Duodenal seromyectomy in the management of adherent colonic carcinoma in elderly patients

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Objective: To determine if partial denudation of the duodenum by seromyectomy can achieve tumour clearance in elderly patients with adherent primary colonic carcinoma.

Design: A case series.

Setting: An urban tertiary care centre.

Patients: Seven elderly patients with Dukes' class C primary adenocarcinoma of the ascending colon adherent to the duodenum but without distant metastases. The follow-up ranged from 29 to 41 months.

Interventions: Right hemicolectomy and seromyectomy of the duodenum at the site of adhesion.

Main outcome measures: Patient survival and tumour recurrence.

Results: One patient died 29 months postoperatively of myocardial infarction but without tumour recurrence. Another patient had a solitary metastasis in the right liver lobe 7 months postoperatively. She was disease free 34 months after a right hemihepatectomy. The other 5 patients were alive and disease free at their last follow-up.

Conclusion: Duodenal seromyectomy with postoperative chemotherapy for locally advanced adherent colonic cancer seems to be an acceptable management strategy for elderly patients in whom major en bloc resections present a greater than average risk of death.

Objectif : Déterminer si une dénudation partielle du duodénum par séromyectomie peut permettre de dégager une tumeur chez des patients âgés atteints d'un carcinome primitif adhérent du côlon.

Conception : Étude de cas.

Contexte : Centre urbain de soins tertiaires.

Patients : Sept patients âgés atteints d'un adénocarcinome primitif du côlon ascendant, de catégorie C de Dukes, adhérant au duodénum mais sans métastases à distance. La durée du suivi a varié de 29 à 41 mois.

Interventions : Hémicolectomie droite et séromyectomie du duodénum au point d'adhérence.

Principales mesures des résultats : Survie du patient et réapparition de la tumeur.

Résultats : Un patient est décédé 29 mois après l'intervention, d'un infarctus du myocarde, mais aucune tumeur n'était réapparue. Une autre patiente avait une seule métastase au lobe droit du foie sept mois après l'intervention. Elle ne présentait aucune maladie 34 mois après avoir subi une hémihépatectomie droite. Les cinq autres patients étaient vivants et n'avaient aucune maladie à leur dernier suivi.

Conclusion : Une séromyectomie du duodénum conjuguée à une chimiothérapie postopératoire pour le traitement d'un cancer du côlon adhérent avancé localement semble constituer une stratégie acceptable de traitement des patients âgés chez lesquels des résections importantes en bloc présentent un risque de décès supérieur à la moyenne.

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The operative management of colonic cancer is well established, and long-term results have improved significantly with the introduction of adjuvant chemotherapy. Some management dilemmas remain. Adjacent organ involvement is a well recognized phenomenon and is seen in 5% to 10% of patients with colorectal cancer.[1] By definition, this involvement may take one of two forms: an inflammatory adhesion, encountered in 43% of patients according to one series,[2] or frank tumour invasion. In a study of 43 patients with colorectal cancer involving adjacent organs, Hunter, Ryan and Schultz[3] concluded that any attempt at lysis of the "malignant tumour adhesion" from the adjacent organ was associated with a local recurrence rate of 77%, compared with only 36% after an en bloc resection of the adjacent organ with the involved colonic segment.

One of the most difficult things to do in locally advanced colorectal cancer is to determine its resectability. Although we have some guidelines, there are several borderline situations in which the entire clinical picture, the age of the patient and the likely outcome should be considered in addition to the technical aspects, such as when the primary colonic tumour is adherent to the duodenum in an elderly patient. Earlier experience in this field has been disappointing. In the studies by Hunter, Ryan and Schultz[3] and Heslov and Frost,[4] where en bloc pancreatic duodenal resection and colectomy were performed simultaneously, the long-term results in terms of survival and outcome were disastrous. Kroneman, Castelein and Jeekel[5] reported similar results with en bloc resection of adjacent organs in a series of 33 patients.

The serious nature of duodenal involvement in carcinoma of the right colon and the dismal outcome irrespective of the type of resection, especially in elderly patients, led us to adopt a new approach. We started with the hypothesis that the immediate postoperative outcome of surgery in patients with carcinoma of the right colon involving duodenum could be partly determined from the extent of surgical trauma after pancreatic duodenal resection. The question we asked ourselves was "Would partial denudation of the duodenum by seromyectomy achieve tumour clearance in these elderly patients?"

