ACTA CHIRURGIAE PLASTICAE

INTERNATIONAL JOURNAL
OF PLASTIC SURGERY

16 · 4

1974

Acta chir. plast., 16, 1974, No. 4

AVICENUM - CZECHOSLOVAK MEDICAL PRESS
PRAGUE

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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, 120 00 Praha 2, Legerova 63, Czechoslovakia. — Press: Středočeské tiskárny, n. p., provoz 01, Hálkova 2, Praha 2

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NSR - Ev.č. 3214 - 5 listů
II.mezinárodní symposium o bilancované výživě v léčbě. (aktivní účast).

11.4. - 16.4.1973
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NDR - Ev.č.3231 - 12 listů
II.vědecké zasedání spol.pro potírání zhoubných nádorů v NDR.

23.4. - 26.4.1973
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NDR - Ev.č.3236 - 17 listů
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20.5. - 25.5.1973
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J. E. Purkyně University, Brno (Czechoslovakia)
Department of Plastic Surgery
Head Prof. V. Kubáček M.D., CSc.

MEDIAN CLEFT OF THE UPPER LIP AND JAW

PĚNKAVA

We classify median clefts of the upper lip and jaw amongst rare developmental defects. The groups reported in literature usually comprise only individual cases. This is the reason why no incidence of this congenital defect can be determined.

In the 30 years of his work with patients afflicted with facial clefts, P.F. Andersen only met with 17 median facial clefts (6) out of 4200 cases in the group.

Among 174 patients with cleft of the lip and palate, K. G. Gürsu met with 4 median clefts, a number which can be considered to be extraordinarily high (5). In our group of 2856 facial clefts, we ascertained 4 patients with median cleft of the upper lip and jaw.

There exist, on one hand, true median clefts — taking their course in the central plane of lip and jaw — a group of clefts which is usually without any further large defects and then there exist pseudomedian clefts, usually connected with aplasia or hypoplasia of the incisive bone with the respective part of the lip and philtrum.

Because of the rare incidence of the true median cleft, it may remind us in many ways by its anatomic changes on the lip and teeth, of conditions diagnosed as frenulum labii sup. hypertrophicum breve, or of diastema between the upper central incisors. There arises the belief, whether some of the thus diagnosed cases could not be considered to be a microform of median cleft, because at this defect too, the upper lip is stretched during its function by a short frenulum and a notch appears in the region of Cupid's bow. The short frenulum proceeds between the distracted 1+1 to the palate. An intraoral x-ray picture on the interincisive suture would certainly verify the diagnosis.

If the notch in the lip proceeds at median cleft more cranially, a groove is formed in the columella and the alar cartilages distract. The nasal bones may be also parted and the nasal septum may be even missing. In this case the nose is flat and of saddle form (5). Sometimes the frenulum of the upper

lip is doubled and a gap shows between the central incisors. At complete cleft of the intermaxillary bone, we find a doubled spina nasalis anterior, with the incisors being inclined at the edge of the cleft into the cleft slot, possibly rotated in addition. Usually the secondary palate remains intact (4).

Fig. 1. Marked groove of the philtrum with a notch in the central part of the vermilion of the upper lip

Fig. 2. Strong and short frenulum of the upper lip, passing between the distracted central incisors to the palate

As far as the pseudomedian cleft is concerned, there are certain doubts whether a defect of the intermaxillary bone connected with a defect of the philtrum can be classified as a disorder of the olfactory region of the brain or whether it is rather a bilateral cleft with intermaxillary defect.

Burian considers agenesis of the intermaxillary bone to be a defect on arhinencephalic basis. He claims contact of the front poles of the upper jaw to be a differentially diagnostic sign from bilateral total cleft.

Bednář B., Benešová D. and ass., claim that formation of the pseudomedian facial cleft is not a developmental inhibition, but rather a defect of the front segment of the face combined in addition with malformation of the brain, ranging amongst arhinencephalias (2).

The pseudomedian cleft is characterized by agenesis of the intermaxillary bone, of the median part of the lip, columella and nasal septum. In the front

Fig. 3. Deeply sunk scar in the central plane of the upper lip after prior operation of median cleft

section of the alveolar arch of the upper jaw there is a notch with a defect corresponding by its extent with the size of the intermaxillary bone (of the primary palate). The secondary palate is usually intact.

Frequently the pseudomedian cleft is combined with further defects. There have been reports on pseudomedian clefts with bilateral total cleft of the palate or combinations with malformations of the auricles, hypoplasia of the nose, atresia of the nasal passages and with congenital defect of the skin on top of the head and hypertelorism (5).

Associated defects have been even ascertained with the true median cleft. Scrimshaw ascertained in his patients — besides cleft of the lip — even cleft of the nose, medial nasal cyst with fistule, pedicle formations in the nostril

and hypertelorism. G. Baibak and B. E. Bromberg (1) report median cleft of the lip and palate connected with meningocele in the region of the nasal septum.

The aetiology is usually being connected with anomalies of the chromosomes (13—15 trisonics). The majority of seriously afflicted children die at an early age. Chronologically, median facial cleft is formed during week 4—7 of intrauterine life.

CASE REPORTS

In our group of 2856 children with clefts, we have 4 patients with median cleft. Two are true median clefts and two are pseudomedian clefts with agenesis of the intermaxillary bone.

Fig. 4. Doubled frenulum of the upper lip in the same patient

P. A., case history Nr. 814, born 27. 2. 1948.

Family case history insignificant, personal case history also. We find a groove on the upper lip in the centre of the philtrum, broadening in direction of the prolabium, reaching at its edge a width of 4 mm and of a depth of about 3 mm (Fig. 1). There is a notch in the prolabium, in which a strong mucosal fold stretches and fixes the upper lip to the alveolus. This mucosal string proceeds between the distracted incisors in direction of the palate (Fig. 2). At the operation a notch was ascertained in the alveolus.

The therapy consisted of repair of the vermilion by means of V-excision and by arranging the mucosal string below the upper lip so that wedge flaps were exchanged.

V. J., case history Nr. 25351, born 12. 3. 1921.

The patient was sent to our Department for repair of the vestibulum oris, prior to making artificial teeth. In consideration of the existing defect, the personal case history is insignificant. Now the patient, aged 41 years, claims

Fig. 5. Distraction in the sutura interincisiva in patient on fig. 3 — Fig. 6. The repair consisted of resuture of the upper lip and of modelling of the nasal alae

Fig. 7 and 8. Mongoloid habitus, hypoplasia of the nasal bones, orbitae approaching central plane, agenesis of the intermaxillary bone

to have been operated-on on the lip after having met with an „accident“ in his youth. He is in good condition somatically. A scar from the prior operation is visible in the central plane on the upper lip (Fig. 3). The philtrum is clearly marked. The vestibulum under the upper lip in the central plane, is partitioned by a doubled frenulum (Fig. 4). The palate is intact. The intraoral x-ray picture demonstrates diastasis in the interincisive suture, reaching about 3 mm dorsally to the palate (Fig. 5). Diastema between the central incisors. In the face there is a strikingly wide nose with the nostrils ventrally opened and with large alae. The surgical treatment consisted of correcting the lip and of reducing the size of the nasal alae (Fig. 6).

Fig. 9. Agenesis of the intermaxillary bone and the corresponding parts of the upper lip. The nasal septum is also not developed

Š. G., born 1. 10. 1970.

No congenital developmental defect reported in the family case history. The mother had a spontaneous abortion in 1968. The present gravidity took a physiologic course, the delivery was spontaneous and without events. The weight of the child at birth was 3750 gr. A further child from third pregnancy is a boy, absolutely healthy. Our patient (a girl) was transferred after birth from the Department of new-borns, to the IInd Child Department, where it underwent general examination. We should like to report some of the findings: bilirubin 13,2, Rh+, EEG monorhythmical, slow formations as manifestations of the process of the attack. 27. 10. 1970 on the EEG curve, the activity of sleep and awakeness is missing. Epileptic potentials in attacks, glycaemia in attacks 46 mg%. Neurological finding: flection hypertonus on the lower extremities.

Mongoloid habitus (Fig. 7—8). The child has no developed reflex of suction and swallowing.

Psychologically on the level of idiocy.

The x-ray picture of the skull demonstrates ossification of the cranial wall at a small extent, sutures and fontanelles wide, nasal bones small, orbits also small and near the central plane. Agenesis of the intermaxillary bone and vomer, hypoplasia of the nasal bones (Fig. 9). The hard palate intact, expecting the missing front pole, which is normally formed by the primary palate. The child made very bad progress and was sometimes fed by gastric tube. Generalized clonic cramps set in 18 days after birth. The child could not be operated on, due to the generally bad physical condition. It died 7 months after birth of disseminated bronchopneumonia.

J. R., born 16. 6. 1972

No congenital defects reported in the family case history. The elder brother was placed in an institution for deaf persons (after an accident). The mother suffered from biliar colics during gravidity. Birth from third pregnancy, birth weight 2800 gr. Due to unsuitable conditions at home, the child was placed in a nursing home. It suffered several times of bronchopneumonia, drinked little, feeding by gastric tube was necessary. The child is atrophic, sleepy and does not follow motion. Microcephalus, large fontanelle 1×1 cm, occipital region asymmetrical. Cutis laxa. Heart sounds soft. Stomach on the level of the chest, liver overreaching the edge of the ribs by 2 cm, spleen not enlarged. Muscles hypotrophic, limited abduction of the lower extremities. External genitals normal. Breathing strenuous, inspiratory stridor. Increased dermographism.

The central region sunk, exophthalmus with orbits very near to the central plane. Nasal bones undevelopped, a small protuberance projects from the profile about in the middle of the nasal height. Nasal septum missing, central part of the upper lip and intermaxillary bone also missing. Nasal alae hypoplastic and located near to the central plane. A defect between the poles of the lateral segments (processus alveolares) reaches to the palate to foramen incisivum. Secondary palate intact.

Diagnosis: microcephaly, pseudomedian cleft of the upper lip and jaw, idiocy.

CONCLUSION

It is our intention, to contribute by publication of our four patients, to the world literature dealing with such rare congenital anomalies as median clefts are, because only thus will it be possible to accumulate a sufficient number of cases, in order to discover the secret of their pathogenesis.

I should like to thank the Chief Physician Krafka, M.D., the director of the Institute for Infants in Brno-Hlinky, for kindly lending me the medical findings on the third case.

SUMMARY

After a clinical analysis of the true and pseudomedian cleft of the upper lip and the jaw, four cases of these rare congenital developmental defects are described.

Fissure médiane de la lèvre supérieure et du maxillaire supérieur

Pěnkava J.

Après avoir analyse la fissure médiane véritable et fausse de la lèvre supérieure et du maxillaire, on décrit quatre cas de ces malformations congénitales de développement très rares.

ZUSAMMENFASSUNG

Mittlere Spalte der Oberlippe und des Kiefers

Pěnkava J.

Nach klinischer Analyse der echten und unechten mittleren Spalte der Oberlippe und des Kiefers wurden vier Fälle dieser seltenen angeborenen Entwicklungsfehler beschrieben.

RESUMEN

Fisura media del labio superior y del paladar

Pěnkava J.

Después de un análisis de una fisura media verdadera y falsa del labio superior y del paladar cuatro casos de estos defectos del desarrollo congenitos están descritos.

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MODIFICATION OF CSAPODY'S METHOD OF CONJUNCTIVAL SAC RECONSTRUCTION IN COMPLETE OBLITERATION OF THE CAVITY

V. I. MOROZOV, V. A. GRECHUSHKINA

Formation of a conjunctival cavity in complete obliteration is one of the present-day and very complicated tasks of ophthalmological plastic surgery.

Practice has shown that the various methods do not bring about the expected result: The reconstructed cavity grows smaller, obliterates and becomes unsuitable for holding an eye prosthesis. This holds particularly true in patients in whose case history a burn due to alkaline or acid corrosion is found (Kolen, 1959; Gundorova et Morozova, 1964; Largot et al. 1964 and others). The tendency towards cicatrization of damaged tissues in these patients is so striking that sometimes five to six plasties must be carried out, and in the end these patients must be fitted with an ectoprosthesis.

Reconstruction of a conjunctival sac of full value in complete obliteration of the cavity can only be effected by the addition of several conditions, the essentials of which are: adequate excision of the scar tissue from the orbit, excision of a skin graft sufficiently large to line the future conjunctival sac, exact apposition and good lay-out of the transplanted graft inside the reconstructed cavity.

The data from the literature bear witness to the fact that most of the recommended methods do not ensure adequate apposition and tension of the skin inside the newly formed cavity. Apart from that, in bloody tarsorrhaphy the eyelids undergo deformation which has a negative effect on the cosmetic results of the operation. However, the chief disadvantage consists in that there is no possibility for visual control of the take of the skin graft and of the scar formation in the newly formed conjunctival sac which is constantly covered by the eyelids sutured over it. (Lotin, 1928; Medvedev, 1935; Neyman, 1939; Klutsevaya, 1961; Gundorova et Morozova, 1964; Tagibekov, 1965; Shotter, 1966; Burian, 1967; Esser, 1917; Lagrot et al., 1957, and Lagrot et al., 1964, and others.)

In 1956 the Hungarian ophthalmologist Csapody published the results of an operation he recommended for reconstruction of the conjunctival sac in complete obliteration. The essence of his method is the employment of a special widening screw and the excision of the skin graft of exact dimensions and special shape.

The authors of this communication have decided to use this original method in a number of patients with severe and complete scar obliteration of the conjunctival sac as a result of burns.

When executing the operation according to Csapody, it was observed that a deep upper and lower vault was formed, which was suitable for fitting the artificial eye. However, it was very difficult to create the medial and lateral concavities. Most frequently, it became quite difficult to control the tension and apposition of the skin graft in reconstruction of the lateral and medial walls, which had to be carried out with mattress stitches anchored on beads.

The authors observed that insufficient tension of the mattress stitched led to insuffficient apposition of the skin grafts and the formation of shallow vaults. Strong tension in the mattress stitches might lead to necrosis of the

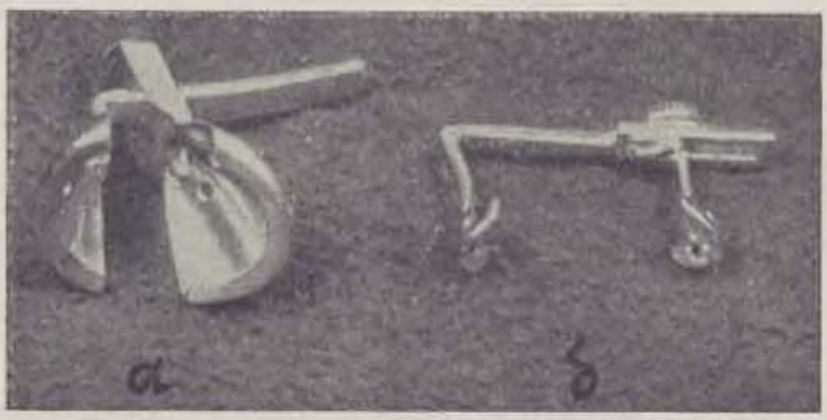

Fig. 1. Csapody screw (a) and (b) horizontal spoons attached to Csapody screw

graft in the region of the beads and to their cutting through the tissues of the medial and lateral angles of the eye.

