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Extirpation of Pituitary Gland on Arterial Blood Pressure of Dogs with Experimental Hypertension.

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The introduction by Goldblatt, Lynch, Hanzal and Summerville[1] of a reliable method by which hypertension can be produced in dogs has opened an avenue of approach of great importance to study of experimental hypertension. It consists in producing renal ischemia by means of adjustable silver clamps applied to the renal arteries.

Since the pituitary gland has been thought by some observers, notably Cushing,[2] to be involved in the genesis of hypertension in man, we have sought to find whether it also is associated in the genesis of hypertension produced by the method of Goldblatt, Lynch, Hanzal and Summerville.

Blood pressure measurements were made according to the method of Van Leersum. Arterial pressure was measured usually daily until it seemed certain that the normal variability of the pressure was known. A clamp was then applied to the right renal artery. If the rise in pressure which followed showed no tendency to disappear, hypophysectomy was performed by the subtemporal method of Sweet[3, 4] (4 animals). This method allows one to remove the whole hypophysis intact under visual guidance. Consequently it was not necessary to kill the animals to ascertain whether the operation had been complete. Failing a sufficiently steady, elevated level of arterial pressure, a clamp was applied to the left renal artery (2 animals). In one case, 5 days after the left clamp was applied, the left kidney was removed and 180 days later the right clamp tightened. In 3 animals, in which the right kidney had been clamped before hypophysectomy, clamps were applied to the left kidney after hypophysectomy. Clamps were applied to both kidneys after hypophysectomy in 4 animals. As a control the operation was performed without removal of the hypophysis in a dog

1 Goldblatt, H., Lynch, J., Hanzal, R. F., and Summerville, W. W., *J. Exp. Med.*, 1934, **59**, 347.

2 Cushing, H., *Arch. Int. Med.*, 1933, **51**, 487.

3 Sweet, J. E., and Allen, A. R., *Ann. Surg.*, 1913, **57**, 485.

4 Sweet, J. E., *Ann. Surg.*, 1935, **102**, 1069.

in which the left renal artery was clamped. Two weeks later the gland was removed followed 38 days later by application of the clamp to the right renal artery.

Normal variations of pressure from 100 to 180 mm. of Hg were observed in our dogs. Clamping of the renal arteries produced marked elevation of arterial pressure, in some cases as high as 320 mm. of Hg.

Hypophysectomy was well borne in all of the dogs but one. The day after operation the animals ate their food and were up and about. In all but one diabetes insipidus was observed and some of the animals have become excessively fat and indolent.

The blood pressure of 4 normal dogs on which hypophysectomy had been performed appeared to be somewhat reduced below the control level, but in 2 others it was unchanged. Performance of a dummy operation without removal of the hypophysis on an animal with hypertension had no effect on average arterial pressure, but when the hypophysis was removed, arterial pressure fell from an average level of 230 mm. to 170 mm.

In the 4 dogs with induced hypertension due to clamping of the left renal artery, on the other hand, hypophysectomy caused a fall in arterial pressure; the fall began either at once or within 6 days

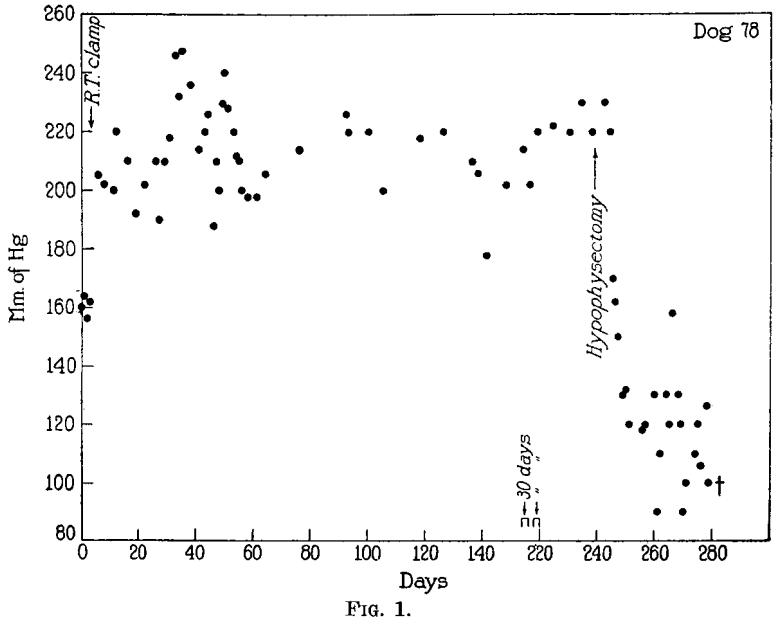

FIG. 1.

Effect of hypophysectomy on arterial hypertension in a dog (No. 78). The clamp was applied first to the right renal artery, 230 days later the hypophysis was removed.

after operation (Fig. 1). It continued until the pressure had dropped to normal. It has remained normal for 130 days in the dog which was first to undergo operation. One animal behaved differently in that the pressure fell only part of the way to normal; from a pre-operative level of 240 to 290 mm. of Hg to 160 to 200 mm. of Hg. In the 2 dogs in which both renal vessels were clamped, and after a control period of 90 days hypophysectomy performed, arterial pressure also fell to normal.

We have been less successful in keeping the hypophysectomized animals alive when the clamps were applied after hypophysectomy. Removal of the gland appears to make the animal unusually susceptible to anesthesia. Often they did not recover from the operation of clamping, a circumstance rarely occurring with normal animals or those with hypertension. Application of the clamp was usually followed by a rise in pressure (4 animals) but it may be transient. In one dog, after applying the second clamp it rose to 280 mm. The animal died 7 days after the latter operation.

Conclusions. Hypophysectomy in dogs with hypertension produced by renal ischemia (method of Goldblatt, Lynch, Hanzal and Summerville) reduces arterial pressure to about normal levels. It appears to reduce slightly the blood pressure of normal dogs. Preliminary hypophysectomy does not prevent the rise in blood pressure established by renal ischemia, but the rise tends to be transient.

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A Summary of Studies on the Effect of Ferric Chloride on Tuberculous Rabbits.*

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The object of this brief report is to describe further experiments on the effect of ferric chloride on the progress of tuberculosis in rabbits previously immunized with a strain of BCG (Bacillus Calmette-Guerin) and subsequently reinfected with a virulent bovine strain of tubercle bacilli (Ravenel). Previous studies have demonstrated that concomitantly with the accumulation of iron in tuber-

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