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ALLOTRANSPLANTATION IN MECHANICAL EYELID INJURIES

M. V. Zaykova, V. G. Lubnin, J. V. Koroleva

Primary surgical treatment of mechanical eyelid injuries (excluding gunshot injuries) is a very important, yet not sufficiently explored problem of ophtalmotraumatology.

Imperfect primary surgical treatment of mechanical eyelid injuries very often results in the deformation of the eyelid as well as of the orbital zone.

The primary plastic operation of gunshot injury of the eyelid has been sufficiently described in a number of papers (1, 4). However, literature on primary plastic eyelid operations of injuries of mechanical origin is scarce (3—7).

The authors performed primary combination blepharoplasty as part of primary surgical treatment of mechanical injuries of the eyelid and orbital region in 120 persons.

The composition of patients according to their age was as follows: children up to 14 years — 26 cases, from 15—20 years — 6 patients, from 21 — 30 years — 29 persons, from 31 — 40 years — 26 patients, from 41 — 50 years — — 19 cases, from 51 — 60 years — 11 persons, and over 60 years — 3 persons. The injury was caused by the following materials and objects: glass and metal fragments, sticks, blunt objects and others. These injuries were classified according to the following types: stab wounds — 2 %, cuts — 6 %, lacerated wounds — 12 %, incised wounds — 14 %, lacerated-contused wounds — 21 %, contused wounds — 45 %. A single-wound injury occurred in 87 %, multiple-wound injury in 13 %. Uncomplicated injuries, i.e. solely eyelid injury, occurred in 68 % of the patients, complicated injuries, i.e. injury of the eyelid and the adjoining anatomical parts of the face involved 32 % of cases. Non-perforating wounds were found in 24 %, perforating wounds in 76 % of the patients.

The control group consisted of 40 patients with similar eyelid injuries whose primary surgical treatment went without allotransplantation.

SURGICAL TECHNIQUES

Prior to the primary surgery, the authors made a detailed assessment of the type of the wound with regard to the agent responsible for it and with

regard to the direction and the depth of the wound. X-ray and tomographic examinations of the orbit were performed and the sequelae of earlier eyelid tissue injuries as well as of the orbital region were considered. The extent of the eyelid tissue damage was determined by way of comparing it with the opposite side. The authors decided on the type of primary surgery to be performed with a view to the clinical nature of the lesion as well as to the condition of the surrounding tissues. To get a clearer idea, the authors elaborated a classification of blepharoplastic operations of mechanical eyelid injuries (see Table).

Table 1. Classification of primary blepharoplasty in mechanical eyelid injuries and of patients (in %) and their arrangement into groups*

Blepharoplasty				
time of operation	depth of wound	area extent	basic technique	tissues used
primary 82,6 %	superficial 28,2 %	simple 68,8 %	local shifting 97,9 %	non-combination 27,5 %
primary delayed 17,4 %	complete 71,8 %	complicated 31,2 %	free transfer 1,4 %	one-stage combination 72,5 %
			one-pedicle flap 0,7 %	

*arranged with the assistance of Prof. V. V. Volkov

In this classification, the authors used peace-time, war-time and plastic surgery terms (1, 2, 4).

In this context, the primary plastic surgery of the eyelid injury is understood to mean a plastic operation performed within 24 hours of the injury, and primary blepharoplasty means plastic surgery performed within 2—4 days of the injury. Uncomplicated surgery, in this context, means plastic surgery for eyelid injury only, while complicated surgery involves an operation both of the eyelid and the surrounding parts of the face. A plastic non-combination surgery relates to operations which make use of some techniques of autotransplantation only (local shifting, free transfer, etc.), while a combination blepharoplasty refers to a combination of the techniques using an allotransplant.

A method of primary combination one-stage plastic surgery of the eyelid injury was devised and tested in clinical practice. This method is based on auto- and allotransplantation performed simultaneously with primary surgical treatment (3, 4). Allotransplantation in fresh injuries was carried out for the purpose of consolidation of the supportive connective tissue of the eyelid. This

surgical technique was used by Stallard (8), however, only in cases of later post-traumatic changes.

Allotransplantation as part of the primary surgical treatment for the eyelid injury was performed in 120 patients employing the dura mater in 93 subjects and amnion in 27 cases. The allogenic tissues were preserved in 0.2 % thymol solution for a period of several days up to one year.

According to the nature of the eyelid injury, the following forms of primary combination plastic surgery were used: local shifting in 115 patients, free transfer in 3 persons, one-pedicle flap in 2 patients. Superficial blepharoplasty was performed in 34 persons, complete blepharoplasty in 86 patients.

The general principle in the primary plastic surgery of the eyelid injury was to achieve best results both from topographical and anatomical aspects. The majority of surgical treatment was performed under the microscope.

Primary surgical treatment for the eyelid injury is known to involve common simple forms of the local transfer (lateral transfer, bringing the wound edges together, and others). In their group of patients, the authors mostly used local transfer technique.

The superficial eyelid surgery in a non-perforating injury was performed in the following way: foreign bodies were removed, the wound edges were separated, necrotic parts were excised with due regard for the patient and the edges were cut to shape. The subcutis was sutured by catgut. In order to avoid the formation of a retracted post-operative scar, the authors inserted beneath the edge of the wound a strip of allograft of 0.2—0.8 cm in width either subcutaneously or into the layer of the tarso-orbital fascia; the length of the strip corresponded to the wound length. The width of the strip depended on the condition of the wound edges: in uneven infiltrated edges wider strips were used. After primary surgical treatment for perforating eyelid injuries localized in the region of the internal and external canthus, ptosis of the eyelid or its deformation due to scarring are often observed. In order to prevent this deformation, the authors performed combination surgery using local shifting. The cutaneous-muscular layer was detached from the anterior part of the cartilage thus creating a subcutaneous tunnel placed parallel with the ciliary edge of the eyelid in the distance of 3 mm from it. Into this tunnel, a strip of dura mater, measuring 15—25 × 3—5 mm was inserted. Both ends of this strip were sutured by catgut to the anterior part of the tarsus.

If the wound was situated in the external or internal third of the eyelid, then one end of the strip was slightly stretched and sutured to the corresponding canthus to achieve consolidation of the supportive connective tissue of the eyelid.

Methods of the primary combination one-stage surgery using local shifting differed according to the form and size of wounds. In perforating injuries and in contused eyelid tissue, the strip of the dura mater was of such length as to facilitate its fixation to either canthus. In case of lacrimal duct injuries, the authors simultaneously performed their restitution.

For illustration, the authors present the following case:

Patient V., 22 years old, was admitted with a left-sided, extensive com-

plicated perforating injury of the eyelid and orbital region. The injury occured at the workplace by accident, a foreign body (a fragment of emery belt) entering the ethomoidal labyrinth.

The condition on admission: an extensive wound with gaping edges from the right frontal region obliquely between the eyebrow to the inner third of the upper eyelid, along the lower conjunctival fold, the medial third of the lower lid and the upper part of the facial zone. A part of the foreign body can be seen between the edges of the wound (Fig. 1).

On 22nd December 1977, primary surgical treatment and primary plastic surgery were performed with local shifting and with the removal of the foreign body from the ethmoidal labyrinth. The wound edges were opened by hooks. The foreign body (fragment of emery belt, measuring 5 × 4 mm), located beneath the bulb and ethmoidal labyrinth was taken out and carefully

Fig. 1. Patient V. Extensive perforating injury of the eyelid and orbital region caused by the entry of foreign body.

removed with bone forceps. The wound edges in the eyelid zone were widely separated: two flaps were formed: a) and b) (Fig. 2). Strips of allograft (dura mater) measuring 2 × 0.5 cm were put onto the wound region near the eyelid edges. The ends of the strips, slightly stretched in the horizontal direction, were sutured on one side into the subcutis of the internal canthus and, on the other side, to the anterior zone of the tarsus. The edges of the conjunctiva were sutured by catgut, very fine stitches being used for the cutaneous edges (fig. 2/1—3, fig. 3). The wound healed by first intention. After 10 years, the eyelids are in correct position and they close. The upper lid suffers from partial traumatic ptosis but the patient refuses to have it removed. The patient is satisfied with the outcome of the operation (Fig. 4).

The authors performed primary combination skin surgery using a free transfer in case of non-perforating eyelid injury when a tissue defect was involved. The surgical procedure was as follows: the wound edges were widely separated, a strip of dura mater was inserted subcutaneously near the lid edge and its ends were sutured into the subcutis. The skin transplant taken from

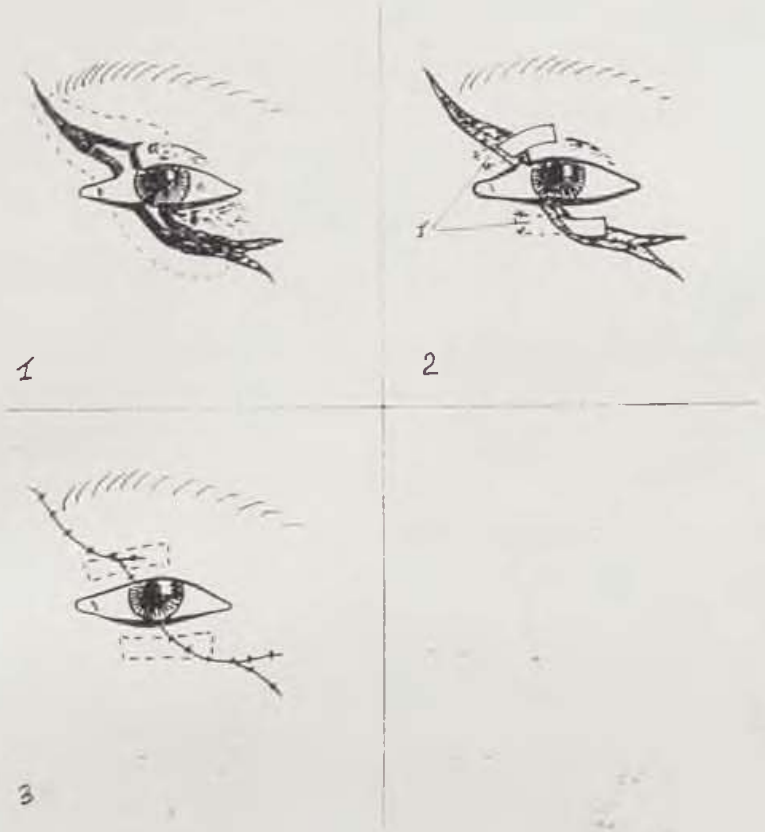

Fig. 2. Schema of primary combination surgery of the eyelid and orbital zone in patient V; 1. Suture of allogenic strips into subcutis of the inner half of lids. 2. Skin flap modelling a) and b) and separation of edges. 3. Suture of the other end of strips while they are stretched; suture of the wound edges.

the posterior part of the auricle or the inside of the arm was sutured to the edges of the skin defect. The dimensions of the skin transplant depended on the dimensions of the skin defect of the eyelid.

The primary complete combination blepharoplasty using one-flap pedicle was performed in cases of perforating injury accompanied by the defect of the external third of the lower eyelid. The surgery technique was as follows: the mucosa obtained from the oral cavity was sutured to the edges of the conjunctival defect. A strip of dura mater measuring 18 × 4 mm was sutured parallel to the eyelid edge. The one-pedicle flap taken from the temporal region was sutured to the edges of the skin defect.

In the post-operative period, the patients were given antibiotics, hemostatic and roborant drugs, and underwent magnetotherapy, reflexive therapy, etc.

Fig. 3. The same patient after surgery.

Fig. 4. The same patient after 8 years following operation

RESULTS AND ASSESSMENT

Healing by first intention was noted in 97 % cases of the basic group. Complications occurred in 3 % patients after surgery, one patient with almost totally avulsed and contused lower lid suffered from partial necrosis. Partial exposure of the transplant, followed by a rapid epithelialization, occurred in 2 patients, the functional result not being affected. On discharge, the functional and aesthetic results were considered good in 96 % persons, in 4 % satisfactory.

The discharged patients continued to be followed up for the period of 10 years. In 97 % of patients the result was good: the lids were in correct position, scars were soft, slightly visible. A partial success of the primary surgery in 3 persons of the basic group was due to the incorrect choice of technique which later required correction.

The healing by first intention in the control group was noted in 84.3 % of patients. A partial suture dehiscence was observed in 15.7 % of persons. This complication was due to the great tension in the wound edges, especially in the region of the lid margin, already observed during suture.

On discharge, good results were found in the control group in 76.4 % cases, satisfactory in 23.6 %; in the later period a good result was achieved in 73.7 % patients. The condition of 26.3 % of cases was assessed as being only satisfactory due to the scarry lid deformation.

Our follow-up showed that after a longer time period, the aesthetic and functional results were better in the basic group of the patients. This seems to be primarily due to the immediate use of allotransplantation and consolidation of the supportive connective tissues of the eyelid during primary surgical treatment.

SUMMARY

For the purpose of stabilizing the supportive connective tissue of the eyelid in mechanical non-gunshot injuries, the authors developed a technique of primary combination plastic surgery performed simultaneously with primary surgical treatment. The technique consists in the transfer of allogenic tissues (dura mater, amnion and others) performed already during the primary surgical treatment with the aid of one of the techniques used in one-stage autotransplantation (local shifting, free transfer, one-pedicle flap). Primary combination blepharoplasty (mostly performed by local shifting) was carried out in 120 patients with mechanical eyelid injury. Healing by first intention was seen in 97 % of patients, and in 84 % of persons of the control group. Good aesthetic and functional results were noted in the basic group of the patients in 96 % when discharged, later on, in 97 %; good results were also achieved in the control group — 76.4 % of discharged patients, and after a time interval in 23.7 %. Primary combination plastic surgery of the eyelid has a wide range of indications in cases of non-gunshot injuries, in adults and children alike.

Key words: eyelids, injury, plastic surgery.

RÉSUMÉ

Homogreffe chez les traumatismes non-ballistiques des paupières

Zaïkova, M. V., Loubnine, V. G., Koroleva, J. V.

Afin de consolider l'appareil conjonctif de soutien des paupières chez les traumatismes non-ballistiques, on a élaboré une méthode de plastie combinée primaire, effectuée en même temps avec le traitement chirurgical primaire. La méthode consiste au transfert des tissus allogènes (dure mère, amnia et d'autres) qui est effectué déjà lors du traitement chirurgical primaire. On se sert d'une des méthodes d'autogreffe à un temps (glissement local, transfert libre, lambeau à un pédicule). La blépharoplastie combinée primaire (généralement par glissement local) a été effectuée chez 120 patients présantant un traumatisme non-ballistique des paupières. La guérison per primam était constatée chez 97 % de malades, dans un groupe témoin chez 84 % de malades. Un bon résultat cosmétique et fonctionnel était marqué dans le groupe de base en 96 % au moment de renvoie, en 23,7 % avec un recul de temps. La plastie combinée primaires des papuières se distingue par un vaste champs d'indication auprès des traumatismes non-ballistiques, et cela chez les adultes, ainsi que chez les enfants.

ZUSAMMENFASSUNG

Eine Allotransplantation bei nonsclopetarischen Verwundungen der Augenlider

Zajkowa, M. V., Lubnin, V. G., Korolowa, J. V.

Zwecks Festigung des stützenden Bindegwebes der Augenlider bei nonsclopetarischen Verwundungen wurde eine Methode der primären kombinierten Plastik ausgearbeitet und zugleich mit der primären chirurgischen Behandlung angewandt. Diese Methode besteht in einer Übertragung allogener Gewebe (harte Gehinhaut, Amnion usw.) bereits bei der primären chirurgischen Behandlung unter Anwendung einer der Methoden der einstufigen Autotransplantation (örtlicher Verschub, freie Übertragung, einstieliger Lappen). Diese primäre kombinierte Blepharoplastik (überwiegend örtliche Verschiebung) wurde bei 120 Patienten mit nonsclopetarischen Verwundungen der Augenlider ausgeführt. Das Verheilen per primam wurde bei 97 % der Patienten festgestellt, in der Kontrollgruppe bei 84 %. Ein gutes kosmetisches und Funktionsergebnis wurde bei der grundlegenden Patientengruppe bei der Entlassung in 96 % der Fälle festgestellt, im Laufe der Zeit bei 97 %, und in der Kontrollgruppe bei der Entlassung in 76,4 % der Fälle. im Laufe der Zeit bei 23,7 %. Die primäre kombinierte Plastik der Augenlider besitzt ein weites Indikationsfeld bei nonsclopetarischen Verwundungen der Augenlider und dies sowohl bei Erwachsenen als auch bei Kindern.

RESUMEN

Alotransplantación en las heridas mecánicas del párpado

Zajkova, M. V., Lubnin, V. G., Koroleva, J. V.

Con el fin de consolidar el tejido conectivo soportador del párpado en las heridas mecánicas (excluyendo los escopetazos), los autores elaboraron una técnica de la primaria cirugía plástica combinada efectúada simultáneamente con el primer tratamiento quirúrgico. La técnica consiste en la transferencia de los tejidos alogéneos

(dura mater, amnion) ya realizada durante el tratamiento primero quirúrgico con ayuda de uno de los métodos de la autotransplantación de una etapa (la traslación local, la tranferencia libre, el colgajo de un pedículo). La blefaroplastía primaria combinada (efectúada principalmente por la traslación local) fué realizada en 120 enfermos con las heridas mecánicas del párpado (excluyendo los escopetazos). La curación per primam fué logrado en 97 % de los pacientes y en 84 % de los enfermos en el grupo de control. Un bueno resultado cosmético y funcional se observó en el grupo básico de los enfermos a la salida del hospital — 96 %, después del lapso de tiempo en 97 % de casos y en el grupo de control este resultado se logró en 76,4 % de los pacientes a la salida del hospital y más tarde en 23,7 % de casos. La blefaroplastía primaria combinada tiene un gran escala de indicaciones en las heridas mecánicas de los párpados no solamente en los adultos pero también en los niños.