This is why the authors decided to investigate the possibility to form the medial and lateral concavities by the same principle as is applied in the reconstruction of the upper and lower vaults by the method of Csapody.

For this purpose, instead of beads a special instrument,a small horizontal spoon reinforced by a screw and fixed to the base of the upper spoon screw of Csapody was constructed. The horizontal screw as recommended by the authors acts in the same way as the basic screw of Csapody, only it spreads out the graft in a horizontal direction, thus forming the medial and lateral walls of the cavity.* In this way, the employment of the improved Csapody

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* Rationalization proposal certificate No 2/100 issued by the Moscow Helmholtz Scientific-Research Institute of Eye Diseases on June 28, 1972.

instrument widens the cavity in two directions, both vertical and horizontal (Figs. 1 and 2).

The authors have operated on nine patients, six men and three women, aged between 15 and 41, using the above method. The loss of eye and complete obliteration of the conjunctival sac had been corrosion with acids in three, with alkali in another three and with molten metal in the last three patients. Seven of these patients had already been operated on twice or three times without effect. All patients were admitted with completely obliterated cavities and various deformations of eyelids.

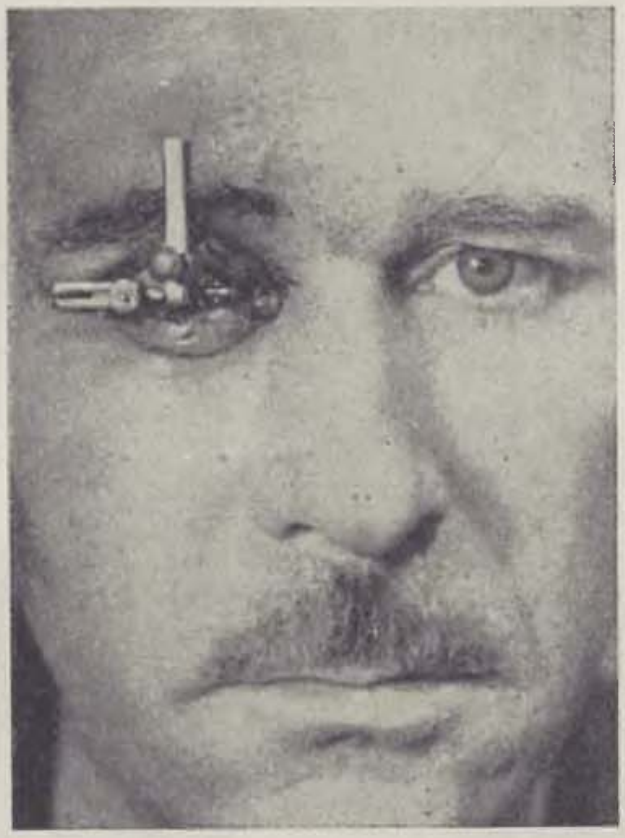

Fig. 2. Patient S. with Csapody screw and horizontal spoons introduced into orbital cavity, six days after operation

OPERATION AND POSTOPERATIVE CARE

Preparation of the cavity was carried out in the usual way: The incision was made along the lid edges, provided these edges had been preserved, otherwise along the supposed edges, dissection of tissue upwards and downwards right to the orbital margins, excision of all scar tissue in the orbit and packing of the thus prepared cavity with gauze swabs.

A free skin graft taken from the medial aspect of the arm according to Csapody's pattern was fixed to the wound surface of the reconstructed cavity using the Csapody spoons and the horizontal screw. The edges of the graft were sutured to the edges of the eyelids, the medial and lateral angles of the

eye. After fixation was completed, the skin graft was maximally tautened in a vertical and horizontal direction and the floor of the graft was perforated in a chess-bord pattern and then the cavity was firmly packed with gauze swabs soaked in vaseline. A monocular bandage was applied for three to four days. After operation each patient received a total of 4 000 000 to 6 000 000 units of antibiotics by intramuscular injections.

Fig. 3. Result of reconstruction of conjunctival sac in patient M. — a) Condition on admission (obliteration of conjunctival cavity with scar changes in skin of eyelids, eye brows and temples after acid corrosion; operated on three times without success), — b) Condition six weeks after operation

The first change of dressing, including the gauze swabs, was carried out after a week and afterwards it was repeated every day together with introduction of 1 % hydrocortisone plus 1 % synthomycin ointment into the cavity. Two weeks after operation, the two instruments were removed, the stitches taken out and an eye prosthesis of maximum size introduced. Meticulous care was taken of the skin graft during the entire postoperative period. Postoperative complication have not been observed by the authors.

In order to diminish the processes of cicatrization, three weeks after operation, lidase was injected under the graft at doses of 64 u. every second day for ten to twelve days, altogether 320—384 u. per patient. The patients were in hospital for four to six weeks.

As a result of the treatment, a cavity with deep vaults had formed in eight patients and fitting with an artificial eye achieved a good cosmetic effect (Fig. 3). In one patient, aged 15, who had suffered a burn of the eye at the age of one and had been operated on three times unsuccessfully, development of the right orbit had been retarded which was the reason why the result of operation was unsatisfactory; the prosthesis did not hold fast enough. Later, the prosthesis dropped out and the cavity obliterated.

Let us consider the problem of fitting the orbit with an artificial eye to the reconstructed conjunctival sac. The basic principle, known to ophtalmologists for a long time, is the immediate fitting of a prosthesis of maximum size. Residual cavities left without a prosthesis even for a few hours grow considerably smaller and removal of the prosthesis from the orbit becomes

Fig. 3 c) Condition three years after operation

impossible. The patient must, therefore, be specially warned that it is impermissible to leave the conjunctival sac without a prosthesis. Removal of the artificial eye is permitted only for a short period so it can be cleaned.

The authors usually fitted the reconstructed conjunctival sac with a double-walled glass or plastic prosthesis of a standard set after removal of the screws. In the following, a prosthesis individually made had usually to be supplied in order to achieve the optimal cosmetic effect. The individual prosthesis was produced, taking care that it perfectly fitted the cavity with a stable pressure on the upper and lower vaults. When the individual prostheses are changed, it must particularly be taken care of the new prosthesis not to be smaller than the last one.

All the patients referred to above were fitted with individual prostheses.

The effect of the operation of reconstructing the conjunctival sac in case of its complete obliteration was appraised both by its early and late results. All patients operated on were checked up for the condition of the reconstructed

cavity and the cosmetic effect of the operation, seven of them within three to four years and one patient, a woman, up to one year. In all patients a good cosmetic result was established; the dimensions of the cavity remained stable and the artificial eye held firmly (Fig. 3).

The results achieved permit to recommend the modification of Csapody's operation referred to above to ophthalmological practice as one of the most rational methods of reconstruction of a conjunctival sac in complete obliteration.

CONCLUSIONS

1) Reconstruction of a conjunctival sac in complete obliteration after chemical or thermic injuries by the Csapody method in the modification recommended by the authors of this communication is one of the most rational methods of treatment of such patients.

2) Employement of the special horizontal screw as recommended by the authors permits to regulate the degree of apposition of the skin graft to the wound surface of orbital tissues, which leads to a better formation of the medial and lateral orbital concavities.

3) In reconstruction of a conjunctival sac after chemical and thermic injuries, lidase must be administered in the postoperative period.

4) Employment of the above method gave favourable early as well as late results in eight out of nine patients checked up within four years after operation.

SUMMARY

A method of reconstruction of the conjunctival sac in complete obliteration after thermic and chemical injuries according to Csapody in the modification recommended by the authors of this communication was employed. The modification consists of the use of a special horizontal screw for the formation of the lateral and medial concavities of the orbit. A total of nine patients were operated on. In eight of them good results were achieved: formation of deep concavities, the cosmetic effect is fully statisfactory. The patients were checked up for four years. In one patient the operation failed to give a statisfactory result.

RÉSUMÉ

Modification de la méthode de Csapody formant le sac conjonctival après sa cicatrisation totale

Morozov V. J., Gretchuchkina V. A.

On a réalisé la méthode de la création du sac conjonctival après sa cicatrisation totale par suite des brûlures thermiques qu: avait été proposée par Csapody et, plus tard, modifiée par les auteurs. La modification consiste en utilisation d'une vis latérale spécialisée pour faire une voûte latérale et médiale. On a opéré 9 malades en somme. Le résultat était bon en 8 cas. On a formé des voûtes profondes et l'effet cosmétique était très satisfaisant. La durée de l'observation était 4 ans. Chez un seul malade l'intervention restait sans résultat.

ZUSAMMENFASSUNG

Eine Modifikation der Methode von Csapody zur Bildung des Bindenhautsackes nach seinem vollständigen Verwachsen

Morozow V. I., Gretschuschkina V. A.

Es wurde das Verfahren zur Bildung des Bindenhautsackes nach seinem vollständigen Verwachsen infolge thermischer und chemischer Verbrennungen, das von Csapody entworfen und später von den Autoren modifiziert wurde, zur Geltung gebracht. Die Modifikation beruht auf der Anwendung einer speziellen Horizontalschraube zur Bildung der lateralen und medialen Auswölbung. Es wurden insgesamt 9 Kranke operiert. Bei 8 von ihnen war das Ergebnis gut: es wurde eine tiefe Auswölbung gebildet und der kosmetische Effekt war sehr befriedigend. Die Beobachtung dauerte 4 Jahre. Bei einem Kranken war die Operation ergebnislos.

RESUMEN

Modificación del método Csapody para formar un saco conjuntival después de su cicatrización completa

Morozov V. I., Grachushkina V. A.

Fue aplicado el método de formar un saco conjuntival después de su cicatrización total a consecuencia de quemaduras térmicas y químicas de manera en que fue propuesto por Csapody y más tarde modificado por los autores. La modificación consiste en el empleo de un tornillo horizontal especial para formar la bóveda lateral y medial. Fueron operados 9 enfermos en total. El resultado fue bueno en 8; fueron formadas bóvedas profundas y el efecto cosmético fue muy statisfactorio. La observación duró 4 años. En un solo paciente la operación fue sin resultado alguno.

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PLASTY OF HYPO- AND APLASTIC BREASTS USING ADIPODERMAL GRAFTS

H. BRUCKNER, P. LENZ

Badly shaped breasts affect the self-assurance, lead to inferiority complexes and influence the intimate sphere of women suffering from this disorder. Not infrequently they also lead to disharmony in their matrimonial life and even to divorce because of estragement of sexual partnership. Many of these girls or women, therefore, call on the physician for advice or treatment. While the surgical treatment of macromasty or ptosis does usually not present any difficulty to the experienced surgeon and the results, as a rule, come up to the patients's expectation, plasty of underdeveloped breasts, however, constitutes problems even today.

Plasty of hypoplastic and ptotic breasts should be excluded in this connection. In these cases it is relatively simple to form breasts of a youthful appearance by utilizing local tissue, without having to resort to free grafting in the following way: An incision is made through the skin down to the mammary parenchyma using the Wise pattern (Fig. 1), transposition of the areola is carried out as high as possible in order to gain a large skin surplus. After de-epithelization, this adipodermal flap, still in connection with the body of the gland, is submerged and the skin is sutured over it. The erection of the breast, together with the additional volume provided by the submerged adipodermal flap, forms a cosmetically well shaped breast which also becomes satisfactory with regard to size (Figs. 2 and 3).

For a plasty of a hypo- or aplastic breast, using free grafts, the surgeon may chose between a prosthesis of plastic material and an adipodermal graft.

The implant of plastic material, where it can be procured, is usually given preference. The prostheses made of silicon-rubber and a polyurethan coating, as employed today, have proved more tolerable to tissues than did those of polystan, ivalon or etheron, which were used originally, because encapsulation by connective tissue is no longer as marked as previously when it led to unnatural rigidity of the surgically formed breast. The cancerogenic reaction of this foreign body, which has hitherto been refuted, may definitely be exculded only after years, even decades of observation. In-

corporation is complicated by about 20 %; details are not given here because the authors are lacking experience in this respect.

If a silicon prosthesis is not available, the authors have for years used adipodermal grafts taken from the buttocks or, less frequently, also from the abdomen. The relatively simple, although time-consuming procedure is known and does not require repetition. Only the results of this method are interesting. The initial optimism was increasingly disturbed by necrosis of

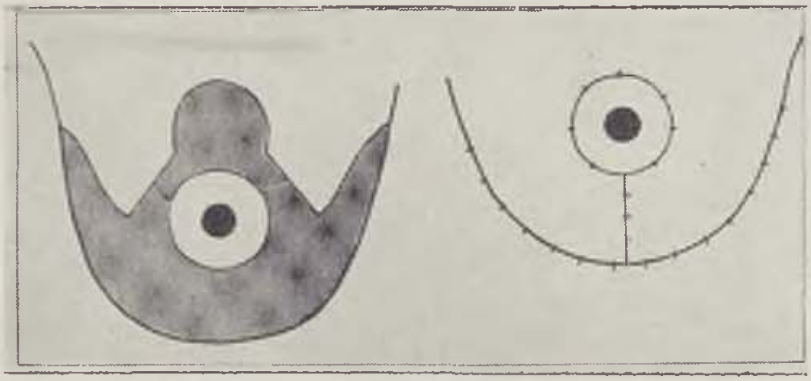

Fig. 1. Increase in volume of hypoplastic and ptotic breast effected by making it erect with a submerged and deepithelized surplus skin flap (dotted area)

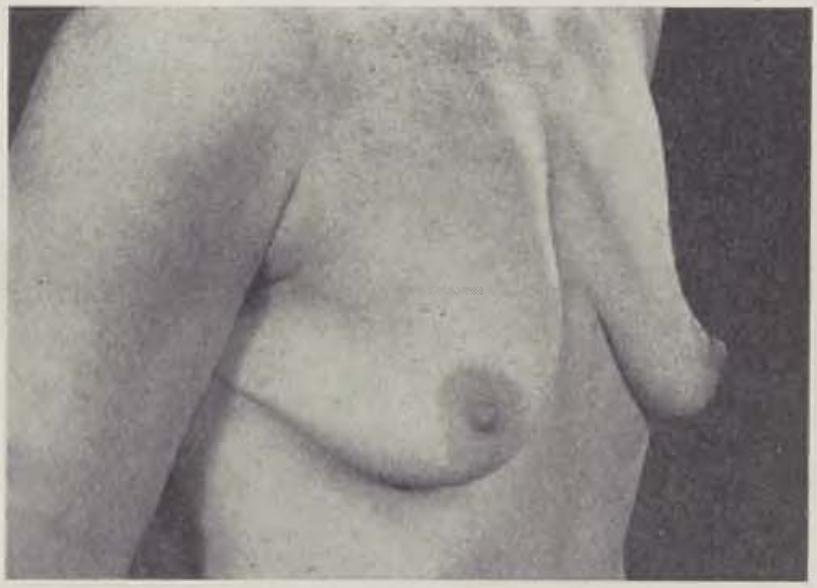

Fig. 2. Hypoplastic and ptotic breast prior to operation

fatty tissue which occurred in more cases than was expected, and the authors asked themselves, whether or not breast plasty with an adipodermal graft was still recommendable to patients and worth the effort of the surgeon with regard to the time required for treatment.

