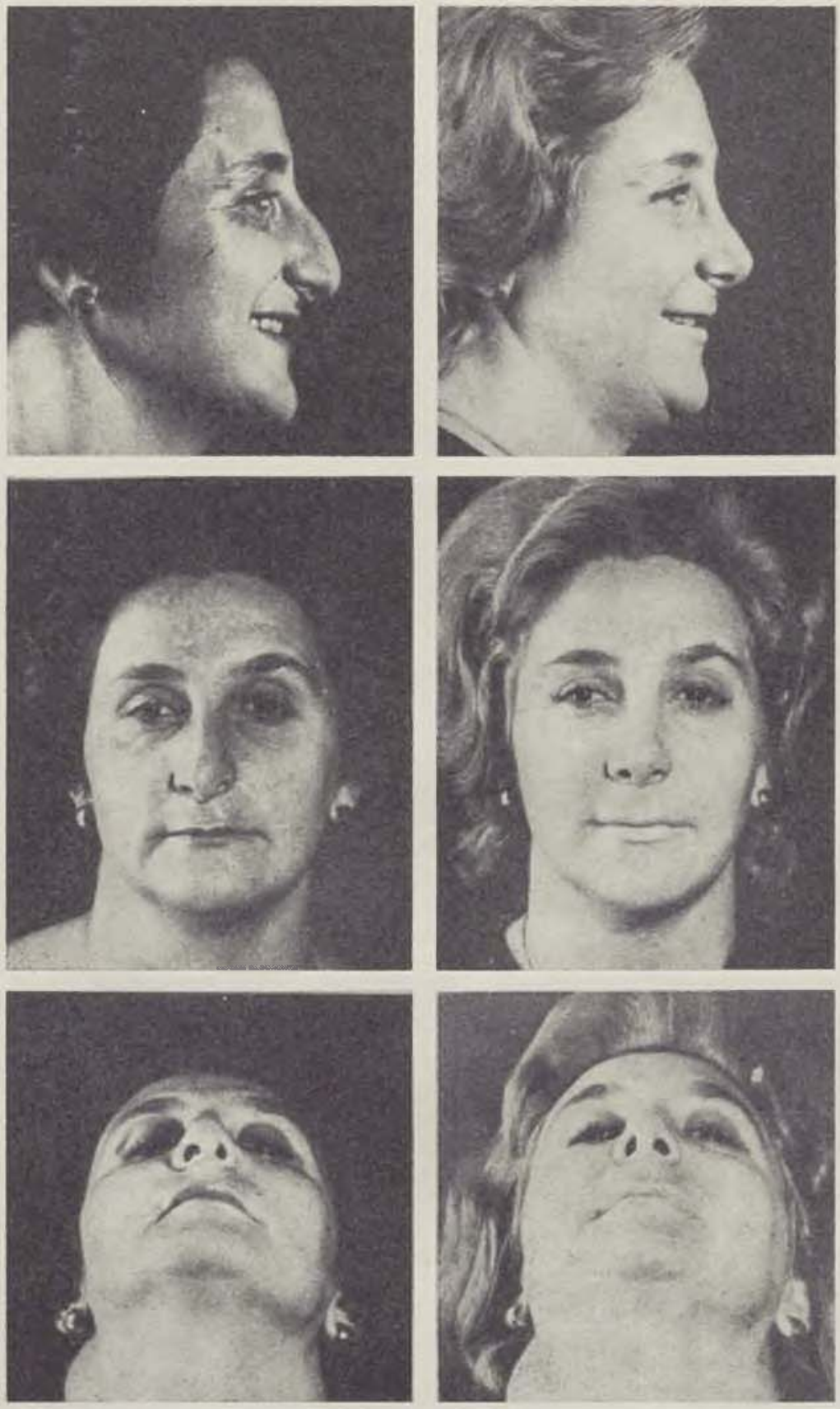


Fig. 11: Before (a) and after (b) rhinoplastic procedure

Fig. 12: Before (a) and after (b), six months later of the rhinoplastic correction

SUMMARY

In short we recommend that the first fracture or removal of the hump be effected in one only osteocartilagenous piece, with our without extirpation of the frontal glabelar portion, according to the case; and when effecting the extirpation of the glabela, that it may be done either in one piece with the removed hump, or "jumping" over the nasal bridge when the nasal height must be respected.

