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Effect of Thymectomy in Immature Rats.*

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It has been reported[1, 2] that Roentgen irradiation of the thymus of 2-day-old rats results in the temporary arrest of development of the spermatogenic tissue of the testis. An analysis of recent literature shows that surgical thymectomy has been carried out on the following age groups of rats: female, age 1 day and male and female, age 21 days;[3, 4] male and female, age 10-23 days;[5] male, age 25 days,[6] and male and female, age 21 days.[7] In none of these experiments were significant effects noted on growth, development, age of puberty, fertility, or differentiation of the endocrine organs.

With the above reports in mind and in order to explain if possible the difference between surgical and Roentgen ray thymectomy in immature animals, the following experiment was carried out.

Thymectomy was performed on half the animals of 10 litters of the Long-Evans strain of rats. Nine litters were operated upon at 4 days of age and one litter at 2 days of age. A total of 46 animals were employed of which 30 were males and 16 were females. The operated animals, both thymectomized and sham operations, were distributed according to littermate controls of equal body weight and size. Thymectomy was performed under ether anesthesia using a midline neck incision involving splitting of the upper part of the sternum, the thymus gland being readily exposed, and removed en masse by blunt dissection. Postoperative complications were negligible and the animals recovered from the effects of the operation without harm. Five litters (20 animals) were autopsied at 33 days

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7 Segaloff, A., and Nelson, W. O., *Anat. Rec.*, 1940, **76** (2), Supplement No. 2, 50.

of age and 5 litters (26 animals) at the age of 87 days. Daily observations were made of the gross behavior of the animals and weekly weights were determined. At autopsy, the weight of the pituitary, gonads, adrenals, thyroid, spleen and kidneys was taken and compared with the body weight. The neck region was thoroughly examined at autopsy and all suspicious tissue subjected to microscopic examination of stained sections. All tissues were routinely examined microscopically using hemotoxylin and eosin stained celloidin sections.

Daily observation of the thymectomized and control animals maintained under the same experimental conditions (diet and handling) demonstrated no apparent difference in the gross behavior, size, time of opening of the eyes, eruption of the incisors and ears, descent of the testes, opening of the vagina, or character of the hair. Body weights and growth curves were of the same character. At autopsy, and after microscopic examination, the neck region of 2 of the 29 thymectomized animals was found to contain small amounts of thymic tissue (estimated at about 1/7th of the normal). Histological examination of the tissues removed at autopsy revealed no apparent difference between thymectomized and controls. There was no arrest of spermatogenesis in the testes of either age group as compared with the controls.

Conclusions. It is felt that on the basis of the reports quoted and on the above data, thymectomy by surgical methods has no apparent effect on the growth, development, or endocrine organ differentiation of the rat when performed at the age of 1-2 days and studied past the onset of puberty. Since surgical thymectomy results in no apparent effects as studied above, it is probable that irradiation thymectomy can have no further effect, and that the cause of the effects described[1, 2] must be sought elsewhere.