During the period between 1968 and the middle of 1972, 30 women, aged between 18 and 43, with hypo- or aplastic breasts and one with excised mammary gland were surgically treated. Twenty-six of them had both and the

others one breast operated. Of these 30 patients, 26 called in person to check-up, while three only answered a questionary.

Only in six patients did the adipodermal graft take without necrosis. The loss of volume due to tissue atrophy was moderate in four cases, while in two cases it seemed rather marked. The breasts were rigid, yet symmetrical and

Fig. 3. Enlargement of breast by erecting and submerging of de-epithelized skin

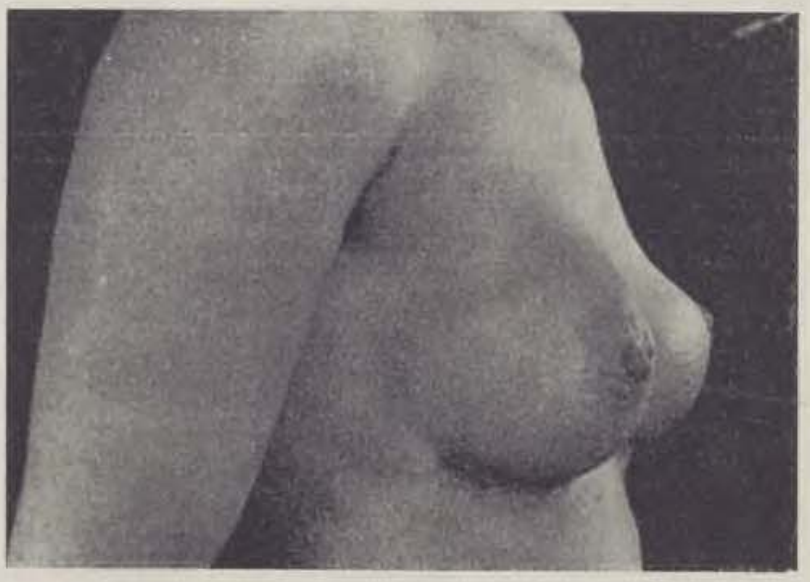

Fig. 4. Plasty of hypoplastic breast using a free adipodermal graft from buttock. Two years after operation: very good result

well shaped (Fig. 4) and the patients could dispense with wearing a brassiere. The scars on the breasts were soft, thin and inconspicuous. The results fully satisfied the patients.

In another three women partial success could be registered, since at least one breast was well shaped, while in the other, the initially good result was

annulled by necrosis of fatty tissue which led to development of a fistula (Fig. 5). The resulting difference in size of the two breasts was considered more disturbing to the patients than the preoperative condition.

In most patients, i.e. in 19 cases, however, bilateral necrosis of fatty tissue developed after primary healing of the wounds four to six weeks after oper-

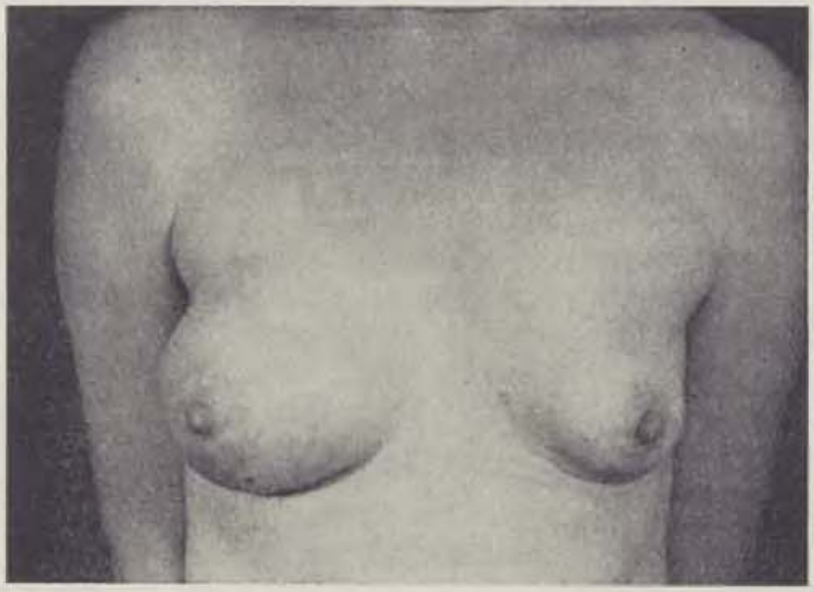

Fig. 5. Two years after breast plasty using adipodermal grafts. Necrosis of fatty tissue developed on left side and led to ugly asymmetry

Fig. 6. Bilateral fatty tissue necrosis after breast plasty using adipodermal grafts, more pronounced on right side

ation, which led to fistulae taking various periods (eight to 18 weeks) for healing. In four of these women, slight enlargement of the breasts could be registered on check-up, while in the rest of them the plasty had completely lost its effect (Fig. 6).

Taking of the graft from the buttocks without exception led to broad scars, on the abdomen (hypogastrium), however, the scars remained thin and showed no reaction.

The authors are not satisfied with their results. The risk of partial, and particularly of total necrosis seems to be in no proportion to the positive results which had satisfied the patients. They are in striking contrast with the results of Pierer who had only seen one fistula lasting for a short time in his patients in whom he had carried out breast plasties using adipodermal grafts. This discrepancy is incomprehensible. The authors always endeavoured to use a subtle and tissue-sparing technique both in formation and transplantation of the graft and the coverage of the donor site; the operation itself was shortened by employment of two surgical teams; and damage by chemical, mechanical and heat effects was avoided. Control of haemorrhage was carried out meticulously. Adipodermal grafts with and without muscle fascia were used and the wounds closed with or without drainage. After operation a light pressure bandage was applied, the patients were kept in bed for ten days and etrenuous work was diencouraged for several weeks.

This enumeration of measures should make it clear that nothing had been left unattempted to create favourable conditions for taking of the adipodermal grafts, i.e. to exclude any factors which might have induced or maintained partial or total necrosis of fatty tissue, or at least keep it in limits. The results, unfortunately, did not come up to expectation. They were depressing to such an extent that the authors felt to be forced to abandon plasty of underdeveloped breasts using adipodermal grafts.

SUMMARY

The authors cannot share in Pierer's optimism with regard to plasty of hypo- or aplastic breasts using adipodermal grafts. They experienced too many cases of fatty tissue necrosis and are, therefore, unable to recommend the method. Implantation of silicon-rubber prostheses hitherto seems to be the method of choice.

RÉSUMÉ

Plastie des seins hypo- et aplastiques par un lambeau adipocutané

Brückner H., Lenz P.

Les auteurs ne sont pas d'accord avec l'optimisme de Pierer quant à la plastie des seines hypo- ou aplastiques par un lambeau adipocutané. Ils ont trop souvent observé les cas de nécrose du tissu adipeux et c'est pourquoi ils ne peuvent pas recommander cette méthode. Pour le moment, c'est la méthode utilisant la prothèse de silicon-caoutchouc qui peut être choisie.

ZUSAMMENFASSUNG

Plastik der hypo- und aplastischen Brüste mit Hilfe des Adipodermallappens

Brückner H., Lenz P.

Die Autoren teilen nicht mit den Optimismus von Pierer betreffs der Plastik der hypo- oder aplastischen Brüste mit Hilfe des Adipodermallappens. Sie beobachteten nämlich zu oft Falle der Fettgewebenekrose, um diese Methode empfehlen zu können. Die Implantation von Prothesen aus Silikonkautschuk scheint bisher die Methode der Wahl zu sein.

RESUMEN

Plástica de los senos hipo- y aplásticos mediante un lóbulo adipocutáneo

Brückner H., Lenz P.

Los autores no están de acuerdo con el optimismo de Pierer en cuanto a la plástica de los senos hipo- o aplásticos del lóbulo adipocutáneo. Es que observation demasiado a menudo casos de una necrosis del tejido adiposo para poder recomendar éste método. Mientras tanto una implantación de las prótesis de silicon-cauchuco parece ser un método que pueda ser elegido.

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PERIPHERAL NERVE HOMOGRAFTING
A preliminary report

Y. HIRASAWA, R. ODA, K. NAKATANI, T. FUJII, T. MOROTOMI

The repair of a large defect in the peripheral nerve is one of the most difficult problems in the surgical treatment of the extremities.

A number of techniques have been experimented to bridge irreducible gaps, with various methods such as stretching, tubulation, resection of a bone, cable grafts, and nerve grafts, but with minimum success in the human subject.

The purpose of the peripheral nerve grafting is to give the regenerating nerve fibers a pathway which bridges the defect between the proximal and the distal nerve stumps.

Nerve homografting in the human started with the work by Albert (1885), and many trials have been made to improve the grafting method.

Recently, Campbell (1963) and Marmor (1963, 1964, 1969) tried a high voltage cathode irradiation method for the treatment of the nerve graft and reported its excellent results in the animal and the human. The use of the cathode irradiation on the nerve grafts has been observed to sterilize the grafts and reduce the rejection reaction.

In the authors' clinic, researches have been done to improve the sterilization method and the preservation method using the Cialit solution and the cathode irradiation, the immunosuppressive method using steroid hormone and Imuran, and the micro surgical technique such as the silicome tubing method, and applied these experimental results to some clinical cases.

It is our purpose to review the clinical course in patients with the peripheral nerve homografting done at our hospital (Tab. 1, a, b).

CASE REPORT

Case One

A twenty-year-old carpenter was involved in a motor car accident at Meishin Highway and sustained a severe crushing injury involving the right forearm with multiple lacerations, on August 4, 1967. He had been treated at the near-by hospital for 4 months. But he developed the loss of the sensation of right 4th and 5th fingers and the disturbed motions of these fingers, with ulcer formation at the hypothenar region of the right hand.

Tab. 1a

Patient Case No.	Age	Sex	Type of injury	Injured nerve	Level	Defect of nerve (cm)	Combined injury	Time since injury (days)	Length & type of graft (cm)
#1 KS	20		Traffic accident	Ulnar Nerve (Right)	middle	11,5		130	9,0 homograft
#2 SM	29		electric shock	Ulnar nerve (Right)	high	20,0	Skin defect of right arm, above elbow amputation (Left)	240	20,0 homograft
#3 SK	22		broken glass	peroneus profundus nerve (Right)	high	3,5		74	4,0 homograft
#4 TY	42		press machine	mediam nerve (Right)	low	3,5		140	4,0 homograft
#5 MK	42		injection of antibiotics	radial nerve (Right)	high	5,0		162	5,3 homograft
#6 KK	28		chisel	ulnar nerve (Left)	low	5,0		120	4,0 homograft
#7 FD	20		glass	ulnar nerve (Right)	low	4,0		90	3,3 homograft

In December 1967, he visited our clinic for further treatment. Physical examination was negative except for the abnormality of the right upper extremity, as described in the following: There was a long scar at the right forearm ca. 21 cm over the flexor side. There was anesthetic area on the right 4th and 5th fingers which was surrounded by the hypoesthetic area (Fig. 1). There was also a ulcer formation at the right hypothenar region (ca. 1 cm in diameter) (Fig. 1). He had a claw finger deformity with some atrophy of interossei, hyperthenar and hypothenar regions (Fig. 2). The Froment's sign was positive. Electromyographic examination with the needle electrode

Tab. 1b

Patient	Treatment of graft	Blood type of donor (type)	Blood type of recipient (type)	Preservation period of graft (days)	Follow-up (months)	Result
#1 KS	× 5000 Cialit	0	0	14	56	M_0S_0
#2 SM	× 5000 Cialit	0	B	26	55	M_0S_0
#3 SK	× 5000 Cialit 2 × 10 r.e.p. irradiated	A	A	4	25	M_4S_3
#4 TY	× 5000 Cialit 2×10^3 r.e.p. irradiated	A	A	28	24	M_2S_1
#5 MK	× 5000 Cialit 2×10^3 r.e.p. irradiated	A	0	62	23	M_0S_0
#6 KK	2×10^3 r.e.p. irradiated	B	B	7	4	—
#7 FD	× 5000 Cialit 2×10^3 r.e.p. irradiated	B	A	20	3	—

revealed fibrillation voltage at rest, and no discharge on voluntary contraction of the fingers, in the 1st interossei dorsi, the abductor digiti minimi and the opponens digiti minini, preoperatively.

The operation was done on December 14, 1967. There was a 11. 5 cm defect of the ulnar nerve. The defect of the ulnar nerve was bridged with 9.0 cm human nerve which was previously removed from the amputated arm of another patient. The nerve grafted was the ulnar nerve which was removed immediately after the amputation and was stored for 14 days in Cialit solution at —24 ^{0}C. The suture lines were covered with silicon tubes (Fig. 3). A plaster cast was applied as the splint for 3 weeks after the surgery and low frequency therapy continued.

In February 1968, the silicone tubes were removed from the suture lines. There was no neuroma formation over the graft with minimal adhesion to the surrounding tissue (Fig. 4).

In the following months, an advancing Tinel's sign had been elicited along the ulnar nerve trunk.