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ANTHROPOMETRIC RESEARCH OF THE LATERAL SURFACE AND THE EDGE OF THE EARS IN GROWN-UP BULGARIANS

M. M. Madzharov

The lateral surface and the edge of the ears have a complex and individual relief. There are almost as many kinds of ears as people exist. That's why criminological medicine expertise sometimes identifies persons by their ears. Therefore, dimensions and form of the basic elements and anatomic details of the lateral surface and the edge of the ears is of utmost importance for their aesthetical view. That's why knowledge of the normal average values of these dimensions and their varieties in grown-up persons appears to be an objective criterion in plastic forming of ears in art as a whole and in plastic surgery in particular.

The review of the literature, however, shows that a profound anthropometric research of the relief of the lateral surface and the edge of the ears has not been made in our country and abroad, which is the task of this work.

MATERIAL AND METHODS OF RESEARCH

For the purpose of researching of the relief of the lateral surface and the edge of the ears, during the period from 1975 to 1979 we took 44 dimensions of 450 Bulgarians — 225 men and 225 women aged between 21 and 40 from all districts of Bulgaria, all clinically healthy and without visible deviations from normal human ears.

In defining the dimensions the classical anthropometric points by Martin-Saller (2) were used (Fig. 1) and the 34 new anthropometric points determined by us (Fig. 2). The measurement was done with the cephalometer apparatus designed by us (Fig. 3) and of separate parameters only, using tape-measure and compasses. Anthropometric methods and biostatistic characteristics are described in details in another study (1). Here are exposed the average values only ($\bar{x}$) and their variations (min-max) which may be used as norms in plastic forming of the ears.

RESULTS

The final results of the studies are shown in Table 1. According to these results anthropometric characteristics have been made (mm) of the basic

(outer) dimensions, anatomic parts and details of the lateral surface and the edge of the ears. According to the table, 5 basic dimensions concern the ear and the ear cartilage as a whole, the remaining 39 characterize eight anatomic parts which are distributed as follows: 1. lobulus auriculae — 3; 2. concha auriculae — 8; 3. tragus — 2; 4. antitragus — 2; 5. incisura intertragica — 2; 6. anthelix — 9; 7. helix — 11; 8. porus acusticus externus — 2.

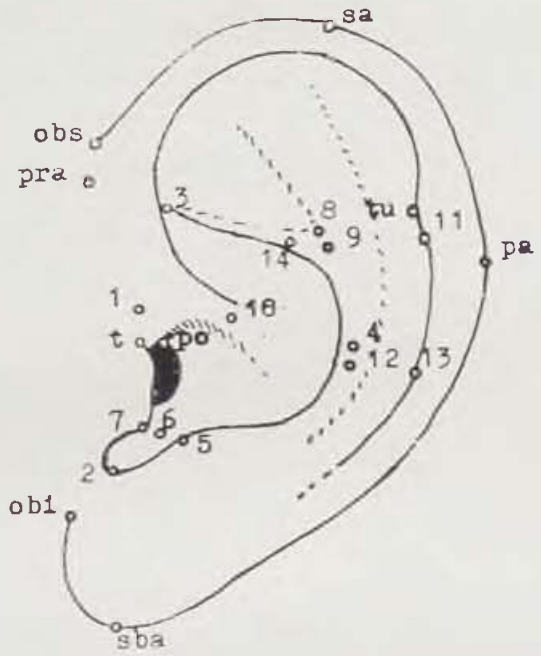

Fig. 1. Well known anthropometric points (by Martin-Saller)

A. with defined abbreviation: **sa** — superaurale, **sba** — subaurale, **pa** — postaurale, **pra** — praeaurale, **tu** — tuberculare (tuberculon), **obs** — otobasion superius, **obi** — otobasion inferius, **po** — porion, **t** — tragion

B. With undefined abbreviation: 1 — front end of incisura auriculae anterior, 2 — the deepest part of incisura intertragica, 3 — the frontest point of the crest of crus anthelicis anterior, 4 — point of crossing of the crest of anthelix with the line, drawn perpendicular to the physiognomic length of ear from the point of the front end of incisura auriculae anterior, 5 — the most protruding lateral point of the top of antitragus, 6 — middle point of the line, drawn between the top of antitragus and the top of the lower tuberculum of tragus, 7 — lower tuberculum of tragus, 8 — bifurcation of crura anthelicis, 9 — the crossing point between crest of anthelix and the line of morphologic width of the ear, 10 — the crossing point between crest of a crus helicis and line of physiognomic length of the ear, 11 — the crossing point between the edge of helix and the horizontal line, drawn through the point of bifurcation of crura anthelicis, 12 — the crossing point between anthelix and the horizontal line, drawn through porion, 13 — the crossing point between the edge of helix and horizontal line drawn through porion, 14 — the crossing point between crus anthelicis anterior and the line of physiognomic length of the ear

Numerical data in the table describe the average values ($\bar{x}$) of these dimensions and their variations (min—max) in mm for two sexes in the Bulgarian population.

CONCLUSION

Lateral surface and the edge of the ears has been characterised, as their complex relief can be investigated antropometrically. Having in mind, that the

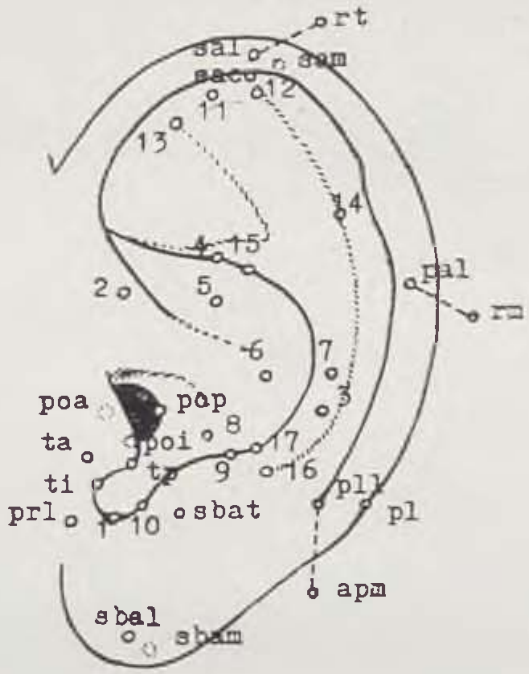

Fig. 2. Anthropometric points newly defined by us

A. With defined abbreviations: **pal** — postaurale laterale, **sbat** — subantitragion, **pll** — postlobulare laterale, **pl** — postlobulare, **prl** — praelobulare, **sbal** — subaurale laterale, **sbam** — subaurale mediale, **poa** — porion anterior, **ti** — tragion inferius, **tp** — tragion posterius, **ta** — tragion anterius, **sal** — superaurale laterale, **sam** — superaurale mediale, **sac** — superaurale caudale, **poi** — porion inferior, **pop** — porion posterior, **apm** — apex processus mastoidei, **rm** — regio mastoidea, **rt** — regio temporalis

B. With undefined abbreviation: 1 — lowest point of the lower edge of incisura intertragica, 2 — the crossing point between crest of crus helicis and the length line of concha propria, 3 — the crossing point between crest of anthelix and the width line of cavum conchae, 4 — the most protruding laterally point from the crest of crus anthelicis anterior, 5 — the deepest point of cymba conchae, 6 — the first point of crus helicis in concha propria, 7 — the crossing point between crest on anthelix and the horizontal plane, drawn through the first point of crus helicis, 8 — the deepest point of cavum conchae, 9 — upper (back) frontier point of antitragus, 10 — point of transit of antitragus in incisura intertragica, 11 — point of transit of crest of crus anthelicis posterior in the channel of helix, 12 — back frontier point of the upper end of crus anthelicis posterior, 13 — anterior frontier point of the upper end of crus anthelicis posterior, 14 — posterior frontier point of the upper end of the body of anthelix, 15 — anterior frontier point of the upper end of the body of anthelix

exact re-creating of the form of the lateral surface of ears is an extremely difficult task, researching of average values and variations of its sizes are of special interest. The results taken by 44 investigated sizes in grown-up

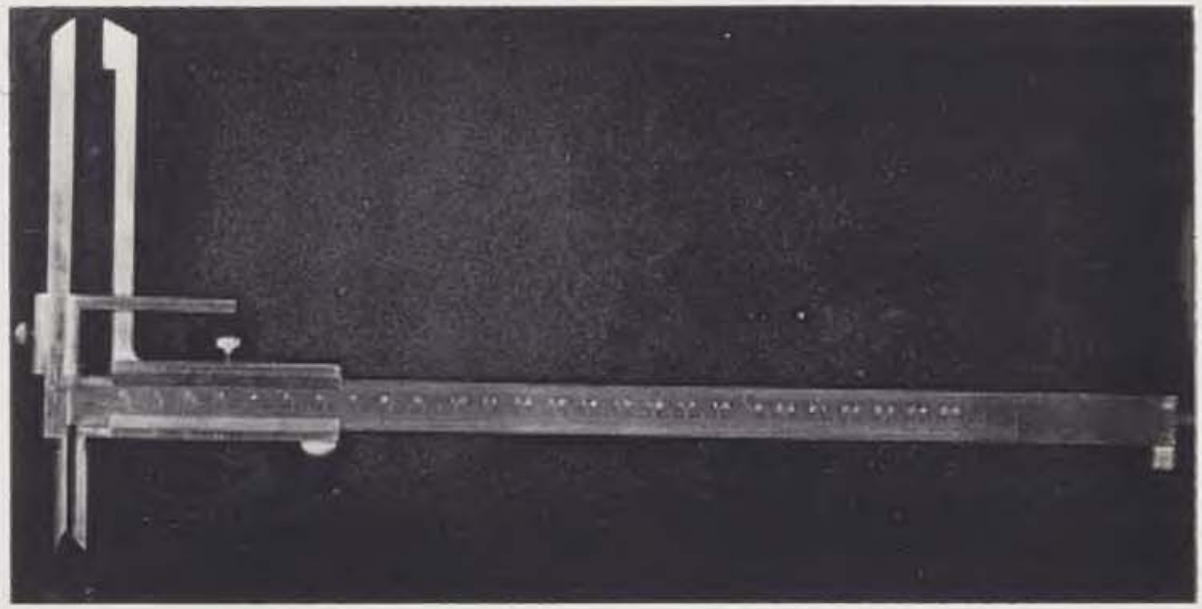

Fig. 3. Cephalometrics apparatus

Bulgarians can be accepted as norms not only in plastic forming of the ears in art and plastic surgery, but also in other clinical and non clinical disciplines like otorhinolaryngology, criminological medicine, anatomy and so on.

SUMMARY

For the purposes of art as a whole and of plastic surgery in particular an anthropometric research of lateral surface and the edge of the ears has been carried out from 1975 to 1979 among 450 grown-up persons of Bulgarian origin (♂ = 225, ♀ = 225). Using an apparatus for cephalometrics constructed by the author of this study, compasses and measuring tape, applying the classical points of Martin-Saller and the defined by the author 34 new anthropometrical points the average values (mm) are accepted and their variations of 44 dimensions. Five of the shown features determine the outer dimensions of the ear and the ear cartilage, and the remaining 39 — the dimensions of the basic anatomical parts of the lateral surface of the ear, as follows: 1. lobulus auriculae, 2. concha auriculae, 3. tragus, 4. antitragus, 5. incisura intertragica, 6. anthelix, 7. helix, 8. porus acusticus externus. It is considered, that knowing of these dimensions in grown-up persons can have a leading role in re-creating and sculpturing of the ears.

Dimensions (mm) of the lateral surface and the edge of the ears in Bulgarians between 21 and 40 years old

N	Dimensions	Sex	Age	n	x̄	SD	m	v	min-max
1	2	3	4	5	6	7	8	9	10
A.	BASIC DIMENSIONS								
	1. Physiognomic length of the ear (29)* (sa-sba)	♂	21—30	125	63,65	3,97	0,70	6,23	51—73
			31—40	100	65,93	4,01	0,80	6,09	53—75
		♀	21—30	125	58,88	2,93	0,51	4,98	52—66
			31—40	100	58,63	3,46	0,69	5,90	50—68
	2. Morphologic length of the ear (32) (obs-obi)	♂	21—40	100	51,03	3,38	0,68	6,62	43—59
		♀	21—40	100	48,02	3,67	0,73	7,65	40—57
		♂	21—30	125	38,60	2,47	0,43	6,39	31—46
			31—40	100	39,15	2,62	0,52	6,69	31—45
	3. Physiognomic width of the ear (30) (pa-pra)	♀	21—30	125	35,08	2,24	0,39	6,39	28—42
			31—40	100	35,12	2,68	0,54	7,63	30—41
	4. Morphologic width of the ear (tu-front end of inc. auriculae ant.) (31)	♂	21—40	100	30,51	3,36	0,67	11,00	23—38
		♀	21—40	100	27,17	2,53	0,51	9,31	21—33
	5. Length of the ear cartilage (sa-sbat)	♂	21—30	125	43,69	3,42	0,60	7,02	38—56
			31—40	100	49,84	3,50	0,70	7,02	38—59
		♀	21—30	125	44,70	2,67	0,47	5,97	38—52
			31—40	100	44,30	3,36	0,67	7,58	36—54
B.	ANATOMIC PARTS AND DETAILS								
	I. Lobulus auriculae								
	1. Length of lobulus auriculae (sba-sbat)	♂	21—30	125	15,03	2,47	0,43	16,41	10—22
			31—40	100	16,45	2,51	0,50	15,24	12—23
		♀	21—30	125	14,21	2,16	0,38	15,20	9—22
			31—40	100	14,44	2,10	0,42	14,57	9—20
	2. The largest width of lobulus auriculae (pl-prl)	♂	21—30	125	28,69	2,61	0,46	9,10	21—35
			31—40	100	29,00	2,93	0,59	10,09	22—35
		♀	21—30	125	27,04	2,68	0,47	9,92	20—34
			31—40	100	27,10	2,33	0,47	8,60	21—33
	3. Thickness of lobulus auriculae (sbal**-sbam)	♂	21—30	125	6,41	0,95	0,19	14,82	4—9
		♀	21—40	100	6,07	0,86	0,17	14,22	4—8

N	Dimensions	Sex	Age	n	x	SD	m	v	min-max
1	2	3	4	5	6	7	8	9	10
	II. Concha auriculae								
	1. Length of concha propria (34) (Fig. 1, point 3 — Fig. 1, point 2)	♂	21—30	125	26,46	1,94	0,34	7,34	21—32
			31—40	100	26,84	1,80	0,36	6,72	22—30
		♀	21—30	125	24,89	1,88	0,33	7,55	19—30
			31—40	100	24,78	1,80	0,36	7,28	21—29
	2. Width of concha propria (34-1) (Fig. 1, point 1 — Fig. 1, point 4)	♂	21—40	100	22,93	2,22	0,44	9,70	18—29
		♀	21—40	100	21,75	2,44	0,49	11,23	17—28
	3. Length of cavum conchae (Fig. 1, point 2 — Fig. 2, point 2)	♂	21—30	125	17,82	1,61	0,28	9,03	13—22
			31—40	100	18,05	1,74	0,35	9,64	14—22
		♀	21—30	125	17,30	1,58	0,28	9,13	13—32
			31—40	100	17,04	1,51	0,30	8,86	14—21
	4. Width of cavum conchae (poa — Fig. 2, point 3)	♂	21—30	125	31,58	2,31	0,42	7,63	25—38
			31—40	100	31,60	2,48	0,50	7,85	27—39
		♀	21—30	125	29,24	1,98	0,35	6,76	24—34
			31—40	100	29,12	1,96	0,39	6,73	25—34
	5. Length of cymba conchae (Fig. 1, point 3 — Fig. 2, point 2)	♂	21—30	125	8,54	1,39	0,24	16,28	5—12
			31—40	100	8,88	1,64	0,33	18,47	6—13
		♀	21—30	125	7,62	1,58	0,28	20,73	4—11
			31—40	100	7,70	1,55	0,31	20,13	5—12
	6. Depth of cymba conchae (Fig. 2, point 4 — Fig. 2, point 5)	♂	21—30	125	9,72	1,85	0,33	19,07	7—15
			31—40	100	9,62	1,27	0,25	13,21	7—12
		♀	21—30	125	10,30	1,25	0,22	12,14	7—13
			31—40	100	10,12	1,29	0,26	12,75	7—13
	7. Depth of concha propria opposite crus helicis (Fig. 2, point 7 — Fig. 2, point 6)	♂	31—40	125	9,80	1,54	0,27	15,71	6—14
		♀	31—40	125	9,28	1,63	0,29	17,56	5—13
	8. Lower depth of concha propria (Fig. 1, point 5 — Fig. 2, point 8)	♂	21—30	125	13,22	1,47	0,26	11,14	10—17
			31—40	100	13,20	1,27	0,25	9,64	10—16
		♀	21—30	125	12,30	1,19	0,21	9,67	9—15
			31—40	100	12,47	1,24	0,25	9,92	9—16
	III Tragus								
	1. Length of tragus (t-ti)	♂	21—30	125	14,21	1,32	0,23	9,26	11—18
			31—40	100	14,95	1,40	0,28	9,33	11—18
		♀	21—30	125	12,90	1,23	0,22	9,53	9—16
			31—40	100	13,05	1,19	0,24	9,16	10—16
	2. Width of tragus (tp-ta)	♂	21—30	125	8,99	1,18	0,21	13,16	7—14
			31—40	100	9,00	1,25	0,25	13,88	7—13
		♀	21—30	125	8,10	0,92	0,16	11,36	6—10
			31—40	100	8,32	0,99	0,20	11,88	6—11

