THE PLACE OF EXTENDED GASTRIC RESECTION IN THE TREATMENT OF GASTRIC MALIGNANCY

STANLEY O. HOERR, M.D., and GEORGE CRILE, JR., M.D.
Department of General Surgery

EXTENDED gastric resection is required in some patients if the primary malignant growth is to be removed completely in the hope of cure. An *extended* resection does not necessarily imply *total* gastric resection. It does imply removal of adjacent organs or structures involved by extension of the primary cancer. Enough stomach should be resected to insure the removal of an adequate margin of normal tissue around the tumor; and neighboring structures such as the mesentery of the transverse colon, the transverse colon itself, part of the pancreas with the spleen, or portions of the diaphragm or left lobe of the liver, may be removed en bloc with the stomach. If the patients are properly selected, the results often are gratifying; but if extended operations are used routinely in the treatment of hopelessly advanced malignant disease, cancer is disseminated and nothing but harm is done.

The following cases are illustrative of satisfactory results.

Case 1. (*S.O.H.*) *Survival for 4 years and 363 days after partial proximal esophagogastrectomy with resection of the spleen and portions of the left lobe of the liver, pancreas, and diaphragm.* The patient, a 40-year-old man, had a large tumor involving the entire upper end of the stomach with extension into the diaphragm, the left lobe of the liver, and the hilum of the spleen. The extended resection was undertaken in the absence of distant metastases and because of the comparative youth and good general condition of the patient. Additional diaphragm was removed when frozen section study showed the original line of resection to be close to the tumor. The pathologic report of the tumor was as follows: "Undifferentiated carcinoma of stomach, body and cardia, massive, ulcerating. Marked local extension into wall, to spleen, portion of pancreas, diaphragm."

The patient recovered without complications and did well for about four and one-half years, at which time pain in the back developed and heralded hopeless recurrence. He died after a chordotomy for unremitting pain, just two days short of a "five-year survival." Postmortem examination disclosed retroperitoneal recurrence of cancer.

Comment.—Although he was not cured, the patient had a very satisfactory palliation for more than four years; without resection, survival probably would have been measured in months.

Case 2. (*S.O.H.*) *Well, five years and four months after subtotal gastric resection with simultaneous transverse colectomy.* The patient, a 64-year-old woman, had a huge ulcerating tumor involving the distal two thirds of the stomach with extension into the transverse mesocolon. At operation there was no evidence of distant metastases. An en bloc resection of the stomach, the greater omentum and the involved mesocolon was performed. This compromised the blood supply of the transverse colon, necessitating a transverse colectomy. A feeding jejunostomy and a decompressive tube colostomy supplemented the

resection. The pathologic report was as follows: "Carcinoma of stomach, simplex and poorly differentiated adenocarcinoma types, ulcerating, with 1 of 16 lesser curvature lymph nodes and 3 of 25 greater curvature lymph nodes involved."

The patient is seen periodically; she has developed a cyst of the right kidney but otherwise has remained well without evidence of disease for more than five years.

Comment.—This case represents an unusual instance wherein an invasive tumor with involvement of lymph nodes has responded satisfactorily to surgical excision.

Case 3. (*S.O.H.*) *Well, five years and four months after total gastric resection with simultaneous transverse colectomy, splenectomy, partial pancreatectomy, and resection of a portion of the anterior abdominal wall.* The patient, a 52-year-old man, had a large tumor with a seven-centimeter central ulceration extending directly to the transverse mesocolon and the pancreas. The tumor involved practically the entire stomach, and was adherent anteriorly to the abdominal wall. After it had been determined that there were no distant metastases, en bloc resection was performed, leaving a one-centimeter cuff of stomach at the esophageal end. A Billroth I type of anastomosis was performed, with a supplementary feeding jejunostomy and decompressive tube colostomy. The pathologic report was as follows: "Undifferentiated carcinoma, extensive, of body and pyloric antrum of stomach, rapidly growing, none of 5 lymph nodes involved."

The patient has remained well for more than five years, engaging in his strenuous occupation in a foundry, often working 60 hours a week.

Comment.—The application of the en bloc principle has effected an apparent cure in this patient who seemed to have a very unfavorable tumor.