When seen at 40 months later, the anesthetic area had developed to the hypoesthetic area, while the hypoestehtic area had developed to the normoesthetic area (Fig. 5, 6). He had protective sensation on all and two point

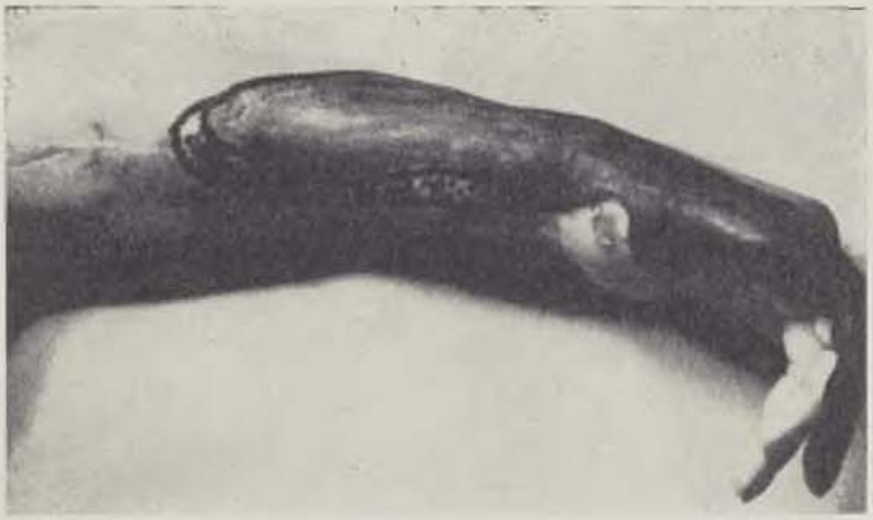

Fig. 1. Case One: Preoperative condition. There were anesthetic and hypoesthetic areas on the right 4th and 5th fingers. There was an ulcer formation at the right hypothenar region. ■■■ : Anesthetic area, ... : Hypoesthetic area

Fig. 2. Case One: Preoperative condition. There was claw finger deformity with loss of sensation at the right 4th and 5th fingers. ■■■ : Anesthetic area

discrimination was between fifteen and twenty millimetres. There was no sweating abnormality. The Froment's sign was still slightly positive. The clawing was less obvious and the ulcer had healed up (Fig. 6). Electromyographic examination with the needle electrode revealed biphasic wave with 12—15 msec. duration in the 1st interossei dorsi muscle, monophasic waves

with 4—5 msec. duration in the abductor digiti minimi muscle minimal discharge in the opponens digiti minimi muscle and no discharge in the adductor pollicis brevis muscle (Fig. 7).

The patient has now resumed his former work as a carpenter, and is able to perform fine finger works.

Fig. 3. Case One: Completed graft. The suture lines were covered with silicone tubes

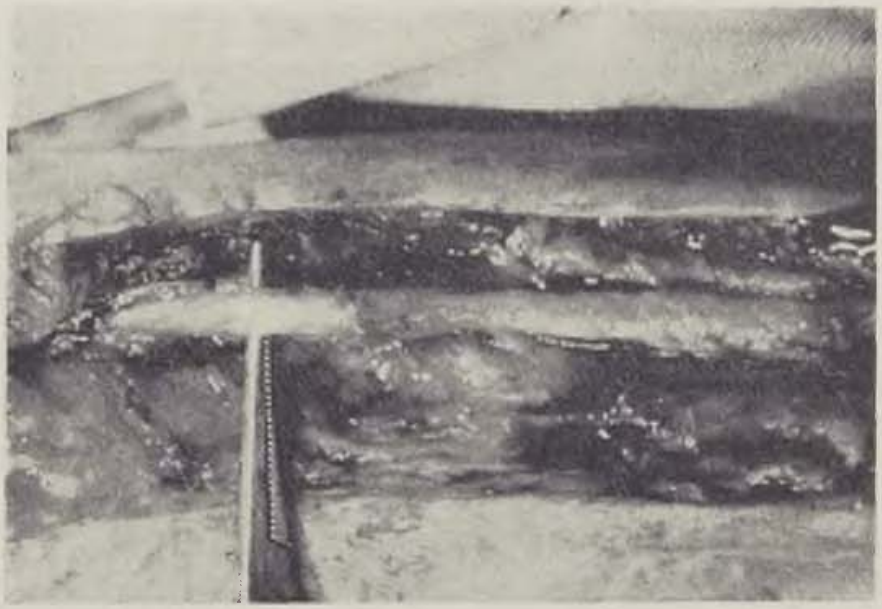

Fig. 4. Case One: Two months after grafting. Appearance of the silicone tubes at removal of the silicone tubes. There was no neuroma formation over the graft with minimal adhesion to the surrounding tissue

Case Two

A 29-year-old electric engineer was struck by electricity over the both upper extremities on April, 1967. At the emergency hospital, he underwent the above elbow amputation of the left upper extremity and the debridement

of the right arm with the removal of the necrotic ulnar nerve (ca. 20 cm in length).

In December 1967, he was transferred to our hospital. On December 26, 1967, the ulnar nerve was explored through a posterolateral approach. The nerve was repaired by a 20 cm Cialit treated homograft. The suture lines were covered with silicone tubes. The wound healed without difficulty.

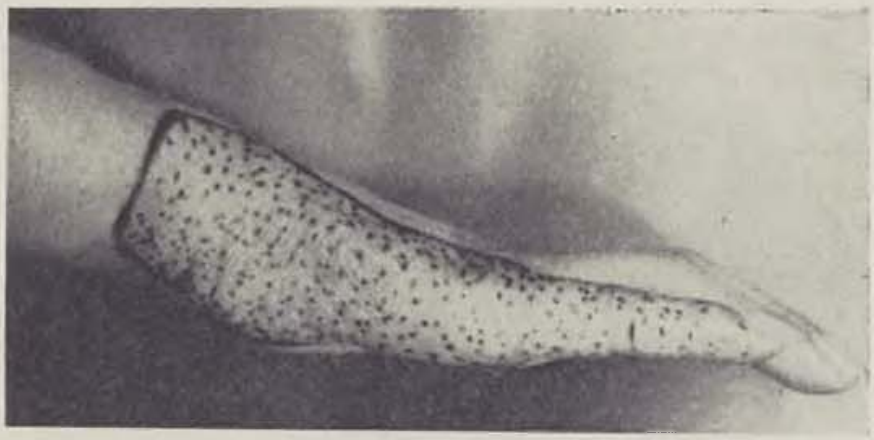

Fig. 5

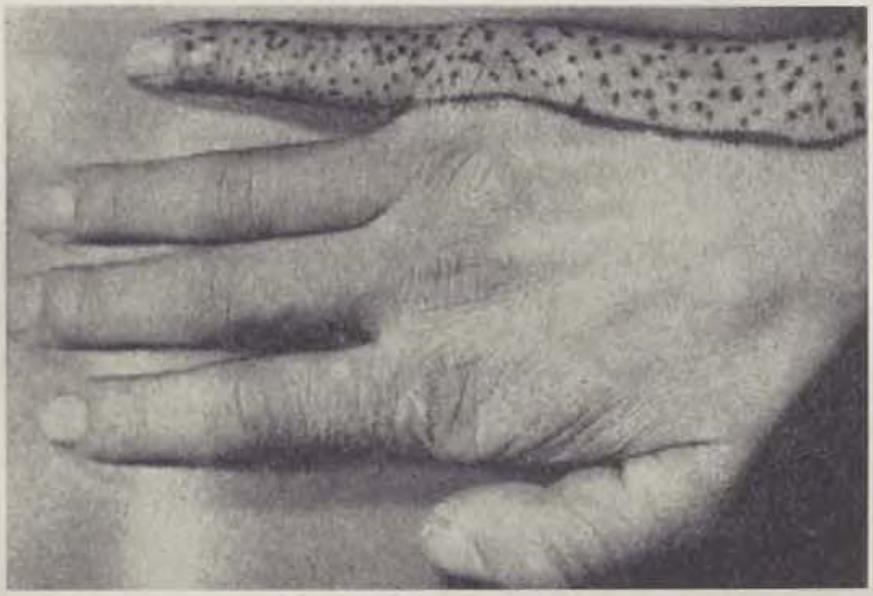

Fig. 5, 6: Case One: Forty months after grafting, the anesthetic area had developed to the hypoesthetic area. There was no anesthetic area. ..... : Hypoesthetic area

On December 4, 1968, the Tinel's sign was at the level of the medial epicondyle. The electromyogram on December 4, 1968, did not reveal any return of motor activity in the intrinsic muscles of the hand supplied by the ulnar nerve, except for the flexor carpi ulnaris which showed a complex NMU voltages at the voluntary contraction. There was no evidence of the sensory return over the ulnar nerve distribution.

The patient had not noted any improvement in his hand in 1968, and does not visit us since.

This case would be classified as a failure so far.

Case Three

A twenty two-year-old female suffered from a deep irregular laceration over the right upper tibial region due to a broken show window, on April 3, 1970. She had emergency treatment at some hospital, and remained at that hospital for 2 months for physical therapy. During that time, she complained of the drop foot with the inability of the dorsiflexion of the ankle and

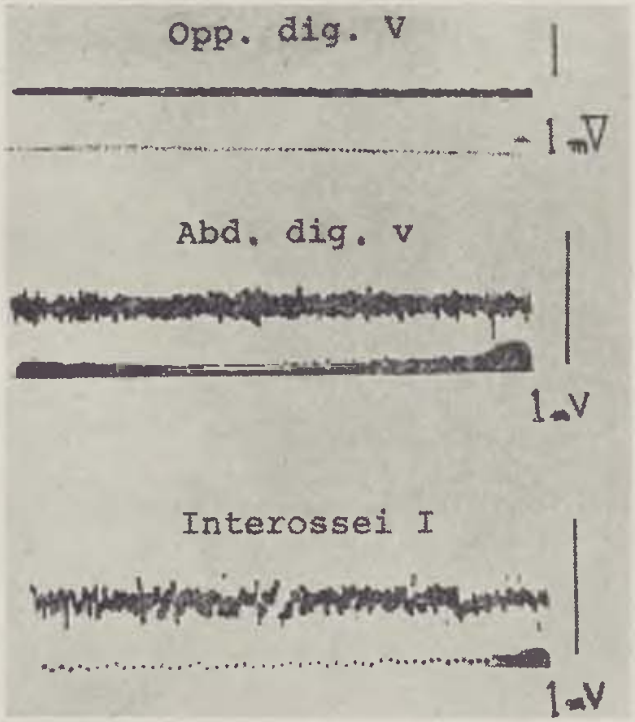

Fig. 7. Case One: The finding of electromyographic examination, at forty months after grafting

the toes. She had loss of sensation of the dorsal aspect of the foot. She also complained of the difficulty in walking.

In June 1970, she was transferred to our hospital for further evaluation and the treatment.

On the physical examination, complete disability of the dorsiflexion of the right foot and toes was detected with complete loss of the sensation from the area distal to the wound to the dorsal aspect of the foot (Fig. 8, 9). There was a longitudinal scar ca. 10 cm in length over the proximal region of the right fibular region. As there had been no improvement of the symptom after 3 weeks of conservative therapy, operative exposure of the wound was done on June 23, 1970. At that time, there was a 3.5 cm defect in the right deep peroneal nerve. Because the difficulty of the approximation of the nerve, the wound was

closed without neurorrhaphy after placing stitches on both stumps as a landmark.

On July 7, 1970, the wound was reopened and a 4.0 cm nerve homograft which had recently been taken from the amputated leg of another patient was transplanted over the defect of the nerve (Fig. 10). The grafted nerve was the peroneal nerve which was removed immediately after the amputation of the

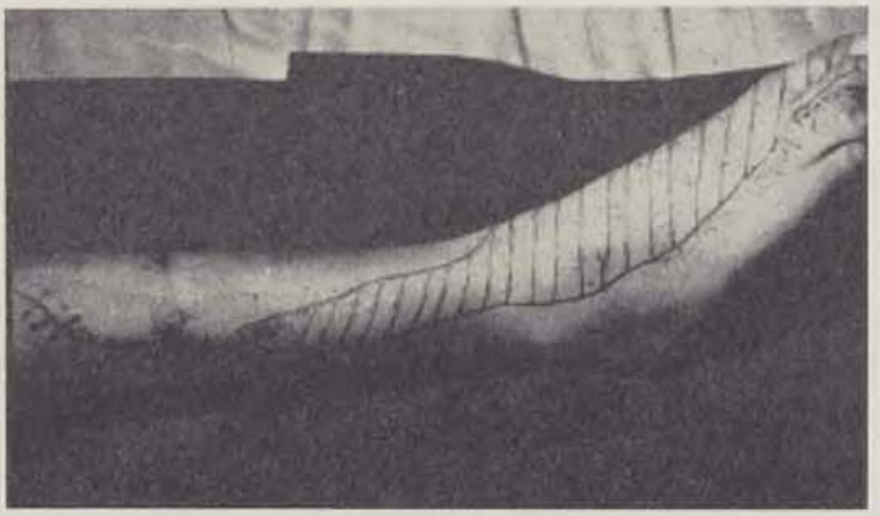

Fig. 8

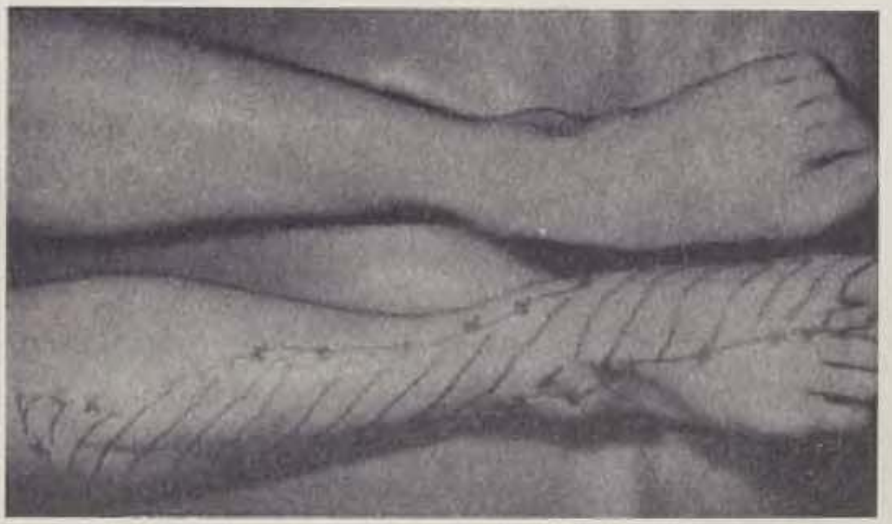

Fig. 8, 9. Case Three: Preoperative condition. Complete disability of the dorsiflexion of the right foot and the toes was detected with complete loss of the sensation from the area distal to the wound to the dorsal aspect of the foot. ▨: Anesthetic area

legs. The graft was irradiated with 2×10^6 r.e.p. for 15 seconds in the dry-ice alcohol bath and stored for 4 days at $-25\,^0$C in 5000 times diluted Cialit solution. The suture lines were covered with silicone sheets.

Postoperatively, a cast splint was applied for 2 weeks and a short leg brace was applied for 12 months. Low frequency therapy had been continued.

The Tinel's sign was able to be elicited along the deep peroneal nerve in the following months.

In ten months postoperatively, the patient noticed having slight dorsiflexion of the ankle and toes.

On January 14, 1972, he had no sweating abnormality with the ninhydrin test. Anesthetic area became hyperesthetic (Fig. 11). Dorsiflexion of the ankle and the toes was possible (Fig. 12). Manual muscle test, in January 1972, revealed 4 (good in extensor hallucis and in the extensor digiti muscles). She had no difficulty on dorsiflexion of the ankle and the toes.

