INISTRY OF PUBLIC HEALTH OF THE USSR

THE ALL-UNION SCIENTIFIC SOCIETY OF SURGEONS

XXVII ALL-UNION CONGRESS OF SURGEONS OF THE USSR

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THERMAL BURNS

Prof. A. A. Vishnevsky, G. D. Vilyavin,
Doctor of Medical Sciences M. I. Shraiberkh

1. The reaction of the body to thermal burn develops in human beings somewhat differently than in animals. Such a variance is explained not only by the anatomical features of the human skin structure, but also by the high organization of the nervous system which is characterized by a considerably more intimate regulation of all functions of the organism than in animals.

2. A powerful thermal irritant in extensive burns precipitates a sharp change in the state of the nervous system. This predetermines the regularly occurring disturbances in the nervous and endocrine regulation of the activity of all organs and systems of the animal organism. The above-mentioned should be taken into consideration during the elaboration of therapeutic measures.

3. The severity and the rate of burn shock development leave their impression over the entire future course of burn disease. The markedness of the subsequent phase of toxemia is proportionate to the severity of shock. In a number of instances the development of burn shock could be prevented, or its manifestations alleviated by effecting an early, long-term and elaborated antishock therapy.

A complex method, comprising elements of pathogenetic therapy, is the only justified mode of treating burn shock. The complex of antishock measures should also be employed for preventive purposes in all cases where there exists a potential possibility of shock.

4. Pathogenetic therapy of burn shock is conducive to a reduction of capillary permeability, it lessens the loss of plasma and hemoconcentration, and therefore

enables one to abstain from the hazardous flooding of the organism with an excessive quantity of fluid in extensive burns.

5. During the course of burn septicemia intensive and diverse deleterious factors incessantly influence the patient's central nervous system. The treatment effected in this phase should be sparing and must contain elements of pathogenetic therapy.

6. The primary surface treatment after Vilbushevich is very traumatic, it should be substituted by a sparing method of treatment.

7. The open and closed methods of treating burn wounds should be employed in accordance with specific indications. The open method is indicated mainly in burns of the face, perineum and external genitalia in adults, as well as in burns of different localization in children, especially in early childhood.

8. Early total debridement of devitalized tissues in deep burns and skin grafting of the defect by autotransplantation should be instituted only in cases when this operation is practically safe, i. g. in more or less limited deep burns with the area of affection not exceeding 10% of the body surface, provided the patients could tolerate it.

In extensive deep burns the method of nectrotomy and stage-by-stage necrotomies, performed painlessly during routine dressing procedures, is the least dangerous and most sparing one.

9. When the necessity arises of grafting extensive skin defects of paramount importance is auto- and homotransplantation.

Among the different variants of plastic repair of the skin in weakened patients with extensive burns, particular attention is to be devoted to stage-by-stage combined (auto and homo) transplantation of small grafts, applied to surface granulations.

10. Successful results in the therapy of burns and the prospects of further study of this complex problem are largely dependent on the concentration of patients in well-equipped specialized departments. Such departments should be set up at the hospitals of republican and regional centers. A well-functioning system of preparing and preserving cadaveric skin is also quite necessary.

11. In the process of subsequent elaboration of the burn problem attention should be paid to the search of simple modes of therapy, suitable for rendering mass medical aid.

BURN SHOCK, ITS PREVENTION AND TREATMENT

Professors I. S. Kolesnikov and T. Ya. Ariev (Leningrad)

1. The incidence and the degree of severity of burn shock are directly dependent on the extensiveness of the area of deep burn wounds.

2. Symptoms of burn shock, marked to a greater or lesser degree, are observed in 30—40% of patients in whom the body surface of burn wounds exceeds 10%. In burns of the trunk, face and upper respiratory tract the possibility of burn shock development is very great.

3. In a number of current theories relative to the pathogenesis of burn shock there is an underestimation of the cessation of the physiological function of the skin, inevitable in extensive and deep burns. The division of burn shocks into primary, secondary, tertiary and toxic ones entails difficulties in the clinical practice.