In regard to the second fracture, we insist that Aufricht's "outfracturing" is necessary, although we effect it slanting the line of fracture upwards and outwards to obtain the maximum height in this fracture. Also, we prefer to effect this second fracture before the lateral fracture which we denominate "third fracture". That we always effect externally, following Straatsma, and which we consider can solve with only one knock of the chisel the whole technical problem of this fracture, if the chisel is placed on the point where the lines of resistence, cross (or butresses of the nasal architecture) (Fig. 6, c). This point is found preciselly where the two curved lines intercross. On one side the line is the curved nasogenian line from the height of the nose down to the cheek bone (Fig. 6, a) and on the other side the curved line runs from the nasal root in the lateral base, to the base of the piriform opening (Fig. 6, b), that is, the whole length of the ascending apofisis of the maxilar, which, as we know, constitutes the main part of the external lateral base of the nasal pyramid.

RÉSUMÉ

**Ostéotomie dans la rhinoplastique**

Mir y Mir L.

On recommande de faire ce qu'on appelle «la première fracture» (c'est-à-dire l'enlèvement de la protubérance nasale) dans un seul bloc ostéocartilagineux sans ou avec l'extirpation de la partie antérieure de glabelle selon occasion. Mais on peut aussi enlever la glabelle en bloc avec la protubérance qui est amputée en même temps ou en sautant le pont nasal, si l'on veut garder la longueur originaire du nez.

Quant à ce qu'on appelle «la deuxième fracture», nous demeurons constants dans l'opinion qu'il est nécessaire de faire une brèche selon Aufricht aussi en cas si la ligne de la rupture est faite à l'extérieur obliquement en haut pour obtenir la hauteur maximum de la fracture en question. Outre cela il est mieux de faire cette deuxième fracture avant la fracture latérale laquelle est caractérisée comme la soit-disante «troisième fracture». Celle-ci est réalisée toujours à l'extérieur (selon Straatsma) et nous supposons que le problème technique de la «troisième fracture» puisse être résolu par un seul coup du ciseau, si cet instrument est appliqué au point où les lignes de résistence — les piliers d'apui de toute la construction nasale se croisent (Fig. 6 c). Ce point se trouve exactement dans l'espace où les deux courbes se croisent: d'une part la ligne menée du nez au menton se dirigeant du sommet du nez en bas vers l'os zygomatique (Fig. 6 a), d'autre part la courbe qui passe la racine du nez dans le bord latéral vers la base du trou piriforme (Fig. 6 b), c'est-à-dire en longueur entière de l'apophyse ascendente du maxillaire supérieur qui — comme on sait — forme la partie principale du bord latéral extérieur de la pyramide nasale.

ZUSAMMENFASSUNG

**Die Osteotomie in der Rhinoplastik**

Mir y Mir L.

Es wird empfohlen, die sogenannte „erste Fraktur" (beziehungsweise die Behebung des Nasenhöckers) in einem einzigen Knochenknorpelblock je nach Bedingungen ohne oder mit Herausschneidung der vorderen Glabellarpartie durchzuführen. Hierbei kann auch die Exzision der Glabella in einem Block mit dem zu entfernenden Höcker oder mit einem „Sprung" über die Nasenbrücke ausgeführt werden, falls die Nasenlänge zu erhalten ist.