The patient returned to her former work as a teacher of the Kindergarten.

Fig. 10. Case Three: At surgery. A 4.0-cm nerve homograft was transplanted over the defect of the nerve

DISCUSSION

In conducting nerve grafting, a through examination of the indication is necessary. Of course, it is not necessary to stick to homo- or heterografting when there is a possibility of the satisfactory recovery by the autografting.

In the clinical cases reported so far, the results of nerve grafting were not satisfactory. This could be probably because nerve grafting was performed as the final means after the lapse of long period of failure in many attempts of various treatments. Better results would be expected with a performance of early, positive operation of nerve grafting considering the indication thoroughly.

There are numerous factors which have an effect on the prognosis of the nerve grafting, such as (1) the type of injury (2) size, location and level of the defect of the nerve (3) the age of the patient, state of the local nutrition, muscle atrophy, extent of the scar, and complications (4) time lapse between the injury and the grafting (5) accuracy of the repair, tension at the sutured

sites and the suturing method (6) kinds, thickness and length of the graft used (7) method of the sterilization and the preservation of the graft (8) histocompatibility (9) immunosuppressive method (10) rehabilitation, and so on.

It can be said that the younger the patient, the better the result. When the general condition of the patient is poor, the grafting should be postponed until it becomes better. When there is infection at the wound, it is better to

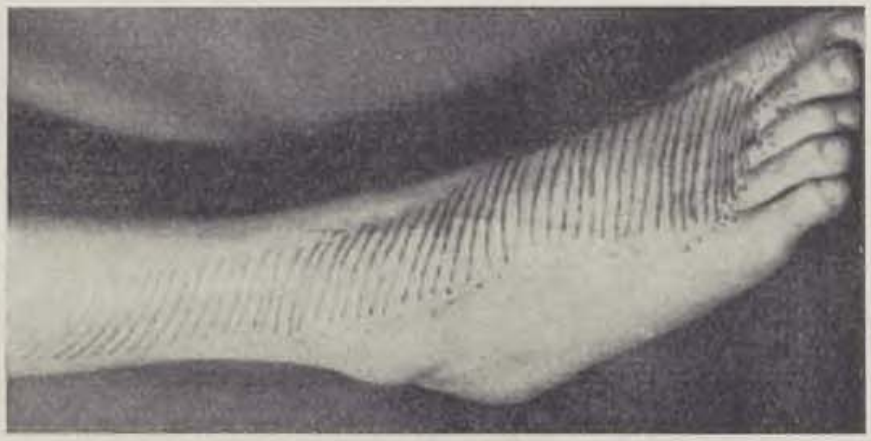

Fig. 11. Case Three: Eighteen months after grafting. Anesthetic area became hypo- & hyperesthetic. There was no anesthetic area. ▨: Hypoesthetic area, ⋯: Hyperesthetic area

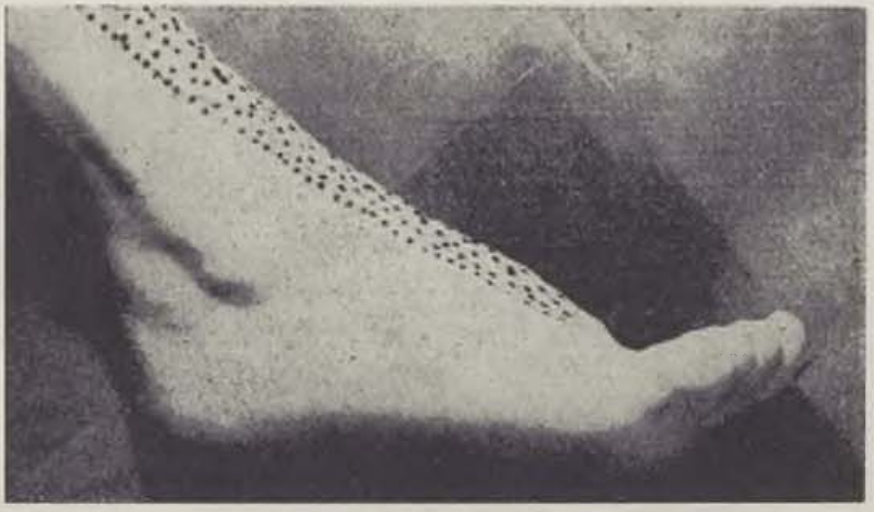

Fig. 12. Case Three: Eighteen months after grafting. Dorsiflexion of the ankle and the toes was possible. Manual muscle test revealed "good" in the extensor hallucis and the extensor digiti muscles. ⋯: Hyperesthetic area

wait until it subsides. The prognosis is poor when the nerve defect lies around the joint or when there is a complication such as fracture, contracture of the joint, and so on. The prognosis is also poor when the defect of the nerve is at a high level like in case 2 and 5, as there is long distance between the injured site and the endorgan.

Even in a simple nerve suture, recovery of motor function becomes difficult in case a year and half have passed before the surgery, and recovery of sensory return is also hard in many cases if there are 2 or 3 blank years. Therefore, it is also necesary to consider this point in nerve grafting.

In case the defect of the nerve is more than 20 cm long as in the case #2, recovery of the nerve function would be almost impossible because of the cell infiltration that obstruct the regeneration of the nerve or the degeneration of the endorgan. Therefore, further consideration should be given to the lapse of time after the injury and the length of the defect of the injured nerve.

In case the prognosis of a grafting is not satisfactory, the combined use of the tendon grafting should be taken into consideration.

In getting pieces of nerve from a donor, there will be comparatively few problems if they are taken directly from the amputated limbs; however, there may be some ethical and religious problems involved in case it is taken from the cadaver. We take nerve graft from the amputated limbs as a rule. Moreover, we exclude those donors who have malignant tumour, syphilis, tuberculosis and other infectionus diseases.

Cialit solution is an organic compound of mercury which was started to use for the tendon grafting by Iselin (1963).

The authors are now improving the sterilization and the preservation method, using the cathode irradiation and the Cialit solution. We now consider the following as the best method to obtain the nerve graft: the grafts are obtained from the amputated limbs under the clean condition and immediately packaged in the heat-sealed polyethylene bags which contain of 5000 times diluted Cialit solution and frozen to —25 ^{0}C. The grafts are then irradiated with 2 million r.e.p. by van de Graaff generator for 13 seconds, in dry-ice alcohol bath. They are then stored in a deep freezer at —25 ^{0}C until used. They could be stored for 8 weeks.

We keep the various nerve grafts in the Nerve Bank, and classify them according to the blood grouping and tissue typing including the hem-agglutination inhibition of the saliva.

It is apparent that some additional help is required to insure successful result for the nerve grafting, such as immunosuppressive agents.

SUMMARY

Three cases of the peripheral nerve grafting which had been carried out at authors' clinic were reviewed. Four other cases are now being followed-up.

The factors which influence the prognosis of the nerve grafting are discussed.

RÉSUMÉ

Homoplastie des nerfs périphériques (rapport préalable)

Hirasawa Y., Oda R., Nakatani K., Fujii T., Morotomi T.

On décrit trois cas de homoplastie des nerfs périphériques réalisés à la clinique des auteurs. A présent, encore 4 malades sont traités d'une manière analogique. On discute les facteurs qui influencent la prognose de la greffe autoplastique des nerfs périphériques.

ZUSAMMENFASSUNG

Homotransplantation von peripheren Nerven (vorläufige Mitteilung)

Hirasawa Y., Oda R., Nakatani K., Fujii T., Morotomi T.

Beschreibung von drei Fallen der Homotransplantation von peripheren Nerven, die an der Klinik der Autoren durchgeführt wurden. Zum gegenwärtigen Zeitpunkt werden analog weitere vier Kranke behandelt. Es werden Faktoren diskutiert, die die weitere Prognose der Transplantation von peripheren Nerven beeinflussen.

RESUMEN

Homoplastia de los nervios periféricos

Hirasawa Y., Oda R., Nakatani K., Fujii T., Morotomi T.

Fueron descritos tres casos de trasplantes autoplásticos de los nervios periféricos que se realizaron en la clínica de los autores. En la contemporaneidad otros 4 pacientes son tratados de manera análoga. — Se discuten los factores que influyen en la prognosis de los trasplantes autoplásticos de los nervios periféricos.

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ON PROBLEMS INVOLVED IN THE STERILIZATION OF TRANSPLANTATION MATERIAL

H. A. HACKENSELLNER

It is well known that one must distinguish between two fundamentally different preservation methods, i.e., homovital preservation which aims at vitality maintenance, and homostatic preservation which sacrifices the survival of the preserve. Homovital preservation of tissues (e.g., bone marrow, cornea, skin) or organs requires under all circumstances an unbroken aseptic chain.

Of course, homostatic preservation can also be based on the principles of continuous asepsis. But such a processing is very expensive. It needs special operating rooms and, above all, highly qualified personnel.

But homostatic preservation also permits to secure under the conditions of clinical autopsy material which is likely to be primarily not unobjectable, i.e., to secure material which is severely contaminated with bacteria at the moment of removal at the latest and at least superficially (externally). This will be possible in the following cases:

1. Prior to preparation, the (primarily germfree) source material is subjected to surface sterilization ("case sterilization") and all subsequent manipulations are performed under continuous asepsis. — Saveljev used formaldehyde and iodine tincture as sterilizing agents.

2. A sterilization procedure is introduced between preparation and preservation, and the subsequent technological steps comply with the rules of asepsis. — The following antibacterial agents and techniques are of immediate interest: antibiotics, ethylene oxide (introduced by Hufnagel), betapropiolactone (suggested by LoGrippo) and the so-called cold shock (developed by Klen); the elegant peracetic acid procedure must still be tested for usefulness in tissue preservation.

3. The preservation procedure itself exerts a sufficiently reliable bactericidal effect. — In this connexion, we would like to mention the Kiel method, the last step of which consists in a treatment with ether vapour, and the preservation by means of aqueous solutions of formaldehyde or of certain mercurial preparations, such as Merthiolate and Cialite.

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

4. The packed preserves are subjected to a terminal sterilization. Ionizing rays, especially gamma-rays, and also, with some restriction, gaseous ethylene oxide are suited for this purpose.

5. The preparations are sterilized immediately before implantation, e.g., by boiling or autoclaving.

The choice of the sterilization procedure is not at all entirely free. From the viewpoint of safety, only physical sterilization technique (dry and moist heat, beta- and gamma-rays) should be used. In the frameworks of tissue preservation, chemical sterilization methods should be generally rejected. Strictly speaking, the success of transplantation is determined by the quality of the transplantation material which must be viewed complexly. To ensure successful cornea grafting is it necessary to sterilize that tissue only by means of antibiotics.*)

Other preparations, such as deproteinized bone, can be boiled or autoclaved several times without impairing their value. If the preparation of native bone aims to maintain the strength of the latter, sterilization by means of rays and preservation with the aid of the Kiel method or with Cialite are not convenient.

The possibility of obtaining the source material for tissue preserves without respecting asepsis does not dispense from the observation of strict selection principles, even though the sterilization procedure is absolutely reliable. If the clinical epicrisis or the patho-anatomical findings (also a secondary finding or a complication) are indicative of bacterial or viral infection, the respective corpse cannot be accepted as a donor. This is justified not only because of possible deterioration of the graft by heterolytic processes, but also since pyrogenic substances might be formed. These considerations are speculative in that there is still a scarcity of exact scientific findings which could serve as a basis for the production of "tailor-made" tissue preserves. During the years to come, an important task of research will consist in the systematical investigation and the elucidation of the very complicated relationships between autolysis, heterolysis, denaturation and pyrogen formation in the graft (processes which depend qualitatively and quantitatively, among others, on the nature of the sterilization and preservation procedures) on the one hand, and of the reaction (also the imunological reaction) and the clinical result of the grafting on the other hand.

In the Transfusion and Transplantation Division of the Department of Medicine of the Humboldt University, various human tissues have been preserved by lyophilization for 16 years; calf's bones have been preserved by means of the so-called Kiel method for 10 years.

After preparation and prior to freezing, the human transplantation material, which is obtained 36 hours after death subsequent to clinical autopsy, was and is subjected to chemical sterilization. Through 1965, treatment with liquid ethylene oxide (EO) for 60 minutes has been used for sterilization. Submersion in a 1,5 % buffered solution of beta-propiolactone (BPL) at 37 ^{0}C. for 90 minutes has been employed since 1966. The treatment with EO or BPL is followed by short-time bathing in an antibiotic cocktail (penicillin + streptomycin). Finally

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*) Here and elsewhere, the terms "sterilization" and "sterilize" are used from the pragmatical viewpoint of tissue preservation and transplantation.

we recommend the surgeons also rehydration in physiological salt solution added with antibiotics.

Up to now, more than 30 000 homologous tissue preserves have been prepared by us in this way. The proportion of non-sterile preparations (more exactly: the proportion of preparations which had to be rejected in view of the result from testing for sterility) was in general less than 1 %. More than 20 000 graftings were performed with the aid of lyophilized and EO-treated or BPL-treated tissue preparations of our production. A serious complication imputable to the preserve was observed in no case. The rate of secondary healings amounted to 5 %, which corresponds positively to results achieved with autografts.

The animal transplantation material that is obtained from a slaughterhouse is treated with ether vapour during the third step of preservation. This treatment is first intended to free the preparations from fat. Simultaneously, the ether destroys the vegetative forms of bacterial. Since 1967, sterilization with ether vapour has been completed by gamma-ray irradiation of the packed preparations. We adopted this terminal sterilization for reasons of safety. We had no scruples about this since the strength of bones preserved by means of the Kiel method is impaired to such an extent that they can be used only if strength is no problem and if transplantation aims merely to stimulate the process of healing, e.g., in case of bone-hole plombage. Under these conditions, the additional decrease in strength of the bone preparations which will result from irradiation is acceptable. The results obtained in transplanting bone sterilized with the aid of the Kiel method are positively comparable with those gained in grafting lyophilized homologous bones.

The poor reliability of chemical sterilizing methods in tissue preservation incited us to perform experiments on artificially contaminated spongiosa pins and cubes. The pins were severely contaminated superficially; the cubes, centrally. Liquid EO, 1 % BPL and the so-called cold shock (Klen) were used for sterilization. Staphylococcus aureus, group A streptococci, Escherichia coli, Bacillus subtilis, and Candida albicans served as test organisms. The concentration of the bacterial suspension corresponded in any case to the value of 10 of the McFarland turbidity scale.