N	Dimensions	Sex	Age	n	x̄	SD	m	v	min-max
1	2	3	4	5	6	7	8	9	10
	IV. Antitragus								
	1. Length of antitragus (Fig. 2, point 9 — Fig. 2, point 10)	♂	21—30	125	13,83	1,41	0,25	10,21	10—19
			31—40	100	14,49	1,42	0,28	9,83	11—18
		♀	21—30	125	13,10	1,06	0,19	8,10	9—17
			31—40	100	13,05	1,17	0,23	8,96	10—16
	2. Level of protrusion of antitragus (Fig. 1, point 5 — prl-pl)	♂	21—40	125	3,31	1,60	0,28	48,23	0—7
		♀	21—40	100	3,32	1,41	0,25	42,34	0—6
	V. Incisura intertragica								
	1. Length of incisura intertragica (35-a) (Fig. 1, point 6 — Fig. 1, point 2)	♂	21—40	100	6,83	1,18	0,24	17,33	4—10
		♀	21—40	100	6,40	1,02	0,20	15,93	4—8
	2. Width of incisura intertragica (35) (Fig. 1, point 7 — Fig. 1, point 5)	♂	21—40	100	6,90	1,58	0,32	22,87	4—12
		♀	21—40	100	6,44	1,53	0,31	23,78	3—12
	VI. Anthelix								
	1. Distance between crus anthelicis anterior and apex auriculae (33-3) (Fig. 1, point 14 — sa)	♂	21—40	100	24,90	1,86	0,37	7,46	20—30
		♀	21—40	100	22,31	1,71	0,34	7,68	18—27
	2. Length of anthelix (Fig. 2, point 11 — Fig. 2, point 9)	♂	21—40	100	44,57	3,67	0,73	8,24	36—53
		♀	21—40	100	39,61	3,82	0,76	9,65	31—50
	3. Length of crus anthelicis posterior (Fig. 2, point 11 — Fig. 1, point 8)	♂	21—40	100	15,48	1,63	0,33	10,52	12—20
		♀	21—40	100	14,40	1,51	0,30	10,49	10—18
	4. Length of crus anthelicis anterior (Fig. 1, point 3 — Fig. 1, point 8)	♂	21—40	100	15,92	1,74	0,35	10,90	12—19
		♀	21—40	100	15,02	1,93	0,39	12,87	11—21
	5. Distance between ends of crura anthelicis (Fig. 2, point 12 — Fig. 1, point 3)	♂	21—40	100	14,90	1,53	0,31	10,24	12—19
		♀	21—40	100	14,19	1,64	0,33	11,52	11—19
	6. Width of the upper end of crus anthelicis post. (Fig. 2, point 12 — Fig. 2, point 13)	♂	21—40	100	12,45	1,36	0,27	10,92	10—17
		♀	21—40	100	11,96	1,40	0,28	11,70	9—15
	7. Width of the upper end of the body of anthelix (Fig. 2, point 14 — Fig. 2, point 15)	♂	21—40	100	14,43	1,50	0,30	10,38	10—18
		♀	21—40	125	12,83	1,70	0,30	13,21	8—16
	8. Width of the lower end of the anthelix (Fig. 2, point 16 — Fig. 2, point 17)	♂	21—40	100	5,64	1,14	0,23	20,14	4—8
		♀	21—40	125	5,34	1,16	0,20	21,68	3—8

N	Dimensions	Sex	Age	n	$\bar{x}$	SD	m	v	min-max
1	2	3	4	5	6	7	8	9	10
	VII. Helix								
	1. Physiognomic length of helix (Fig. 2, point 6 — pll)	♂	21—40	100	120,14	6,59	1,32	5,49	101–136
		♀	21—40	100	108,69	6,89	1,38	6,34	92–129
	2. Morphologic length of helix (obs-pll)	♂	21—40	100	91,36	5,16	1,03	5,65	76–106
		♀	21—40	100	82,08	6,16	1,23	7,51	67—99
	3. Length of crus helicis (Fig. 2, point 6 — obs)	♂	21—40	100	28,65	2,80	0,56	9,78	20—36
		♀	21—40	100	26,66	2,49	0,50	9,36	21—32
	4. Width of helix (sal-sam)	♂	21—30	125	7,42	1,17	0,20	15,75	4—11
			31—40	100	7,21	1,01	0,20	14,05	4—10
		♀	21—30	125	6,78	0,92	0,16	13,57	5—9
			31—40	100	6,86	0,89	0,18	12,97	4—9
	5. The superaurale to superaurale caudale distance (sa-sac)	♂	21—40	100	4,69	0,83	0,17	17,65	3—7
		♀	21—40	100	5,21	1,12	0,22	21,42	2—8
	6. Thickness of helix (sal — medial surface of the end of helix)	♂	21—40	100	3,67	0,66	0,13	18,07	2—6
		♀	21—40	100	3,34	0,53	0,11	15,97	2—4
	7. Distance between tuberculum auriculae and anthelix (tu — Fig. 1, point 9), (36-1)	♂	21—40	100	10,87	2,76	0,55	25,35	6—19
		♀	21—40	100	8,28	2,77	0,55	33,47	3—19
	8. Distance between helix and anthelix on the level of bifurcation of crura anthelicis (Fig. 1, point 8 — Fig. 1, point 11)	♂	21—40	100	13,56	2,21	0,44	16,30	7—18
		♀	21—40	100	11,80	2,06	0,41	17,49	7—18
	9. Distance between helix and anthelix on the level of porus acusticus externus (Fig. 1, point 12 — Fig. 1, point 13)	♂	21—40	100	5,85	1,57	0,31	26,92	3—11
		♀	21—40	100	5,08	1,50	0,30	29,46	3—9
	10. Distance between crus helicis and apex auriculae (Fig. 1, point 10 — sa), (33-4)	♂	21—40	100	35,51	2,09	0,42	5,87	31—41
		♀	21—40	100	32,26	2,18	0,44	6,76	28—38
	11. Width of the ear to helix (pal-pra)	♂	21—40	100	34,80	2,56	0,51	7,36	28—41
		♀	21—40	100	32,55	2,56	0,51	7,86	26—38

N	Dimensions	Sex	Age	n	$\bar{x}$	SD	m	v	min-max
1	2	3	4	5	6	7	8	9	10
	VIII. Porus acusticus externus								
	1. Large diameter of porus acusticus externus (po-poi)	♂	21—30	125	10,26	1,28	0,22	12,51	7—13
			31—40	100	10,35	1,40	0,28	13,48	6—14
		♀	21—30	125	9,73	1,20	0,21	12,33	6—13
			31—40	100	9,84	1,16	0,23	11,83	7—13
	2. Small diameter of porus acusticus externus (pop-poa)	♂	21—40	125	6,99	1,02	0,18	14,53	5—10
		♀	21—40	125	6,57	1,13	0,23	17,27	3—10

*N according to R. Martin[2]
**sbal — subaurale laterale — a point where the physiognomic length of the ear (sa-sba) crosses the blunt outer edge of the ear-lobe

RÉSUMÉ

Examen antropométrique de la surface latérale et des bords de pavillons d'oreille chez les adultes en Bulgarie

Madzharov, M. M.

Ayant pour but l'aprofondissement de maîtrise de la chirurgie générale, et surtout de la chirurgie plastique, on a effectué, dans les années 1975—1979, les examens antropométriques de la surface latérale et des bords de pavillons d'oreille chez les sujets adultes, d'origine bulgare (♂ = 225, ♀ = 225). Se servant de l'appareil céphalométrique, mis au point par l'auteur de cette communication, du compas, du mètre à ruban, de points classiques Martin-Saller, et également de 34 points antropométriques, nouvellement déterminés par l'auteur, on a désigné les grandeurs moyennes (mm) et leurs variantes pour 44 dimensions. Parmi les caractéristiques désignées, 5 déterminent les dimensions extérieures du pavillon d'oreille et du cartilage auriculaire, les 39 autres caractéristiques déterminent les dimensions des parties anatomiques fondamentales de la surface latérale d'oreille, c'est-à-dire: 1. lobulus auriculae, 2. concha auriculae, 3. tragus, 4. antitragus, 5. incissura intertragica, 6. anthélix, 7. hélix, 8. porus acusticus externus. Nous en concluons que la connaissance des dimensions ci-dessus des sujets adultes puisse jouer un rôle important dans le prccès de formation et de remodelage de l'oreille.

ZUSAMMENFASSUNG

Die antropometrische Untersuchung der seitlichen Oberfläche und der Ränder der Ohren bei erwachsenen Bulgaren

Madzharov, M. M.

Zur Steigerung der Meisterschaft sowohl der allgemeinen als besonders der plastischen Chirurgie wurden in den Jahren 1975 bis 1979 antropometrische Messungen

der seitlichen Oberfläche und der Ränder der Ohren bei 450 erwachsenen Personen bulgarischer Herkunft ausgeführt (♂ = 225, ♀ = 225). Unter Anwendung eines vom Autoren dieser Mitteilung konstruktierten cephalometrischen Geräts, eines Zirkels, eines Messbandes und der klassischen Martin-Saller'schen Punkte sowie der ebenfalls vom Autoren neufestgelegten 34 antropometrischen Punkte wurden die durchschnittlichen Grössen (mm) und ihre Varianten für 44 Dimensionen bestimmt. Fünf der festgelegten Züge bestimmen die äusseren Abmessungen des Ohrs und des Ohrknorpelgewebes, die übrigen 39 die Abmessungen der grundlegenden anatomischen Teile der seitlichen Oberfläche des Ohrs, und zwar 1. lobulus auriculae, 2. concha auriculae, 3. tragus, 4. antitragus, 5. incisura intertragica, 6. anthelix, 7. helix, 8. porus acusticus externus. Man erachtet, dass die Kenntnis dieser Abmessungen bei Erwachsenen eine wichtige Rolle bei einer Neuformung und Modellierung des Ohrs spielen kann.

RESUMEN

La investigación antropométrica de la superficie lateral y de los bordes de las orejas en los adultos en Bulgaria

Madzharov, M. M.

Con el fin de alcanzar buenos éxitos en la cirugía general así como en la cirugía plástica, entre los años 1975—1979 se efectuaron mediciones antropométricas de la superficie lateral y de los bordes de las orejas en 450 adultos del orígen búlgaro (♂ = 225, ♀ = 225). Con ayuda del aparato cefalométrico construído por el autor de este papel y por medio del compás, cinta métrica y los puntos clásico de Martin-Saller así bien por medio de nuevos 34 puntos antropométricos fijados por el autor, se establecieron las cantidades medias y sus variantes para 44 dimensiones. Cinco de los puntos dados fijan las dimensiones exteriores de la oreja y del cartílago auricular, los otros 39 puntos fijan las dimensiones de las partes anatómicas fundamentales de la superficie lateral de la oreja, es decir: 1. lobulus auriculae, 2. concha auriculae, 3. tragus, 4. antitragus, 5. incisura intertragica, 6. anthelix, 7. helix, 8. porus acusticus externus. El autor es de opinión que el conocimiento de estas dimensiones en las personas adultas puede jugar un papel importante en la reconstrucción y formación de la oreja.

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RECENT ADVANCES IN BURN WOUND MANAGEMENT IN CHINA

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INTRODUCTION

Wound management has an extremely important place in burn treatment. In recent years some progress in several spheres has been achieved in our country, i. e. widening the range of surgical indications; application of micro-skin grafts; exploration of new wound coverings; epidermal cell culture and transplantation as well as development of topical antimicrobial agents.

I. WIDENING THE RANGE OF SURGICAL INDICATIONS

Early escharectomy, tangential excision followed by immediate autotransplantation have been increasingly used in patients with moderate or small deep burns (third degree and deep second degree burns), especially in those with burns on functional parts of the body, such as the hand, face, neck, perineum and all extremity regions. Thus the functions and appearance of such burned patients have been greatly improved. In other words, with regard to plastic surgery, we have achieved far better results in those burned patients.

Third degree burns with deep tissue damage, such as electrical burn and heat-compression burn, commonly occur in the carpus region. Beside pedicle flap transfer, reverse island forearm flap, groin and dorsal pedis free flap have been increasingly applied to the early debrided wound recently, and the results are satisfactory. As electrical burns have their own specific features, one should be careful not only to remove the necrotic tissues but at the same time to preserve viable tendons, nerves, etc. as much as possible during débridement as well as in flap covering, as this usually can prevent further necrosis and infection, and facilitate the recovery of limb functions.

In the past, we often used the exposure method in the management of deep facial and neck burns in order to protect the eschar from moisture as well as an early infection. We removed the eschar when it began to slough off spontaneously and transplanted autograft skin. Nevertheless, we observed after a period of time that the cicatrization on the face and neck resulted in very unfavourable functional and cosmetic sequellae. The possibility of im-

provement of the scars by reconstructive surgery was very limited. It has been proved that early escharectomy, tangential excision and large pieces of skin graft along the division line of the face can yield far better results, early as well as late ones, than those obtained in the past. However, there is still a controversy which skin thickness should be used: thinner split thickness, split thickness or full thickness skin (1). The granulomatous tissue on the face can also be cut off and large sheets of thinner split thickness skin are grafted, and, except for the neck wound, split thickness is recommended in order to decrease scar formation.

II. APPLICATION OF MICRO-SKIN GRAFTS

This surgical procedure has been quite successful since the method of transplantation combining allo- and autografts in the treatment of extensive deep burns was discovered in China. Auto-split thickness skin is cut into tiny pieces smaller than 1 mm, which are spread on a piece of silk cloth. Normal saline is added to let the micrografts float up; then the fluid is drained out through a perforated tray leaving the micrografts on the silk cloth with its epidermis facing upward at more than 99 %. This effect is due to the fact that the total amount of fat in the epidermis is 6 times greater than that in the dermis, and therefore the specific gravity of the former is prominently lower than the latter. The micrografts are then transferred to a large sheet of allograft used for transplantation. About 4 weeks after operation, most of the allografts become necrotic and turn into dry crust, and when this peels off, the micrografts coalesce and cover the whole wound.

The advantages are as follows: 1. the expansion ratio of the micrografts reaches a maximum of 15.5 : 1 (slightly higher than the combination method which corresponds to 7—10 : 1); 2. the healed wound becomes smooth and less scarred; 3. less medical personnel and time are needed for the operation. At present, the above method is being widely used all over the country. According to the published data, the largest burn surface areas treated by this method were 95/85 and 94/84. In granulating wounds, when compared to fresh wounds, the application of this method results in the following differences: 1. an initial excision of the superficial granulating tissue not only diminishes the local infection but also leaves the wound surface smoother; 2. use of thinner split thickness allograft, 5 × 5 in dimension; 3. the expansion ratio of the micrografts is 7—10 : 1; 4. after the union of the micrografts, allografts turn into crust and peel off. The wound heals completely within about one month (2).

III. EXPLORATION OF NEW WOUND COVERINGS

Beside skin autograft, wound coverings have become an indispensable condition in the treatment of extensive deep burns. Their aim is to diminish the loss of body fluids and proteins, to provide protection against bacterial invasion, to reduce pain and to promote the autograft expansion as well as an overall wound healing.

1. The storage of skin grafts

1. Refrigeration at 4°C:

Upon the immersion of the skin in RPMI-1640 solution, one week later, the vitality of the skin is about 90 % (only 33—48 % are immersed in normal saline), the optimum ratio of the skin graft and cell culture medium being 2—4 cm^2/ml. Beside the autograft, it can also preserve a fresh allograft for about 1 week to be used for emergency burn operation, thereafter the remaining skin is placed in a liquid nitrogen container (3).

2. Very low temperature:

The present opinion is that skin preserved in liquid nitrogen is nearly as effective as fresh skin. In the course of 642 days of preservation, allografts preserved in liquid nitrogen were used to cover excised wounds, their survival rates exceeding 90 %.

3. Softened freeze-dried glutaraldehyde skin:

The skin immersed in 0.9% sodium chloride 30 minutes prior to application may be used on wounds after escharectomy or on granulating wounds. If the autografts are placed 0.8 cm apart, they join together in about 20 days. At present, such skin can be regarded as good wound dressing next to cryopreserved skin (4).

4. Chlorhexidine-alcohol refrigerated porcine skin:

It can be stored for a long time at 4 °C in refrigerator. Immersed in isotonic saline for 1.5—3 hrs. prior to application, the skin can be used in superficial non-infected burn wounds.

5. Refrigerated amniotic membrane:

The membrane stored at 4 °C in a refrigerator may be used as cover in non-infected second degree or deep second degree burn wounds. Most wounds heal beneath the crust.

6. Glutaraldehyde-preserved bovine amniotic membrane:

The membrane can be stored for a long time at room temperature. It may be used for second degree burn wounds (5).

2. Prolongation of survival time of allo- and xeno-skin grafts:

It is evident that Langerhans' cells (LC) in the epidermis play a key role in the rejection process of skin transplantation. Beside dexamethasone and flucinolone acetonide, several new methods have been investigated for delaying the onset of rejection:

a) RPMI-1640 skin stored at 4°C: following the xeno-transplantation, the 7-day survival period of stored mouse skin was significantly prolonged compared with the control group. Simultaneously, the ATPase content in the LC was significantly lower than that in the control.

b) Short-wave ultra-violet rays were used to irradiate the dermal surface of mouse skin and medium-wave rays for guinea pig skin, both of them

causing a significant delay in the onset of rejection. The colour of ATPase in the LC of the former becomes pale and histologic observation in the latter showed that the onset of cellular infiltration delayed from 3 days in the control group to 13 days (6).

c) Medicinal herbs: 0.3 % of Gui-zhi broth was used for immersion of rabbit skin prior to xeno-transplantation. Due to this, the survival time of the rabbit skin was prolonged from 8.7 to 12.2 days ($p < 0.01$) in the control group, and the rosette formation test as well as the vacuole formation tests showed that Gui-zhi broth had an inhibitory effect both on T cells and B cells.

d) Triamcinolone acetonide: after the LACA mouse skin was treated in vitro with triamcinolone acetonide, the ATPase relative content in the LC of the epidermal layer was significantly lower than that in the control group.

3. Composite skin

Allo- and xeno-skin grafts can cover the wound temporarily and form a "frame" for the expansion of auto-skin, but due to its high content of transplantation antigen in the epidermis, an early rejection occurs. Therefore, it is recommended to substitute the epidermis with some kind of membraneous layer — auto-epidermis or other biological membranes, as these do not contain transplantation antigen — to form "composite skin" together with xeno-dermis. This is a new type of wound covering available for clinical use which at present is under experimental testing.

1. After the application of xeno-dermis of porcine skin treated with trypsin and covered with auto-epidermis, no signs of rejection were observed during a 4-months follow-up period (7).