Hinsichtlich der sogenannten „zweiten Fraktur" bestehen wir darauf, dass das „Ausbrechen" (outfracturing) nach Aufricht notwendig ist, auch wenn man die Bruchlinie schräg nach oben und äusserlich zur Erzielung der maximalen Höhe dieser Fraktur führt. Ausserdem bevorzugen wir diese zweite Fraktur von der lateralen Fraktur durchzuführen, die wir als sogenannte „dritte Fraktur" bezeichnen. Diese führen wir durch stets äusserlich (nach Straatsma) und glauben, dass das ganze technische Problem der „dritten Fraktur" mit einem einzigen Meisselschlag gelöst werden kann, wenn das Werkzeug an die Stelle gesetzt wird, an der sich die Widerstandslinien beziehungsweise die Stützpfeiler der gesamten Nasenstruktur kreuzen (Abb. 6 c). Dieser Punkt befindet sich genau an der Stelle, wo sich zwei Kurven kreuzen: einerseits die Nasenkinnlinie, die vom Nasengipfel nach unten zum Gesichtsknochen (Abb. 6 a) verläuft, andererseits die Kurve, die von der Nasenwurzel in lateraler Kante zu der Base des Foramen piriforma (Abb. 6 b) führt, d. h. in der gesamten Länge der aufsteigenden Apophyse des Oberkiefers, die bekanntlich den Hauptteil der äusseren lateralen Kante der Nasenpyramide bildet.

RESUMEN

**Osteotomia en la rinoplastia**

Mir y Mir L.

Se recomienda que la llamada "primera fractura" (respectivamente la exstirpación de la protuberancia nasal) sea efectuada en un bloque osteo-cartilaginoso con o sin exstirpar la parte glabelar anterior, según las circunstancias. Al realizarlo la exstirpación de la glabela puede también ser efectuada en un bloque con la protubertancia a exstirpar o sea con un "salto" a través del puente nasal, si el largo de la nariz deber ser respetado.

En cuanto a la llamada "segunda fractura" insistimos en que una "fractura hacia fuera" (outfracturing) según Aufrijt es necesaria, aun cuando la línea de la fractura sea trazada oblicuamente hacia arriba y por fuera para conseguir la altura máxima de esta fractura. Además preferimos efectuar esta segunda fractura antes de la fractura lateral, la que denominamos como la llamada "tercera fractura". Esta se efectúa siempre por el exterior (según Straatsma) y presuminos que todo el problema técnico de la "tercera fractura" pueda ser resuelto por un golpe del cincel, si el instrumento está puesto en el lugar, donde se cruzan las líneas de resistencia resp. los arbotantes de la estructura nasal entera (Fig. 6 c). Este punto se encuentra precisamente en el lugar en el que se cruzan dos corvaduras: por una parte la línea entre la nariz y el mentón conducente de la punta de la nariz hacia abajo al hueso facial (Fig. 6 a), por otra parte la corvadura que pasa desde la raíz de la nariz en la crista lateral hacia

la base del agujero piriforme (Fig. 6 b), es decir en todo el largo de la apófisis del maxilar superior que, como es sabido, forma la parte esencial de la cristal lateral de la pirámide nasal.

REFERENCES

1. **Aufricht, G.:** A few hints and surgical details in rhinoplasty. Laryngoscope, 53, 317, 1943.

2. **Aufricht, G.:** Personal Teaching, 1946.

3. **Mosher, H. P.:** The direct method of correcting lateral deformity of the nasal bones. Laryngoscope, 16, 28, 1906.

4. **Straatsma:** Personal Communication and Teaching, 1946.

Dr. L. Mir y Mir, Balnes, 197 - entio., 2.°, Barcelona - 6, Spain

---

## Vth International Conference on Oral Surgery 21—25 April 1974 — Madrid, Spain

The International Association of Oral Surgeons will be holding its Fifth International Conference on Oral Surgery in Madrid, Spain from 21—25 April 1974.

A scientific and social programme has been planned together with a special programme which will interest the ladies. The scientific programme will include a Symposium on "The Tongue" and one on "Facial Asymetry". There will also be a programme of communications from delegates and a film programme. Four post-conference tours incorporating visits to oral surgical centres in Greece, Israel, England and USSR and Hungary have been planned and in addition a tour has been arranged to Italy as well as a special visit to the Seville Fair.

Further details regarding the Conference can be obtained from the General Secretary, Vth International Conference on Oral Surgery, P. O. Box 46078, Avda General Peron 22, Madrid, Spain.