In preliminary tests, EO was effective against external infection as well as against internal contamination with a suspension containing more than 13 milliards of B. coli germs/ml. BPL was efficient only against external contamination (spongiosa pins). It exerted no sterilizing effect on spongiosa cubes which were primarily non-sterile or adventitiously contaminated from the environment (autopsy room). Increasing the concentration of the BPL solution (up to 2 %) or prolonging the time of its application (up to 2 hours) did not lead to more favourable results. The cold shock was in any case inefficient.

The cold shock was also inoperative in the principal trials where centrally contaminated spongia cubes were lyophilized subsequent to chemical treatment. In these experiments, EO and BPL were again ineffective against St. aureus,

B. subtilis and C. albicans. It must be emphasized that BPL (in contrast with the result from the preliminary tests) was efficient against E. coli. It seems that E. coli is injured by the chemical treatment to such an extent that it will be no longer cultivable after lyophilization. The results of our experiments lay stress on the limitations of the procedures tested in sterilizing tissue preserves.

We think that the cold shock is not suited for sterilizing transplantation material removed in the autopsy room. As evidenced by our experience gained in routine preservation and by the results of our experiments, EO and BPL will be sufficiently reliable only in case of a favourable constellation of various variables. The sterilizing effect is determined by the concentration of the respective agent, the temperature at which it is used and the duration of its application, and by the kind, of tissue, the thickness of the preparation and the concentration of the contaminating germs.

If our proceeding in routine preservation is observed, sterility will be accomplished with the highest degree of reliability by EO as well as by BPL. It goes without saying that this does not dispense from the sterility control under aerobic and anaerobic conditions and in a fungi culture medium.

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NEWS

On September 21-st 1974 suddenly died President of Section Assoc. Prof. Teobald Adamczak.

All duties of the President will be held by Assoc. Prof. Michael Kraus, M.D., for the period 1974—1976.

Executive Board Members of Section — Prof. Jan Goldstein, M.D., Antoni Trybus, M.D.

Secretary — Jerzy L. Potocki, M.D., Association of Polish Plastic Surgeons, Warszawa, Poland.

General Hospital, Tema (Ghana) — Department of Surgery
Primarius Dr. V. Bobek

SYNDROME OF ARTERIOMESENTERIAL DUODENAL COMPRESSION IN CHILDREN WITH BURNS

V. BOBEK

A series of symptoms, appearing in patients, if the duodenum is compressed between the aorta and the upper mesenteric vessels, is called the syndrome of arteriomesenterial duodenal compression (also syndrome arteria mesenterialis cranialis). It has been first described by Rokitanský (2) in 1842. He pointed out especially the convulsive and intermittent vomitting of the duodenal contents. The syndrome may occur in patients with serious cachectic conditions, such as complicated appendicitis with peritonitis, neurotic conditions (6), longterm confinement to bed (4), acute pancreatitis or intestinal inflammation, namely Crohn's disease (7) in persons with scoliosis (1), or in cases when different spinal diseases require application of a plaster of Paris jacket (5) and finally in persons with burns, in which there are septic complications with loss of weight.

OWN OBSERVATIONS

In the course of five years, we had opportunity to study 5 children with burns, in which arteriomesenterial doudenal compression had manifested.

1. Girl aged 11 years, burned by kerosene when a stove exploded. The burns covered 45 % of the surface, 15 % of them were of third degree, especially on the stomach and chest. On day 22 after admittance, strong vomitting manifested and the clinical symptoms tended to prove clearly duodenal compression. The loss of weight amounted to 9 kg. The required perenteral therapy with suction, was instantly introduced and the condition improved later considerably when food rich on calories had been administered and the loss of weight regained. After graftings, the patient was released for domiciliary treatment after 89 days.

2. Girl aged 10 years, after car accident, suffered of an extensive, open and strongly contaminated splintered fracture of the right tibia and rupture of the ileum. The explosion of the petrol tank caused burns on 30 % of the surface, of which 10 % were of third degree on both upper extremities. Due to the general serious condition after antishock treatment, the right tibia had to

be amputated below the knee, the abdominal cavity had to be revised and the ileum sutured. On day 15 after the operation, symptoms of duodenal compression manifested with signs of general sepsis. Because the condition did not improve after introducing suction, blood transfusions and after administering a wide spectrum of antibiotics, we considered duodenojejunostomy. However, on day 23 after admittance, the child is dying of standstill of circulation under symptoms of general sepsis.

3. Boy aged 14 years, burned in a bush fire, suffered of burns to a total extent of 35 %, chiefly on both lower extremities, buttocks and chest, with 18 % being burns of third degree. Doudenal compression manifested on day 17, the loss of weight amounted to 7 kg. Suction was maintained for 7 days and then the condition normalized. Release for domiciliary treatment on day 65.

4. Boy aged 13 years. When a house on fire, he suffered burns on 45 % of the body surface, 20 % were of third degree, chiefly on both upper extremities and the back. The course was still further complicated by sickle-cell anaemia, the duodenal compression manifesting on day 27 after admittance. The patient lost 8½ kg on weight and the condition did not improve after conservative treatment. On day 6 after the syndrome manifested, after pre-operative preparation, duodenojejunostomy was therefore carried out. The condition normalized after the operation and the boy was released for domiciliary treatment on day 89 after the accident. There were no signs of gastrointestinal complaints, when controlling the patient one month later.

5. Girl aged 8 years, scalded by hot water, 20 % of the surface on both lower extremities and stomach burned, total of burns 20 %. The syndrome formed on day 20 after admittance, the loss of weight amounted to 3 kg. After introducing suction and general therapy, the condition of the child improved after 5 days and release for domiciliary treatment took place on day 54 after the accident.

DISCUSSION

In patients with extensive burns, there is an increased possibility of incidence of the syndrome of duodenal compression under the influence of the loss of weight. The weight is known to decrease with some children by as much as 15 %, the fatty tissue is being reduced especially in the retroperitoneum and the mesentery and this may induce duodenal compression of different degree, causing intestinal closure.

Early diagnostics are of special importance in conditions of heavy burns and very much depends on the evaluation of the initial symptom, usually vomitting, but this kind of vomitting must be differentiated from the kind which accompanies general sepsis, wound infection or disturbed acidobasic balance. Furthermore, it is necessary to differentiate vomitting which accompanies pyloric obstructions in the formation of Curling's ulcers in burned patients (4). The x-ray examination plays here an important part. Regular suction of the gastric contents or the introduction of a duodenal sound are preventive measures.

The x-ray examination discloses characteristic changes, stomach and duodenum may be dilated, whereby the third portion of the duodenum is the most marked finding, its filling is seemingly cut-off from the left into the right iliac fossa. Furthermore present is the reflex of the barium meal from duodenum into stomach.

In the conservative method of s.a.m.cr. treatment, the most important step is the removal of contents of the dilated duodenum and stomach by suction, best by nasogastric introduction of the sound. Kettenbach and Palumbo recommend Trendelenburg's position, but this incurs the danger of aspiration. In the initial stage, relief is afforded to the patient by the half-sitting position with the head elevated by 45 degrees.

A further important phase in the treatment is the regular control of the weight, making up its losses by food containing large amounts of vitamins and calories and chiefly by making up for the lost proteins and by regulating the acidobasic balance.

When treating burned children in Africa it must be borne in mind that the general condition of the children is complicated by general malnutrition and by the suffered conditions of malaria. Even the maintaining of aseptic conditions in burned patients is not always sufficiently possible, thus afflicted children mostly reach hospital with a delay, possibly after prior treatment in villages by various native remedies.

In such cases no results are achieved by conservative therapy and surgical solution must be undertaken. The opinion on the kind of operation is not yet uniform. Already Delbet proposed a heroic performance based on the founding of gastroenterostomy, duodenojejunostomy and gastrojejunostomy, but Stavely proved mere gastrojejunostomy to be sufficient. Some authors have been recently recommending duodenojejunostomy which is also expedient having performed it themselves in one patient.

SUMMARY

The syndrome a. mesenteria cranialis may manifest in children with extensive burns. It is induced especially at great losses of weight when the fatty tissue in the retroperitoneum and mesentery is reduced so that it gets weak and the duodenum is compressed between the aorta and the upper mesenterial arteries. With some patients it is sufficient for removal of this syndrome, to carry out decompression of the stomach and to make up for the loss of weight. In cases when no results were achieved by conservative therapy, duodenojejunostomy proves satisfactory. We have studied ourselves s.a.m.cr. in 5 children and established duodenojejunostomy in one. Of 4 patients treated by conservative therapy, one child died, its conditon was even further complicated by general sepsis after peritonitis due to rupture of the intestine and amputation in tibia due to an extensive open splintered fracture.

RÉSUMÉ

Syndrome de la compression artériomesentérique du duodénum chez les enfants avec des brûlures

Bobek V.

Syndrome d'arteria mesenteria cranialis peut paraître chez les enfants avec des brûlures d'une grande extension étant provoqué surtout par de grandes pertes du poids où se produit une réduction du tissu graisseux dans l'espace rétropérotonéal et dans le mésentrè. Celui-ci est habituellement affaibi et le duodénum comprimé entre l'aorte et le vaisseau mésentérique supérieur. Chez quelques malades, il suffit de comprimer simplement l'estomac et de suppléer la perte du poids pour supprimer ce syndrome-ci. Dans les cas où le traitement conservatif reste sans résultat, c'est la duodénojejunostomie qui se montre utile. Les auteurs ont observé le syndrome d'arteria mesenterica cranialis sur 5 enfants chez l'un desquels nous avons fait la duodénostomie. Des 4 enfants traités d'une manière conservative un est mort. Son état était compliqué par la septicémie totale provenant d'une péritonite après une rupture de l'intestin et par une amputation dans la région tibiale et péronière faite à cause d'une vaste fracture ouverte et comminutive.

ZUSAMMENFASSUNG

Das Syndrom der arteriomesenterialen Kompression des Duodenum bei Kindern mit Verbrennungen

Bobek V.

Das Syndrom der a. mesenteria cranialis kann bei Kindern mit umfangreichen Verbrennungen erscheinen, hervorgerufen wird es besonders bei grossen Gewichtsverlusten, wenn es zur Reduktion des Fettgewebes im Retroperitoneum und Mesenterium kommt. Dieses pflegt erschlafft zu sein und das Duodenum ist zwischen der Aorta und den oberen Mesenterialgefässen komprimiert. Bei einigen Kranken genügt zur Behebung dieses Syndroms eine einfache Magendekompression und der Ersatz des Gewichstverlustes. In Fällen, wo das konservative Verfahren ohne Ergebnis ist, bewährt sich die Duodenojejunostomie. Selbst beobachteten wir das Syndrom der a. mesenterica cranialis bei 5 Kindern, bei einem legten wir die Duodenojejunostomie an. Von 4 konservativ behandelten Kindern ist ein Kind gestorben, sein Zustand wurde durch allgemeine Sepsis infolge von Peritonitis nach Darmriss und durch Amputation im Unterschenkel wegen einer umfangreichen offenen und zersplitterten Fraktur kompliziert.

RESUMEN

Síndrome de una compresión arteriomesentérica del duodendo en niños con quemaduras

Bobek V.

El síndrome de la arteria mesenteria cranialis puede aparecer en niños con quemaduras extensas, está provocado especialmente al lado de pérdidas grandes de peso, cuando se produce una reducción del tejido adiposo en el retroperitoneo y mesenterio. Éste suele ser flojo y el duodeno está comprimido entre la aorta y los vasos mesenté-

ricos superiores. En algunos pacientes una decompresión simple del estómago y una recompensa de la falta de peso basta para suprimir este síndrome. En los casos en que el tratamiento conservativo es sin resultado alguno, una duodenoyeyunostomia se mestra útil. El autor mismo observó el síndrome de la arteria mesenteria cranialis en 5 niños, en uno fue hecha la duodenoyeyunostomia. De los 4 niños tratados de manera conservativa murió uno, su estado fue complicado por septicemia general a consecuencia de la peritonitis después de la ruptura del intestino y después de una amputación en la canilla de la pierna debido a una fractura extensa abierta y cominutiva.

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5th International Congress of Lymphology will be held March 23—26, 1975 in Buenos Aires, Argentina and March 26—29, 1976 in Rio de Janeiro, Brasil.

The scientific program includes: Buenos-Aires session: Lymphomas — Lymphatic System and Immunology — Lymphatic Dissemination of Cancer. Rio de Janeiro session: Progress in Lymphadenography — Medical and Surgical Treatment of Lymphedemas and Chylous Effusions — Anatomo-physio-histopathology of the Lymphatic System.

Information and Program available through: Dr. C. M. Grandval, Austria 2626, Buenos Aires or Dr. R. C. Mayall, C. P. 1822, Rio de Janeiro GB, Brasil ZC-00, or Prof. H. Weissleder, Deutsche Klinik für Diagnostik, D - 62 Wiesbaden.