4. The sensation of pain is not characteristic of severe forms of burn shock. If there is full thickness skin necrosis, involving more than 20% of body surface the prognosis of burn shock is dubious.

5. The most effective means of treatment in reversible burn shock is infusion therapy, blood transfusion in particular. All types of novocain blocks are highly efficacious. Primary surgical debridement of burn wounds after the method of Vilbushevich aggravates the course of burn shock and is conducive to its recurrence.

6. Tracheostomy is indicated in all cases of severe burn shock and, in particular, in burns of the trunk, face and upper respiratory tract.

FUNCTIONAL DISTURBANCES AND MORPHOLOGICAL CHANGES OF INTERNAL ORGANS IN BURN DISEASE

Prof. N. S. Molchanov, V. P. Kuznetsova,
I. N. Katrushenko, L. M. Klyachkin,
P. V. Pilyushin, V. P. Pinchuk (Leningrad)

1. Thermal burns are attended with multiform changes of different systems and organs of the body, as well as with disturbances of metabolic processes, the character and course of which to a considerable extent depends upon the phase of development of the pathological process (shock, toxemia, the peak of infection, septic complications).

2. In the early periods following injury functional disorders prevail, later, there develop morphological changes of varying degree of markedness.

3. The intensity of functional and morphological changes of systems and organs is proportionate to the extent of the burn surface, the degree of the burn and to the general reactivity of the body.

4. Changes of the cardiovascular system, digestion, kidneys and lungs become manifest at an early date.

5. In patients who had succumbed to burn disease one could find various morphological changes in the internal organs.

6. The pathogenesis of metabolic disorders and changes of the functional state of internal organs in burn disease is complex, and proves to be different in individual phases of disease development. In capillary permeability disturbances a considerable part is attributed to reflex influences and to infection.

7. An early recognition of changes in the internal organs and studies of their pathogenesis enalbe to timely institute therapeutic and preventive measures, and thus influence the outcome of the disease.

BURNS IN CHILDHOOD

Prof. S. D. Ternovsky, S. V. Shishakova, (Moscow)

1. The anatomo-physiological features of the child's organism entails a more severe course of burns in children, as compared with adults.

2. When burns in children involve 10—15% of body surface manifestations of shock set in. If the scope of antishock measures in such children is inadequate a lethal outcome may result.

3. The severity of the course of burn associated with shock in children within the first 24 hours depends on the age, the size of the area affected and the depth of the burn.

4. The medical treatment of burns should consists in:

a) the institution of measures for the prevention and control of shock;

b) surface treatment of burns.

5. In the control of shock it is necessary to maintain a complex of measures, including the administration of narcotics and anesthetics.

6. The coagulative method of Nikolsky-Bateman is one the best means of surface treatment, especially in children with extensive burns. A paraffin dressing applied to the extremities yields good results.

These methods diminish the sensation of pain, ensure good healing and are most advantageous for the treatment of children with burns.

7. The existing modes of therapy of children with burns in special children's surgical institutions made it possible to reduce the lethality rate during the last years down to 2%.

8. Proper organization of surgical aid for children (primary treatment, skin grafting) and further improvement in the treatment of complications associated with burns will be contributive to a drop in the lethality.

9. A widespread sanitary education work among the population is necessary for the prevention of traumatism in children.

SKIN TRANSPLANTATION IN EXTENSIVE BURNS

E. V. Bonch-Bruevich (Moscow)

1. Early free skin grafting (immediately after separation of slough) is the most effective mode of treating extensive third degree burns.

2. Autoplasty ensures the best results.

3. Cadaveric skin transplanted prior to autoplasty is a good temporary biological dressing, which prevents the loss of protein, hemoglobin, precludes the growth of bacteria and alleviates intoxication. It enables to save the time necessary for the grafting of the extensive granulating surface, when the patient's skin is insufficient.

4. A meticulous preparation of the affected patients by elevating their body resistance is a prerequisite for successful skin grafting.

5. For the control of anemia and hypoproteinemia, preservation of the patient's tone and prevention of emaciation it is imperative from the very beginning to institute massive transfusions of protein fluids, blood, electrolytes, ACTH therapy and maintain a high-protein diet.

