Carcinoma of the Adrenal Cortex in a Rabbit

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(Received for publication September 15, 1943)

During the course of routine pathological examinations of 9 rabbits injected with relatively large amounts of the dye T-1824 (Evans blue), which is used for the determination of total plasma protein (Gregersen, Gibson, and Stead) and which has also been employed in therapeutic attempts in experimental cancer research (Brunschwig, Schmitz, and Jennings; Duran-Reynals), a bilateral tumor of the adrenals was found.

The tumors were found in a male rabbit, weighing 2.4 kg., which had been injected intravenously with 3 cc./kg. of an 0.5 per cent Evans blue solution and which was killed approximately 6 months later. The postmortem examination showed that the upper incisor teeth were bluish in color; the testes were blue; the left adrenal was enlarged to about twice normal size and of a peculiar brown color, while the right adrenal was blue and attached to the pancreas and duodenum. The other organs were grossly normal with the exception of the testes, which were small.

The histological examination of the adrenals revealed that the tissue of the left adrenal was placed like a triangular cap upon a small bean-sized mass consisting of huge foam cells containing in places numerous small, oval nuclei (Fig. 1). There were

Fig. 1.—Huge foam cells, some having multiple nuclei and showing slit-like inclusions.
scattered throughout the intact tumor tissue small slit-like crevices such as result from crystalline cholesterol deposits. The tumor was not demarcated by a capsule from the normal adrenal but merged directly with it. The rather thin fibrous capsule surrounding the other parts of the tumor was in places penetrated by small groups of the large foam cells which invaded the surrounding fat and reticular endothelial fibrous cushions. The liver and duodenum were hyperemic. The spleen contained areas with a thick hyaline network involving mainly the lymph follicles and the surrounding tissue, which contained large multinucleated giant cells often possessing a large vacuole. Similar hyaline matter was present in the renal glomeruli, while large albuminous casts were found in the distended cortical tubules.

Fig. 2.—Foam cell neoplastic infiltration into the periadrenocortical tissue.

connective tissue (Fig. 2). The central portions were occupied by large necrotic granular masses. The right adrenal was completely replaced by an identical tumor tissue which advanced into the adherent subserosa of the duodenum.

The testes were completely atrophic. The seminiferous tubules were often represented by very narrow lumina surrounded by thick hyaline rings embedded in a thickened fibrous tissue (Fig. 3). In other parts collapsed tubules lined by scattered Sertoli cells were found.

The brain showed a few small glial foci near the floor of the fourth ventricle as well as a lysis of nuclei and Nissl substance in some of the large ganglion cell centers nearby. Heart and aorta were normal. The lung was hyperemic and the intrapulmonary branches of the pulmonary artery had sub-

COMMENT AND CONCLUSIONS

The bilateral adrenal cortical tumors described are apparently adenocarcinomas derived from adenomas, which, however, have not produced any metastases. They are not tumors of the interrenal type, as the testicular atrophy observed is attributable to a testicular toxic action of the dye injected, as is evident from a more extensive toxicopathologic study of the effects of excessive doses of this dye introduced into dogs, cats, rabbits, and rats (Hueper and Ichniowski). The toxic action of T-1824 accounts also for the other pathological lesions noted in the various organs. It is not likely that the adrenal tumors found in this particular rabbit were directly or indirectly elicited by the toxic action of the dye, as none of the numerous animals of different species treated similarly showed
any signs of a hyperplasia of the adrenal cortex, unless the time necessary for such a development was in general not sufficiently long.

REFERENCES


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*Cancer Res* 1944;4:176-178.

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