

Anastomotic Ulcer of the Colon Following Colonic Replacement of the Esophagus *

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COLONIC BYPASS of the esophagus with or without resection is being utilized with increasing frequency and success in the surgical management of both benign and malignant lesions of the esophagus.^{4, 10, 11} The colon has been preferred to the small bowel not only because of its more dependable blood supply and ease of mobilization but because of its alleged resistance to acid peptic digestion.^{4, 11} It has even been used to replace excised stomach after subtotal gastrectomy for duodenal ulcer.⁶

We have encountered severe peptic ulceration of the colon at the gastric anastomosis of a patient with colonic replacement for a high esophageal carcinoma. In view of the alleged rarity of this complication, we are reporting the clinical course of the patient in detail with a review of the experimental and clinical reports pertaining to the resistance of the large bowel to acid peptic digestion.

Case Report

This 51-year-old white man was admitted to the hospital for the first time in August 1958 because of dysphagia of three weeks' duration. Barium swallow revealed an obstructing lesion of the upper third of the esophagus beginning at the level of the second thoracic vertebra and extending distally for 10 cm. Esophagoscopy revealed squamous cell carcinoma, grade III.

On August 29, 1958 the esophagus was transected in the neck and an esophagostomy established. The proximal esophagus was resected through the bed of the right fourth rib and the distal end of the esophagus turned in. A tube gastrostomy was done. Pathology examination confirmed the biopsy diagnosis of carcinoma, grade III, of the esophagus.

The patient did well postoperatively and received 6,000 r of radiation treatment to the upper esophagus by October 21, 1958. On November 13, 1958 an ileocolic replacement was carried out, passing the mobilized colon through a substernal tunnel and establishing an end-to-side esophago-ileostomy. Distally, an end-to-side cologastrostomy was fashioned and the vascular supply of the colon, consisting of the ileocolic artery and right branch of the middle colic artery, was passed anterior to the stomach.

The patient recovered satisfactorily from the operation and was discharged on December 4, 1958 able to swallow a full diet of solid food, the gastrostomy tube having been removed during his convalescence.

The patient entered for the last time on February 18, 1959 because of radicular pain in both arms and recurrent dysphagia. Narrowing of the anastomosis in the neck was demonstrated by photofluorography. Neurological examination revealed weakness in the right arm involving the deltoid, flexors, and extensors of the right elbow, with associated diminished reflexes and sensation over the right deltoid.

Because of the severe pain, the patient consented to a prefrontal leukotomy. This was carried out by means of wire electrodes passed through frontal burr holes. Postoperatively the patient was free of pain and cheerful. However, subsequently he developed signs of increasing respiratory distress and hypotension and died on March 8, 1959.

At autopsy the body was that of an emaciated man weighing eighty pounds. Beneath the operative scar in the left neck just below the left lobe of the thyroid the proximal ileo-esophageal anastomosis was identified just below the pyriform sinus. The larynx and esophagus were separated with great difficulty from the cervical spine posteriorly, where there was a mass of tumor replacing the entire posterior and anterior walls of the esophagus with invasion of the upper trachea just below the larynx. The tumor had invaded the superficial portions of the spine and the right thyroid lobe at this point and had involved the roots of the brachial plexus. In addition, it infiltrated the anastomosis narrowing it to a diameter of less than 0.5 cm.

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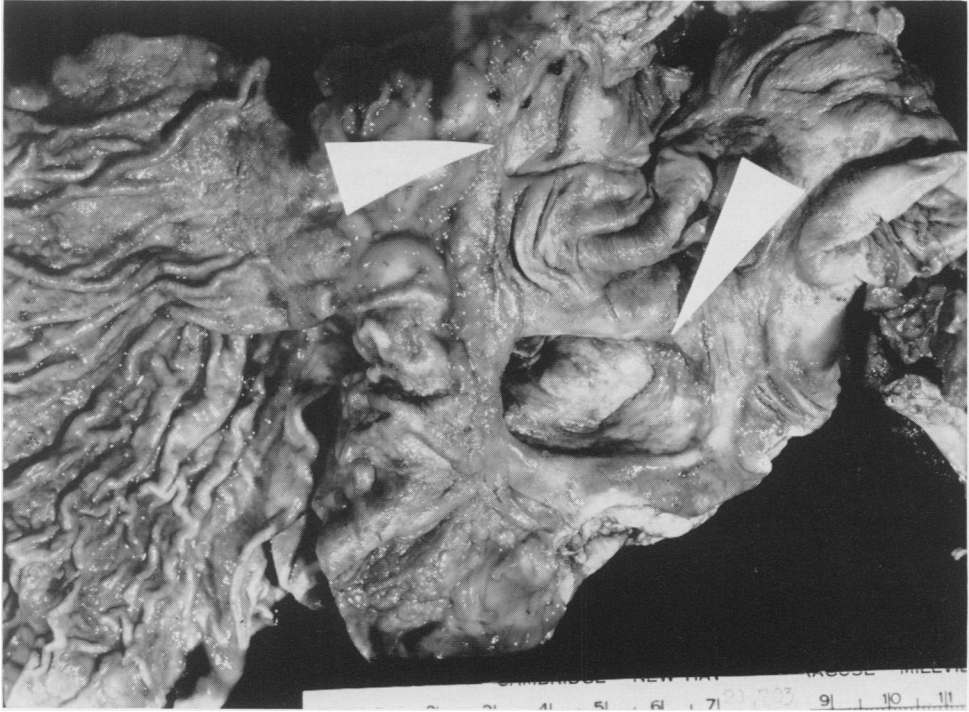


FIGURE 1.