6. The factor of infection should be dealth with antibiotics, with special regard for bacterial sensitivity.

7. The report is based on the analysis of 78 patients with severe third and fourth degree burns, involving from 20% to 70% of body surface, treated in hospitals of the Sklifasovsky Institute (1949—1958). Extensive skin grafting (up to 3,500 cm^2) was performed in 35 patients.

DIFFERENTIAL INDICATIONS FOR THE USE OF BLOOD AND BLOOD SUBSTITUTES IN BURN DISEASE

Prof. D. M. Grozdov (Moscow)

1. Hemotherapy could be of paramount importance in the complex of curative measures effected in extensive burns. The use of modern blood-substituting fluids

makes it possible to elevate the effectiveness of treatment, especially in the first and second phases of burn disease.

2. The Surgical Clinic of the Central Institute of Blood Transfusion for a course of many years has been conducting studies for the comparative assessment of the efficacy of various transfusion media in burn disease. On the basis of the data derived indications and contraindications have been elaborated for the transfusion of blood and blood substitutes in this pathological process.

3. It was found that transfusion of polyglucin is the most reliable preventive and therapeutic method of controlling burn shock. This substitute rises considerably the effectiveness of antishock measures, and, concurrently, sharply reduces the loss of blood, plasma and serum.

4. For the control of severe intoxication the most warranted means is the blood and plasma of burn convalescents. In such cases the employment of low-molecular fractions of polyvinylpyrrolidone is also justified

5. In hypoproteinemia and hypoalbuminemia, along with plasma transfusion, an extensive use of protein hydrolysates and heteroprotein fluids is also indicated.

6. In the control and prevention of anemia one must, apart from the use of protein solutions, systematically conduct transfusions of blood and erythrocyte mass.

7. Inasmuch as burns are often attended with an impaired function of the liver and kidneys, the transfusion of blood substitutes should be effected with strict control of the functional indices of these vitally important organs. If marked changes of the liver and kidneys become manifest it is necessary to widen the scope of plasma and serum transfusion, with a corresponding decrease, or even discontinuance, of the whole blood transfusion.

8. In the first and second phases of burn disease hemotherapy is quite often the decisive therapeutic factor. In the third phase the employment of hemotherapeutic agents is essential in combination with: 1) active surgical intervention, consisting in plastic repair of extensive burn surfaces; 2) wide use of vitamins, hormone preparations and a corresponding dietary.

Only a wide complex of curative measures could ef-

fect a drop in the lethality rate and prevent the development of wound emaciation in patients with severe extensive burns.

THE TREATMENT OF BURNS ACCORDING TO DATA OF LENINGRAD HOSPITALS

Prof. B. M. Khromov, Docent L. I. Garvin, Senior Scientific Collaborator N. D. Kazantsev, E. A. Khodneva, N. I. Svistunov, K. N. Lazareva and S. M. Fedorovsky

1. According to data of the Leningrad First Aid Station burns comprise nearly 5% of all injuries.

2. The results of studies of over 1,000 cases of burns testify to the fact that neither in the clinical, nor in the polyclinical practice there exists a universal method of treatment.

3. During the past 20 years in Leningrad the lethality rate due to burns has dropped 4—5 times. The maximal lethality rate (3.5%) is observed in the pre-school age group of patients and in those over 50 years.

4. Shock comprised 45% of all complications, while toxemia — 20%. Shock was the principal cuase of death in 50% of all lethal issues associated with burns.

5. The prevention and treatment of shock and toxemia were effected in the hospitals of Leningrad by routine methods. Neuroplegic substances were employed very rarely in the treatment and prophylaxis of burn shock. Further investigations are necessary for the assessment of the expediency of their use.

6. Up to the present time different methods of surface treatment in burns are practiced in the hospitals of Leningrad. Surgical treatment was made use of only in a limited number of cases. At the time of discharge from the hospital a complete healing of the affected area occurred in 50% of patients; in 48% of cases there were inconsiderable granulating surfaces.

7. Further improvement of the results of burn treatment necessitates the elaboration of a universal complex method of general and local therapy and its introduction into the practice of medical institutions.

