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THE EARLY SURGICAL TREATMENT OF CHEMICAL BURNS

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THE EARLY SURGICAL TREATMENT OF CHEMICAL BURNS

Following is the translation of an article by Candidate of Medical Sciences M. I. Bystritskiy and V. P. Skorokhodov entitled "Ranneye Operativnoye Lecheniye Khimicheskikh Ozhogov" (English version above) in *Khirurgiya* (Surgery), Vol. 36, No. 5, 1960, pages 104-106.⁷

From the orthopedic-traumatological section (Head M. I. Bystritskiy) of the First Krivoy Rog Municipal Hospital.

We have been occupied for a number of years in the treatment of chemical burns in miners and have become convinced that their healing proceeds exceedingly slowly in the presence of conservative treatment, via the tearing off of necrotized tissues and the formation of sluggishly granulating wounds.

The accumulator lamp with which miners are equipped in the mining shaft, is charged with an alkaline electrolyte. When it gets on the skin, the electrolyte as a rule evokes burns of the third degree.

The tissues are not coagulated in the presence of alkali burns, as a consequence of which alkalis penetrate to the subcutaneous cellular tissue and deeper. In view of their slow action on the tissue, after the tearing away of the scab a granulation surface remains. The slow, gradually developing cicatrization often leads to the disfiguration of the integuments in the area which has been subjected to the burn.

Some surgeons have already for a long time used resection of the injured tissues in the presence of third degree thermal burns (V. I. Belyayeva and B. N. Postnikov, 1934; F. L. Gektin, 1937, and others); this method is, however, still not very widespread.

The treatment of burns, in particular, of chemical burns, by conservative methods is accompanied by a prolonged period of incapacity for work. When the method of resection of the burns is used, these periods are shortened by three to four times.

Chemical burns by electrolytes are almost never extensive. Their maximal area reaches dimensions of 15 X 15 cm. In the majority of cases the operation is limited to the resection of the necrotized tissues and to the application of sutures. Sometimes one is forced to resort to the transplantation of skin.

Fifty-two patients with burns due to alkaline electrolyte from the battery of an accumulator lamp have been under our observation from January 1957 on. Of them 39 individuals were subjected to operative intervention and 13 to conservative treatment. The localization of the burns is shown in the table.

As is evident from the table, burns of the lumbar region predominate, in connection with the circumstance that the batteries of the accumulator lamp are attached to the belt from behind at the time of work.

Table

Localization of the burn	Number of patients operated on	Number of patients treated conservatively	Total
Shoulder girdle	2	1	3
Forearm	1	-	1
Chest	2	-	2
Lumbar region	27	9	36
Buttocks	4	2	6
Thigh	2	1	3
Shin	1	-	1
TOTAL	39	13	52

A bacteriological investigation was performed on 16 victims before the operation. Staphylococcus albus and staphylococcus aureus and streptococci were isolated.

The operation of resection of the injured tissues, as a rule, was performed by us in the hospital on the second and third day after the burn. In this period the contours of the necrotizing area had already clearly appeared. Under local penicillin-novocaine anesthesia, keeping a distance from the edge of the burn surface of 0.5 cm, we resected the entire

area of injury with the subcutaneous cellular tissue. After careful hemostasis we loosely applied nodular sutures. In two cases after the resection of the injured tissues a defect was formed to gather in which with sutures did not seem to be possible and we had to resort to free transplantation of the skin by the method of B. V. Parin. In both cases the skin flaps took root.

The sutures, applied after the resection of the injured tissues, could be expediently removed on the ninth to the tenth day. Early removal of the sutures (on the sixth to the seventh day) leads to a partial, and sometimes to a complete dehiscence of the edges of the wound.

It is necessary to underline, that, keeping a distance of 0.5 cm from the edge of the injured area, we nevertheless did not resect it in the limits of healthy tissues, as certain authors recommend (A. I. Antonov, 1957; G. Ts. Sarkisyan, 1957, and others). In the limits of 0.5 cm from the edge of the injured area the tissues were edematous and in places are found in a state of necrobiosis, as a consequence of which adhesion of the edges of the wound after the application of sutures and the process of repair proceed more slowly.

In two patients the edges of the wound separated, in one suppuration arose in the wound and its healing proceeded by a secondary tension.

We present brief excerpts from the histories of the disease.

Patient O., 28 years in age [mining] drifter, admitted into the section 13 May 1957. A burn of the left lumbar region had been received 6 May. He was treated ambulatorily. The injured area of 8 X 5 cm had necrotized. Around the necrosis the tissues were slightly hyperemic and edematous. After the resection (13 May) sutures were applied with some tension of the skin. After five days the sutures were cut through, the edges of the wound separated. The wound healed with secondary tension on the 45th day.

Patient A., 20 years old, driller, admitted into the division 2 July 1957, on the second day after a burn of the lower external quadrant of the left buttock and the posterior surface of the upper third of the left thigh 15 X 12 cm in dimensions. The resection was performed 3 July. The sutures were successfully applied after mobilization of the edges of the wound and of tension of the skin. The sutures were cut through on the sixth day and were removed, the edges of the wound separated. Healing was by secondary tension on the 32nd day.

Patient S., 28 years old, timberer. A burn of the left upper arm [nadplech'ye] 7 X 5 cm in dimensions had been

received 25 June 1957. The resection was performed 27 June. To contract the edges of the wound and apply the sutures, slackening incisions were performed. On the fifth day suppuration appeared in the wound; pus began to exude between the sutures. The latter were removed. Healing was by secondary tension on the 25 day.

The periods of treating chemical burns subjected to resection, are exceptionally short. The duration of lack of capacity to work of the 36 patients (of the 39 operated on), in whom the wounds healed by primary tension, was equal on the average to 13.5 days. In the 13 patients treated conservatively, the average periods of incapacity to work were equal to 43.2 days.

We have come to the conclusion that resection of burns obtained by alkaline electrolyte, with the application of primary sutures reduces the periods of treatment and incapacity to work by three to four times; it is more expedient to conduct the operation of resection of the injured tissues on the second to third day; the excellent results obtained by the method described permit us to recommend it for wide use.

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