Case 4. (*G.C., Jr.*) *Well, five years and ten months after resection of huge leiomyosarcoma with apparent extension to the liver, and 19 years after the original exploration for "inoperable" neoplasm.* The patient, a 41-year-old man, had required many transfusions for repeated gastric hemorrhages during a period of 18 years. Tissue from a tumor biopsied but not resected 14 years before, in 1936, was reported as being "undifferentiated carcinoma"; the prognosis was regarded as hopeless. Nine years later, in 1945, the patient was advised to undergo exploration because of a palpable tumor mass and persistent hemorrhages, but he refused surgery. In 1950, through a thoraco-abdominal approach an enormous tumor with regional lymph nodes was removed; the apparent extension to the liver was cauterized with the Bovie unit. There were no distant metastases, but the regional lymph nodes were very large and seemed grossly involved. The pathologic report was as follows: "Leiomyosarcoma, slowly growing, with 2 massive ulcerations; marked sarcoid reaction in lymph nodes without apparent neoplasm."

Since that operation in 1950, the patient has remained well, working 40 hours a week as a foreman in a factory. He has had no more hemorrhages.

Comment.—The long history of illness made it clear that the tumor was slow growing; the resection has proved worthwhile and apparently curative.

Discussion

Realistic surgical treatment of gastric malignancy calls for a clean resection of the primary tumor with an adequate margin of normal tissue. This should be done en bloc without a biopsy, for a biopsy may disseminate cancer. The greater

omentum and the lymph-node-bearing area from the esophagus downward, including the nodes around the left gastric artery, are removed routinely with the stomach. Secondary attention is given to those ill-defined areas of lymphatic drainage which are difficult of access; their involvement by the tumor we believe to be comparable to invasion of supraclavicular nodes by cancer of the breast, and connotes surgical incurability. The nodes in question are those at the porta hepatis or posterior to the pancreas, and fixed nodes about the aorta posterior to the stomach or at the celiac axis.

Before a surgeon commits himself to an extended resection, he should determine whether a cure is within the realm of possibility. It is presumed that in the preoperative survey a roentgenogram of the chest has shown no evidence of metastases, and that physical examination has excluded the presence of supraclavicular nodes, a nodular liver, ascites, or a rectal shelf. If there is clinical evidence of distant metastases, the simplest means for obtaining a tissue diagnosis should be employed—lymph node biopsy, needle biopsy, or cytologic study of ascitic fluid. If tissue diagnosis is positive for metastatic malignancy, further surgery ordinarily is contraindicated.

At operation the surgeon carefully examines both lobes of the liver for hepatic metastases, and searches the peritoneal surfaces for implants. The presence of either is confirmed by frozen section study of a small piece of tissue that has been taken with every precaution to prevent dissemination of cancer. Positive findings ordinarily contraindicate a resection.

Next, the surgeon inspects the undersurface of the transverse mesocolon, a favorite site of extension. Involvement at the root of the mesentery, particularly near the superior mesenteric vessels, precludes a cure. The same may be said for extension along the left gastric vessels and retroperitoneal extension over the great vessels. It may be necessary to divide the attachment between the greater omentum and the transverse colon in order to determine whether there is posterior extension. The surgeon must avoid the pitfall of committing himself to performing a massive resection before discovering that it cannot possibly cure the patient. This error usually is the result of underestimating the degree of extension that exists posteriorly above the pancreas.

If *hopeless fixation* is ruled out, en bloc dissection may be attempted. The surgeon's efforts should be aimed principally at encompassing the primary lesion and its immediate zone of lymph node metastasis. Accessory procedures such as splenectomy should be performed only when they facilitate the operation. Dissection of lymph nodes behind the head of the pancreas or off the hepatic artery, or a dissection about the celiac axis may be performed as adjunctive procedures if conveniently done without increased risk, but improvement in results will be unlikely. If there is no involvement of lymph nodes, these additional dissections are unnecessary; if lymph nodes are involved in those locations, the outlook is so very poor that additional surgery, no matter how extensive, follows the law of diminishing returns and the risk exceeds the probable benefit.

Summary and Conclusions

1. *Extended gastric resection* is defined as en bloc removal of adjacent organs together with an adequate amount of stomach; it is not necessarily a total gastric resection.

2. Extended resection often is justified when no evidence of incurability of the lesion is found.

3. Evidence of distant metastases such as peritoneal implants should be specifically sought: their presence contraindicates an extended resection.

4. Extension of the primary tumor into the root of the transverse mesocolon, into the celiac axis or retroperitoneal tissues, and lymphatic metastases at the porta hepatis or posterior to the head of the pancreas, also contraindicate extended gastric resection.

5. In properly selected patients, extended gastric resection may give good results; four examples are reported.