2. Epidermis and dermis were obtained from mice and pigs respectively and both combinations of auto-epidermis and xeno-dermis were used to cover fresh wounds. Hair growth was observed on both composite skins with no signs of rejection.

3. Porcine dermis transplanted on Kun-ming mice and covered with cellophane membrane or glutaraldehyde bovine amniotic membrane, adhered closely with no signs of rejection.

IV. EPIDERMAL CELL CULTURE AND TRANSPLANTATION

Collagen smeared on F_{46} membrane, on which epidermal cells were cultured, made it possible to take the cultured epidermal cell sheet out of the culture dish intact without contraction. Cultured with fibronectin as a substrate, the human epidermal cells join together, proliferate and expand faster than they do with other substrates, and the time period from the inception to the formation of an epidermal cell sheet has shortened to 5—13 days (8). It was reported that epidermal cells could be transferred in series to six subcultures. After culturing the autogenic epidermal cell, sheets were grafted on the escharectomized wound or a single epidermal-cell suspension was prepared with trypsin and dropped into the holes of the allogenic skin which

was spread on the escharectomized wound; on the 18th day, epithelium was found between the wound at the allogenic skin. A very interesting discovery was made that after the cultured allogenic epidermal cell sheets were applied to fresh escharectomized wounds, no immune rejection phenomenon was seen from 50 days to 16 months. Thus we believe that the emphasis in the study of epidermal cell culture should be laid on a serial subculture transfer and the improvement of grafting techniques. However, it is still necessary to carry out further investigations of allogenic cultured epidermal cells.

V. DEVELOPMENT OF TOPICAL ANTIMICROBIAL AGENTS

The extensive use of Sulfamylon and silver sulphadiazine has effectively reduced and postponed burn wound infection as well as increased the survival rate. This, however, gives rise to the following problems: the drug-resistant bacterial strains gradually appear and predominant bacterial species change. Specialists in our country have carried out many investigations in this respect. At present, it is believed that the third-generation pyridonic acid derivative — silver norfloxacin is a more promising topical agent. It has been confirmed (9) that silver sulphadiazine-resistant pseudomonas aeruginosa are hypersensitive to the agent in vitro and in experiments with animals. But the conclusions still depend on the outcome of clinical trials. In burn units, ointments containing Zn-SD_2 have been used more frequently in recent years. The Compound Quick Healing ointment consisting of 4 % of Zn-SD_2 and 2 % of Ag-SD was reported to have the best composition of Zn-SD_2. It has powerful anti-microbial and wound-healing promoting effects. Besides, cerium nitrate/silver sulphadiazine is also a new useful agent that has several advantages: broad spectrum, stronger ability of inhibiting bacteria, lower toxicity and a better wound-healing effect (10).

SUMMARY

The latest advances in burn wound management in China may be summarized as follows: 1. Escharectomy, tangential excision and skin grafting is being performed widely in moderate and small deep burns especially in functional sites; immediate flap transfer after débridement for deep third degree burns; tangential excision, escharectomy and large sheet skin grafting along the division lines of the face for deep facial burns. 2. Micro-skin grafting — a new operative method used in China was introduced to manage extensive deep burns. 3. Softened freeze-dried glutaraldehyde preserved skin, chlorhexidine-alcohol refrigerated porcine skin, frozen amniotic membrane — all are effective as burn dressings. 4. The new methods of prolonging the survival time of allo- and xeno-skin grafts are used with ultraviolet rays, medicinal herbs and in vitro treatment with triamcinolone acetonide. 5. No remarkable rejection occurred after application of composite skin grafts to burn wounds. 6. The time of culturing epidermal cells has been shortened to 5—13 days. Preliminary successful results were obtained in patients after transplantation of cultured epidermal cell plate or cell emulsion dropped into

the holes of allo-skin grafts. No rejection occurred for 50 days up to 16 months after allo-transplantation of epidermal cell plate. 7. Silver norfloxacin, zinc sulphadiazine and cerium nitrate/silver sulphadiazine had a strong bacteria inhibiting action and promoted wound healing.

RESUME

Succès récents dans le traitement de brûlures en Chine

Yue-liang Ding, Chun-mao Han

Les progrès récents du traitement des brûlés en Chine puevent etre résumes de façon suivante:

1. Enlèvement d'escarres, excision tangentielle et greffe de peau sont mis en valeur chez les brûlures légères et peu vastes, mais profondes, surtout sur les sites importants sur le plan fonctionnel; lambeaux transplantés sans délai, après l'excision et le nettoyage de la plaie chez les brûlures de 3ème degré; excision tangentielle, enlèvement d'escarres et transplantation de grands lambeaux cutanés de long des lignes divisant le visage, dans le cas de profondes brûlures au visage. 2. Microgreffes cutanées — nouvelle méthode opératoire, utilisée en Chine pour le traitement de vastes et profonds traumatismes. 3. Ramollisement de la peau conservée par le dessèchement sous la galée· avec l'utilisation de la glutaraldéhyde; peau de porc refroidie par la chlorhexidine-alcool; membrane amniotique surgelée et membrane amniotique bovine conservée par la glutaraldéhyde — tout cela convient comme matériel de recouvrement de la plaie de brûlure. 4. De nouvelles méthodes servant à la prolon gation de survie des lambeaux cutanés — de type homo- et hétérogreffe — sont mises en valeur paralèllement comme les rayons UV, plantes médicales et dans le traitement par la triamcinolone-acétonide in vitro. 5. Il n'y a pas de signes visibles du rejet des lambeaux cutanés, appliqués sur la plaie d'une manière compliquée. 6. Le temps de cultivation des cellules épidermiques a été réduit à 5—13 jours. De bons résultats préalables ont été obtenus chez les malades, après la transplantation des couches de culture des cellules épidermiques ou après l'application d'une suspension cellulaire par gouttes dans les orifices du lambeau cutané d'homogreffe. Nul rejet n'était remarqué dans un délai de 50 jours jusqu'à 16 mois, après une homogreffe de couches des cellules épidermiques. 7. Norphloxacine d'argent, zincsulphadiazine, nitrate de cerium et sulphadiazine d'argent avaient un fort effet bactéricide et accentuaient la guérison des plaies.

ZUSAMMENFASSUNG

Die neuesten Erfolge bei der Behandlung von Verbrennungen in China

Yue-liang Ding, Chun-mao Han

Der neueste Fortschritt bei der Behandlung von Verbrennungen in China kann wie folgt zusammengefasst werden: 1. Beseitigung der Kruste, tangentiale Exzision und Transplantation der Haut, was bei leichten und nicht sehr grossen jedoch tiefen Verbrennungen zur Geltung kommt, besonders an funktionswichtigen Stellen; unmittelbare Transplantation der Lappen nach Exzision und Säuberung der Wunde bei tiefen Verbrennungen III. Grades; tangentiale Exzision, Beseitigung der Kruste und Umsetzung grosser Lappen der Haut entlang der Teilungslinien des Gesichts bei tiefen Verbrennungen des Antlitzes. — 2. Mikrotransplantate der Haut, eine neue Opera-

tionsmethode, die in China bei der Behandlung ausgedehnter und tiefer Traumata angewendet wird. — 3. Erweichung der bei Frost durch Austrocknen konservierten Haut unter Anwendung von Glutaraldehyd; mit Chlorhexidinalkohol gekühlte Schweinshaut; tiefgekühlte amniotische Membranen und durch Glutaraldehyd konservierte amniotische Rindermembranen. — Alles dies geeignet zum Überdecken der Verbrennungswunde. — 4. Neue Methoden der Verlängerung der Lebensdauer der Allo- und Xenolappen der Haut angewendet gemeinsam mit ultravioletten Strahlen, Heilpflanzen sowie bei der Behandlung mit Triamcinolon acetonid in vitro. — 5. Bei der Anwendung kompliziert zusammengesetzter Hautlappen auf die Wunde entsteht keine erkennbare Heilung. — 6. Die Dauer der Kultivierung epidermaler Zellen wurde auf 5—13 Tage verkürzt. Vorläufige erfolgreiche Resultate wurden bei Patienten nach dem Umsetzen von Platten mit Kulturen epidermaler Zellen erzielt oder nach dem Aufträufeln einer Zellensuspension in die Öffnungen im Lappen des Hautallotransplantats. Nach einer Allotransplantation der Platten epidermaler Zellen wurde in der Zeit von 50 Tagen bis zu 16 Monaten keine Heilung des Lappens beobachtet. — 7. Silbernorfloxacin, Zinksulphadiazin und Ceriumnitrat: Sulphadiazinsilber hatten einen starken, Bakterien unterdrückenden Erfolg und unterstützten das Heilen der Wunden.

RESUMEN

Nuevos éxitos en el tratamiento de las quemaduras en China

Yue-liang Ding, Chun-mao Han

El nuevo adelantamiento en el tratamiento de las quemaduras en China se puede resumir de manera siguiente:

1. La escarectomía, la excisión tangencial y el injerto cutáneo se usan extensamente en los casos de las quemaduras modernas y pequeñas pero hondas situadas especialmente en las zonas importantes del aspecto funcional; la transplantación inmediata de los colgajos después de la excisión y el desbridamiento de la lesión de las quemaduras de gravedad III; la excisión tangencial, la escaarectomía y la transposición de los grandes colgajos cutáneos a lo largo de las líneas que dividen la cara en el caso de las quemaduras hondas faciales. 2. Los microtransplantes de piel — una nueva técnica operatoria que se emplea en China para el tratamiento de los traumas extensos y hondos. 3. El reblandecimiento de la piel conservad por medio de la liofilización y con ayuda de glutaraldehido; la piel porcina congelada por clorhexidina-alcohol; la membrana amniótica congelada y la membrana bovina amniótica conservada por glutaraldehido — todos estos medios están adecuados de consequir la cobertura de la lesión. 4. Los nuevos métodos de la conservación de los alo- y xenoinjertos prolongan la sobreviviencia de éstos y se usan con éxito conjuntamente con los rayos ultravioletas, las hierbas y durante el tratamiento por acetonido triamcinoloma in vitro. 5. Después de la aplicación de los injertos de piel compuestos no fué observado ningún rechazamiento significante. 6. El período de la cultivación de las células epidérmicas fué reducido a 5—13 días. Los exitosos resultados preliminarios fueron obtenidos en los pacientes después de la transplantación de las chapas cultivas de las células epidérmicas o después de dejar caer la suspensión celular en los huecos de los aloinjertos cutáneos. No se observó ningún rechazamiento dentro del período de 50 días hasta 16 meses después de la alotransplantación de las chapas celulares epidérmicas. 7. Norfloxacina de plata, sulfadiazina de zinc y el nitrato de cerio y sulfadiazina de plata tuvieron un efecto marcado, el que suprimió la actividad bacteriana y soportó la cicatrización.

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ALLOPLASTIC OPERATIONS AND AUTODERMATOPLASTY IN SURGICAL TREATMENT OF PARAPROCTITIS

V. M. TIMERBULATOV

Elaboration and introduction of radical operative interventions in suppurative diseases of the perineum and rectum made it possible to improve considerably the results of treatment. At the same time, performing radical operations is connected with manipulations on the closing apparatus of the rectum. Surgical interventions on high (deep) forms of pararectal abscesses presume dissection of the sphincter, often its considerable part or the whole of it. Sphincterotomy, its ligature method, is frequently (in 9.1 to 33 %) accompanied by a more or less pronounced insufficiency of anal sphincter (1, 6). What is more, the formation of a coarse scar in the perianal zone in an extensive destructive process is accompanied by secondary insufficiency of the anal sphincter. In addition, it is known that a suppurative process in pararectal cellular tissues in itself causes impairment of the function of anal sphincter.

Another aspect of the above mentioned problem is connected with the peculiarities of a suppurative process in the pararectal zone. A suppurative-inflammatory process in the given localization frequently leads to a considerable soft-tissue defect. The filling of the wound cavity proceeds slowly, especially in the high (ischiorectal, pelvirectal, retrorectal) forms of paraproctitis. It has been found that the speed of regeneration of the ischiorectal cellular tissues is considerably lower than of the subcutaneous tissue (3); according to A. M. Aminev (3), it is up to two times slower than the healing of wounds in other localizations. It is known that "this cellular tissue is easily and rapidly destroyed during a suppurative inflammation and its restoration is very slow and imperfect" (4).

The topographic-anatomical peculiarity of the "levels" of pararectal cellular tissue spaces, the varying speed of regeneration — all these factors are responsible for the predomination of contraction of the wound surface. The varying speed of regeneration in the different layers of pararectal cellular tissues and wound contraction conditions the formation of "residual" cavities with rigid walls, incapsulation of infection in the granulation tissue, the formation of pararectal fistulae. No doubt, the incapsulated chronic focus

of "dormant" infection in the pararectal cellular tissues bears the potential risk of relapse of paraproctitis.

It should also be noted that perineal, pararectal wounds are of "extensive" character more frequently in the high forms of paraproctitis, in large soft-tissue necroses. For this reason, an objective quantitative characteristic of regeneration of the mentioned wounds can be obtained on the basis of comparative evaluation of the extent of perineal wounds over certain periods of time. Our observations have shown that the mean speed of healing of wounds according to their extent is 2.2 ± 0.35 cm^3/day (or 4.5 ± 0.6 cm^3/day) in the surface forms and up to 1.7 ± 0.3 cm^3/day in the deep forms. The filling of the soft-tissue defect and complete healing of perineal wounds occurs over fairly long periods — in 25 ± 3.5 days, on an average. It follows from the above mentioned data that — owing to the topographic-anatomical peculiarities of the pararectal zone and the low speed of soft-tissue regeneration — the restoration of the anatomy of this region under "natural" conditions of the postoperative period is considerably protracted.

A specific peculiarity of perineal wounds is their constant microbial contamination, constant ingression of the intestinal content into the wounds. The pronounced disturbance of regional blood circulation in suppurative infection should also be borne in mind: these two factors, together with the above mentioned, are responsible for the formation of a functionally inadequate scar.

The examination of the state of blood circulation in the rectum by the method of rheorectography has shown that the degree of its disturbance correlates with the extent of the suppurative-destructive process, the clinical form of paraproctitis. The most serious vascular disturbances were observed in the gangrenous, putrescent, high forms.

On the basis of the above mentioned data and with respect to the pathomorphological and pathogenic peculiarities of suppurative pathology of the given localization, the following complex of measures of surgical rehabilitation in suppurative disorders of the perineum and rectum can be outlined.

In the first place, radical operations should avoid or reduce to a minimum, injury to the sphincter of the rectum, i. e., they should bear a sphincter-sparing character. In our opinion, the principle of "dissecting the fistula" through the anal sphincter can be replaced by the principles of plombage, fistuloplasty without intervention on the anal sphincter.

Secondly, the substitution of the soft-tissue defect should be made by filling the wound cavities with allo- or autoplastic materials or by creating conditions for the regulation of the processes of wound contraction.

Thirdly, all efforts to close skin defect or wound as early as possible and as thoroughly as possible is justified in virtually all cases.

METHODS

To solve the first two tasks, the author developed a method of surgical treatment which, while observing the radical character of the intervention, precludes injury to the closing apparatus of the rectum. In the

literature, there are reports on plastic operations on perineal wounds using free grafts from fatty tissue to cover the internal opening of the fistula in chronic paraproctitis with pararectal fistula (10, 11, 12). However, necrosis and rejection of the fatty grafts were observed in virtually all cases and the method has not found practical application (2, 7).

On the basis of observations, we arrived at the conclusion that the failures in using the mentioned method are connected with substantial shortcomings of the graft for plastic purposes and with some peculiarities of the operative technique. It is known that suppurative-inflammatory processes easily develop in the subcutaneous fatty tissue and necrosis in its free grafts. The risk of infection in paraproctitis is extremely high, which also strictly limits the application of the given transplant.

In our opinion, the graft used in suppurative diseases of the given localization should meet the following requirements: 1. resistance to suppurative infection; 2. low susceptibility to disturbances of blood circulation; 3. long periods of resorption necessary for the formation and replacement of the transplant by newly formed tissue in the region of the soft-tissue defect and the internal opening of the fistulous passage; 4. the possibility of preserving the structure and the functional capabilities of the transplant after preservation. The study of literature and experimental observations led us to the conclusion that these requirements are met by the subcutaneous fatty tissue of the sole. It is known that this tissue is notable for its strength, elasticity, its ability of being given the necessary shape (being mouldable), its containing strong dense connective-tissue fibres net (8). In addition, its extremely valuable property is the poor vascularization of the stroma, the presence of zones with little blood supply or even avascular zones, and low antigenic properties.