The distal turned-in esophagus measured 8 cm. in length and was free of tumor.

The ileocolic bypass was in place and the vascular supply was found anterior to the stomach. Upon opening the cologastrostomy two anastomotic ulcers of the colon were present, one 3×4 cm. and the other 1.4×1 cm. (Fig. 1).

The trachea and bronchi were filled with greenish yellow gastric contents. The lungs weighed 1,200 Gm. together, with little crepitation in either lung. Cut surface revealed a very red, wet parenchyma with areas of consolidation and granularity most marked on the right side. Examination of the brain revealed the lesions of an electrical prefrontal leukotomy.

Microscopic examination confirmed tumor involvement of the tissue adjacent to the ileo-esophagostomy and presence of aspiration bronchopneumonia. Sections of the colonic ulcers showed erosion through the muscularis, with marked fibrosis, subacute, and chronic inflammation and thick-walled blood vessels in the base of the ulcers. There was peptic digestion of the luminal base of the ulcers.

Discussion

In 1924, Dragstedt and Vaughn¹ reported that a patch of colon with intact blood supply could be implanted into the stomach without peptic digestion. These

experiments have been interpreted by some^{4,6} to suggest increased resistance of colonic mucosa to gastric secretions. However, the same series of experiments demonstrated a similar resistance by transplants of duodenal, jejunal, and ileal mucosa, not to mention kidney and spleen. Florey and Harding² showed extreme resistance of the stomach to a drip of 0.1N HCl and resistance of the duodena to 0.05N HCl. Neither the colon or jejunum, however, could tolerate the latter concentration.

Since the experiments that demonstrate resistance of colonic mucosa to digestion also show the same resistance by small bowel, they can hardly serve as arguments in favor of a particular resistance by the colon.

Very little work has been done on the relative resistance of the colon to peptic digestion. McMaster⁸ by producing end-to-side anastomoses between the stomach and various levels of distal bowel, demonstrated a progressively increasing incidence of ulceration the more distal the anastomosis. However, many of his distal gastro-ileos-

tomies and gastrocolostomies showed not marginal ulceration but a diffuse ileitis or colitis. These findings are not analogous to peptic marginal ulceration and, since the animals showed the extreme depletion associated with an abnormally low gastro-intestinal anastomosis, this factor must also be taken into consideration.

Matthews and Dragstedt⁷ produced duodenal, jejunal, ileal, and colonic peptic ulcer in patch transplants previously shown to be resistant to digestion¹ by excluding the reflux of duodenal contents. They stated that resistance to the action of pure gastric juice decreases progressively from stomach to colon. Morton⁹ likewise showed ulceration in previously resistant jejunal transplants to stomach using the Mann-Williamson preparation. Location of the transplant in the stomach wall was a partial factor in these experiments. Mann and Bollman⁵ also showed a decreasing resistance of the intestinal mucosa from duodenum of ileum.

It would appear that there is little experimental evidence to support the idea that the mucosa of the colon has any greater resistance to digestion than the small bowel. However, there seems little doubt that the colon and small bowel are not nearly so susceptible to digestion as the esophagus, which shows remarkably little resistance to acid-peptic exposure.³

A probable factor leading to ulceration in this patient was the chronic starvation occasioned by the virtual closure of the cervical anastomosis by recurrent tumor. Presumably the intact stomach produced an adequate supply of gastric juice which had easy access to the lower colon through the large, patent gastrocolic stoma. The placement of the blood supply of colon anterior to the stomach with bowstringing of the vascular pedicle over the gastric antrum may have produced some degree of antral retention which may have contributed to the ulceration.

We are inclined to believe that any merit the colon may have as a esophageal replacement must rest primarily on technical fac-

tors and not on any intrinsic resistance to peptic ulceration as compared to other segments of the gastro-intestinal tract with the exception of the esophagus itself. The importance of maintaining an adequate intake to neutralize gastric secretion and in providing adequate gastric emptying would seem of equal importance in gastrocolic anastomosis as in other gastroenterostomies.

Summary

A case of severe peptic ulceration of the colon following colonic replacement of the esophagus is presented.

There is little evidence to support the thesis that the large bowel is more resistant than the small bowel to digestion by gastric contents.

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