

nephrotic patients in concentration greater than that observed in normal controls or in patients with other forms of disease.

Summary. An assay for desoxycorticosterone-like activity in biological fluids is presented, having a sensitivity in the order of 10^{-7} of DOCA. The critical nature of solvent

vehicle choice and of time-dosage of urinary extracts is presented and discussed. Urinary extracts from some edematous patients with heart failure and nephrosis show a sodium-retaining activity greater than that observed in normals and in non-edematous controls.

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Autotransplantation of Adrenal Gland in the Spleen and Mesentery of Rats. (17615)

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Ovarian transplants in the spleen survive and serve as an excellent tool in elucidating the role of the liver in gonadal hormone metabolism(1). Transplants of the adrenal gland in the spleen have hitherto been unsuccessful(2,3).^{*} This paper reports the successful autotransplantation of the adrenal gland in the spleen and mesentery of the rat, with evidence that such a transplant permits normal maturation of the animal.

Experiments. In one experiment, each of 3 male and 3 female immature rats of the Long-Evans strain, averaging 62 g in weight, was subjected to 2 operations. In the first procedure, either a half or the entire left adrenal gland was transplanted into the spleen, except in 2 animals, where the ileocolic mesentery was employed. The second procedure consisted of right adrenalectomy. In the 3 females, this was done 8 days after the first operation, and the animals drank normal saline instead of water for the subsequent 8 days. Right adrenalectomy was performed in the 3 males 16 days after the initial transplantation, and tap water was the only fluid provided. Food was supplied *ad libitum* throughout the experiment. After 108 days, the 6 animals were sacrificed. They now

averaged 240 g in weight and appeared normally developed when autopsied. In 5 of these 6 animals, the transplants varied from 3 to 5 mm in diameter, and were sharply outlined. On microscopic examination, they were composed of cells of the adrenal cortex. One of the 4 intrasplenic transplants could not be traced; of the other 3, a typical example is shown in Fig. 1A, B. Both of the ileocolic mesenteric transplants were successful; one of these shown in Fig. 2A, B.

In another experiment, 6 Long-Evans, adult, female rats were bilaterally adrenalectomized, and at the same time one of the adrenals was transplanted into the spleen. Two of the animals were sacrificed after 50 days and the remainder after 75 days. There was an average weight gain of 30 g and all of the transplants were successful. The transplants after 50 days were 4 mm in diameter and from 2-4 mm after 75 days. In every case they were composed of cells of the adrenal

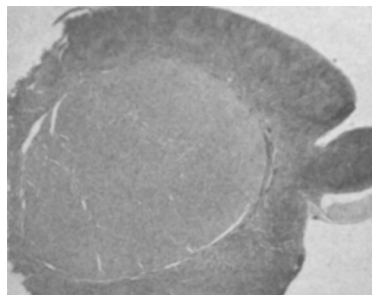


FIG. 1 A.

(S-3044 10 $\times$ approximately) A 108-day-old transplant is well outlined in the splenic pulp.

1. Biskind, M. S., and Shelesnyak, M. C., *Endocrinology*, 1942, v30, 819.

2. Oldberg, E., *Am. J. Physiol.*, 1929, v91, 275.

3. Grieco, F., *Arch. Ital. di Anat.*, 1932, v3, 589.

^{*} Addendum: An apology is offered to E. O. Butcher for oversight of his report in *Endocrinology*, 1948, v43, 30.

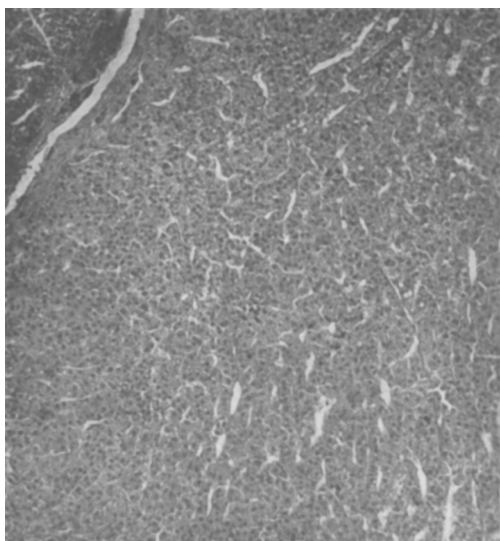


FIG. 1 B.

(S-3044 50 $\times$ approximately) A higher magnification of 1 A demonstrates that the cells of the cortex are not demarcated into zones. No medullary tissue was found.

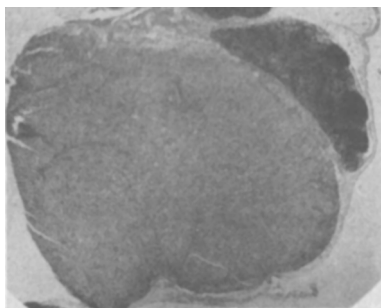


FIG. 2 A.

(S-3037 10 $\times$ approximately) This adrenal transplant in the ileocolic mesentery is 108 days old and is derived from one-half of the left adrenal gland.

cortex, microscopically. In all of these animals, extensive abdominal adhesions were present, particularly around the spleen.

In 8 other adult rats, the left adrenal was transplanted to the spleen, and the right adrenal left *in situ*. Autopsy 92 days later revealed complete atrophy of the adrenal transplants in these animals.

Discussion. Since autopsy revealed no adhesions in 4 out of 5 successful transplantations of the adrenal gland in the immature rat, secretions from the splenic transplants could only be liberated into the portal circulation, and from the mesenteric transplants

into the portal, or abdominal lymphatic circulations. If these transplants are composed of functioning tissue of the adrenal cortex, and if accessory adrenal cortical tissue is not responsible for the growth and maintenance of the animals, then it would indicate that the liver plays no essential destructive role in the metabolism of the adrenal cortical steroids. The control experiments in 8 animals in which the transplants atrophied when the right adrenal gland was left *in situ* indirectly suggests that the presence of functioning adrenal cortical tissue prevents successful transplantation. Since no medullary tissue was found in any of the successful transplants, it is suggested that such transplants are composed of regenerated adrenal cortical cells. In addition to the above work under investigation, reports will soon be forthcoming on embryonic homotransplantation and transplantation in castrates.

Summary 1. Autotransplantation of the adrenal gland in the spleen and mesentery of the rat was successful.

2. A technic is described which may aid in the elucidation of the role of liver in adrenal cortical metabolism.

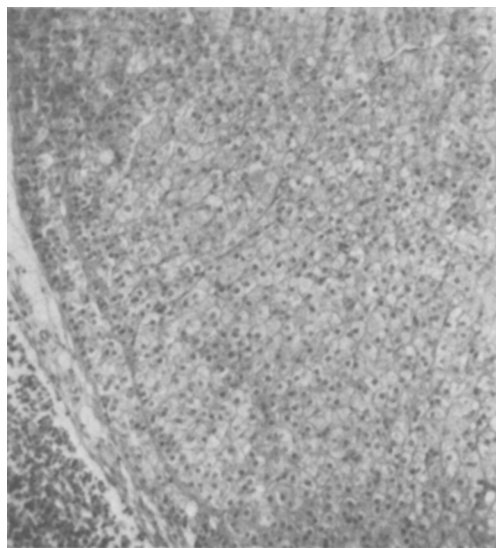


FIG. 2 B.

(S-3037 70 $\times$ approximately) In a higher magnification of 2A the cells of the adrenal cortex are arranged in cords but without distinct zonal pattern. No medullary tissue was present.

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