Operative treatment using the proposed method is carried out as follows: It begins with the incision, dissection of the pararectal abcesses, of the affected anal crypt without intervention on the anal sphincter. Further treatment of the suppurative wound proceeds according to the routine practice with simultaneous administration of antiseptics into the rectum. When the perineal wound is completely cleaned and granulations appear, plastic surgery of the abortive fistulous communication with the lumen of the rectum is performed (criteria of readiness for the plasty are the same as in autodermoplasty). The wound is thoroughly rinsed with antiseptic solutions (Fig. 1 a), its edges are refreshed and a graft is cut out from preserved subcutaneous tissue of the sole corresponding to the shape and size of the internal angle of the perineal wound. The transplant is inserted into the wound and sutured to the internal angle of the wound by interrupted kapron or catgut stitches catching the internal layers of the rectal wall and the internal opening, and to the soft tissues outwardly (Fig. 1 b). A microirrigator is applied to the region of the transplant. If the internal opening in the rectum is not liquidated during the first operation, it is possible to use combined plastic operations (methods of N. M. Blinnichev, A. M. Aminev and

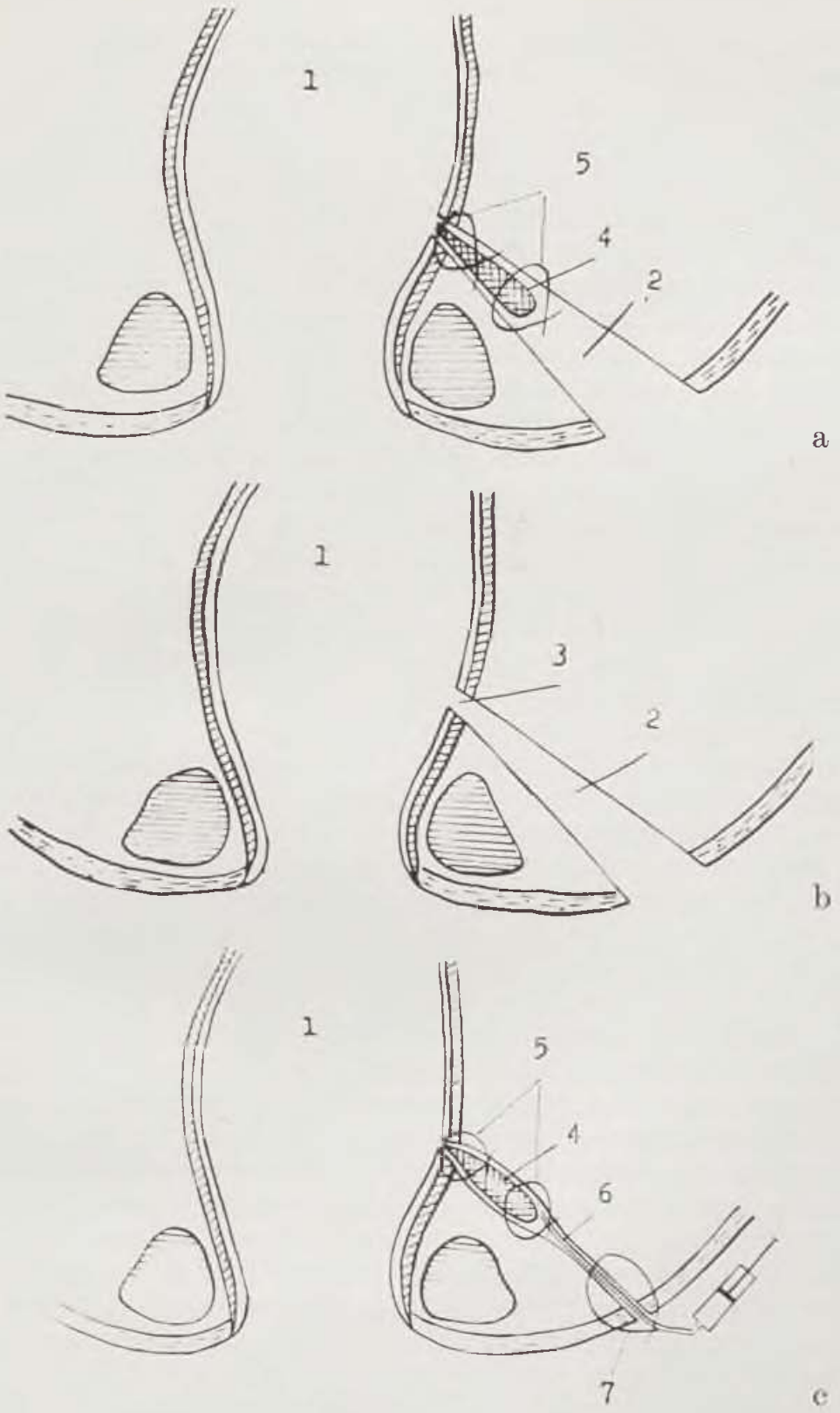

Fig. 1. Alloplasty

a — stage 1, b — stage 2, c — stage 3

1 — rectum, 2 — canal of pararectal wound, 3 — internal opening, 4 — allotransplant, 5 — sutures fixing the allotransplant, 6 — microirrigator, 7 — skin suture

others) employing mucosal-submucosal flaps, etc. The skin over the transplant is sutured by interrupted stitches (Fig. 1 c).

In the first 2—3 days, antibiotics, antiseptics, sometimes hormones, are administered through the microirrigator. Skin sutures are removed at usual intervals.

RESULTS

The effectiveness of the method was confirmed in 48 patients. It should be pointed out that the method was used in the most complicated forms of acute paraproctitis with extrasphincteral passage of the fistulous communication. In 30 patients, it was ischiorectal including two cases of horseshoe-shaped paraproctitis, in 12 patients it was retrorectal, and in 6 pelvorectal. Mean age of the patients operated on was 34 years. The plastic operation was usually performed 6—8 days after dissection of the pararectal abscess. The average size of the transplants was 1.8 × 3 × 0.4 × 0.5 cm. In 11 cases, alloplasty was combined with autodermoplasty or partial suture of the wound and autodermoplasty. In the postoperative period, partial lysis of the graft and itch in the perianal region were observed in 2 patients. Late results were studied up to 36 months in 46 patients. Relapse of paraproctitis (from the opposite side) occured in one patient 25 months postoperatively, no complications were observed in the other patients. In all cases, the function of the anal sphincter remained within the normal.

The author studied the possibility of the allotransplant influencing the surrounding tissues and the organism. Moderate signs of reaction of the surrounding tissues (swelling and hyperemia) were observed in 4 (8.3 %) patients. The study of the immune state (concentration of serum immunoglobulins, T- and B-lymphocytes, nonspecific factors of immunity), the titre of specific antibodies, did not reveal any deviations or changes following alloplasty.

To solve the third task, we improved the method of autodermoplasty — in particular we substantiated the method scientifically. In suppurative diseases of the soft tissues, autodermoplasty is usually carried out immediately after radical excision of the abscess or after complete cleaning of the wound. At the beginning, we also carried out autodermoplasty at varying intervals following radical operation for acute and relapsing paraproctitis: immediately after operation (Group 1), after 12 h (Group 2), after 18 h (Group 3), after 20 h (Group 4), after 24 h (Group 5), after 26 h (Group 6) and after 48 h (Group 7). The results of autodermoplasty depending on the terms of its performance were as follows: in Group 1 (12 patients) no effect at all, in Group 2 (11 patients) results obtained in 3 patients, in Group 3 (13 patients) results in 8 patients, in Group 4 (17 patients) in 17, in Group 5 (15 patients) in 15, in Group 6 (11 patients) in 7, in Group 7 (14 patients) in 4 patients. Complete take of the transplanted skin was achieved in groups 4 and 5 of patients whereas after immediate and postponed autodermoplasty, the results were considerably worse.

In parallel, additional examinations, such as microbiological, cytological,

electrothermometry, follow-up of wound potentials, were carried out in patients of these groups. The results are shown in the Table 1.

Tab. 1. Indices of the course of wound healing depeding on the terms of autodermoplasty

Indices	Group of patients						
	1	2	3	4	5	6	7
Number of microbes in 1 mg of tissue	10^5—10^7	10^2	10^2	10—12^2	10—12^2	10^3	10^7—10^5
Wound electropotentials, mV	34±1	30±3	25±2.5	16±2	15±2	23±2.5	25±2

No growth of microflora was observed in the first 24 h following radical operation, i. e., in the first 24 h following radical excision of the suppurative wound — the zone of open injury — remains "clean", afterward it becomes infected. The indices of wound electropotentials and results of electrothermometry confirm that the most favourable terms for autodermoplasty (subsiding inflammatory signs, improved microcirculation, and others) occur 20—24 h from the moment of radical operation. Cytological examination of wound prints also confirmed the above mentioned data. In the first 12 h, the inflammation is moderate, lysis predominates in blood elements. As is known from the literature (5), the precipitation of fibrin reduces exudation during the first day. At the same time, the processes of proteolysis predominate as long as 12—18 h, which explains the poor effectiveness of early autodermoplasty. Starting from 20 h, the processes of proteolysis are inhibited, this preventing the lysis of the transplanted skin. At later periods (over 24 h), there is an increase in the inflammatory phenomena, exudation, microbial infestation, which leads to rejection of the graft.

By the present time, autodermoplasty at the mentioned terms was accomplished in 93 patients. A good take of the transplanted skin flaps was obtained in all cases. A 100 % graft take was achieved in 90 patients; in the remaining 3 patients, partial rejection was observed, not exceeding 10—15 %. In the period of observation up to 3 years no complications were observed, not even scars deforming the perianal region. Autodermoplasty was performed by means of a dermatome or the Tiersch method.

Indications to autodermoplasty after radical operations for acute paraproctitis in our patients were as follows: 1. subcutaneous, ischiorectal forms of paraproctitis with intrasphincteral communication of the abscess (with the lumen of the rectum); 2. radical excision of the abscess within healthy tis-

sues; 3. skin wound defect exceeding 7—10 cm^2; 4. relapsing forms of paraproctitis.

Autodermoplasty, in particular the initially adjourned, permits to shorten the time of work incapacity of the patients by 10 and more days. It is an effective method of surgical rehabilitation of the respective category of patients.

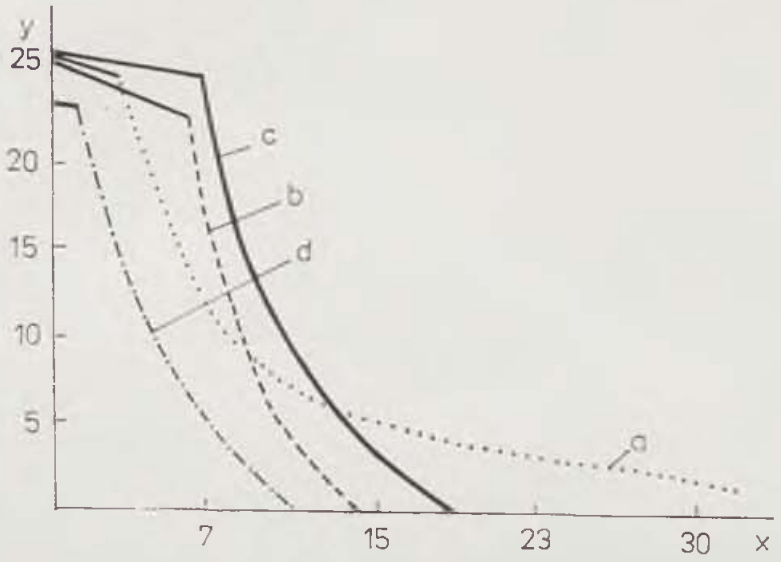

Fig. 2. Exponents of wound healing in the traditional method (a), in the alloplasty method (b), in the initially adjourned method of autodermoplasty (d), in secondary dermatoplasty (c), x = days

The correctness of the above mentioned data is confirmed by the following illustrations. Fig. 2 presents exponents of wound healing in the traditional method (a), in the alloplastic method (b), in the initially adjourned (c) and in secondary autodermoplasty (d).

CONCLUSIONS

1. The topographic-anatomical, pathomorphological prerequisites and peculiarities of regeneration of pararectal cellular tissue confirm the necessity and substantiation of replacement of soft-tissue defects — of both cellular tissue and skin.

2. Alloplasty of abortive formation of fistulous passages using preserved allografts is indicated in complicated forms of paraproctitis where radical operation involves injury to the anal sphincter.

3. Autodermoplasty carried out at optimum terms (20—24 h) after radical excision of the absecss permits considerable shortening of the time of treatment and improves late anatomic-functional results.

SUMMARY

The necessity of alloplastic operations for the replacement of tissue defects has been substantiated on the basis of investigation of pathomorpho-

logical, reparative characteristics of the soft tissues of pararectal cellular tissue and perineal skin. The author's own method of alloplasty of pararectal wound, of a non-healing fistulous passage, has been described. An analysis of results of autodermoplasty at different terms, taking into account the peculiarities of a suppurative wound, make it possible to recommend optimum terms of skin transplantation after radical operations in connection with suppurative diseases.

Key words: rectum, perineum, acute paraproctitis, pararectal fistulae, rectal rheography, wound potentials, alloplasty, preserved allograft, autodermoplasty, method of alloplasty, results of autodermoplasty.

RESUME

Les opérations alloplastiques et l'autodermoplastie dans le traitement chirurgical de la paraproctitis

Timerboulatoff, V. M.

A la base des examens de caractéristiques réparatives patomorphologiques des tissus moux des tissus cellulaire pararéctal et de la derme périnéale, on justifie la nécessité d'opérations alloplastiques pour la substitution des défauts tissulaires. On décrit la méthode d'alloplastie d'une lésion pararéctale élaborée par l'auteur, le passage fistulaire non formé. L'analyse des résultats de l'autodermoplastie effectuée dans les délais variés, appréciation des particularités des lésions suppurantes, donnent lieu aux recommendations de meilleurs moments pour l'exécution des greffes cutanées, après les interventions radicales lors des maladies suppurantes.

ZUSAMMENFASSUNG

Alloplastische Operationen und die Autodermoplastik bei der chirurgischen Behandlung von Paraproktitiden

Timerboulatoff, V. M.

Auf Grund der Erforschung pathomorphologischer reparativer Charakteristik weicher Gewebe pararektaler Zellenstoffe und perinataler Haut wird die Notwendigkeit alloplastischer Operationen beim Ersetzen von Gewebedefekten begründet. Es wird die vom Autoren ausgearbeitete Methode der Alloplastik pararektaler Wunden, eines nichtheilenden Fisteldurchgangs beschrieben. Die Analyse zu verschiedener Zeit ausgeführter Ergebnisse der Autodermoplastik sowie die Erwägung der Besonderheiten eitriger Wunden gestatten es, optimale Termine zu einer Hauttransplantation nach radikalen Operationen bei eitrigen Erkrankungen zu empfehlen.

RESUMEN

Las operaciones aloplásticas y autodermoplásticas en el tratamiento quirúrgico de paraproctitis

Timerboulatoff, V. M.

Los resultados de los estudios de las características reparativas patomorfológicas del tejido blando creando el tejido celular pararectal y la piel perineal muestran

la necesidad de realizar operaciones aloplásticas las que sustituyen los defectos tisulares. El papel describe la técnica aloplástica elaborada por el autor que se emplea en caso de las heridas pararectales consistiendo en el pasaje fistuloso no creado. El análisis de los resultados de la operación autodermoplástica, efectuada en verios períodos de tiempo, la evaluación de los razgos específicos de la herida, hacen posible recomendar el óptimo término para realizar la transplantación cutánea después de las operaciones radicales cuando la enfermedad está acompañada por los procesos supuratorios.

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AURICULOPLASTY FOR KELOID SCARS

V. S. BONDAR

There is a wealth of literature concerning earlobe surgery, especially problems of plastic operations for a variety of congenital defects and deformations. However, it fails to provide sufficient information on the surgical treatment of the after-effects resulting from diverse damage or neoplasms.

Keloid formations on earlobes occur quite frequently. Acute or chronic traumas are, as a rule, responsible for their development. Earlobes, the most prominent, sensitive and finely modelled organs on the human body, are the most frequently exposed to the effect of a variety of traumatic factors. This fact stands out all the more that of all the habits of uncivilized people to adorn one's body, the civilized world has developed extensively the habit of wearing earrings in the earlobes, a custom responsible for the development of both acute and chronic trauma.

Alibert (1810) is believed to have first described keloid (taken from the Greek world "keleis" — "tumour" and "eidos" — "appearance, likeness") although the cause has yet to be explained as Prof. H. Pešková (1971) rightly said, pointing out: "Not even extensive histochemical and biochemical research conducted over the past few years has thrown any light on its pathogenesis. Clinical and experimental data seem to justify the hypothesis that too many different causes and influences take a share in the development of keloids."

In clinical practice, keloid scars are known to appear as a result of different traumata (injection, insect bite, scratches, burns, surgically removed tattooing, pierced earlobes), boils or even without any visible skin damage (spontaneous keloid scars).

Although changeable, depending on the body's individual peculiarities (age, sex, duration of illness, recurrence, nature of the trauma sustained, etc.) the morphological picture is, nevertheless, generally characterized by the presence of fibroblastic processes in the focus of the injury, by a tendency to invade neighbouring healthy tissues, and by hyperplasia of underdeveloped connective tissue rich in giant fibroblasts developing in accord-

ance with the embryonic type in what is clearly limited differentiation of cellular elements. This apparently is the groundwork for the growth of a keloid scar (L. A. Bolkhovitinova, M. N. Pavlova, 1977).

Keloid scars are an all too visible cosmetic defect likely to cause psychic discomfort to the victims. Hence the need for surgical treatment. Since keloid scars tend to develop relapses (Fig. 1), their treatment is often an unenviable task.

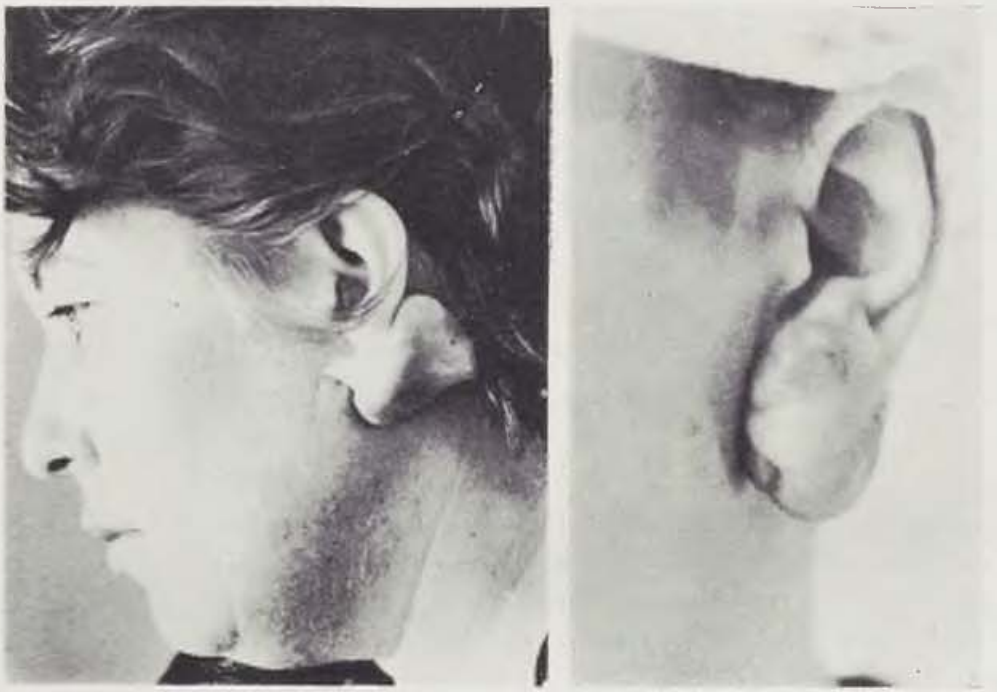

Fig. 1 Relapsing keloid scars of pinnae multiple nonradical surgical development

Keloid scars have to be removed surgically from within healthy tissue, which accounts for the frequent need to amputate the pinna in the course of the operation and, at the same time, to remodel them from local tissues using the method of excision and replacement by tongue-shaped skin flaps on a vascular pedicle (Fig. 2).