Patients and methods

From 1991 to 1995 we studied 7 patients (3 men, 4 women) who had Dukes' stage C2 malignant neoplasms of the ascending colon with duodenal involvement. The men ranged in age from 71 to 78 years and the women from 66 to 76 years. There was no evidence of distant metastases. Right hemicolectomy was performed. The lymphatics and blood vessels were isolated and ligated before the tumour-bearing segment of the right colon was mobilized and manipulated.[6,7] The area of the duodenum where the tumour was adherent was not lysed from the colon. Instead, a complete disc of serosa and smooth-muscle layer of the duodenum was removed, taking care not to damage the mucosa and the submucosal arcade of vessels. We usually found it helpful to perform a Kocher manoeuvre to gain full control of the area. The disc of the duodenal wall, including the serosal and smooth-muscle layers, was dissected out in vitro and the absence of tumour infiltration in the margins and deeper aspects of the excised specimen was ascertained by frozen section examination. The duodenum was left undisturbed, and a nasogastric tube was introduced with its tip distal to the area of seromyectomy. The procedure was concluded by an assessment of the subpyloric and para-aortic lymph nodes and the liver.

Extreme care was taken not to damage the duodenal mucosa denuded by the seromyectomy. Bleeding from the margins of the seromyectomy was controlled by careful low-power diathermy, but any oozing from the submucosal area was controlled by tamponade. The standard principle applied was to perform seromyectomy with a 2-cm tumour-free margin on all sides. Frozen section was used to exclude tumour infiltration in the deepest layer of the duodenal smooth muscle. No attempt was made to cover this denuded area with omentum (Table I). Routine intraoperative antibiotic prophylaxis (a single dose of 1.5 g of cefuroxime and 1 g of metronidazole) was used in all cases.

The nasogastric tube was removed on the third postoperative day, and the patients were allowed up to 1000 mL of clear fluids, depending upon the passage of flatus. The patients were carefully observed postoperatively for signs of anastomotic leakage and duodenal perforation and were discharged from hospital 10 to 16 days postoperatively (Table I).

Histopathological examination of the specimens showed that all patients had node-positive Dukes' class C carcinoma of the colon. Gastroduodenoscopy was performed on each patient 1 month postoperatively to assess the mucosa of the second and third parts of the duodenum. All patients were given adjuvant chemotherapy with 5-fluorouracil and levamisole for 1 year, according to protocol. Colonoscopy of the anastomotic region (ileotransverse ostomy) was performed at 6-month intervals for 2 years. Gastroduodenoscopy of the duodenal mucosa for signs of local recurrence was performed at 6-month intervals for 2 years. Hepatic function (serum aspartate aminotransferase, alanine aminotransferase, alka-

line phosphatase, γ-glutamyl transferase, bilirubin and albumin levels) and carcinoembryonic antigen (CEA) levels were measured at 3-month intervals for the first year and at 6-month intervals for the second year. Ultrasonography of the liver and upper abdomen was done routinely at 6-month intervals for 2 years. CT was performed 1 and 2 years after operation.

Results

The type of duodenal invasion was tumour growth and not inflammatory adhesion in all patients. The follow-up period ranged from 29 to 41 months. One patient, a 77-year-old man (patient no. 7, Table II) died of massive myocardial infarction 29 months after operation. Autopsy showed no evidence of tumour recurrence. The remaining 6 patients were alive at the last follow-up (Table II). None of the patients had local recurrence in the colon, duodenum or elsewhere in the bed of previous resection. One 75-year-old woman had a solitary metastasis, 1.4 cm in dimension, in the right lobe of the liver 7 months after operation (patient no. 5, Table II). She was otherwise fit and doing well but had a CEA level of 55 μg/L. She underwent a successful right hemihepatectomy and continued with adjuvant therapy; 34 months later she was alive, without evidence of recurrence and with a CEA level of 3 μg/L. All patients had a preoperative CEA level greater than 25 μg/L. This level regressed and finally normalized during the period of adjuvant

Table I

Clinical Data for Seven Elderly Patients Who Had Duodenal Seromyectomy for Adherent Colonic Carcinoma