THE TREATMENT OF EXTENSIVE THERMAL BURNS

Doctor of Medical Sciences R. L. Ginzburg (Moscow)

1. The development of burn shock should be anticipated before the onset of clinical manifestations.

Intravenous administration of morphine, novocain, bilateral paranephric novocain block, transfusion of blood and blood substitutes, long-term oxygen therapy, etc., considerably reduced the number of deaths from burn shock as compared with the past.

2. Specific immunotherapy by means of intravenous introduction of the serum or whole blood of a burn convalescent, according to the method recommended by the Institute of Blood Transfusion, produces an antitoxic curative effect. This method is subject to further studies.

3. Parenteral and local antibiotic therapy is indicated in all cases of burn disease. A proper antibiotic for the control of infection could be selected after the determination of bacterial sensitivity of different antibiotics.

4. The principal complications in severe burns — toxemia and infection — could be controlled with the aid of early debridement of devitalized tissues and homoplasty, with subsequent autoplasty.

5. Closure of an extensive burn wound during the first stages of treatment is effected with biological material: homografts, heterografts (peritoneum of cattle), fibrin film.

These methods are one of the means of saving the patient's life. General therapeutic measures in combination with early homoplasty enables to save the lives of patients who were previously considered as doomed.

6. In extensive deep burns and severe condition of the patient autoplasty should be carried out only when the general condition of the patient improves and the area of wound diminishes.

7. The employment of the method of skin grafting in extensive and deep burns is ever increasing. Hence, the necessity has arisen of the organization of laboratories for skin preservation, which would permit wide use of this method.

THE CLINICAL PICTURE AND TREATMENT OF FACIAL BURNS

Prof. M. V. Mukhin (Leningrad)

1. Thermal burns of the face are often encountered in peacetime as well as during the time of war. In view of the specific features of the face contours, the severity of the thermal injury is variable in different areas of the face. Injuries of the upper portions (nose, supraorbital arches, zygomatic regions, auricular conchae) are the most common ones.

2. Up to 1960 under our observation were 108 subjects with burns of the face and their sequelae.

In the clinical course of facial burns there are distinguished mild and severe forms. First and second degree burns, as well as third degree burns with limited areas of affection, are attributed to the first group. Patients of this group require only conservative treatment, the duration of which amounts to 2—4 weeks. After healing of such burns there are no noticable scars and deformations on the face.

The second group includes burns of the second, third and fourth degree, with a prevalence of third degree burns. If hot air and smoke was inhaled simultaneously with burns of the face there could occur irritation and even burns of the mucous membrane of the upper respiratory tract, which sometimes cause a prolonged aphonia.

3. In the first 10—12 days following thermal injury of the face there is no possibility to determine the borderline between burns of the second and third degree. Hence, taking into consideration the complex structure of the face, one should excise necrotic tissues only after the expiration of this time.

4. The first medical aid in burns of the face consists in the administration of narcotics and fluids. Primary surface treatment is effected. The treatment of facial burns should be conducted by the open method. It is necessary to perform a daily toilet of the burn surface and irrigation with antibiotic solutions, or application of synthomycin emulsion. During the transportation of the patients a dressing with synthomycin emulsion should be applied to the face.

In burns of the oral region the ingestion of hard food is difficult — in such cases liquid food should be provided.

5. Free skin grafting in third degree facial burns could be effected not earlier than in 15—18 days. First of all skin grafting of the lips and eyelids should be done, in order to prevent their ectropionization. On the affected areas of the face there are, as a rule, pathogenic microbes resistant to penicillin, streptomycin and biomycin. However, this should not be an obstacle to skin transplantation. Split skin grafts should be employed. Perforation of the grafts is inexpedient, inasmuch as there remain spots at the site of perforations. Skin homoplasty is contraindicated in the treatment of burns of the face.

6. Deep burns of the conchae are often complicated by chondritis, which noticably aggravates the clinical picture.

7. The length of treatment of deep burns of the face averages three-four months, not counting the time necessary for subsequent plastic operations for repair of cicatricial deformations, which may require several months, or even years. Keloid scars often remain after burns of the face.

