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Effect of Double Jejunal Lumen Gastrojejunal Anastomosis upon Production of Ulcers by Histamine.

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Von Eiselsberg¹ introduced the exclusion operation for the treatment of duodenal ulcers. The stomach was severed at its distal end. The pyloric segment was closed and the larger proximal segment of the stomach was anastomosed to the jejunum. Devine² advocated the division of the stomach at a more proximal level than in the Von Eiselsberg technic. The intent of both of these operations was to exclude the corrosive action of the acid gastric juice from the duodenum and thus bring about the healing of the duodenal ulceration. The results of these operations proved disappointing since jejunal ulcer developed in a majority of the patients operated by the exclusion methods. The Von Eiselsberg and the Devine procedures were tested in the laboratory.^{3,4} Jejunal ulcers occurred with regularity when in addition, the alkaline duodenal contents were diverted from the gastrojejunal anastomosis by the Exalto procedure.⁵

The senior author has previously published studies concerning the factor of spasm in the etiology of peptic ulcers.^{4,6} In one of these studies a larger jejunal lumen was created by the anastomosis of two parallel jejunal segments in an anti-peristaltic direction.⁶ This newly created and enlarged jejunal lumen was anastomosed to the proximal part of the stomach after the closure of the distal seg-

ment according to the method of Devine. At the same time the alkaline duodenal contents were diverted from the gastrojejunal anastomosis by the Exalto procedure.⁵ None of the 4 dogs operated in this manner and with a double jejunal lumen developed jejunal ulcers. Of the 12 dogs with the Devine and the Exalto operations and with a single lumen gastrojejunal anastomosis, 75% developed jejunal ulcers.⁶

The present studies have been performed for the purpose of determining the effect of this double lumen jejunojejunal anastomosis upon the production of ulcers by histamine-in-beeswax injection. Varco, Code, Walpole and Wangenstein⁷ produced peptic ulcers in 100% of dogs with an intact gastrointestinal tract after daily injections of histamine-in-beeswax. Lannin⁸ made extensive experiments with the histamine-in-beeswax preparation to determine which of the various gastrojejunal anastomoses gives the most protection against the jejunal ulcer. He was able to produce jejunal ulcers in 100% of dogs subjected to a gastroenterostomy and to the Devine exclusion operation. In our experiments we have performed the gastroenterostomy and the Devine exclusion operation, and in place of the standard single loop gastrojejunal anastomosis we employed the double lumen jejunal anastomosis. Two normal dogs were given daily injections of histamine-in-beeswax, and each of these developed ulcers. Two dogs with double jejunal lumen gastroenterostomy and one with a double jejunal lumen and a Devine exclusion operation were subjected to daily injections of histamine-in-beeswax. One of these 3 animals developed a jejunal ulcer.

¹ Von Eiselsberg, A., *Wien. Klin. Wchnschr.*, 1910, **23**, 44.

² Devine, H. B., *Surg., Gynec., and Obst.*, 1925, **40**, 1.

³ Winkelbauer, A., *Arch. f. klin. Chir.*, 1926, **143**, 649.

⁴ Steinberg, M. E., *Am. J. Surg.*, 1934, **23**, 137.

⁵ Exalto, J., *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1911, **23**, 13.

⁶ Steinberg, M. E., and Starr, P. H., *Arch. Surg.*, 1934, **29**, 895.

⁷ Varco, R. L., Code, C. D., Walpole, S. H., and Wangenstein, O. H., *Am. J. Physiol.*, 1941, **133**, 475.

⁸ Lannin, B. G., *Surgery*, 1945, **17**, 712.

The other 2 with double lumen anastomosis remained in perfect condition and were sacrificed 43 days after the starting of the injections. No evidence of erosions or ulcers were found in the stomach, duodenum or jejunum.

Protocols. Dog No. 1, weight 30 lb. Operation December, 1946. Gastrojejunostomy with a double lumen jejunojejunal anastomosis. April 7, 1947 histamine beeswax, 30 mg daily. April 29, 1947 dog sacrificed. Shallow round jejunal ulcer, 1 cm in diameter with a pin-point penetration.

Dog No. 3, weight 26 lb. Operation, January 16, 1947. Gastroenterostomy with a double lumen jejunojejunal anastomosis. April 7, 1947, daily injections of 30 mg of histamine beeswax. May 20, 1947 dog sacrificed. No ulcers or erosions found.

Dog No. 4, operation, January 22, 1947. Devine exclusion procedure with a double lumen gastrojejunal anastomosis. April 7, 1947, daily injections of 30 mg of histamine beeswax. May 20, 1947, dog sacrificed. No ulcers or erosions found.

Normal dog No. 1, weight 22 lb. May 12, 1947, daily injections of histamine beeswax. May 20, 1947, dog sacrificed. Shallow ulcers about 1 x 1 cm with induration on the lesser curvature of the pylorus.

Normal dog No. 2, weight 18 lb. May 12, 1947, daily injections of histamine beeswax. April 29, 1947, dog sacrificed. Several small ulcers and erosions in the mucosa of the transverse stomach. Two large ulcers of the first part of the duodenum and one shallow ulcer 4 cm distal to the pylorus.

16018

Effect of Urethane on a Transplantable Acute Lymphoid Leukemia.*

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(With the technical assistance of Lester E. Bunker, Jr.)

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It has been shown that urethane produces a pronounced reduction in blood leukocytes and in immature myeloid cells in both the human and the mouse in cases of myeloid leukemia.^{1,2} In addition definite palliative effects have been reported for human beings.¹ The response in human lymphoid leukemias was less pronounced and more variable than in myeloid leukemias. Recently,³ the response to urethane of spontaneous lymphoid leu-

kemias in the mouse has been studied and the following encouraging effects were obtained: (1) a pronounced fall in blood leukocytes to or below normal levels and maintenance of these levels with continued therapy (2) a marked reduction in the number of immature cells in the circulating blood. (3) a temporary stabilizing effect on hemoglobin levels. (4) a pronounced diminution in size of subcutaneous lymph nodes, spleen and thymus and (5) a significantly greater life expectancy for urethane-treated cases.

A study of the effect of urethane on several acute and chronic lymphoid and myeloid transplantable leukemias in the mouse has been made. This paper summarizes the response of a transplantable acute lymphoid leukemia, line L825, which arose spontaneously in ♀ 79374 (6 months of age) of the C58 inbred leukemic strain of mice. The leukemic

* This work has been aided by grants to the Roscoe B. Jackson Memorial Laboratory by the Jane Coffin Childs Memorial Fund and the National Advisory Cancer Council.

¹ Paterson, E., Haddow, A., Thomas, I. A., and Watkinson, J. M., *Lancet*, 1946, **250**, 677.

² Engstrom, R. M., Kirschbaum, A., and Mixer, H. W., *Science*, 1946, **105**, 255.

³ Law, L. W., *Proc. Nat. Acad. Science*, 1947, **33**, 204.