Patient no.	Age, yr/sex	Site	Dukes' class	CEA value	Duodenal invasion	Tumour size, cm	Node involvement	Hospital stay, d	Complications
1	73/F	Ascending colon	C	43	Yes	6.2	–	10	None
2	77/F	Ascending colon	C	68	Yes	5.9	++	11	Urinary tract infection
3	71/M	Hepatic flexure	C	98	Yes	6.4	+	14	None
4	78/F	Ascending colon	C	56	Yes	6.9	+	13	Wound infection
5	75/F	Hepatic flexure	C	105	Yes	6.7	++	14	Chest infection
6	74/M	Ascending colon	C	115	Yes	5.8	–	12	None
7	77/M	Ascending colon	C	77	Yes	6.6	+	16	None

CEA = carcinoembryonic antigen; – = no node involvement, + = ≤ 3 nodes involved, ++ = > 3 nodes involved

Table II

Follow-up Data After Right Hemicolectomy and Duodenal Seromyotomy

Patient no.	Operation	Adjuvant chemotherapy	Recurrence	Survival, mo	Cause of death	Autopsy findings
1	RH + DSM	Yes	No	33	NA	NA
2	ERH + DSM	Yes	No	31	NA	NA
3	ERH + DSM	Yes	No	34	NA	NA
4	RH + DSM	Yes	No	31	NA	NA
5	RH + DSM	Yes	Yes	41	NA	NA
6	ERH + DSM	Yes	No	32	NA	NA
7	ERH + DSM	Yes	No	29	MI	No tumour recurrence

RH = right hemicolectomy, ERH = extended right hemicolectomy, DSM = duodenal seromyectomy, MI = myocardial infarction, NA= not applicable

therapy. In one man, frozen section revealed some doubt as to the the radicality of tumour clearance, but no attempt was made to extend the resection. The man had no recurrent cancer at the last follow-up.

Discussion

There is a scarcity of reports on the management of duodenal invasion by colorectal cancer. Moynihan[8] first described adjacent organ invasion by locally advanced colonic cancer and recommended radical resection. Sugarbaker[9] and Turner[10] reported large series and also favoured en bloc resection. Talamonti and colleagues[2] reported their experience with 70 patients in whom there was invasion of the urinary bladder by colorectal carcinoma. They recommended extended en bloc removal of all or part of the urinary bladder.

At the beginning of this study, it was clear that most surgeons dealing with large Dukes' C cancers fixed to the duodenum in the elderly would bypass the tumour through some sort of a drainage procedure and not attempt extensive resection in view of the advanced age of the patients. Since either way it would be impossible to enhance the tumour-free survival, a less invasive approach made sense. Past experience with en bloc resection of these tumours, along with the adjacent organ, especially duodenum, has given poor results.[3,4]

Several aspects of our present approach need to be examined. First, invasion of the adjacent organ is often not clinically apparent. There are a few reports in the literature about the accuracy of predicting adjacent organ invasion by primary tumours,[10,11] but since there is often no clinical indication of the simultaneous adjacent organ invasion, appropriate imaging is often not requested. Dukes' stage and the extent of cancer infiltration into adjacent organs cannot be accurately assessed preoperatively or indeed intraoperatively.[12,13] Also, it is difficult to put together a large enough patient population to assess the accuracy and clinical benefit of imaging techniques. Second, we still have not considered the patients who actually have tumour invasion of the duodenal mucosa (none in the present series) to such a degree that mucosal resection for tumour clearance may significantly constrict the duodenum. A detailed analysis of outcome after any kind of surgical approach for each individual adjacent organ invaded by colorectal carcinoma is practically impossible because of the small numbers of patients and the relatively long follow-up required. Therefore, experience with smaller series is an important addition to the literature. Third, the importance of factors like node-positive disease versus node-negative disease and inflammatory adhesion versus frank tumour invasion needs to the addressed further.

In our experience, elderly patients with large-bowel tumours adherent to sensitive organs like the duodenum perform badly, with rapid deterioration, if the operative procedure performed is not optimal or if there is obstruction of proximal small bowel or common bile duct with infection. Bypasses do not always function well and do not necessarily improve the patient's quality of life. In addition, anastomotic leaks occur more frequently in elderly patients with advanced cancers, and the surgeon should look out for them if a drainage procedure is the only real solution. The surgeon is often in a dilemma when at laparotomy a large tumour is found invading an adjacent sensitive organ. The surgeon's attitude is important since a radical en bloc resection may be considered too risky especially in elderly patients, and we have all learned bitter lessons from past experience. Therefore, choosing the best possible procedure is crucial. The approach described in this paper may provide a valuable alternative in the management of this serious condition.