The repair of deformations and defects of the face, due to burns, in the majority of cases makes necessary multi-stage plastic operations with the employment of various modes of skin grafting.

NEW DATA ON THE PATHOPHYSIOLOGY AND PATHOMORPHOLOGY OF BURN SHOCK

E. A. Kruglova (Frunze)

1. The principal gap in our information relative to the morphology of burn shock is the nonstandard nature of the injuries, i. e. the varying conditions of trauma. Only experimental burns could be uniform (as regards the conditions of their infliction). Hence, the importance of

the problem of creating an experimental model of burn shock.

2. For a long time experiments were carried out only with exteroceptor thermal burn shock, inasmuch as it is encountered more often; interoceptors were not considered more inert than the exteroceptors. However, thermal burns of the stomach (G. L. Lyuban's model) as well as our data, show that this is true apparently only for conditioned stimuli; at any rate this is untrue with regard to unconditioned stimuli: the shock in thermal burn of the stomach could be just as disastrous as in skin burns.

However, the incidence of burns of the stomach is very rare or it is not encountered at all. In view of this a problem arose of creating a more adequate model—chemical burns of the stomach. We have elaborated two such models — "acid" and "alkaline". Upon introduction into a dog's stomach of 3 ml of 60% acetic acid per kg body weight, or 3 ml of 20% NaOH per kg body weight it is possible to obtain a marked picture of shock, leading to the death of the animal in 40 minutes to 7 hours. Experimental burns of the stomach with chemical agents differ from thermal ones by the absence of erectile phase manifestations. It is substantiated that the erectile phase affects not only the arterial pressure and if the latter is considered apart from other manifestations one could overlook the erectile phase of burn shock.

3. Morphological data indicate that in exteroceptive and in interoceptive burn shock changes of uniform character consist in the increase of the permeability of the vascular walls. Perivascular hemorrhages occur more seldom. More pronounced changes are usually found in the liver, lungs and suprarenals.

4. Special consideration should be given to the results of experiments with surgical parabiosis. Altogether 28 experiments on 56 white rats were staged. The junction was effected by way of a cutaneous-muscular anastomosis after L. R. Perelman's method. 10 days afterwards one of the experimental animals was subjected to a burn with boiling water, involving 45% of body surface (posterior half of the body). The animal subjected to the burn perished earlier. Only in 3 cases out of 28 the non-injured animal died sooner. Two variants of experiments were carried out: 1) a rapid death of the animal — from

1—2 minutes to one hour, 2) with a more prolonged shock — from one hour to 3½ hours. Morphological changes associated with burn occurred in the injured and non-injured animal. They were of analogous character, however they were marked to a considerably lesser degree in the non-injured animal. The data obtained (especially morphological) in the experiments with surgical parabiosis show that the role of burn toxemia is, apparently, more important than it was considered lately.

5. The unvarying nature of morphological changes of burn shocks, provoked from different receptor fields and of diverse etiology, are in aggreement with the viewpoint of N. V. Golikov on the polyetiological and monopathogenic (parabiosis of vasomotor and respiratory centers) character of burn shock — one of the variants of traumatic shock (Yu. Yu. Dzhanelidze).

EARLY PLASTIC REPAIR OF LARGE SKIN DEFECTS DUE TO BURNS

Docent V. D. Bratus (Kiev)

1. The report is based on observations in a surgical clinic of 1670 patients with burns, of which 418 cases were third degree burns of varying extensiveness.

There were performed 172 autoplastic skin transplantations in different periods following the burn and 34 homoplastic transplantations, mainly from live donors.

Our experiences, as well as literature data, make it possible to assert that only early plastic closure of the wound surface in complex with up-to-date modes of general treatment and dietary could solve the problem of treating extensive and deep burns of the skin. Early skin autoplasty, performed as a rule on the third week following burn, ensures a good closure of the surface wound, and a favorable functional and cosmetic effect.

During the first three hours following thermal injury skin grafting is justified only in limited deep burns and is, therefore, of no parctical importance.