

FATAL SUPERFICIAL BURNS AND THE SUPRARENALS

NOTE ON THE OCCURRENCE OF SUPRARENAL LESIONS IN UNCOMPLICATED FATAL CASES OF EXTENSIVE SUPERFICIAL BURNS *

H. G. WEISKOTTEN, M.D.
SYRACUSE, N. Y.

It is quite generally accepted that clinical manifestations, anatomic findings and experimental evidence all indicate that extensive superficial burns are followed by severe toxemia which not infrequently results fatally within a few days. Of the lesions found at necropsy, emphasis has been placed on cloudy swelling of the liver and kidneys, focal degeneration in the splenic lymph nodules, and degenerative changes in the lymph nodes and intestinal lymph nodules.

My necropsy experience in uncomplicated cases of superficial burns fatal within a few days has shown that, in addition to the lesions mentioned, in all of these cases there occur changes in the suprarenals which are more or less characteristic. In fact, these changes in the suprarenals are the most prominent and characteristic of the necropsy findings.

The suprarenals are markedly swollen and deep red. The perisuprarenal fat tissue shows marked edema. On section, certain areas suggest extensive hemorrhage obliterating the normal markings. On section through other parts, the cortex and medulla appear markedly swollen and show reddish streaks suggesting congestion of the blood vessels.

On microscopic examination, there is evident marked congestion of the blood vessels with scattered areas of hemorrhage penetrating among the parenchymal cells. The gland cells are pale staining and much swollen. Many are apparently undergoing hydropic degeneration. Necrotic cells being invaded by polymorphonuclear and endothelial leukocytes are not infrequent. The picture in general is more or less comparable to the central necrosis occurring in the liver of the guinea-pig in chloroform poisoning, except that in the suprarenals the process is diffuse.

These changes in the suprarenals have been noted at necropsy in cases in which death has apparently resulted primarily from extensive superficial burns of two, three, four and six days' duration. In one case the left suprarenal measured 9 by 3 by 1.5 cm. and weighed 20.5 gm.; the right measured 7 by 4.5 by 2.5 cm. and weighed 25 gm. (average normal weight, from 4 to 7 gm.). This was the case of a railroad fireman, aged 21, who received extensive superficial burns of the face, forearms, thighs and legs as a result of a boiler explosion, and died three days later.

Kolosko,¹ in 1914, described what were apparently similar findings in the suprarenals in a number of fatal cases of extensive superficial burns. He interpreted the findings as representing hemorrhagic infarction of the glands.

It is perhaps noteworthy that these changes in the suprarenals are comparable to the changes occurring in the suprarenals of guinea-pigs dying several days after the administration of diphtheria toxin. This suggests that the changes are the result of the action of a more or less specific toxin possibly somewhat similar to diphtheria toxin.

As far as I know, such marked changes of this character in the suprarenal glands, at least in man, have not been observed in any other condition.

As a result of the foregoing observations, it would seem that these changes in the suprarenals are the best anatomic evidence we have that in extensive superficial burns death may be due to the action of a specific toxin originating probably in the burned areas.

THE CAUSE AND PREVENTION OF
HERNIA *MARSH PITZMAN, M.D.
ST. LOUIS

While the etiology of hernia should remain a subject of general interest until greater unanimity of opinion has been achieved, it takes on a more particular interest at this time, when hundreds of thousands of our young men are about to be mobilized. I say "general interest" advisedly because, according to the newer point of view, the problem of prophylaxis must essentially fall on the medical adviser. The considerable gap between the progressive scientific opinion of today and the conception of most practitioners is partly due to the fact that the interest of teachers has run beyond such an ordinary every-day occurrence as hernia into newer fields. Further, it is only natural that a new point of view should have difficulty in making headway against established conceptions—not only natural, but just—for this attitude is our only check against false innovations! The point of view presented in this discussion, however, is not really new, for it has had time to be accepted into many of the progressive texts of anatomy and of surgery. One very practical asset of the newer point of view is that it breaks away from the congenital theory, against which we acknowledge our defenselessness, and offers a positive plan by which, within limitations, hernias may be prevented.

A few lines will suffice to summarize the essential anatomic points. The real strength of the abdominal wall is due to the muscles, aponeuroses and deep fascias. Aponeuroses are simply wide flattened-out tendons, while deep fascias are layers made up of matted white fibrous tissue, which serve to encase all muscles on all surfaces. The five points of naturally lesser strength in the abdominal wall are the umbilicus and the two inguinal and the two femoral regions. The umbilicus is a puckered scar, while the inguinal canals serve as the passageway for the spermatic cord in the male and for the round ligament of the uterus in the female. It is possible to have a hernia follow along any vessel which goes through the abdominal wall, as the vessels start from inside of the inner deep fascia of the wall. Hernias along the femoral vessels, which are much the largest of those leaving the abdominal cavity, are simply relatively more frequent.

The newer point of view maintains that hernia is caused by increased intra-abdominal pressure, which must, however, be maintained during a prolonged period of time. Hernia is obviously not due simply to the strength or weakness of the abdominal wall, for it is a matter of common knowledge that many strong persons have hernias, whereas most weaklings do not. Perhaps the fairest statement is that hernia

* From the Department of Pathology, Syracuse University College of Medicine.

1. Kolosko: Ueber Befunde an der Nebennieren bei Verbrennungstod, *Vrtljschr. f. gerichtl. Med.*, 1914, **47**, I, Supp. p. 217.

* Revision of a paper read at the meeting of the St. Louis Medical Society, April 14, 1917.