144 (2667)

Further note on the fusus coli of the rabbit.

By JOHN AUER.

[*From the Department of Pharmacology of St. Louis University School of Medicine, St. Louis, Missouri.*]

In a preceding communication an apparently unknown spindle-shaped structure in the rabbit was described, which connects the transverse colon with the descending colon. Evidence was submitted which proved that this section of the gut forming the spindle was anatomically and functionally different from the neighboring transverse and descending colon. It was shown in brief that this organ was slightly curved, spindle shaped, 4.5 to 8.5 cm. in length along the greater curvature, provided with a sphincter towards the descending colon side, devoid practically of any mesentery, more pink and thicker-walled than either the ascending or the transverse colon, with a thick, smooth mucosa arranged in longitudinal folds, and quite different from that found in adjoining sections of the gut. It was emphasized that the scybala found in normal rabbits towards the ascending colon side were large, grayish, soft and rich in water, while those immediately below the sphincter in the descending colon, were smaller, grayish yellow, hard and dry.

Functionally the organ behaved as follows in a morphinized rabbit after laparotomy: the intravenous injection of 0.1 to 0.3 mg. of physostigmin caused well marked peristalsis in the ascending and transverse colon. As the wave of contraction reached approximately the middle part of the spindle, the neck of the spindle contracted powerfully and antiperistaltically, preventing the passage of the scybalum. The *peristaltic* wave relaxed first, and the contents of the bulging portion between the two constrictions is pushed back *antiperistaltically* by the maintained or increasing antiperistaltic contraction of the sphincter area. After this the sphincter area relaxes slowly. This phenomenon is repeated several times, and occasionally gas and liquid can be seen passing through the narrowing sphincter. Finally, however, the antiperistaltic contraction wave at the neck relaxes before the peristaltic contraction advancing from the transverse colon, and then the contents of the spindle is pushed into the dilating thin-

walled descending colon. When now 0.2 to 0.5 cc. adrenalin are injected intravenously, the spindle exhibits more or less powerful rhythmic contractions and relaxations while the rest of the gut, especially the descending colon and small intestine, are largely motionless and relaxed.

Stimulation of the peripheral stumps of the vagi (sectioned beneath the diaphragm) or of one splanchnic nerve (cut below the diaphragm) cause motor responses like those described after physostigmin and adrenalin. Inhibitory effects were also observed, both after nerve stimulation and after drugs.

Still more evidence that the *fusus coli* is a morphological entity is revealed when this structure is studied microscopically. The spindle as well as portions of the transverse colon, ascending colon, caecum and duodenum were excised from a freshly killed, normal rabbit, washed clean in saline or Ringer solution, then filled with Orth's fluid, ligated, and immersed in liberal amounts of the same fixative. After fixation, the tissue was prepared for mounting in paraffin, and longitudinal and transverse sections were cut and stained with haematoxylin-eosin and Van Giesen.[2]

The main results are as follows:

Longitudinal muscle layer:

At the neck of the spindle, the site of the sphincter, this coat forms a continuous layer enveloping the entire circumference; it varies in thickness in different places of the same transverse section, but is always definitely thicker than in the descending colon or in the transverse colon.

Circular muscle coat:

This layer is markedly thickened at the spindle neck, forming a definite sphincter, and may be more than four times as thick (viz. 140 m.) as the same layer in the ascending and transverse colon, and descending colon. This layer then gradually thins as it approaches the transverse colon.

Mucosa:

In the spindle-body this layer may be 4 to 5 times thicker than the mucosa of the ascending colon, for example 630 m. against 120 m. It exhibits no papillæ like the ascending and transverse colon, but is composed of closely packed, simple tubular glands,

[2] Thanks are due to my colleague, Dr. Pohlman, for kindly permitting his technician to carry out this work.

standing at right angles to the *muscularis mucosæ,* which they do not perforate. The neck of these glands shows mucus cells.

The plexus of Auerbach at the neck of the spindle discloses thicker and apparently more numerous ganglion cell-aggregates than are generally found in the transverse and ascending colon.

145 (2668)

Continuation of secretion of the ovarian follicular hormone by the human corpus luteum.

By EDGAR ALLEN and EDWARD A. DOISY.

[*From the Department of Anatomy, University of Missouri, and the Laboratories of Biological Chemistry, St. Louis University School of Medicine, St. Louis, Mo.*]

Our studies have demonstrated the presence of a hormone in the ovarian follicles of hens, swine, cattle, sheep and women.[1,2,3,4] These tests seem sufficient to indicate the expected non-specificity of this substance among different species. Repeated tests of similarly prepared extracts of *corpora lutea* of both oestrous and pregnancy from swine and cattle have shown that this hormone is not present in appreciable amounts in the fully formed corpora of these animals. These data seemed to warrant the general conclusion that the ovarian follicle produces the stimulus which periodically causes growth and secretion in the tissues of the genital tract, and that this function wanes rapidly or is lost after ovulation.

Since our earlier interpretations were made we have had an opportunity to extend our work to tests of human ovarian tissues, chiefly through the interest and co-operation of Doctor J. P. Pratt of the Henry Ford Hospital, Detroit. The results of these experiments, which are tabulated below, seem to indicate that the human *corpus luteum,* unlike that of the sow and the cow, continues the secretion of the follicular hormone for an appreciable period.

---

[1] *Am. J. Anat.*, 1924, xxxiv, 133.

[2] *J. Biol. Chem.*, 1924, lxi, 711.

[3] *Am. J. Physiol.*, 1924, lxix, 577.

[4] PROC. SOC. EXP. BIOL. AND MED., 1924, xxi, 500.