

The histologic studies served to confirm and amplify the gross findings. The enamel-epithelium was lacking in the anterior zone and markedly reduced in the basal zone. The enamel was chiefly altered in the basal zone and was often completely absent. The dentin was found almost completely to fill the anterior zone; in the basal zone it showed multiple foldings and was often poorly calcified. The pulp was almost entirely limited to the basal zone and was of reduced vascularity. The cementum was thickened. Regressive changes could also be observed in Hertwig's sheath, the periodontal membrane and the labial alveolar periosteum.

No changes were found in the molars which had usually attained their growth before operation.

Intermediate changes were found in an additional group of 5 rats which were apparently partially hypophysectomized as indicated by retarded growth and infrequent oestrous cycles.

5605

Studies on Experimental Jejunal Ulcer.

HILGER P. JENKINS AND WALTER L. PALMER.

From the Departments of Surgery and Medicine, University of Chicago.

In this paper we are concerned with the experimental production of jejunal ulcers by the "duodenal drainage" method described by Mann. This consists of resection of the pylorus, closure of the upper end of the duodenum, section of the jejunum just beyond the ligament of Treitz, anastomosis of the proximal loop of the jejunum to the ileum, and an end-to-end anastomosis of the distal loop to the end of the stomach. The only striking difference between the method used here and that of Mann was that a side-to-side gastroenterostomy stoma was made instead of the end-to-end anastomosis that he used. The duodenal secretions along with bile and pancreatic juice were drained into the ileum or jejunum at varying levels instead of close to the caecum as he described.

In a series of 12 dogs, 2 died in 13 and 25 days from complications without ulcer formation. One animal is alive one year after the operation apparently in good health. Nine animals died and a definite ulcer was found in the jejunum. Of these 7 died from peritonitis following perforation of the ulcer and 2 from incidental in-

fections. The ulcers were located on the mesenteric side of the jejunum opposite the end of the stoma in 6 animals, while in 2 the ulcer was located on the anti-mesenteric side just beyond the stoma. In one animal there were 2 ulcers found located in the 2 positions described. The size of the ulcers varied from a diameter of .7 cm. to an oval shaped one measuring 2.5 x 3.2 cm. The size of the stoma varied from 4.5 cm. to 12 cm. in circumference. The average circumference was 7.42 cm. The shortest duration of life in which an ulcer was found was 32 days. The longest duration was 228 days. The average length of life was 100 days. The point of drainage varied from the relatively shortest distance from the caecum of 75 cm. to as high as 175 cm. from the caecum. Weight loss was observed in all the animals, which varied from 2.8 kg. to 9.2 kg., or an average of 5.4 kg., except the animal which is still alive and has gained 5 kg. since operation. Gastric analyses made on most of the animals demonstrated an acidity which did not deviate strikingly from the normal.

Conclusions. 1. When the "duodenal drainage" procedure described by Mann was modified by the use of a wide gastroenterostomy stoma instead of the narrow end-to-end anastomosis, jejunal ulcers developed in 90% of the animals which survived the operation one month. The lesions were located opposite the end of the stoma or just beyond it, not at the suture line. It seems to us that the possibility of mechanical injury of the jejunal mucosa due to the ejection of chyme from a narrow stoma is not very great, because these lesions were obtained with a large stoma. This experiment apparently emphasizes the importance of the chemical action of unneutralized gastric juice on the jejunal mucosa. 2. The point of drainage of the duodenal secretions into the small bowel did not appear to markedly alter the formation of ulcers except that the animals which had a relatively high implantation survived longer. The animal with the highest implantation is still alive and in good condition one year after the operation.