OUR EXPERIENCE IN THE TREATMENT OF THERMAL BURNS

By P. I. Khel'ben

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OUR EXPERIENCE IN THE TREATMENT OF THERMAL BURNS

Following is the translation of an article by P. I. Khel'ben entitled "Nash Opit Lecheniya Termicheskikh Ozhogov" (English version above) in Khirurgiya (Surgery), Vol. 36, No. 5, 1960, pages 85-87.

From the surgical division (Head -- P. I. Khel'ben) of the medico-sanitary section (Chief -- M. I. Leykevich) of the Kuybyshev Oil-Refining Plant.

There are no disagreements among surgeons in the choice of general methods of treating burns; almost all use morphine, novocaine blockade, massive transfusions of plasma, blood, and blood-substitute liquids, penicillin therapy. The local treatment of burns has partisans of the open, closed, and semi-open (lotions) method.

I. S. Kolesnikov and T. T. Ar'yev consider that these methods should not be placed in opposition to each other, since they have their indications and contraindications.

We have used the closed method of treatment in 79% of burned individuals and the open method, in only 21%, predominately in the presence of burns of the face. Our observations embrace 245 burned individuals who were found under treatment at the hospital of the surgical division of the medico-sanitary section of the Kuybyshev Oil-Refining Plant from 1951 to 1959. Production burns amounted to 43.26% and burns suffered in the course of daily life, to 56.74%. 142 of the individuals were men, 103 were women. Thanks to the prophylactic measures and sanitary-educational work from 1955 on, the quantity of burns, particularly of production burns, was sharply lowered. Among the causes which evoked burns were: flame (48.14%), boiling water (27.74%), hot food (10.66%), steam and other causes (13.46%). Flame burns gave a more severe clinical course than the burns evoked by the other thermal factors. We have adhered to the generally accepted division of burns into three degrees (Hildanus and Boyer). The measurement of the dimensions of the surface of the burn was conducted according to the method of B. N. Postnikov. In spite of the discussions conducted among the population concerning the rules
rendering first aid in the presence of burns, in the cases of
21.03% of those admitted, first aid had not been rendered and
bandages had not even been applied. Only at the health point
of the factory were aseptic bandages or sterile sheets applied
to all victims, and morphine or pantopen administered sub-
cutaneously. All victims reached the hospital in the first
hour after thermal trauma, and only three from the region
reached the hospital after nine hours. Ten patients had first
degree burns, 200 patients had second degree burns, and 35
patients had third degree burns. The primary treatment was
conducted in the bandaging room without narcosis, after the
subcutaneous administration of one ml of a one percent solu-
tion of morphine. Antitetanus serum was administered to all
burned individuals (1,500 - 3,000 antitoxin units).

We conducted the primary treatment of the burn accord-
ing to the following method: the burned surface was irrigated
from a syringe with a one per cent novocaïne solution, a one
per cent alcoholic solution of methylene blue or brilliant
green was painted on, embracing the surrounding healthy skin;
the scraps of epidermis were removed, incisions were made in
the blisters, after which a bandage with a 10% solution of
syntomycin emulsion was applied. We treated burns of the face
by the open method, painting the burn surface for the first
two days with a one per cent solution of methylene blue, and
from the third day -- with a streptocidal ointment or a syn-
tomycin emulsion. Penicillin therapy was performed for all
the burned individuals.

In the secondary treatment of the burn we used hemo-
bandages or a solution of rivanol (1:1,000).

In the presence of third degree burns we conducted the
usual treatment, and waited for the tearing off of the scab
or removed it, after which on the 30th day we performed the
free transplantation of skin in accordance with the Dzhanelidze
method or the Al'glava-Pysetskiy method in the Krikent modi-
fication. Transplantation of skin was used in 24 of the burned
individuals with favorable results, covering 800-1,625 square
cm of the burn surface, and in two cases we used donor skin
(homotransplant) and did not perceive any advantages of it
over autotransplantation. The outcomes of treatment are pre-
sented in Tables 1 and 2.

The length of treatment amounted on the average to 4.4
bed-days in the presence of first degree burns, to 13.6 bed-
days with second degree burns, and to 65.5 bed-days with third
degree burns.

If 10 years ago Yu. Yu. Dzhanelidze classified more
than 41% of victims with a surface burn in the group of fatal-
ly burned and 26 of his patients died, now at the present time,
thanks to the use of modern methods of treating burn disease
not only in the large clinical institutions, but also in the peripheral hospitals more than half of this group of extraordinarily severely burned individuals are successfully saved.

Table 1

Results of the treatment depending on the dimensions of the injury

<table>
<thead>
<tr>
<th>Area of the burn in relation to the total body surface (in %)</th>
<th>Number of patients</th>
<th>Of which the following numbers</th>
<th>Percent mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Recovered</td>
<td>Died</td>
</tr>
<tr>
<td>Up to 10</td>
<td>135</td>
<td>135</td>
<td>-</td>
</tr>
<tr>
<td>From 11 to 20</td>
<td>60</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>From 21 to 30</td>
<td>25</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>From 31 to 41</td>
<td>17</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>From 41 to 50</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>From 51 to 75</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>245</td>
<td>241</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Outcome of treatment</th>
<th>Number of patients</th>
<th>In %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smooth recovery</td>
<td>213</td>
<td>96.91</td>
</tr>
<tr>
<td>Contractures</td>
<td>16</td>
<td>6.54</td>
</tr>
<tr>
<td>Keloidal scar</td>
<td>9</td>
<td>3.69</td>
</tr>
<tr>
<td>Trophic ulcers</td>
<td>3</td>
<td>1.23</td>
</tr>
<tr>
<td>Lethal outcome</td>
<td>4</td>
<td>1.63</td>
</tr>
</tbody>
</table>

Patient R., 17 years old, admitted 2 January 1953 with a flame burn with injury, predominantly of the third degree, of 59.27% of the surface of the skin. In the course of two months there was toxemia, sepsis, body temperature 39-40°, delirious state. The first 20 days treatment was by the open method under a shell, and then the closed method of treatment was used. Eighteen liters of plasma and 6.4 liters of blood were transfused to the patient; penicillin therapy was conducted. In the patient, the external ears, the soft coverings of the head, the skin of the extremities, necrotized and fell off. Transplantation of the skin by the Dzhanelidze method
was twice performed with excellent results. On 29 April 1954
he was discharged on account of recovery.

In conclusion it should be noted, that the results of
burn disease, independently of the general treatment, to a
considerable extent depend on the primary treatment of the burn
and on early skin transplantation. The closed method of treat-
ment with the use of syntomycin emulsion with rare bandages
(once in seven to 10 days) gave the very best results with an
average length of treatment of 20.7 bed-days and 1.6% mortality.

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