With the keloid scar removed, we always try to accomplish a primary plastic operation of the ensuing defect by covering it with a full-thickness pedicled skin flap which we cut out from the retroauricular regions. This is of major importance because the surgeon's effort for a radical removal of a keloid scar is free from the danger of causing an auricular defect. By using that kind of flap, we can succesfully perform the primary plastic operation of the defect concerned (Fig. 3).

So long as the keloid scar is localized in the upper portion of the helix and its vicinity the plastic operation for the defect of the earlobe using a retroauricular flap is limited in the range of indications determined by the size of the defect designed for removal (Fig. 4). If the wound defect cannot be covered with local tissues owing to the size of the removed keloid scar, all the more so if a relapsing keloid scar is to be removed, we opt for

a free split-thickness skin autotransplant (Fig. 5). This kind of plastic operation serves its purpose where tube flap plasty will have to be used in the future in order to replace the earlobe (F. Burian, 1962).

As clinical research shows the graft thickness is of major importance for free skin transplants, to cover the wound defect in the earlobe: the thicker it is, the less likely it is to turn into a keloid scar later on. Admittedly, this is a great impediment for an esthetic modelling of the earlobe.

Scientifically speaking, the development of keloid formations in the earlobes is interesting in that their development fails to coincide with the well-known thesis of keloid scars growing in dependence on their localization in the direction of collagen fibres which are usually found running parallel to the skin lines and at right angles to the direction of muscular contractions. There is another parallel worth mentioning: the wedge-shaped excision of

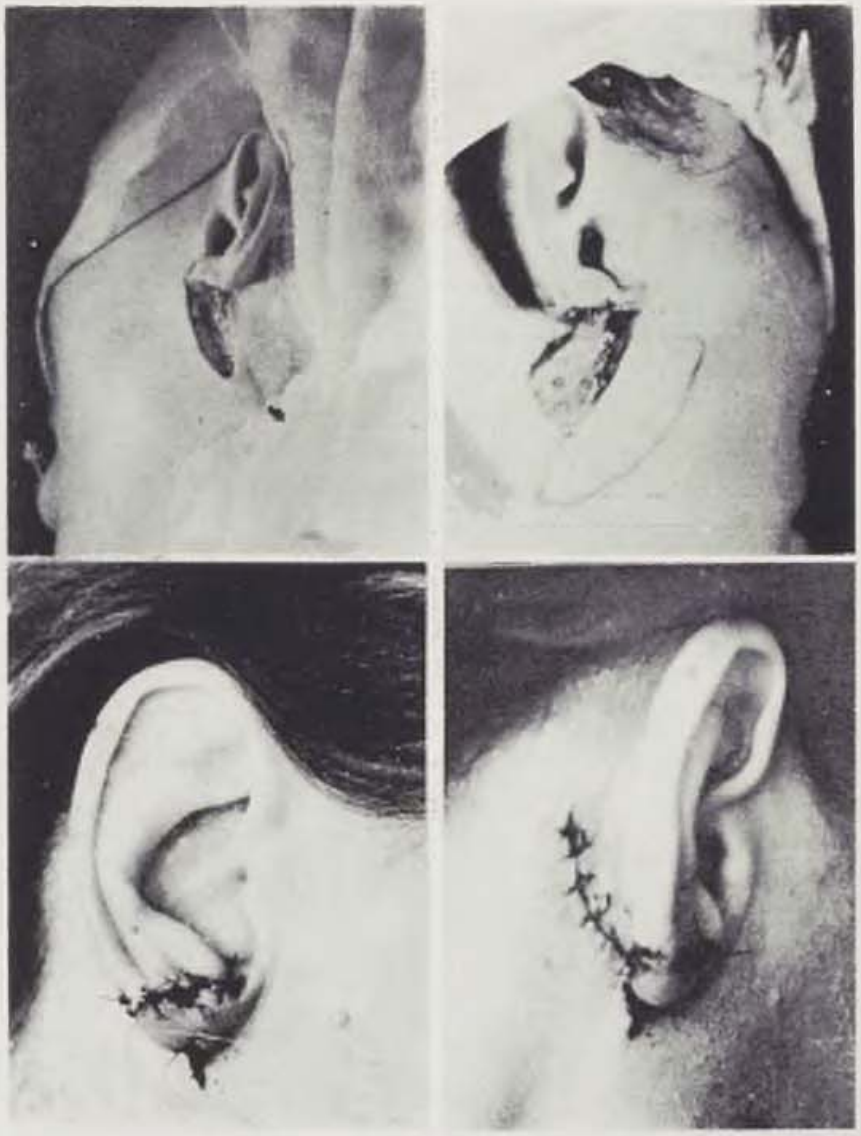

Fig. 2 Surgical removal of keloid scars on pinnae with simultaneous modelling of the pinnae using the technique of pedicle skin flap replacement

skin-cartilaginous grafts from earlobes for plastic operations on alae nasi defects, a method which we used in 23 men of different ages, just as much as reconstruction of excessively long pinnae performed in 8 women, never caused the development of keloid scars in as much as a single case.

Surgical treatment for keloid scars in the earlobes was employed in a total of 16 patients (14 women and 2 men, aged from 15 to 48 years). In 2 men, keloid scars developed as a result of traffic accidents, in 14 women,

Fig. 3 Keloid scars resulting from the piercing of pinnae for earrings. Radical removal was used with simultaneous plastic operation for pinna defects using local tissues (skin flap replacement)

as a result of ear pinna piercing for reasons of wearing jewellery. Of those patients, 12 were referred to our department with relapses after a history of repeated surgical treatment in other therapeutical institutions, 2 of them as many as five times! We also monitored the development of minor relapses of surgically treated keloid scars which in 3 persons required repeated surgical treatment within three years of plastic operation (Fig. 5).

In the pre-operative and post-operative periods, the patients were, as a

Fig. 4 Keloid scar on ear lobe following accident. Scar was removed radically, wound defect was covered with a full-thickness retroauricular pedicle skin flap

rule, given Pyrogenal in ascending doses up to 500 MPD, lipase, and physiotherapy. As regards keloid formation in the ear lobes, all means of conservative therapy should be seen as auxiliary.

Fig. 5 Relapsing keloid scar resulting from trauma. Keloid scar was radically removed and the defect covered with a free skin autotransplant

SUMMARY

The clinical experience is analyzed of the treatment of 16 patients (14 women and 2 men, aged 15 to 48 years) suffering from keloid formations in the earlobes. The author stresses the need to elucidate the pathogenesis of this condition and presents typical morphological characteristics of keloid scars. The paper also describes the clinical usefulness and methods of plastic operations for earlobe defects with restoration of their anatomic lines after the surgical removal of keloid scars. The atypical nature of the etiological factors is duscussed.

Key words: plastic operation for defects, keloid scars, earlobes, factors of trauma, morphological picture.

RESUME

Plastie des cicatrices kéloïdes de pavillons d'oreille

Bondar, V. S.

Les expériences cliniques du traitement de 16 malades (14 femmes et 2 hommes en âge de 15 à 48 ans) souffrant de formations kéloïdes aux pavillons d'oreille sont analysées. L'auteur fait remarques le fait que la pathogenèse de la maladie est éclairée d'une façon insuffisante. Les caractéristiques morphologiques typiques des cicatrices kéloïdes sont données. On rapport les objectifs cliniques et les méthodiques des plasties de défauts renouvelant des lignes anatomiques de pavillons d'oreille après l'enlèvement chirurgical des cicatrices kéloïdes dont les facteurs étiologiques atypiques sont soulignés.

ZUSAMMENFASSUNG

Die Plastik von Keloidnarben der Ohrläppchen

Bondar, V. S.

Es werden die klinischen Erfahrungen mit der Behandlung von 16 Patienten (14 Frauen und 2 Männern im Alter von 15 bis 48 Jahren) analysiert, die an Keloidnarben der Ohrläppchen litten. Es wird auf die unzureichend geklärte Pathogenese dieser Erkrankung hingewiesen, und es wird die typische morphologische Charakteristik von Keloidnarben angeführt. Ferner wird die klinische Zweckmässigkeit und die Methode der Plastik solcher Defekte der Ohrläppchen bei der Erneuerung ihrer anatomischen Linie nach herausoperierten Keloidnarben beschrieben. Endlich wird auf die atypischen ätiologischen Faktoren ihrer Entwicklung hingewiesen.

RESUMEN

Auriculoplastía de las cicatrices queloideas

Bondar, V. S.

En este papel se analizan las experiencias clínicas con el tratamiento de 16 pacientes (14 mujeres y 2 hombres, entre 15—48 años de la edad) con las formaciones queloideas sobre las perillas de la oreja. El autor acentúa la necesidad de elucidar la patogenesis de esta condición y presenta las características morfológicas típicas de las cicatrices queloideas. El papel también describe las ventajas clínicas y las técnicas de la operación plástica de los defectos de las perillas de la oreja la que restituye sus líneas anatómicas después del removimiento quirúrgico de las cicatrices queloideas. Se discuten los razgos atípicos de los factores etiológicos.

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PROTECTIVE FAMILY REGIMEN IN CLEFT LIP AND PALATE

M. ČERNÝ, M. FÁRA, J. HRIVNÁKOVÁ

INTRODUCTION

Cleft lip and palate in the Czech population occurs frequently (2 per 1,000 newborn children) and can serve as a model situation for medium grave congenital defects conditioned by many factors, prenatally semi-lethal, affecting approximately 2 % of all children.

At our department, academician Burian laid foundations for comprehensive care of children with cleft defects (1), which has been developed and built-on ever since (6, 7, 8). The child's defect, in many ways, affects the family life and so the family's good cooperation creates conditions for successful preventive care.

Protective family regimen

The family is the smallest auto-regulatory social and biological system which, in a broader sense, has the responsibility for meeting the demands of its members. The protective family regimen makes use of the family relations for the purpose of prevention and treatment of congenital defects and for regulating family life (1, 3). Therefore it is our duty to provide as many members of the family as possible with information about the care, needs and risks involved.

Woman in puerperium with her cleft-affected child

The mother after giving birth to a child with cleft defect is in an anxious, unstable psychic condition. The relevant data found in Japan show 30 % of the mothers are contemplating suicide. The mother's parents generally have a constructive attitude while the father's parents' opinion varies.

Later on, the mother and family are trying to find an explanation for the defect — which is mostly unidentifiable — this opening a way to speculation and guilt-finding, which may even impair family relationship. The next phase is marked by a rational approach and search for an optimum solution for the child, family and future family planning. The whole process should be moderated and accelerated to a maximum. The mother's condition should be one of the main reasons for inviting her with the child to the clinic as soon as possible (4—6 weeks after birth). During the first visit the family should contact the geneticist, teratologist and psychologist; they can also see the operative results (for example, cleft lip surgery), thus building up a realistic approach towards the situation, and they should also be provided with medical advice to be followed as early as possible.

Neonatal and infant periods of the cleft-affected child

For this period we recommend the following measures to be observed:

1. The defect should not be allowed to become worse. The child must not sleep in the prone position, as it leads to jaw compression. The child should not use a pacifier, should not suck its fingers or any other object as this can deform the maxilla and also widen the cleft. In this way, the infant is deprived of tactile impulses which should be compensated for with his mother's caresses and care (6, 8).

2. Diet. Breast milk is given total preference as breast feeding is sometimes feasible even in more serious forms of clefts, unless the infant is given breast milk in another form. Great care is to be given to the position of the child to prevent aspiration, using the nose as an alternative. Beginning with the 6th month, the child should receive unmixed and non-pasteurized food to strengthen the orcpharyngeal area.

3. Prevention of infections. Apart from harelip, the other types of clefts tend to lead to otitis and respiratory infection. The child's immunity should be enhanced by letting him (her) stay in the sun and open air, which tends to be at variance with the parents' endeavour to keep the child with a visible defect at home; moderate hardening is recommended during bath. During the first visit at the clinic the mother is tested for antibodies against infection of the TORCH group (toxoplasmosis, rubeolla, cytomegalovirus, herpesvirus), against Epstein-Barr virus and Lyme disease. In case higher positive values are found, the child should be examined as well (5).

4. Psychic development. In the proband's group with clefts no evidence of IQ impairment has been found, with the exception of some cases of cleft palate and syndromes. In this period, the child usually lacks oral and tactile stimulations, which may damage the mother—child relationship, resulting in impaired social adaptability later in life. Therefore, it is desirable to concentrate on building up emotional relations between mother and child.

5. Surgery. The operation for cleft lip is performed according to the somatic and health condition of the child, usually at about 6 months of age.

Toddler's and pre-school age

1. Somatic development. The birth weight of cleft-affected children is not significantly lower compared to normal population (except for cases with syndromes and associated defects). In pre-school age, the children usually have lower weight and smaller thoracic circumference. Increased physical activity and added vitamin consumption are recommended. Atypical development of the dentition and mandibles should be taken care of by the stomatologist (especially by the orthodontist) up to adulthood. Asymmetries in the development of facial and cephalic bones, especially in total unilateral clefts are part of anthropological follow-up.

2. Psychomotor development. This is generally in harmony with age. Cleft palate and total cleft defects lead to broken articulation thus impairing verbal communication. Voice and speech rehabilitation should start at the phoniatric department at the age of 18 months and it should be conducted in the form of play as the beginning of the preparatory phase. Intensive training is to precede the operation as, at this age, fixed palatolalia without formation of feedback auditory and proprioceptive mechanisms is very difficult or impossible to attain post-operatively. The aim is to reach complete or almost complete rehabilitation prior to school attendance.

3. Socialization process. Children with clefts have lower values in socialization tests, their group classification being low. Their parents have a tolerant and "misbehavioral" attitude towards them. The children have a decreased score of natural aggressiveness (they will provoke neither verbal nor physical conflicts, they will not fight with their brothers and sisters, or in groups of other children, they lack activity). For this reason, the family is instructed and guided by the psychologist.

We do not recommend putting the child into a collective of children before the age of three. in cases of cleft palate, only after surgery and successful rehabilitation, i. e. at the age of 5—6 years. If the child's performance reaches borderline values only, it is advisable to put off the start of school attendance.

4. The family situation. Children with clefts need increased care, are more prone to contract illness, which usually makes their attendance of preschool institutions undesirable. Therefore, the family may apply for a social benefit, which is fully recommended by the clinic.

In case of a family crisis, we recommend to consult a marital consultation centre which cooperates with our department.

5. Surgery. Surgery on the palate is performed at about the 4th year of age. Setting the term for the surgery is the result of a compromise between the logopedian's demands for an earlier operation and the experience that after an early surgery of the palate, the scarring process deforms the jaw and even leads to the deformation of the dental arch, which can also hinder speech development. Later on, corrective operations are to follow: at about 5 years of age, the elongation of the columella, at about 14 years correction of the tip of the nose, and following stomatological and orthodontical treatment, possibly a filling of the maxillary defect.

School age

For various reasons, the cleft-affected child has a higher rate of absence from school attendance (except for isolated harelip) due to the lasting presence of visible deviations (dental atypia, facial and nasal asymmetry, vocal and speech defects), and moreover, the child displays submissiveness in a group. This is obviously the reason for the group's discriminatory behaviour. A certain role may be also played be hearing defects — result of otitis — and by incomplete family situation due to divorce.

Genetic examination and care

The laboratory of genetics and teratology, at our department, examines the proband and his family at their first visit, informs them about genetic counselling centres and empiric risks as well as about pre-conception and prenatal preventive regimen. We keep records of over 4,000 families from Bohemia and Prague (6 million inhabitants); there is an annual increase of 130—220 new cases according to the birth rate.

The proband's parents fill in a genealogical questionnaire and a questionnaire on the course of pregnancy which is specified by the teratologist.

The aim of the child's examination is to find associated defects and syndromes. His parents undergo examination for atypical dental, oral and facial features, as these "micro-manifestation" might indicate genetic disposition (7), which may be also indicated by some HLA antigens, some ABO antigens (5) and by the mother's parity and multiple pregnancies (4).

The mother's blood is tested for antibodies against TORCH and some other infections (Epstein-Barr virus, Lyme disease, Chlamydia trachomatis). The same blood sample is also tested for biochemical substances. In case of positive findings, the pediatrician is informed and the child is examined. If the mother's history is suspected to contain certain chemical substances or medicaments, their teratogenicity can be tested on chick embryos at our laboratory (8).

Preventive preconception regimen

The aim of pre-conception and prenatal care is to create optimum conditions for the conception and foetus development; this is sometimes called a planned conception (3, 9) or primary prevention (10). In this context, there are still a great many unanswerable questions open to discussion and conflicting opinions.

This idea was probably stimulated by the studies of Warkany (1946, 1947, 1954) who provoked congenital defects in rats through deficiency in riboflavin and other nutrients. Strean and Peer (1956) drew our attention to the influence of vitamins in cleft induced in experimental subjects by corticoids, and Strean (1958) reported on a vitamin deficiency in mothers of cleft-affected children. Conway (1958) reported that the cleft incidence in children had decreased in response to vitamins administered to mothers (2). At our department, in the first half of the 1960s, academician Burian started to

administer vitamins to pregnant women at cleft risk though his opinion of this method was rather reserved (personal communication).

A number of physicians administer vitamins during pre-conception. As the serum levels of vitamins cannot be established routinely, optimum doses can hardly be specified. Vitamins A and D, and probably even riboflavin conventional doses are teratogenic and therefore they should not be administered in the 1st trimester. Based on experiments, pyridoxin obviously blocks the corticoid receptors of the embryonic cells preventing cleft development.