ACTA CHIRURGIAE PLASTICAE — *16*, 1974, No. 1

# TISSUE BANK OF THE UNIVERSITY HOSPITAL IN HRADEC KRÁLOVÉ
## (Conception, Work, Future)

R. KLEN

Twenty years ago, the so called monobanks, i.e., bone, eyes and the like, became unsuitable from the technical and economic standpoint, and therefore we submitted a basic concept for a Tissue Bank — a laboratory which secures, adjusts, examines, preserves and distributes all tissues used in transplantations. Its development was made possible mainly by the increasingly thorough application of physiological principles in all surgical branches, by the development of cold ecology which gave rise to cryobiology, and not in the last instance by the development of low temperature techniques. Our experience over more than ten years led us to make the first comparison of the then existing state with the original concept. Further development took such a vigorous course that it is now desirable to make a fresh evaluation.

Our laboratory is mainly concerned with supplying surgeons with various kinds of grafts. Its practical conception originated from the clinical need with the respect to economical feasibility. The preparation of the sit venia verbo ready-made grafts was supplemented by the preparation of special grafts as, e.g., Cloward's bone grafts for osteosyntheses of the cervical backbone or fascial bands used for reinforcement of the brain vessels aneurysms by coating or incircling the eye bulb in detachment of the retina. Work continued by developing the so called substitute grafts. Primarily in question was heterogenous material which can be easily obtained in a planned manner in any quantity. Heterogenous bone grafts are treated in such a way that they fully replace the homogenous in indicated cases, even under unfavourable circumstances. Heterogenous heart valves provide the only possibility of implanting the natural valve during transplantations into dilated hearts of adults. Here belong nearly all heterotopic grafts. Thus the use of chorion grafts on covering some skin defects showed their superiority over skin grafts and also gave good results in plastic operations on the dura mater. Fascial implants into the sclera in ablatio retinae are also preferred to the use of sclera, due to easier handling. Protection of grafts during various forms of transport and storage in countries with high humidity required the mastering of tropicalization.

---

This paper was presented at the Conference concerning the Cells, Tissues and Organs Conservation held in September 1972 at Chlumec upon Cidlina (Czechoslovakia).

An indispensable feature of all progressive work is research. Progress expands not only vertically but also in horizontal direction. Not only are medical branches linked up with each other and with biology, but also with further, particularly technical sciences. Surprizingly admirable, bilaterally useful symbioses are created. The research work of our laboratory has been conceived as applied research, i.e. to be used in everday life. Its initial part was mainly concerned with the evaluation of clinical results. It was carried out in cooperation with surgeons using the grafts under evaluation. It was linked with the effort to ensure pathogenesis in some grafts in the experiment, as well as by analysis of clinical results, again carried out in cooperation with the users of our grafts. An attempt was also made to gain synthesis of the pathogenesis of transplantation caused by the grafts. Successful use was made of statistical methods which make possible the evaluation of various factors (e.g. selection of skin donors according to macroscopic character and pathologo-anatomic diagnosis or the temperature regimen of the chorion grafts practical before freeze-drying), by which the graft influences the results of transplantations. These data are particularly valuable because they are of immediate and effective assistance in practice. This stimulates all the real necessary for the solution of failures or unsatisfactory results and confirms that he who conceals such experience is breaking his Asclepiadic oath. —

In several cases, the investigations was organically carried over into the high field of basic research. It concerns the making use of high pressure for low temperature preservation, the detection of psychrophils on hemibiotically preserved skin and cornea at a temperature of + 4 $^0$C, the study of some electrophysiological processes of surviving organs, the determination of amino acids of human cornea, the detection of circulating antibodies after transplantations, the problem of survival and rebuilding of the transplanted cornea, the questions of photoactivity of tissues, temperature ecology of experimental tumours. We have defended a total of 7 research tasks and 5 research tasks are in progress, one of them for WHO. A total of 139 papers have been published and 3 films were produced.

