19 would have survived resection, 7 for 3 years and 5 for 5 years. In the years 1940 through 1949, 80 of the 100 would have had laparotomy, 44 would have been treated by resection, and 40 would have survived resection, 18 for 3 years and 14 for 5 years. In the years 1950 through 1959, 90 of the 100 would have undergone laparotomy, 55 would have been treated by resection and 51 would have survived the resection, 19 for 3 years and 15 for 5 years. It should be pointed out that these data include all patients with cancer of the stomach regardless of whether they were operated on or not; this 5-year survival rate, therefore, is an overall survival rate. Comparison of the 1950 through 1959 group with the 1907 through 1916 group shows a 200% increase in the 5-year survival rate, although it is still much lower than one would desire.

Unfortunately, the incidence of involved lymph nodes found in the surgical specimens remains high (69.5%), although not as high as in former years. Surgical mortality rate has gradually been reduced but still remains significantly higher for total gastrectomy (14%) than for subtotal gastrectomy (6.2%). It is of interest that the surgical mortality rate is lower and "5-year cures" were higher when a significant amount of hydrochloric acid is found in the gastric aspirate than when achlorhydria is present.

What procedures are being used at present for cancer of the stomach? In the early 1940's, there was a great deal of enthusiasm for the use of total gastrectomy. A review of our experience with total gastrectomy in 1952 did not permit the conclusion that this was the operation of choice for all patients with carcinoma of the stomach but only for those who had a lesion that could not be completely removed by a lesser operation. In our practice, total gastrectomy is performed in approximately 17% of patients who have the lesion removed, and subtotal gastrectomy is performed in the remaining 83%. 479 patients for whom total gastrectomy was performed from 1916 through 1961 were available for study. The greater omentum and the spleen were removed routinely in these patients, but no portion of the pancreas was resected unless it was invaded by tumor. In our experience, resection of a portion of the pancreas is associated with increased operative mortality rate. The 5-year survival rate in total gastrectomy was 9.9% for those who survived operation. This rate was definitely higher for those who had sarcoma rather than carcinoma. In performing total gastrectomy, we usually make an end-to-side esophagojejunal anastomosis with an enterointerostomy of the "pantaloon" type in a limited number of patients for the purpose of providing a larger area for receipt of food. Experience with this procedure is too limited to permit conclusions regarding its efficacy.

Studies made in 1953 showing the influence of location of nodes involved by carcinoma from the stomach on survival after operation revealed that, among the long-term (5-year) survivors, only 6% had involvement of the subpyloric nodes whereas, among short-term survivors, 71% had such involvement. On the basis of this, we have extended our operation downward to include more of the duodenum and provide greater opportunity for removing the lymph nodes in the subpyloric and suprapyloric regions and along the duodenal hepatic structures. Nodes along the hepatic artery and the celiac axis also are removed with great care.

Fly and his associates found involved nodes in the hilus of the spleen in 30% of patients in whom cancer involved only the distal portion of the stomach. In performing radical subtotal gastric resection, therefore, we have included splenectomy, omentectomy, and resection of about 80% of the stomach. Our usual anastomosis is the Hofmeister-Polya type of procedure, saving about 20% of the stomach and anastomosing it in either an anterior or posterior position, usually in a posterior position to the first portion of the jejunum.

The 5-year survival rate from the usual type of partial gastrectomy performed in previous years was 34% for patients who survived operation. From a recent study of 80 patients in whom radical subtotal gastric resection was performed, an additional 12% can be expected to be added to the previous 5-year survival rate. Since this series of patients is small, positive statements regarding them perhaps are premature. To date, however, this type of radical subtotal gastrectomy appears to offer some prospect for improved surgical results.

Kommentar

Pathophysiologie des Magenkrebses

Von M. Kuru

Die Funktion des Magens ist ungemein mannigfaltig (Tabelle 59). Bekanntlich bewahrt er die Speisen nicht nur eine Zeitlang auf und gibt sie dann zerkleinert ins Duodenum weiter, er sezerniert auch Pepsin, Salzsäure und Gastrin. Die beiden ersteren Sekrete nehmen an der

F. Holle, Spezielle Magenchirurgie
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Tabelle 59. Funktionen des normalen Magens

1. Aufbewahrung
   Bewegungen-Mischperistaltik, Pendelbewegung, Entleerungsperistaltik (Hunger-Kontraktion, Antiperistaltik)

2. Sekretionen
   Aus Belegzellen der Fundusdrüse
   - HCl
   - Pepsinogen
   - Duodenalschleimhaut
   - Prosecretin
   - Secretin
   - Absonderung des Pankreassaftes und der Galle

   Aus Hauptzellen der Fundusdrüse
   - Pepsin (pH 2)
   - Labferment (Chymosin) (pH 4-5)
   - Gastrin (Edkins)
   - Intrinsicher Faktor

   Aus Pylorusdrüse
   - Steapsin (pH 6)
   - Histamin
   - Gastrin (Komarov)

3. Verdauung
   Polysaccharide
   - Speise
   - Hydrolyse
   - Vitamin C

   Eiweiß
   - Pepton
   - Albumose

   Milch
   - Caseinogen
   - Casein
   - Ca-Salz des Caseins (Milchgerinnung)

   Neutrafett
   - Fettsäure
   - Glycerin

4. Absorption
   Monosaccharide
   - Fe^{++}
   - CO_2

   Alkohol

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Intrinsischer Faktor
Extrinsischer Faktor (Vitamin B_{12}) in der Speise
Leber
Knochenmark
Vorbeugung der perniziösen Anämie