The preventive pre-conception programme centres mainly on gynaecological inflammation and on the mother's hormonal condition. The treatment of inflammatory processes attempts to prevent amniotic adhesion which may have a role to play in the "ADAM complex" even in cases with cleft defects. Attention should be also paid to gonadotropin deficiency found in mothers of children with cleft defects. Hormonal preconception treatment helps to reduce the number of abortions (9).

According to Hibbard's finding (1965) of decreased folic acid levels in mothers with cleft-affected children, this substance started to be administered in the pre-conception period.

In our view, in cases of multifactorially conditioned congenital defects at low genetic disposition, the teratogenic threshold is reached due to exogenous factors (from the embryonic aspect). These defects are seldom caused by only one type of exogenous factor (e. g. vitamins) or are due to only one or but a few factors (3, 4, 8). We rather expect a multitude of potentially embryotoxic factors to take part in only a small number of cases, in interactions or on a small scale. Therefore, we try to eliminate as many potential active factors as possible even though not much is known about them in humans. Thus the preventive pre-conception programme is to be regarded as an empiric method which, moreover, has to be individualized according to the family situation:

1. The time of conception — unless there are reasons against; conception is recommended to take place in May — June, as the neonates concieved in this period have fewer cleft defects.

2. Biochemical screening is performed from a single maternal sample to monitor defects of the thyroid, liver functions, Ca, K, glycemia; blood count and sedimentation rate are established as well as tests for antibodies against the above mentioned infections. Moreover, tests for urine sediment are performed.

3. Individual procedure depends on the anamnestic data and examination results. It usually consists of additional tests for infectious agents (cultivation), husband's examination, internal examination, karyotype testing and relevant changes in medication (e. g. in epilepsy, hyperthyroidism). Environmental factors are checked in cooperation with the district hygienic and epidemiological stations.

4. Gynaecological preparation takes into account the situation, inflammatory processes, uterine hypoplasia or atypia as these can worsen the type of the cleft or represent the dispositional factor (4).

5. Two months prior to conception both spouses should keep to a specific diet which should also continue during the 1st trimester of pregnancy. We recommend a varied diet with sufficient amount of proteins, peas, lentils and beans, minerals and trace elements (Mg, Zn, Mn, Cu, I, K, Fe).

As for medicaments, we recommend the administration of the following daily doses: 100 mg of pyridoxin, 20 mg of vitamin E, 5 mg of folic acid, dry brewer's yeast (Pangamin) in 2 g doses, also 300 mg of vitamin C, if there is not enough fruit, 1 tablet of a combined vitamin preparation (Spofavit — which contains also vitamins A and D in small quantities). On the other hand, we advise to leave out vitamins A, D, riboflavin in a medicinal form, and to take other medicaments only on doctor's recommendation; further, to keep off tinned food, mushrooms, alcohol and smoking.

6. As the female embryo is evidently more resistant to cleft defects, we recommend, in selected cases (e. g., a family without a positive family history had a boy born with harelip) to make an attempt at influencing the child's sex (a female child) in the following way: coitus should occur 3—5 days prior to expected ovulation; approximately 12 hrs. before the intercourse the vagina should be washed out with lactic acid (Lactogyn, Spofa) and the intercourse should take the form of coitus interruptus in introitus vaginae. The diet remains unchanged.

Mothers suffering from epilepsy should consult the neurologist and two months prior to planned conception, they should decrease their drug intake, eliminate hydantoin substances, and increase magnesium intake.

In the prenatal period, during the 1st trimester, we recommended to interrupt pregnancy in the presence of major signs of ab. imminens (except for women treated for infertility or sterility) as the preventive regimen is in itself a treatment for infertility and by maintaining the pregnancy the natural selection could be hindered (4). In positive cases, we check the antibody level as gravidity brings along exacerbation of some diseases. We indicate amniocentesis only for age reasons and perform routine tests for alpha-fetoprotein. In the 2nd trimester, we perform fetoscopy in cases where the empiric cleft risk is higher than 10 %. For the time being it is not possible to detect the defect by means of ultrasound.

The risks of the method

The preventive pre-conception regimen (pre-conception preparation, primary prevention) seems to offer a favourable prognosis, i. e. decrease in congenital defect incidence in the family. However, we should be very cautious in our evaluation. A number of optimistic results have been published (9, 10). Risks ensuing from excessive vitamin intake or imbalance between vitamins and elements are decreased by putting emphasis on a varied diet. Our experiment showed that an excess of folic acid, pyridoxin and vitamin E in the usual doses does not result in harmful consequences.

A more serious argument, however, concerns a different matter. The pre-conception preparation simultaneously acts as prevention against abor-

tion (infertility). In case we should achieve a substantial lethality decrease (through abortion) paradoxically, more children with defects will be born. This situation occurs in defects conditioned mostly genetically (conditioned by one or more factors with a strong genetic component). This method is often considered effective in polygenous (polyfactorial) defects (9, 19). However, these defects are caused by various genetic components in a similar phenotype, and their distribution in the population may range from cases conditioned totally by exogenous factors up to cases with etiological predominance of hereditary agents. For example, women with total bilateral cleft have the highest rate of genetic factors. In such cases, this method usually fails to succeed, sometimes even worsening the prognosis. An example can be seen in cleft defects with positive family history where children with clefts are born as second and next (4). This can be explained by the fact that in primiparity the embryos with cleft undergo a higher prenatal selection. As long as this selection is eliminated or decreased, the risk of cleft defects increases in the first born children. Therefore, in the 1st trimester it is undesirable to maintain gravidity and the woman should act accordingly well before the preparatory phase of pre-conception.

Another risk consists in the publicity given to "primary prevention" of the "pre-conception preparatory phase" at the clinics and through mass media, which influences the family's decision for parenthood. Thus fertility in such families can increase. These considerations lead to the conclusion that the preventive pre-conception regimen should be followed up only in families assumed to have a low genetic disposition for the defect and that this method was still in an experimental stage.

Assessment of preventive regimen results

In our opinion, good results might be achieved in the TORCH infection group and perhaps even in cases with the "ADAM syndrome". The effect in the other cases cannot be considered conclusive for the following reasons:

1. The group of women under observation who became pregnant after finishing the pre-conception preparatory phase are not representative enough due to the "selection structure". On recommendation, only some of the women take part in this preventive regimen. (The reasons vary: they are not willing to commute to the clinic, they become pregnant earlier, they have no interest, etc.). Therefore, these groups do not represent a population sample. Because of this "selection structure", the group does not include many women with a high intelligence quotient (the group's IQ, social status, educational background, etc., are at a higher level) and thus the psychomotor development of the children, for example, is better even without undergoing the pre-conception preparatory phase. The same argument can be raised as for social selection.

2. Sometimes a comparison is made between the number of the newborns with defect and their expected number as a sum of the empiric risks for individual cases (9, 10). The empiric figures serve only as a rough estimate not taking into consideration, for example, the extent of a certain defect, parity and the age of the mother, etc.

3. In cleft lip and palate defects without positive family history, the second and next children have a better prognosis than the first child.

4. A rather significant role may be also played by the gravidity control results. An unsuccessful outcome of the pre-conception preparation can discourage the woman from further cooperation (she fails to return the questionnaire, etc.). Such failings could often change the assessment.

The published results of the pre-conception preparation (primary prevention) do not take into consideration these theoretical objections and thus the conclusions appear to be too generalized and optimistic. A real verification of the effect of the preventive pre-conception regimen is difficult to obtain and there are practically only two possible ways how to do it:

1. To carry out a "blind" experiment in the families at risk, similar to medicament testing. However, due to ethical considerations, we refrain from this procedure.

2. Prospective application of this method in a population group (e. g. in 1—2 districts) were it would cover the highest number of women. Neither this procedure is without ethical objections as it can enhance the incidence of the defect in families with strong genetic disposition.

At present, perhaps an easier method to prevent cleft defects is to concentrate on research into etiological factors and to improve the possibilities of detecting the defects prenatally (4, 5, 8).

SUMMARY

The Department of Plastic Surgery, Prague, provides comprehensive care to children and families where cleft lip and palate occur, which goes under the name of preventive family regimen. Apart from the treatment alone, this regimen is the concern of a number of specialists whose aim is to eliminate the parents' sense of "guilt", and to try, with the aid of the family, to create a situation which would improve the condition for the child's socialization. The geneticist is in charge of the prenatal preventive regimen which consists in the recommendation for the dated conception in an attempt to influence the baby's sex prior to conception, in eliminating potential internal and infectious (TORCH) etiological factors as well as potential teratogenic agents within the family. Gynecological care is aimed at uterine hypoplasia, atypia, gynaecological inflammation and hormonal deviations. Two months prior to conception and in the 1st trimester, it is recommended to keep to a diet rich in proteins, mineral substances, trace elements, vitamins and folic acid. The authors point to the potential risks of this method (impaired prenatal selection, increased fertility of risk families). At present, it is not possible to make an objective assessment of the results of the preventive pre-conception regimen due to the unrepresentative selection of the group under observation.

Key words: cleft lip and palate, preventive family regimen, preventive pre-conception regimen, risks of the method.

RESUME

Régime de protection familiale chez les fentes labiales et palatines

Černý, M., Fára, M., Hrivnáková, J.

A la Clinique de la chirurgie plastique à Prague, les soins complexes prétés aux enfants et aux familles avec la manifestation des fentes labiales et palatines sont renfermés dans la notion de régime de protection familiale. A part les soins médicaux accordés au défaut même, de nombreux spécialistes y intéressés s'efforcent, dans le cadre de ce régime, d'effacer les sentiments de culpabilité et d'impasse chez les parents et d'établir, à l'aide de la famille, une situation qui puisse améliorer les conditions de la socialisation de l'enfant. Le régime de protection prénatale est assuré par le généticte. Il comporte la recommendation du terme de conception, l'essai du choix préconceptif du sexe de l'enfant, l'élimination des facteurs étiologiques possibles du genre de maladies internes et infectieuses (syndrome TORCH, ADAM) ainsi que la supression des agents tératogènes possibles dans l'environnement familial. Les soins gynécologiques s'orientent aux hypoplasies utérines et aux états atypiques de l'utérus, aux inflammations gynécologiques et aux anormalies hormonales. Deux mois précédents la conception et au cours de 1er trimestre de gravidité, nous recommendons une alimentation riche en protéines, substences minérales, éléments de trace, vitamines et l'acide folique. On avertir des risques possibles de la méthode (baisse de sélection prénatale naturelle, augmentation de fertilité des familles à risque). L'évaluation objective des résultats du régime préconceptif de protection (conception controlée, prévention primaire) n'est pas encore réalisable, surtout en conséquence de la „faute" du choix des groupes.

ZUSAMMENFASSUNG

Ein Familien-Schutz Regime bei Lippen- und Gaumenschlitzung

Černý, M., Fára, M., Hrivnáková, J.

Die an der Klinik für plastische Chirurgie in Prag gewährte komplexe Fürsorge für Kinder und Familien mit einer Lippen- und Gaumenschlitzung wird unter der Bezeichnung eines Familien-Schutz-Regimes zusammengefasst. Ausser der Gewährung gesundheitlicher Fürsorge für den Defekt selbst, bemüht sich im Rahmen dieses Regimes eine ganze Reihe interessierter Spezialisten, bei den Familien das Gefühl einer „Schuld" und Ausweglosigkeit zu unterdrücken und mit Hilfe der Familie eine Situation zu schaffen, die die Bedingungen zu einer Sozialisierung des betroffenen Kindes bessern. Der Genetiker sichert das pränatale Schutzregime, das in einer Empfehlung des Termins der Empfängnis beruht, in einem Versuch der Wahl des Geschlechts des Kindes vor der Konzeption, in einer Beseitigung der möglichen internen und ätiologischen Infektionsfaktoren (TORCH, ADAM sy.) ebenso wie in einer möglichen teratogenen Agens im Lebensmilieu der Familie. Die gynäkologische Fürsorge ist auf eine Hypoplasie der Gebärmutter, auf Atypie, auf gynäkologische Entzündungen und hormonale Abweichungen gerichtet. Zwei Monate vor der Empfängnis sowie im ersten Vierteljahr wird eine Kost empfohlen, die reich an Eiweisstoffen, Mineralien, Spurenelementen, Vitaminen und acidum folicum ist. Es wird auf die möglichen Risikofaktoren dieser Methode hingewiesen (Verminderung der natürlichen pränatalen Selektion, gesteigerte Fruchtbarkeit bei Risikofamilien). Die objektive Einschätzung der Ergebnisse des Schutzregimes vor der Empfängnis (geplante Empfängnis, primäre Vorbeugung) ist vorläufig vor allem wegen des „Fehlers" bei der Auswahl der Kollektive nicht möglich.

RESUMEN

El régimen preventivo familiar en las fisuras del labio y paladar

Černý, M., Fára, M., Hrivnáková, J.

El departamento de la cirujía plástica en Praga ofrece una asistencia curativa comprensiva a los niños y familias con la incidencia de las hendiduras del labio y paladar, la que lleva el nombre del régimen preventivo familiar. Aparte del tratamiento del defecto mismo en este régimen participan diferentes especialistas quienes concentran su atención a eliminar la sensación de "culpa" en los padres con ayuda de la familia y crear tal situación que pueda mejorar las condiciones para la socialización del niño. El genetista está encargado del régimen preventivo prenatal que consiste en la recomendación de la fecha óptima para la concepción, porque ésta pueda influir el sexo del niño antes de la concepción, en la eliminación de los factores potenciales, internos y infecciosos (TORCH), factores etiológicos así como los agentes teratogenéticos potenciales en al ambiente de la familia. La asistencia ginecológica se refiere a la hipoplasia uterina, razgos atípicos, inflamaciones ginecológicas y desviaciones hormonales. Dos meses antes de la concepción en el primer trimestre, los autores recomiendan a guardar la dieta con abundancia de proteínas, sustancias minerales, elementos trazadores, vitminas y el ácido fólico. Los autores acentúan los riesgos potenciales de este método (la selección prenatal reducida, la fertilidad elevada en las familias bajo riesgo. Al presente no es posible hacer una evaluación objetiva de los resultados del régimen preventivo de preconcepción principalmente porque la selección del grupo no está representativa.

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A NEW TECHNIQUE OF OPERATION FOR OPPOSITION OF THE THUMB IN THENAR MUSCLE PARALYSIS

K. DLABAL

Characteristic features of peripheral median nerve paralysis include distal trunk involvement due to either simultaneous loss of sensation in the respective volar zone of the hand and motor loss of thenar function or — in cases of thenar motor branch damage — to affection of the short muscles of the thumb.

This type of paralysis includes atrophy of the m. pollicis brevis, flexor pollicis brevis, and musculus opponens pollicis. The thenar is flat. Since the adductor function of the thumb is usually preserved, its adduction position predominates but, at the same time, under the effect of extensors of the thumb, the first metacarpal bone is forced into alignment with the rest of the fingers in what is called the ape hand. Owing to this paralysis, the hand loses its human character and its typical grasping ability.

MATERIAL AND METHODS

The dual-line effort to make up for the opposition of the thumb by surgical means has already been described by Bunnell (4) and Merle (6).

Opposition operations are as follows: 1. static surgery in which the thumb is placed firmly in opposition by means of arthrodesis of the first metacarpal joint according to Lange and Spitzi, or by means of fixing the first metacarpal in opposition using an intermetacarpal bone graft as described by Forster (6). 2. Dynamic surgery: operations of this kind make predominant use of tendons of the flexors of the wrist and fingers whose transposition is designed to replace the paretic muscles of the thenar. Opposition-restoring muscles mentioned by different authors include: m. flexor dig. IV superficialis (10), m. flexor dig. III superficialis (6), m. flexor carpi ulnaris (6, 7), radialis (6) and less so, m. palmaris longus. Also reported are split tendons of the long flexor of thumb but also transposition of the extensor of the index and the thumb (6).

The technique proper of tendon transfer to restore opposition of the thumb was developed by Bunnell (4), who saw the success of the operation as depending on the choice of the activating muscle, in drawing the tendon to the thumb aligned with the os pisiforme, and in a well-accomplished insertion to the bones of the thumb. In his original work, Thompson (10) uses the tendon of m. flexor dig. IV superficialis looping it round the pisiforme to draw it through the thenar subcutis, fixing it finally to the radial sesamoid bone of the thumb and to the insertion of the short extensor of the thumb. In another technique, the tendon is threaded through an opening in the ligamentum carpi transversum and fixed likewise.

Merle is quite right in claiming that inserting the tendon to the metacarpal bone of the thumb makes for weaker opposition while, in contrast, a tendon chosen for the opposition and inserted to the basal phalanx, produced stronger opposition but, at the same time, undesirable flexion with flexion contracture in the basal joint of the thumb as the end result. The outcome can be equally unpleasant in cases of split long flexor of the thumb whose bifurcated branch is fixed similarly.