The research questions of preservation of cells, tissues and organs fall into three basic groups. The first is determination of the state of the tissue at withdrawal and after preservation, the second is the best method of preservation, and the third covers accurate selection and preparation of the graft so that it can fulfil the tasks under the given situation. Estimation of the condition of the graft on withdrawal is a polythematic problem concerning, e.g., microbiology, determination of various properties, ranging from physical, to physiological one. The solution of questions of preservation is also polythematic, but it is framed by cold ecology. It is logical though underestimated that the natural media (e.g., aqueous humour, seminal plasma, blood etc.) under changed temperature are not the most suitable media for preserving tissues with which they come into contact in the body and they are therefore either adjusted or substituted. As to selection and adjustment, we have found that the traditionally stated suitable donors, e.g., of skin, who died of cardiac failure or injury, are less suitable than donors previously considered unsuitable,

e.g., those who died of a malignant tumour. Provided accurate data are obtained on indications and contraindications to withdrawal, suitable preservation will lead to accumulation of grafts that will be equal to classical therapeutics.

Another part of the work of the laboratory is the tuition of medium grade and graduate medical personnel in the Institute for Postgraduate Studies. The Tissue Bank also provides consultations on unusual transplantations. Of special importance are courses and collaboration with surgeons from the devoloping countries. Reconstructive surgery using preserved grafts in subjects suffering from leprosy, tuberculosis and trachoma is feasible if hygiene, epidemiology, immuno- and/or chemotherapy have failed to prevent the development of a condition which can be successfully solved by surgical intervention. In leprosy alone about 2.5 million persons might be offered this benefit. Since some transplantations have become part of our current operation programme and other transplantations will be surely included in it, lecture in temperature ecology which also provides students with basic knowledge dealing with preservation, and a lecture on transplantation have been added to the curriculum of our school.

The performance of operation on the predominant part of patients in which transplantation is indicated, the changing morbidity and the progress of science including progress in treatment, are factors deciding the future of the Tissue Bank, this requires vertical planning. Participation in the horizontal organization of the health service helps to solve some everyday problems. Working capacity is made available on the hand by better organization of work and on the other by ceasing to use certain grafts. This capacity is used for other work requiring cryogenic technique. In this manner, costly plants are used effectively and further work can be done in cryobiology. Even so, to cover the whole expanding field of activity of the Tissue Bank, its all-round development must be ensured. So, e.g., for the preservation of living cells, whether bone marrow, or stabilized cell populations other equipment is required than for the ordinary preservation of tissues while quite different equipment is used for organ preservation. Thus tissue banks become organ and cell banks and a wide conception of their activity develops covering not only the therapeutic care, but also diagnosis and research.

The Tissue Bank holds a key position in the transplantation of cells, tissues and organs. The long-term preservation increases the stock and thus enables better choice, the long-term transport and last but not least to perform the operation without a time stress. Since transplantation is a physiological therapeutic method carrying also the character of prevention in case of using homogeneous and heterogeneous tissues, increasing demands on the work of the Tissue Bank must be expected. Although specialization in the above mentioned sectors is a condition for successful work it has not yet gone so far as to require division of the Tissue Bank into several quite independent laboratories.

Doc. Dr. R. Klen, DrSc., KÚNZ-Tkáňová ústředna, Hradec Králové, Czechoslovakia

# NEWS

## Professor Václav K a r f í k, M. D., DrSc.

completed seventy years of his life on March 3, 1974. He is one of the first pupils of Academician František Burian whom he devotedly assisted in developing the Czechoslovak branch of plastic surgery. He is still very active in scientific work as director

of the Scientific Laboratories, founded by Burian and attached to the Prague Department of Plastic Surgery. The Laboratories have concentrated their interest on congenital malformations, particularly clefts of lip and jaw.

Ad multos annos!

# The czechoslovak spas keep the world healthy

information and bookings
for courses of treatment
can be obtained from

## BALNEA

Representation of Czechoslovak
spas and mineral springs

BALNEA
PRAHA
or
From your travel agency

PRAGUE 1, PAŘÍŽSKÁ 11
Telephone: 26 37 77, 26 37 86
Telegram: BALNEA PRAHA
Telex: 01 2115