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RAPID TECHNIQUE FOR CONTRASTING EMBRYONIC TISSUES IN SECONDARY PALATE DEVELOPMENT STUDIES

M. DOSTÁL, E. BĚHOUNKOVÁ

The embryonic development of the head region is characterised by a number of spatial changes, including that of the primitive oral cavity being partitioned by the secondary palate into the oral and nasal cavities. This developmental process is the result of chronologically and spatially synchronized growth of several structures (i.e., of the nasomaxillary complex, palatal processes, mandible and tongue) the analysis of which requires three-

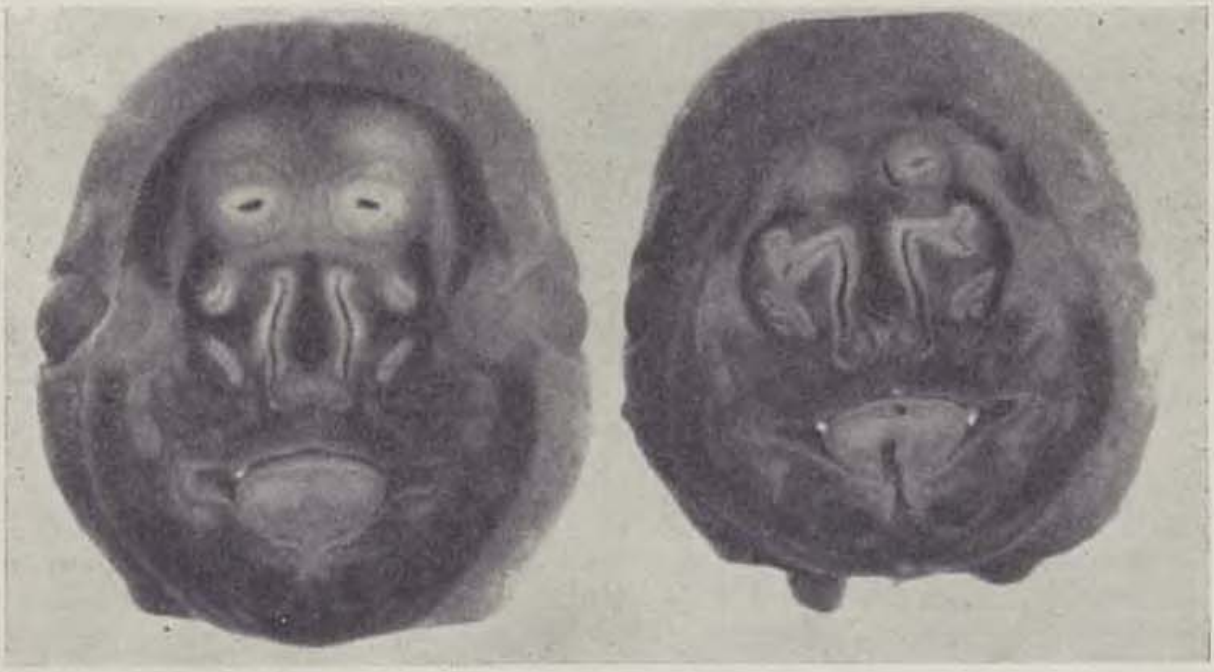

Fig. 1. Frontal head section *in toto* stained by Alcian blue. An H-Velaz mouse embryo on 15th day of embryonic development, state soon after coalescence of palatal processes. — Fig. 2. Frontal head section *in toto* stained by Alcian blue. An H-Velaz mouse embryo on 15th day of embryonic development, state after horizontalization and before coalescence of palatal processes

dimensional morphometric studies. When using the traditional method of histological sections (Babula and Smiley, 1970, Smiley et al., 1971, Hart et al., 1972) it is difficult to avoid processing a complete series since the value of parameters measured (for instance the height of the tongue or the width between Meckel cartilages) changes both in time and the localization of the section. For practical reasons, it would be often difficult to treat in this way a sufficient number of embryos so as to meet the principal condition of

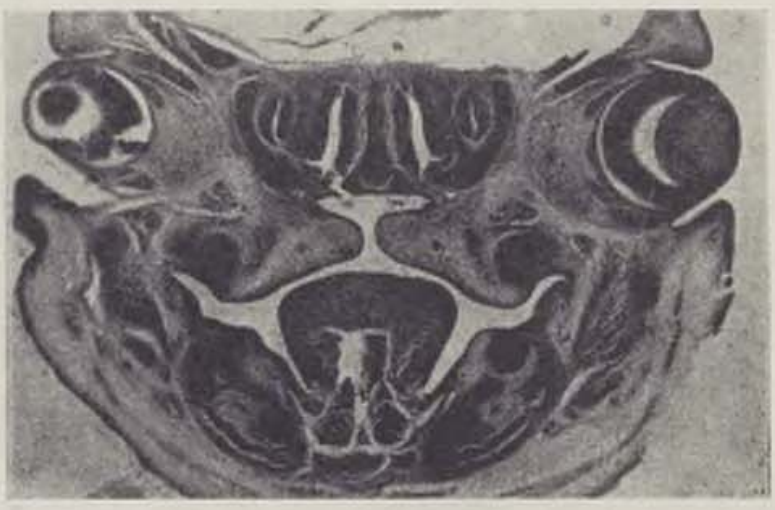

Fig. 3. The same embryo as in Fig. 2 (note damage in lingual region) following histological treatment. Section is cut more to the rear and counterstained by haematoxylin-eosin

quantitative observation — i.e., statistical evaluation. In this situation it may be helpfull to use serial sectioning for the basic orientation, and for further studies to chose one or two sections only. The parameters studied can be in this case measured on the free-hand sectioned and *in toto* stained heads by means of a binocular stereomicroscope. This procedure is quite simple and allows to process enough embryos for statistical evaluation of the growth of particular structures both under normal and experimental conditions. Moreover, this method avoids tissue shrinkage through dehydration as opposed to histological procedures, so that better understanding of spatial relations in the oral cavity is possible.

Due to quantitative and qualitative differences in mucopolysaccharide content, the embryonic head structures markedly differ when stained with Alcian blue, so that cartilages, osseous tissues, epithelia and also glandular and muscle tissues can be easily distinquished. Staining contrast can be controlled by changing pH values of the staining solution (Scott and Dorling, 1965).

METHOD

The embryonic heads are fixed in Bouin-Hollande fixative and free-hand sectioned with a razor blade. The specimens are then washed in successive baths of 70 % alcohol, until the alcohol remains clear. The specimens are

stained for 24—48 hours in 0.5 % solution of Alcian blue in 70 % alcohol. According to our experience, the optimum of contrast is reached on adding 10 volume parts of glacial acetic acid to the staining solution. After staining the specimens are washed again in 70 % alcohol (in which they can be stored). When photographing or projecting the sections by means of a binocular stereomicroscope drawing apparatus, the contrast can be improved using a suitable filter or placing the specimens in methyl orange solution in 70 % alcohol.

Frontal sections of mouse embryonic heads stained *in toto* by Alcian blue before and after secondary palate closure are shown in Fig. 1 and 2. For comparison, Fig. 3 shows histological section of the same specimen counterstained by haematoxylin-eosin.

SUMMARY

Bouin-Hollande fixative and 0.5 % solution of Alcian blue in 70 % alcohol were used for rapid contrasting of embryonic head sections *in toto*. In combination with serially cut paraffin sections, this simple method allows to study sufficiently large samples of embryos for statistical evaluation of morphometric data. Moreover, tissue shrinkage is avoided using this method.

RÉSUMÉ

Méthode rapide de la teinture des tissus embryonnaires utilisée pour pouvoir observer le développement du palais secondaire

Dostál M., Běhounková E.

Le travail présenté décrit la méthode rapide de la teinture des coupes faites à travers les têtes des embryons. Après la fixation dans la liquide de Bouin-Holland, on colore les coupes in toto dans la solution du bleu d'Alcian de 0,5 % dans l'alcool de 70 %. Ainsi, on peut vite compléter les études qui utilisent les coupes paraffiniques fabriquées en série et faire des observations morphométriques sur les ensembles suffisamment grands permettant une élaboration statistique des résultats. En utilisant cette méthode ni ondulation ni sillon ne se produisent sur les tissus à cause d'une déhydratation ce qui est un autre avantage de celle-ci.

ZUSAMMENFASSUNG

Eine Schnellmethode zur Färbung der Embryonalgewebe zum Zweck der Verfolgung der Entwicklung des sekundärn Gaumens

Dostál M., Běhounková E.

Die Arbeit beschreibt eine Schnellmethode zur Färbung der Schnitte durch die Embryoköpfe. Nach Fixierung in Bouin-Hollandescher Flüssigkeit werden die Schnitte in toto in 0,5 % Alzianblaulösung im 70 % Alkohol gefärbt. Mittels dieses Schnellverfahrens kann man die auf serienmässigen Paraffinschnitten beruhenden Studien ergänzen und morphometrische Beobachtungen an ausreichend grossen Aufstellungen durchführen, die die statistische Verarbeitung der Ergebnisse ermöglichen. Ein weiterer Vorteil dieses Verfahrens liegt darin, dass es nicht zum Zusammenschrumpfen der Gewebe durch Dehydratation kommt.

RESUMEN

Método rápido de teñir tejidos embrionales con fin de observar el desarrollo del paladar segundario

Dostál M., Běhounková E.

En la obra se describe un método rápido de teñir las secciones a través de las cabezas de los embrios. Después de haberlas sido fijadas en el líquido Boin-Hollande las secciones son teñidas in toto en la solución del azul Alcián de 0,50 % y en el alcohol de 70 %. Por este método rápido se pueden completar los estudios que usan secciones de parafín en serie y hacer observaciones morfométricas en conjuntos suficientemente grandes que facilitan elaborar los resultados por métodos estadísticos. Otra ventaja de este procedimiento es el hecho que no ocurre arrugación de los tejidos a consecuencia de una dehidratación.

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An Anniversary Symposium will be held by the Slovak and Czech Society for Plastic Surgery on May 22nd—23nd, 1975. Programme: 1) Organizational problems on the treatment of burns. 2) Reconstruction after burn injuries. Foreign specialists are invited to participate. Applications and further information may be obtained from: Dr. Marian Babík, ZÚNZ Košice — Šaca, Czechoslovakia.

Czechoslovak Academy of Sciences, Prague (Czechoslovakia) Laboratory of Plastic Surgery
Director Prof. V. Karfík, M.D., DrSc.

CEPHALOMETRIC STUDY OF FAMILIES WITH CLEFTS

† P. FIGALOVÁ, Z. ŠMAHEL

It is essential in our present research of congenital defects, to focus attention not only upon the afflicted person, but on the entire family or, possibly, on the population in which the defect occurs. The aetiopathologic data on the circumstances of the formation of malformations, on the situation in the family, incidence, etc., are being currently ascertained. The results are frequently based on the analysis of extensive material, as demonstrated in the studies of facial clefts (Klásková, 1973). However, less attention is usually paid to the health status and somatic condition in healthy relatives of the afflicted person. These data are valuable for genetic studies and for learning about the heredity of the defect.

With clefts of the lip and palate, there is also a continuous lack of studies of this type. A higher frequency of further anomalies in cleft families, has been proved for ex. by Niswander, Adams (1968) with so called major defects, or by Smith, Bostian (1964) with minor defects. Tolarová (1969) studied microforms and their incidence. Very few reports, however, are concerned with the anthropometric or cephalometric data on families with clefts. Yet the studies carried out so far, proved already that some craniofacial metric deviations may exist here (see discussion). With congenital defects in general, such atypical cases, provided their incidence with relatives was significantly verified, rather tend to point to hereditary background of the defect. They may be then considered to be associated signs of the respective anomaly and their occurance in the family may influence the genetic prognosis.

What do we expect of such findings? They afford the possibility, to study the relation of the defect to the morphology of the parts of the body, for ex. the craniofacial morphology with clefts (genetically determined predisposition of a certain somatic or morphologic type, towards a congenital malformation). The deviations of shape may represent the extreme limit of the normal variability and may interfere with the morphogenesis of structures as a factor passed on to further generations (under suitable circumstances they contribute then to the manifestation of the defect). It is not at all impossible that in some cases it should be feasible on basis of similar extensive studies, to differentiate phenocopies and to detect the population carrying the genetic background.

Such findings are of importance when investigating the principle of the formation and heredity of the defect and also, in practice, when affording genetic counselling. They specify the prognosis and it will be possible, to express the individual situations (for ex. the presence of microforms or associated signs) empirically (Šmahel, 1974). Another possible application of cephalometry is reported by Pashayan and Fraser (1971).

The submitted study deals with the problems discussed and continues the preliminary report (Figalová, Šmahel, 1971).

MATERIAL AND METHODS

In 1966 there were born in Bohemia (area of the Department of Plastic Surgery in Prague), 166 children with cleft of the lip and/or palate (1 cleft to 500 new-borns — see Klásková, 1973). In thus afflicted families, we carried out cephalometric examinations in the years after. In 12 cases the patient died prior to operation (i.e. 7,2 %) and in some cases we have no further information, or the patients were treated in Brno (Moravia) and the examination of the family could not be arranged. Of the remaining 142 families, we managed to obtain data on 93 families of which 31 families were with a child with unilateral cleft of lip and palate, 9 families with bilateral cleft of lip and palate, 34 families with cleft lip (± alveolus) and 19 families with isolated cleft of the palate. Measurements were carried out in the proband afflicted with the defect and in his brothers and sisters, in the parents of the proband and in their brothers and sisters as well as in the grandparents of the proband, i.e. in three generations. Due to the small number of cases, the data of the brothers and sisters of the proband (a group heterogenic in age), were not evaluated. The submitted study comprises thus 571 healthy relatives of children with cleft. They are divided according to sex on part of the mother and father and according to the coefficient of relationship, always separately in horizontal and vertical line (coefficient of relationship: parents = 0,5 other relatives = = 0,25). The number of relatives of the thus formed group is demonstrated on the table for all types of clefts. The data also disclose the interest taken by the relatives in respect of co-operation, this interest being rather smaller with parents of the father than with the parents of the mother and simultaneously with the male sex rather than with the female sex (the father's father was already only examined in 35 cases — the differences not being predominantly caused by death).

The group is evaluated irrespective of the number of individuals of the same family afflicted with cleft (15 cases of familial incidence i.e. 16,1 %). We did not consider it necessary to exclude them, because they can only stress possible differences.

All measurements were carried out directly (surface dimensions) according to the principles of classical anthropometry. We studied the greatest length of the neurocranium (g - op), the greatest width of the neurocranium (eu - eu), the width of the skull base (t - t, i.e. the width in the region of the tragi), the smallest width of the forehead (ft - ft, i.e. the smallest distance between lineae

temporales), the width of the face (zy - zy, i.e. in the region of pons zygomaticus), the width of the angles of the lower jaw (go - go), the morphologic height of the face (n - gn, i.e. the root of the nose-chin), the height of the upper face (n - sto, i.e. the root of the nose-oral slot), height of the nose (n - sn, i.e. root of the nose-base of columella), distance of the internal eye canthi (en - en), distance of the external eye canthi (ex - ex), the width of the nose (al - al), he width of the oral slot (ch - ch), the subnasal arch (t - sn - t, i.e. the arch tragus-base of the upper lip-tragus) and the submandibular arch (t - gn - t, i.e. tragus - chin - tragus).The used abbreviations can be found — for more accurate orientation — in the textbooks on anthropology (measurement apparature used: spreading caliper, sliding caliper, tape). On basis of direct dimensions, four indexes were calculated : index cephalicus (100 x eu-eu : g-op, i.e. width of the neurocranium in percent of the length of the neurocranium), index facialis (100 x n-gn : zy-zy, i.e. height of the face in percent of the facial width), index nasalis (100 x al-al : n-sn, i.e. width of the nose in percent of the height of the nose) and index intercanthalis (100 x en-en : ex-ex, i.e. distance of the internal eye canthi in percent of the distance of the external eye canthi). They are of importance for the assessment of the shape characteristic of the mentioned body parts. The basic dimensions of the auricle were also measured (length and width).

Examination was carried out in the same manner in a control group consisting of 50 adult men and 50 women aged 20—40 years with a predominace of persons aged 20—30 years. The control groups correspond thus in the age distribution approximately with the age distribution of the parents (and their brothers and sisters) of children with cleft. All related groups of male sex were compared with the control group of men (i.e. father, the father's brother, the mother's brother, the father's father and the mother's father) and similarly all groups of the female sex were compared with the control group of women (thus there is no agreement in age between the control and the grandparents; the mean age of the individual related groups see on table). The differences in the means were tested by Student's t-test. The table demonstrates only the final results of the t-test in groups where significant differences were recorded (the numeric data denote the level of significance, the signs "+" and "—" denoting whether the evaluated data are greater or smaller in comparison with the controls). We do not report the results with respect to the individual types of clefts, because the numbers in this group were small, but some differences are described in the text.