Our sincere thanks to Dr. J.T. Holmes for his constructive criticism.

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Notices
Avis

BiOS Europe '97

A joint meeting of the European Laser Association (ELA) and the International Biomedical Optics Society (IBOS) will be held at the Hotel Londra/Centro Congressi, Sanremo, Italy, from Sept. 4 to 8, 1997. For further information contact: Direct Communications GmbH, Attn. Ms. Karin Burger, Xantener Str. 22, D-10707 Berlin, FR Germany; tel 49 30 881 50 47; fax 49 30 88 68 29 46; 100140.3211@compuserve.com

Congress on biomedical peer review

The *Journal of the American Medical Association*, the *British Medical Journal* and Project HOPE announce The International Congress on Biomedical Peer Review and Global Communication to be held in Prague, Czech Republic, from Sept. 17 to 21, 1997. For further information contact: Annette Flanagin, *JAMA*, 515 N State, Chicago IL 60610, USA; tel 312 464-2432; fax 312 464-5824; aff@ix.netcom.com

Update on digestive diseases

The Faculty of Medicine, University of Toronto will hold a course entitled "1997 Update on Digestive Diseases" on Nov. 7, 1997, in the 18th Floor Auditorium, Mount Sinai Hospital, Toronto. Credits: MOCOMP, AMA Category I. Contact: Continuing Education, Faculty of Medicine, University of Toronto, Room 121, 150 College St., Toronto ON M5S 3E2; tel 416 978-2718; fax 416 971-2200; audrea.martin@utoronto.ca

Interactive surgical symposium

The Mayo Clinic Scottsdale is sponsoring the Mayo Interactive Surgical Symposium, to be held at the Marriott's Camelback Inn Resort, Golf Club and Spa, Scottsdale, Ariz., from Feb. 12 to 14, 1998. The course directors are Drs. John Donohue and William Stone. The symposium will comprise interactive sessions designed to update the general surgeon on state-of-the-art issues in breast surgery, trauma and critical care, endocrine, gastrointestinal/hepatobiliary, and vascular and thoracic surgery. For information regarding CME credits, registration and fees contact: Sara Schnirring, Medical Education Office, Mayo Clinic Scottsdale, 13400 East Shea Blvd., Scottsdale AZ 85259, USA; tel 602 301-7552; fax 602 301-8323.

Colorectal disease in 1998

The Department of Colorectal Surgery, Cleveland Clinic Florida will present the 9th annual symposium entitled "Colorectal Disease in 1998. An International Exchange of Medical and Surgical Concepts." The symposium will be held at the Marriott's Harbor Beach Resort, Fort Lauderdale, Fla., from Feb. 19 to 21, 1998 under the direction of Dr. Steven D. Wexner. Simultaneous translation will be available in Spanish and Italian. Credits: 24.5 hours in Category I of the AMA Physicians' Recognition Award or may be substituted for AOE-CME Category II-A. Contact: Cleveland Clinic Florida, Department of Education, 2950 West Cypress Creek Rd., Fort Lauderdale FL 33309-1743, USA; tel 954 978-5056; fax 954 978-5539; jagels@cesmtp.ccf.org

The pediatric esophagus

The Department of Pediatric Surgery, Faculty of Medicine, Ege University, Izmir, Turkey, will host an interdisciplinary symposium entitled "The pediatric esophagus" from Apr. 20 to 22, 1998, in Izmir (URL—**medicine.ege.edu.tr/pedsurg/ped_oesophagus.htm**). The main topic will be gastroesophageal reflux with a special interest in alkaline reflux. For further information contact: Professor Oktay Mutaf, Department of Pediatric Surgery, Ege University Faculty of Medicine, 35100 Izmir, Turkey; fax 90 232 3 75 12 88; mutaf@bornova.ege.edu.tr

International Federation of Societies for Surgery of the Hand

"The future at hand: sharing knowledge towards the 21st century" will be the theme of the 7th Congress of the International Federation of Societies for Surgery of the Hand (IFSSH). The congress, hosted by the IFSSH and MANUS Canada will be held from May 24 to 28, 1998, at the Vancouver Trade and Convention Centre, Vancouver, BC. For further information contact: Conference Secretariat — Events by Design, 601–325 Howe St., Vancouver BC V6C 1Z7; tel 604 669-7175; fax 604 669-7083; 74117.273@compuserve.com