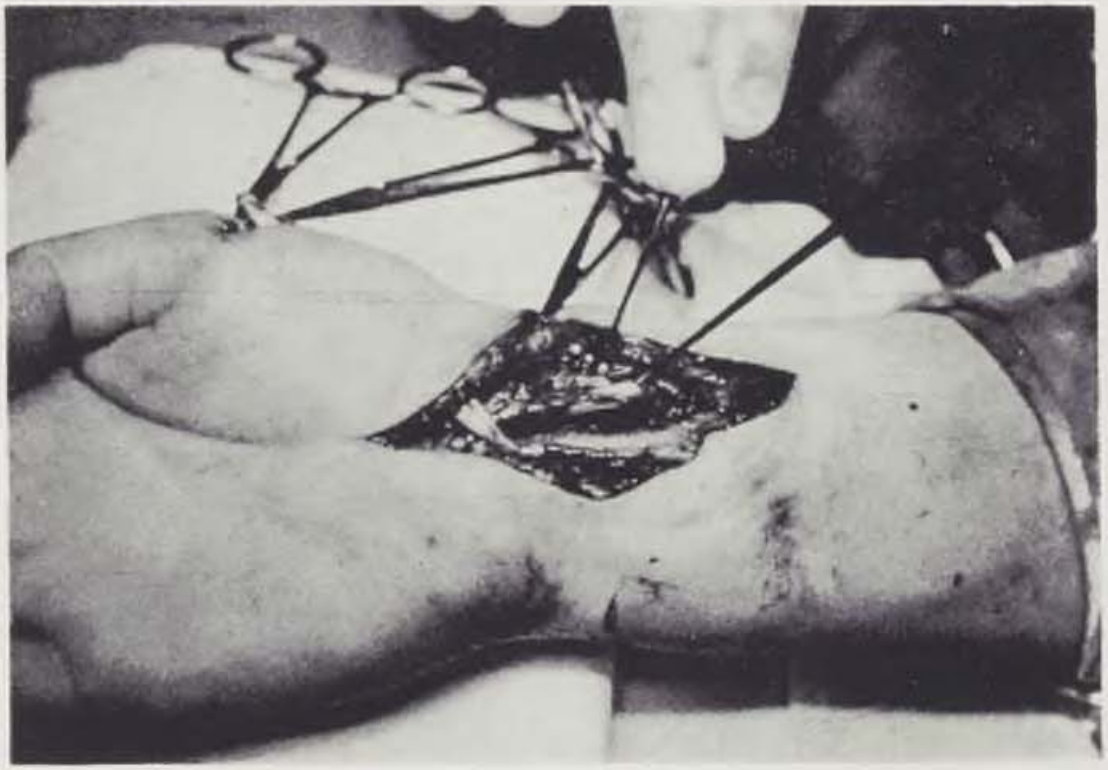

Fig. 1 Tendon graft ready for suture to m. flexor pollicis longus and drawn through the thenar tunnel

Surgical technique employed:

Compared with previous and existing methods, our technique is, to say the least, simpler than the above listed dynamic opponens operations in that it uses, as a functional motor unit, the long flexor of the thumb which, in

cases of the ape hand, is practically the only thumb-moving tendon — except perhaps for musculus adductor pollicis — (flexion in the proximal and distal joints with simultaneous adduction to the IInd digital axis).

The operation is performed in local anaesthesia with 1% mesocaine-adrenaline using a "Z" incision on the wrist continued distalward by transection of the ligamentum carpi transversum volare into the carpal tunnel. Then we expose the tendon of the long flexor of the thumb right down to the wrist (1), preparing simultaneously a tendon graft, usually from the m. flexor dig. IV superficialis, less frequently from other flexor tendons or from the m. palmaris longus. The proximal end of the graft is then sutured in the wrist to the flexor pollicis longus using the technique of continuous suture over a distance of about 2 cm, secured in position with two U-stitches using atraumatic monofile material (Prolene 4/0 or 5/0, Ethicon). Then we draw the graft through a tunnel from the thenar muscle insertion on the transverse ligament of the wrist, a tunnel running obliquely through the muscle distalward to the head of the first metacarpus. Using a short incision on the radial side of the 1st metacarpal bone, we mobilize the insertion of m. abductor pollicis brevis and m. extensor pollicis brevis coiling the graft round those insertions and fixing it as a loop with 2—3 fine sutures. An important condition is that the graft should be inserted distally at slight flexion of the flexor pollicis longus. While suturing the graft during the operation, we invite the patient to flex the distal phalanx of the thumb where, with some support, opposition is usually successful (2). We wind up the operation by suturing the wounds and by applying a removable plaster splint with the thumb in opposition.

Early rehabilitation supervised by a qualified rehabilitation nurse is a highly important post-operative phase (3). From the very first post-operative day, the position of the plaster splint is continually checked. The basic opposition movement should be practised as from the 3rd post-operative day using for the actual practise of opposition of the thumb, a small cone-shaped plastic foam aid placed in the Ist intermetacarpal zone. At the beginning, some patients are invited to dispense with their previous habit of allowing extensors of the thumb to be predominant.

The opposition proper begins with the m. abductor pollicis longus and m. extensor brevis. Once the thumb metacarpus approximates the IInd metacarpus, the m. flexor pollicis longus adapted with the sutured-in graft takes over. A combination of the movement of two antagonistic muscle groups in a smooth flow of motion helps to restore the thumb in opposition, during which its metacarpal bone becomes positioned at right angles with the frontal position of the fingers in agreement with the axis of the IInd radius. We then measure the distance from the proximal joint of 2nd and 3rd fingers to the ball of the thumb, which amounts to an average of 5—6 cm in adults. Opposition practising ends up with the formation of a round pinch to the finger concerned, i. e. with flexing the terminal phalanxes of the thumb and the respective finger (4).

Fig. 2 Graft suture to the m. flexor pollicis longus and to the insertion of the m. extensor brevis. Test for opposition at the time of surgery

Fig. 3 Early post-operative rehabilitation for the opposition of the thumb

On release from hospital treatment, the patient is instructed to apply the opposition splint from post-operative days 28—35. Adding to this physiotherapy, pressure massage of the healed operation site must be applied from the post-operative days 7—8.

From the end of 1984, 47 patients were operated on at our institute. Only 40, though, were included in the basic material; the rest underwent surgery prior to publication and were consequently left out of the picture.

TABLE NR. 1

Tab. 1. Age of the patients

age	—10	10—20	20—30	30—40	40—50	50—60	60—70	70—80
n	1	4	8	10	4	7	5	1

Rated by the diagnosis of peripheral paralysis, we operated on:

17 patients for transcision of the distal trunk of the median nerve
12 patients with severe carpal tunnel syndrome
4 patients following severely bruised distal trunk of the median nerve
2 for brachial plexus injury
2 after poliomyelitis (m. flexor pollicis longus — function preserved)
3 for post-operative paresis

Fig. 4 Thumb in opposition and "round" pinch performed post-operatively

The tendon graft was used in 19 cases from the flexor digiti IV superficialis, in 14 cases from the m. palmaris longus, in 5 cases from the m. flexor digiti II superficialis, in one case from the m. flexor digiti V superficialis, and once from the m. extensor digiti IV pedis.

Within six months of the operation the patients' condition was checked upon to assess the restoration of the habit of opposition by dividing them into three groups. Very good results (25 patients operated on) were characterized as follows: with the thumb opposition accomplished, the axis of the 1st metacarpal bone is aligned with the axis of 2nd finger, the distance between the proximal phalanges of 2nd and 3rd fingers and the ball of the thumb being 5—6 cm, and the thumb can reach the tips of 4th and 5th fingers. In result rated as good (14 patients), the axis is in alignment, the thumb can form a pinch with the tips of the 2nd and 3rd fingers.

In results rated as poor (1 surgical patient) the patient, instead of closing the pinch with the distal phalanx, achieves opposition with the thumb extended.

DISCUSSION

The use of the simplified surgical operation as described above permits to dispense with the complicated practise of opposition which other authors solve by transposing other tendons so that the patient is faced with a need to learn combining the function of the transposed tendon along with the m. flexor pollicis longus and m. abductor pollicis longus and m. extensor pollicis brevis.

We agree with other authors that surgical operation would be wasted on neurotic and less intelligent patients and that the same applies to those who for dislike for work and disregard for physiotherapy rest satisfied with their present condition. While the age of over 50 years used to be regarded as contraindicating opponens surgery, we found as equally unsuitable the patient's age below 10 years for poor cooperation after surgery but we saw the 50-year limit as no obstacle. In the case of one patient we thought that so soon after physiotheraphy he would not be able to achieve opposition for mental simplicity. Nevertheless, he managed to develop the new habit individually after check-ups at 3 and 6 months, which qualified him for group 2.

The rest are commonly shared contraindications for surgery (poor blood supply to the fingers, cicatricial changes in the region of planned operation, and arthrogenic contractures).

The above facts show that thanks to its simplicity, our surgical technique is a positive contribution to restoring the opposition function of the thumb. Moreover, it is attractive not only for the surgeon but also for the physiotherapy workers and ultimately for the patient himself.

SUMMARY

The author presents a new technique of dynamic operation designed to restore the opposition of the thumb in cases of distal median nerve para-

lysis affecting muscles of the thenar. The technique makes use of the function of the long flexor of the thumb as the basic motor unit to make up for the lost opposition of the thumb by means of a tendon graft from the m. palmaris longus or m. flexor digiti IV superficialis. Referring to literary sources and to his own surgical results, the author shows the simplicity of the operation and the usefulness of early rehabilitation for the restoration of the grasping function of the human hand.

Key words: distal median nerve paralysis, opponens operation on the thumb.

RESUME

Nouvelle manière d'opération de la position opposé du pouce dans le cas de paralysie des muscles thénariens

Dlabal, K.

L'auteur rapport une nouvelle manière d'opération dynamique de la position opposée du pouce dans le cas de paralysie distale du nerf médian, atteignant les muscles thénariens. On profite de l'importance fonctionelle du grand fléchisseur du pouce comme d'une unité basale du mouvement qui substitue — à l'aide d'un greffon tendineux du muscle palmaris longus ou du fléchisseur superficial de IVème doigt — l'opposition de pouce perdue. Se basant sur les donnés littéraires et sur ses propres résultats opératoires, l'auteur prouve la simplicitě de l'intervention et les avantages d'une reéducation opportune qui favorisent la reprise fonctionnelle et surtout l'aptitude de maniement de la main humaine.

ZUSAMMENFASSUNG

Neue Operationsmethode der Oppositionsstellung des Daumens der Hand bei einer Lähmung der Muskulatur des Daumenballens

Dlabal, K.

Der Autor führt eine neue Methode der dynamischen Operation der Oppositionsstellung des Daumens der Hand bei Distallähmung des Mittelnervs an, die die Muskulatur des Daumenballens betrifft. Er nutzt die funktionelle Bedeutung des langen Beugemuskels des Daumens als grundlegende Bewegungseinheit aus, die mit Hilfe des Sehnenpfropfens aus dem m. palmaris longus oder flexor dig. IV superficialis die verlorene Opposition des Daumens ersetzt. Auf Grund von Angaben der Literatur sowie auf Grund eigener Operationsergebnisse beweist er die Einfachkeit des Eingriffs und den Vorteil einer rechtzeitigen Rehabilitation zur Wiederlangung der Greiffunktion der menschlichen Hand.

RESUMEN

Nueva técnica operatoria para la posición oponente del pulgar en la parálisis de los músculos del ténar

Dlabal, K.

El autor describe una nueva técnica de la operación dinámica cuyo objeto es restaurar la oposición del pulgar de la mano en la parálisis del nervio mediano afec-

tando los músculos del ténar. La técnica utiliza la función del flexor largo del pulgar como la básica unidad motor que por medio del injerto de tendón obtenido de m. palmaris longus o m. flexor digiti IV superficialis compensa la oposición pérdida del pulgar. Referiendo a los datos de la literatura y a sus propias experiencias el autor muestra la simplicidad y las ventajas de la rehabilitación temprana para la restauración de la función de agarro de la mano humana.

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CORPUS ALIENUM MAMMAE

P. BASSE, BO J. HANSEN

INTRODUCTION

Pseudotumors of the breast have been previously mentioned (1) and that with increasing frequency corresponding to the growing demand of augmentation mammoplasty. To treat the common complication of fibrous capsular formation around the prosthesis with subsequent contraction, closed compression capsulotomy is recommended. However, this manipulation results in prosthesis ruptures in 0.93 % of the cases (1, 2, 3).

In literature concerning foreign bodies located in the breasts, only the above mentioned subjects have been described. This stimulated our interest in the subject.

CASE REPORT

A 58 year-old healthy woman had felt a tumor increasing gradually in size over the past 3 months in her left breast. Examination revealed a possible neoplasm measuring 4 X 5 cm, localized in the left breast at the position of 11 o'clock, free of the underlying fascia and possibly adherent to the skin. Mammography (Fig. 1) disclosed a metallic needle surrounded by connective tissue and without any sign of cancer. The patient told of her habit of placing needles on her blouse collar while doing needlework. One of these needles had apparently entered the breast. In this case, surgery was planned, nevertheless the needle was eliminated spontaneously.

DISCUSSION

The sudden appearance of a growing tumor in the breast should always lead to a thorough examination program, including mammography. In this case, mammography proved to be sufficient in both denying the suspicion of a neoplasm and detecting the X-ray-sensitive foreign body. Furthermore, an article by Gretchen A. W. Gooding et al. (4) suggests that high resolution sonography may be applied in both the detection and precise localization

of foreign bodies. Thus, highresolution sonography could be a good supplement in the diagnosis of tumors in the breast.

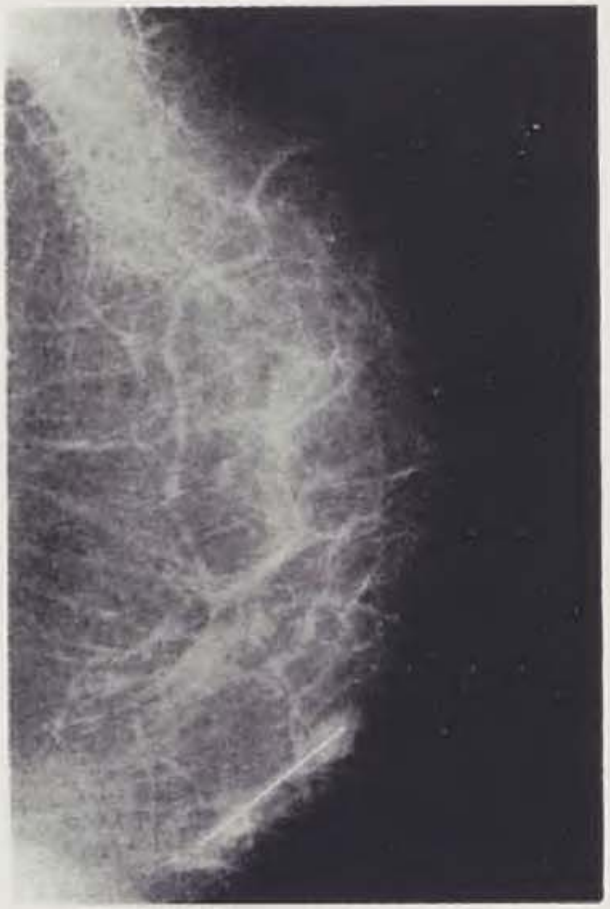

Fig. 1

The usual treatment for a mammary foreign body is surgical removal. In this case, surgical removal was not necessary, as the object was eliminated spontaneously from the breast.

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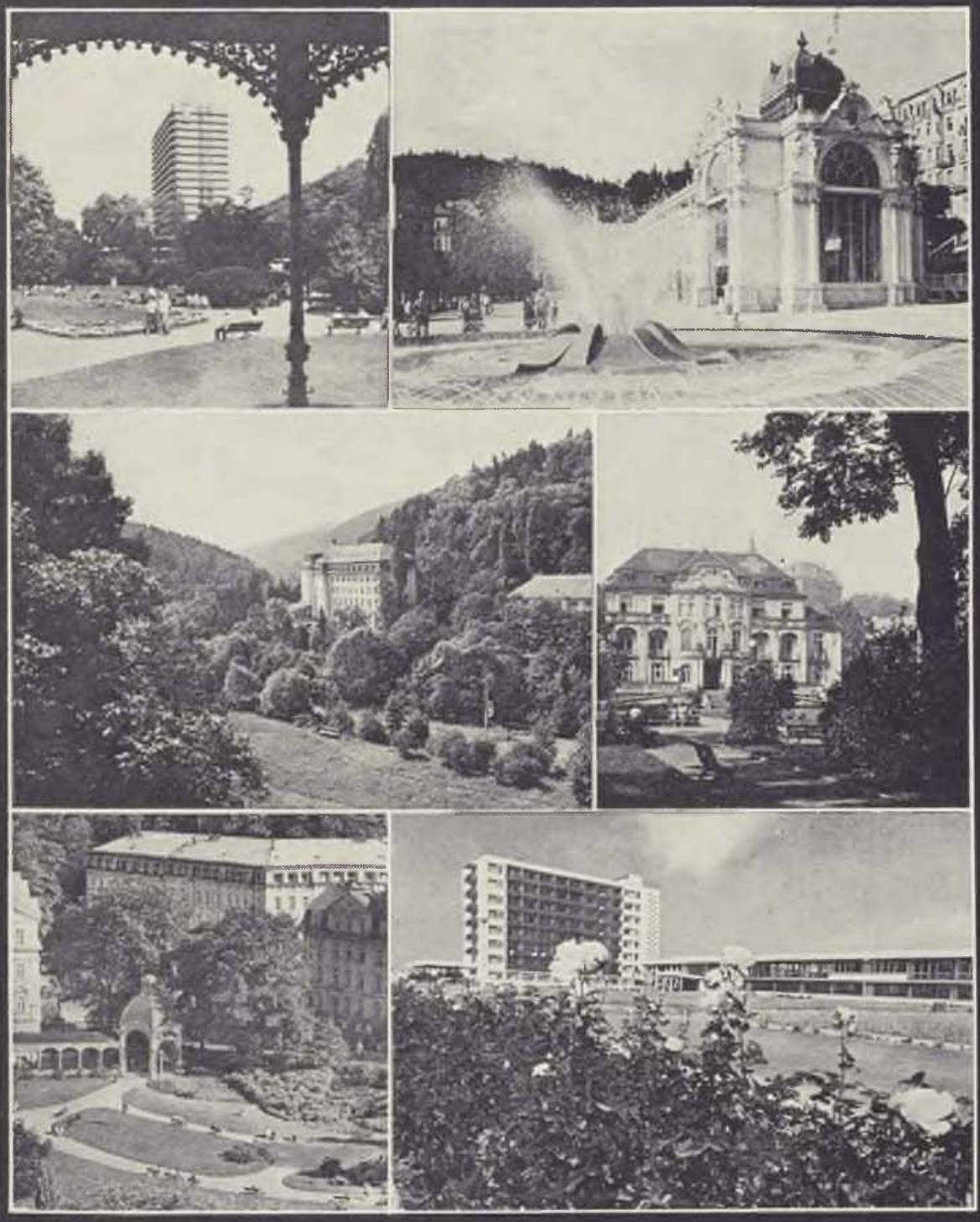

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