For the sake of description we use in the further text also the expression "I. generation" for the grandparents of the proband and „II. generation" for the parents of the proband and their brothers and sisters.

RESULTS

Dimensions of the head (tab. 1). The length of the neurocranium is significantly smaller with the parents of the proband and their brothers and sisters (II. generation) than with the controls. The difference is not

Tab. 1. All types of clefts together (93 families, 571 relatives) — results of the t-test

Relationship	Mother	Mother's mother	Mother's sister	Father's mother	Father's sister	Father	Father's father	Father's brother	Mother's father	Mother's brother
Mean age	24.26	50.93	22.03	55.14	28.53	27.86	57.95	26.10	53.89	25.17
Number of examined persons	80	60	60	50	58	79	35	59	46	44
g - op	−0.05		−0.01		−0.001	−0.05		−0.001		−0.001*
eu - eu	−0.001	−0.02	−0.001		−0.02	−0.05				
t - t	−0.02		−0.05			−0.001				−0.001
ft - ft				−0.01						
zy - zy						−0.05				
go - go	−0.01									
n - gn										
n - sto	+0.05		+0.02	+0.005	+0.02	+0.05	+0.001		+0.005	
n - sn			+0.05	+0.05		+0.02	+0.01		+0.05	
ex - ex				−0.01				+0.01		
en - en	+0.02									
al - al		+0.001*		+0.01			+0.001		+0.001	
t - sn - t			−0.005							
t - gn - t										
i. cephalicus									−0.05	
i. facialis										
i. nasalis			−0.05			−0.001				
i. intercanthalis				+0.01						

*) only in these cases does the difference reach approximately the size of 1 standard deviation of the respective control class (in the other cases 0.4—0.8 SD).

significant with the grandparents, this being possibly due to the still small apositional growth of this dimension as ageing proceeds. The above mentioned fact also shows up with the width of the neurocranium, but it concerns there chiefly the relatives of female sex. The width of the skull base is also smaller in the parents and brothers and sisters of the mother (but not of the father). No deviations were recorded in the bifrontotemporal width of the forehead (individual exceptions do not change the sense of these mentioned facts). With all the significant differences the obtained means differ from the controls usually by 0.4—0.8 standard deviation (SD) of the respective control group, this being insignificant from the practical aspect (cases when the deviation reaches 1 SD are marked in tab. 1).

Facial dimensions (tab. 1). The significant differences ascertained in the facial width with the proband's fathers and in the width of the angles of the lower jaw with the group of mothers are rather only exceptional.

The vertical dimensions of the splanchnocranium show, on the contrary, some differences. Whereas the results in respect of the total facial height are

not significant, the height of the upper face is usually enlarged and with half of the groups of relatives, the height of the nose is also enlarged. Here too, the difference in comparison with the controls, reaches always only 0.4—0.8 SD.

The distance of the external and internal eye canthi does not practically differ from the controls. Thus no tendency towards widening of the interocular space with relatives of cleft children has been ascertained.

Certain differences were found in the width of the nose and in the width of the oral slot, but these are caused by age. With the first sign, the means are significantly higher with the grandparents of the proband, whereas in II. generation the difference is not significant. This is probably caused by further small growth of the nasal width in adults, which is thus wider in the grandparents. With the width of the oral slot where a small enlargement is stated in adults, the calculated means in all groups of II. generation are also smaller than the means with the grandparents. Thus we do not consider both signs to be of significance in the investigated connections.

No significant differences were ascertained in the size of the facial arches, although with the subnasal arch the means are usually smaller if compared with the control (they mark a flattening of the maxilla). There are also no deviations in the measurements of the auricle (greater dimensions in the grandparents are due to the growth of the pinna which lasts till late age).

Indexes (tab. 1). None of the investigated indexes proved changes in shape in the region of head and face with the parents and further related children with cleft (only the deviations in height and width of the nose may sometimes reflect in the values of the index nasalis).

Comparison according to the type of cleft. Comparison of the results in respect of the individual types of clefts, points out some differences in spite of the smaller number of cases in the groups of relatives. Decrease of the dimensions of the neurocranium is not evident with the relatives of children with cleft of the primary palate (lip ± alveolus) whereas in both the remaining groups (lip + palate and isolated palate) this tendency is apparent. Larger vertical dimensions of the central part of the face are indicated in families with occurrence of all types of clefts. Changes in the width of the nose are, on the other hand, only actually significant in relatives of the children with total clefts (i.e. lip and palate), they are also, however, only limited to the I. generation. With clefts of the primary and secondary palate, we found in several experimental groups a significantly decreased subnasal arch tending to prove a flattening of the maxilla.

No deviations were calculated from the indexes in groups of relatives of probands with cleft of the primary palate, whereas craniofacial changes in shape were ascertained in several groups with relatives of probands with cleft of the secondary palate (more frequently isolated than connected with cleft of the lip). Comparison of the individual dimensions (mainly of facial dimensions) between groups of families with occurrence of palatoschisis and

families with occurrence of the other types of clefts, tends to show that the studied body parts in the first group are more gracile. The smallest changes altogether in comparison with the control (excepting the vertical dimensions of the central face) are evident in relatives of children with mere cleft of the lip. The above described differences are only hinted and in spite of the fact that they are well explainable, they must be verified in further research and they have to be better proved.

DISCUSSION

The decrease of the basic dimensions of the neurocranium in relatives of cleft children, may indicate that it is, in average, a matter of smaller individuals (they were not ascertained in relatives of children with mere cleft of the lip). It is not very well possible to consider a direct relation to the cleft. This confirms the necessity to follow up in all such studies also the chief bodily signs. Separating only some parts of the body irrespective of the total somatic condition, might lead to erroneous conclusions.

With regards to the metrical signs of the splanchnocranium, the increased height of the upper face and nose in most of the studied groups, confirms that with the vertical dimensions some deviations in the central facial parts may be found. It is possible to ascertain them in the groups of relatives with all the types of clefts. A greater width of the nose was only proved with the grandparents of the cleft proband and this can be explained by the further growth of this dimension in adults. When assessing, however, the results according to the type of cleft, it appears that the change concerns chiefly the total clefts (lip and palate). But this is rather due to the number of persons in the group, than in connection with the cleft (the smaller numbers also do not allow to draw any serious conclusions). The width of the oral slot and the dimensions of the auricle are chiefly depending on the age relation. Only exceptionally were significant deviations found in the other dimensions, but there is with the relatives of children with clefts of the lip and palate in several groups of relatives a certain flattening of the maxilla evident (the subnasal arch is significantly decreased).

The indexes studied, tend to show that there may exist some differences of the craniofacial shape in relatives of children with palatoschisis. In families with total clefts, such differences were ascertained rather rarely (they are not evident in the group of all clefts together).

In order to test the hypothesis that the shape of the face may be related to the genetic predisposition of the defect, Fraser and Pashayan (1970) carried out anthropologic examination in 25 pairs of parents with children with cleft of the lip and palate. In comparison with the controls, they ascertained a larger flattening of the maxilla, a greater height and width of the face, a less prominent upper lip and a higher frequency of the rectangular and trapezoid shape of the face. Coccaro et al. (1972) ascertained in a roentgenocephalometric study of 20 fathers and 20 mothers of children with cleft, in comparison with the controls, a less convex profile of the face, with a tendency

towards mandibular prognatism, a decrease of the vertical and anteroposterior dimensions of the upper face (in the region of the palate) and a smaller length of the nose.

Due to the different methods and also due to the contents of the individual reports, the results can not be adequately compared. We consider the flattening of the maxilla as reported by Fraser and Pashayan (1970) to be an identical finding that corresponds to the less convex profile of the face according to Coccaro et al. (1972) and to the decrease of the subnasal arch indicated in our report. Thus the tendency to mandibular prognatism (Coccaro et al. 1972) is probably only relative, i.e. in consideration of the flattened maxilla. In all the discussed reports, deviations in the vertical facial dimensions were also found, but they are not of the same character [the increase in height and width of the face in the group reported by Fraser and Pashayan (1970), indicates symmetrical changes of the signs, whereas we could consider disturbances of the proportionality to be rather of significance in relation to the congenital defect]. On this basis we recommend to pay attention in further studies of this kind, to the profile of the face and its vertical dimensions, because it appears that really significant deviations may exist here. Attention has to be focused in detail towards the central stage of the splanchnocranium. No differences probably exist in the basic facial dimensions, excepting the height.

All the significant differences ascertained, differ as a rule from the controls by 0.4—0.8 standard deviation and only very rarely by 1 SD. Thus they can not find any application from the practical aspect for example in genetic counselling. In order to afford a better understanding, we are preparing publication of tables of the basic or significant signs (Figalová, Šmahel, in print).

Further research is essential, if the findings in this field are to be deepened. This research should set aside families with familial incidence of the defect, as it is justified to expect here deviations in the formation of the craniofacial structures (they can not exist in pure phenocopies).

SUMMARY

571 healthy relatives (parents, grandparents and brothers and sisters of the parents) of children with cleft of the lip and/or palate, were cephalometrically examined. They are divided into the individual groups of relatives as demonstrated on the table for all types of clefts together. It was ascertained by comparison with the controls that significant deviations may exist in the central part of the face (increased height of the upper face and height of the nose in our series) and in the profile of the face (flattening of the maxilla in relatives of children with total clefts). We do not consider the significant differences in the other signs, to be of importance in the studied connections. The indexes in the entire group (all types of clefts together), did not prove any craniofacial deviations in shape. As a rule, all the significant differences

lie within the extent of 0.4—0.8 standard deviation of the control group and thus they are of no practical use (in genetic counselling). No deviations were ascertained in the other studied signs, including the interocular distance which is sometimes being discussed.

RÉSUMÉ

Etude céphalométrique des familles avec une fissure

Figalová P., Šmahel Z.

On a fait la céphalométrie chez 571 parents sains (les parents, les grands-parents et les frères et les soeurs des parents) des enfants avec la fente de la lèvre ou du palais. On les a partagés en certains groupes de parenté ce qui est démontré sur le tableau contenant tous les types ensemble. On a constaté à l'aide d'une comparaison et d'un contrôle que les anomalies importantes peuvent exister dans le segment médial de la face (la hauteur de la partie supérieure de la face et la hauteur du nez sont allongées dans notre ensemble) et au profil de la face (l'aplatissement du maxillaire inférieur chez les parents des enfants avec les fissures totales). Les différences expressives des autres signes ne sont pas considérées comme importantes dans les rélations examinées. Les index de tout l'ensemble (tous les types des fissures ensemble) n'ont montré aucune anomalie de la forme craniofaciale. Toutes les différences expressives sont en régle générale en étendue de 0,4 à 0,8 d'anomalie standard de l'ensemble controlé. De point de vue pratique (bureau de consultations génétiques) il n'y en a d'utilisation. Chez les autres signes observés, les distances entre les yeux qui sont souvent discutées y compris, les anomalies n'ont pas été constatées.

ZUSAMMENFASSUNG

Kephalometrische Studie der Familien mit Spalten

Figalová P., Šmahel Z.

Kephalometrisch wurden 571 gesunde Verwandte (Eltern, Grosseltern und Geschwister der Eltern) von Kindern mit Lippen- oder/und Gaumenspalten untersucht. Sie sind in einzelne Verwandschaftsgruppen eingeteilt, wie es die Tabelle für alle Spaltentypen insgesamt zeigt. Durch Vergleich mit der Kontrolle wurde festgestellt, dass in der mittleren Etage des Gesichtes (Vergrösserung der Höhe des oberen Gesichtes und der Nasenhöhe in unserer Aufstellung) und im Gesichtsprofil (Abflachung der Maxilla bei Verwandten von Kindern mit Allgemeinspalten) signifikante Abweichungen existieren können. Die signifikanten. Differenzen bei den übrigen Merkmalen halten wir in den zu untersuchenden Zusammenhängen nicht für bedeutend. Die Indexe in der gesamten Aufstellung (alle Spaltentypen insgesamt) haben keine kraniofazialen Formabweichungen bewiesen. Die gesamten signifikanten Unterschiede liegen in der Regel im Bereich 0,4—0,8 der Standarddeviation der Kontrollaufstellung und von praktischem Standpunkt (genetische Beratung) finden sie deshalb keinen Gebrauch. Bei den übrigen verfolgten Merkmalen, einschliesslich der jeweils diskutierten Zwischenaugenentfernung, wurden keine Abweichungen festgestellt.

RESUMEN

Estudio cefalométrico de las familias con fisuras

Figalová P., Šmahel Z.

Fueron examinados 571 parientes sanos (padres, abuelos y hermanos de los niños con fisuras del labio y/o del paladar. Están divididos en grupos particulares de parentela como se ve en la tábula para todos los tipos de fisura en junto. En comparación con el control fue constatado que anomalias significantes pueden existir en el segmento mediano de la cara (prolongación de la altura de la parte superior de la cara y de la altura de la nariz en nuestro conjunto) y del perfil de la cara (aflojamiento del maxilar superior en los parientes de los niños con fisuras totales). Diferencias significantes en los demás signos no fueron considerados como importantes en las relaciones bajo investigación. Los índices en todo el conjunto (todos los tipos de fisuras en junto) no han mostrado ningunas anomalias de forma craniofacial. Todas las diferencias significantes se encuentran generalmente dentro de 0,4—0,8 de la anomalia standard del conjunto de control y desde el punto de vista práctico (consultorios genéticos) tampoco tienen utilización alguna. En los demás signos observados incluso la a veces discutida distancia interocular no fueron halladas anomalias ningunas.

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IN MEMORIAM

Doc. Teobald A d a m c z a k, M.D., born in 1926, died in Warsaw in September 1974. Dr. Adamczak worked in the years 1954—1955 with another three Polish physicians for 14 months at the Department of Plastic Surgery in Prague, where at that time academician F. Burian was in charge. Dr. Adamczak possessed good surgical erudition and he was greatly interested in plastic surgery which was not carried out systematically in Poland until that time. Being well educated in theory and diligent he quickly acquired the working methods and also the organisational principles. He

gained our friendship and esteem and visited Czechoslovakia frequently. After his return from Prague he succeeded in Poland together with his faithful friend Doc. M. Kraus, M.D., with whome he had studied in Prague that plastic surgery was established as a specialized branch and the interest of new workers was acquired. Dr. Adamczak was an outstanding organizer and he was in charge of the Department of Plastic Surgery in Warsaw. In the last years he was president of the Polish Society of Plastic Surgery and he fought unceasingly for its continuous extension. Many plastic surgeons met him at international meetings at which he represented his country successfully.

His sudden departure is indeed a great loss for Polish plastic surgery and for health care altogether. A sincere friend whome we shall not forget, has left us all.

Prof. H. Pešková, M.D., DrSc.

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