Bypass Surgery: Nutritional Palliation for Alimentary Tract Cancer

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Nutrition in the cancer patient, especially in the patient with an obstructing tumor of the alimentary tract, presents a continuing problem. Surgical procedures designed to bypass this problem and reestablish the gastrointestinal tract as the principal route of nutrition are most often of a palliative nature, affording relief but not cure. Occasionally, however, such surgery is performed as a temporary measure to prepare the patient for an eventual curative surgical resection.

Bypass surgery—which can be accomplished quickly, easily and even under local anesthesia—not only relieves the patient of the painful and debilitating problems associated with obstruction but, with improved nutrition, often causes a reversal of negative nitrogen balance and an improvement in the patient’s weight, strength and general sense of well-being. All of these factors increase the patient’s chances of responding favorably to chemotherapy and radiation.

On the other hand, parenteral hyperalimentation, which has recently received a great deal of interest, while it certainly aids in the nutrition of the cancer patient, also carries its own set of complications, mainly those associated with long-term central venous cannulation and fluid and electrolyte imbalances. Therefore, whenever feasible, bypass surgery is preferable since it utilizes the natural alimentary tract.

Elemental liquid diets—containing amino acids, sugars, vitamins and the necessary electrolytes and trace minerals—are now available for use in various tube feedings to provide rather massive caloric and nitrogen intake. These diets are rapidly absorbed, relatively bulk-free and have the added advantage of not stimulating intestinal, pancreatic or biliary secretions, thus eliminating the bothersome diarrhea of earlier tube feedings.

The following illustrations present the most frequent areas of alimentary tract obstruction due to cancer and the most commonly used surgical procedures designed to bypass the obstruction and establish an effective route for nutrition.

The complexities of the nutritional problems in cancer have been reviewed by Shils, and the effective utilization of intravenous hyperalimentation has been presented by Dudrick. Bypass surgery is but another step toward improving the quality of survival for the patient with cancer.
Cancer obstructing the base of the tongue, hypopharynx, larynx and upper one third of the esophagus occasionally causes complete obstruction with inability of the patient to swallow (a). Although tumors of this size are rarely totally resectable from a curative viewpoint, palliative resection can often be performed. Frequently, these tumors are treated by radiation therapy. In order to establish a route of alimentation, a feeding catheter is placed somewhere below the obstructing tumor. This is most often accomplished with a feeding gastrostomy (b); however, some surgeons prefer a feeding cervical esophagostomy in the more superiorly located cancer (c).
Cancer obstructing the middle and lower one third of the esophagus is not always completely obstructing; however, radiation therapy, which is often employed in treatment, may frequently cause edema during therapy which will lead to almost complete obstruction. A feeding gastrostomy is employed for palliation of the obstructing tumor and as a means of continuing to utilize the gastrointestinal tract for nutrition.

Cancer of the upper portions of the stomach may cause complete obstruction and is frequently far advanced by the time obstruction ensues. It is seldom amenable to a curative resection and rarely is a palliative resection done, since this would necessitate total gastrectomy. More frequently, radiation and/or chemotherapy is employed. In such instances, a feeding jejunostomy is usually the quickest and easiest way to provide a feeding route. Although jejunostomy feedings are notoriously difficult for the patient to tolerate, with careful attention to details extremely satisfactory nutritional balance can be maintained.
Cancer obstructing the lower portions of the stomach (a) is more frequently amenable to palliative resection, which is the preferred treatment. However, if not resectable, this cancer may be bypassed by a gastrojejunostomy. This is usually placed in the most dependent portion of the stomach free of tumor, so that swallowed food passes easily into the jejunum. Despite the fact that the stomach does not empty by gravity, anteriorly placed stomas do not function well. Therefore, the anastomosis should be placed posteriorly, along the greater curvature of the stomach (b).

Cancer of the head of the pancreas, distal common bile duct and ampullary regions frequently presents with obstructive jaundice and only occasionally results in duodenal obstruction (a). A cholecystojejunostomy can often be employed to relieve obstructive jaundice and its accompanying pruritus as well as to enhance the patient’s absorptive ability by returning the biliary secretions to the lumen of the small bowel. If the duodenum is obstructed, some form of gastroenterostomy will decompress the stomach; it is surprising how infrequently this duodenal bypass is necessary despite a rather sizable tumor mass (b).
Involvement of the small intestine with cancer is usually in the form of malignant implants with intestinal adhesions and secondary intestinal obstruction. However, primary tumors of the small bowel do present with intestinal obstruction (a). The preferred treatment of the involved segment of intestine is resection with an end-to-end anastomosis (b). On occasion a bypass of the involved segment with an enterocystostomy is necessary. The maintenance of as much length of small bowel as possible affords a better chance for the most effective nutrition by the alimentary tract. Of particular importance is retention of the ileum where absorption of bile acids occurs (c). Resection or bypass of a sizable length of ileum—more than 100 cm.—almost certainly leads to diarrhea that is extremely difficult to control.

Cancer of the right colon (a) is best treated with a palliative right colectomy and ileotransverse colostomy (b). If resection is not indicated at the time of exploration, a simple ileotransverse colostomy is employed as a bypass (c). This not only reconstitutes a patent gastrointestinal tract but also defunctionalizes the area of the cancer, allowing radiation therapy to be directed to the malignant tumor with less undesirable side effects.
Cancer of the left transverse and descending colon is seldom bypassed; it is usually treated by proximal diverting transverse colostomy when it cannot be resected with reanastomosis. There is a high incidence of obstruction which frequently presents as an emergency with marked distention of the proximal colon, particularly the cecum. Colostomies in the proximal half of the colon are more difficult to control because of the liquid content of the bowel. However, with proper training in dietary habits and application of appliances these can be handled extremely well by the patient.

Cancer of the rectum or sigmoid colon which is not surgically resectable is best decompressed by the use of a proximal descending colostomy. If there is no proximal dilatation of the colon and no significant symptoms of obstruction, despite significant narrowing of the lumen of the bowel on barium enema, colostomy should be avoided in the unresectable patient; it is hoped that radiation therapy and/or chemotherapy might sufficiently reduce the size of the mass to avoid any diversion of the fecal stream. The more distal the colostomy in the large bowel, the easier it is to regulate since the consistency of fecal content more closely approximates that of the normal rectum. Attention to early and vigorous rehabilitation with colostomy training offers great assistance to these patients.

References

1. Shils, M. E.: Nutritional problems arising from the treatment of cancer. Ca 20: 188-196, 1970.
2. Dudrick, S. J.: Intravenous feeding as an aid to nutrition in disease. Ca 20: 198-211, 1970.