Excerpta Medica

The American Journal of Surgery

The American Journal of Surgery 187 (2004) 497–500
Scientific paper

Long-term prognosis of patients with obstructing carcinoma of the right colon

Huann-Sheng Wang, M.D.*, Jen-Kou Lin, M.D., Ph.D., Chih-Yuan Mou, M.D., Tzu-Chen Lin, M.D., Wei-Shone Chen, M.D., Ph.D., Jeng-Kae Jiang, M.D., Ph.D., Shung-Haur Yang, M.D.

Division of Colon and Rectal Surgery, Department of Surgery, Veterans General Hospital–Taipei, National Yang-Ming University School of Medicine, No. 201, Sec. 2, Shih-Pai Rd., 11217, Taipei, Taiwan, Republic of China

Manuscript received October 28, 2002; revised manuscript March 3, 2003

Abstract

Background: The long-term prognosis of patients with colon cancer is dependent on many factors. The aim of this retrospective study was to assess the long-term prognosis of patients with obstructing carcinoma of the right colon.
Methods: From 1981 to 1988, 256 patients at the Veterans General Hospital-Taipei who were status postcurative resection of right colon adenocarcinoma were classified as obstruction group (n = 35) or nonobstruction group (n = 221) as appropriate.
Results: Analysis revealed no differences in age, sex, tumor location, or stage ($P > 0.05$) between the two groups. However, the overall and distant recurrence rates were significant higher in obstructed patients than in nonobstructed patients. Further, long-term crude and cancer-specific survival rates were significantly lower in obstructed patients when examining either overall patient outcome or stage-matched outcomes. Multivariate analysis demonstrated that obstruction and tumor stage were both independent prognostic factors.
Conclusions: Obstruction status was an independent prognostic factor for patients with right colon carcinoma. The long-term prognosis of patients with obstructing carcinoma of the right colon was poor.

Keywords: Prognosis; Carcinoma; Colon

Despite advances in medical care and the application of diagnostic techniques such as barium enema, colonoscopy, and new imaging techniques, a large number of patients with colon and rectal cancer are not identified until advanced stage or presentation with intestinal obstruction. The incidence of intestinal obstruction has been reported to be between 7% and 29% of all patients with colon and rectal cancer [1–6].

Many reports have described significantly lower survival rates for patients with obstructing colorectal cancers when compared with nonobstructing colorectal cancer [1–4,7–9]. In addition, there was an increased risk of surgical mortality, a higher incidence of lymph node metastasis, and a decreased curative resection rate in patients with obstructing colorectal cancer [1–3].

Most studies investigating prognostic factors for large bowel cancers do not distinguish between the subpopulations of colon and rectal cancer, despite the fact that large bowel cancers in the colon possess biological characteristics, treatment modalities, patterns of recurrence, and survival rates distinct from rectal cancers [10–12]. Further, operative strategies for obstructing carcinoma of the left colon differ from procedures employed for the right colon. Some studies suggest that one-stage operation is more advantageous than staged procedures in terms of short-term and long-term survival in the management of patients with the left colon obstructing carcinoma [2,3,13–16]. Nevertheless, most patients with the obstructing carcinoma of left colon and rectum underwent staged operation in our hospital. The aim of this retrospective study was to assess the long-term prognosis of patients with the right colon obstructing carcinoma and analyze clinical characteristics to identify independent prognostic factors.

* Corresponding author. Tel.: +886-2-28757544, ext. 110; fax: +886-2-28729107.
E-mail address: hswang@vghtpe.gov.tw

0002-9610/04/$ – see front matter
doi:10.1016/j.amjsurg.2003.12.028

Methods

Medical record contents of patients with colon and rectal cancer were isolated in a computerized database. The database included (1) name, sex, age, family history, and major medical problems of the patients; (2) location, size, gross appearance, stage, differentiation, and relevant pathological features of the tumor, (3) types of operation, complications, recurrence, and condition at follow-up. These patients returned for follow-up every 3 months during the first 2 years, every 6 months during the subsequent 3 years, and then once a year. When necessary, telephone contact was made with the patient to obtain up-to-date information.

From 1981 to 1988, 366 patients at the Veterans General Hospital–Taipei with right colon carcinoma underwent surgical resection. Those who suffered from carcinoma with perforation were excluded in this series. The right colon was defined as the cecum, ascending colon, hepatic flexure colon, and transverse colon. Among the 366 patients, 256 patients achieved curative resection, and 110 patients underwent palliative resection owing to locally advanced invasion or distant metastasis. All patients with curative resection received right hemicolectomy or extended right hemicolectomy with clear-cut ends and lateral margin. All tumors were histologically determined to be adenocarcinoma.

Obstruction was defined as total absence of flatus or bowel movements for at least 1 day, accompanied by clinical signs of obstruction (abdominal distension and vomiting) or by radiographic evidence (dilated bowel loops), and patients were thereby divided into obstruction and nonobstruction groups.

Clinicopathological variables including age, sex, tumor location, stage, long-term survival, and recurrence rate were analyzed. Statistical analysis was performed using the software program SPSS version 10.0 (SPSS, Chicago, Illinois). The distribution of age was compared using two-sample *t* test. The Pearson chi-square test was used for comparison of sex, tumor stage, and the curative resection rate. Fisher's exact test was applied to compare differences in tumor location. Survival curves, including crude and cancer-specific survival, were generated by the Kaplan-Meier method. Differences in survival rates were determined with the log-rank test. To identify independent prognostic factors for survival, multivariate analysis was performed using the Cox regression hazards model.

Results

Between 1981 and 1988, 366 patients at the Veterans General Hospital–Taipei with right colon carcinoma were identified. Two hundred and fifty-five patients underwent curative resection. Thirty-five of these patients had obstructing carcinoma and underwent emergent operation, and 221 patients had nonobstructing carcinoma and underwent elective operation. The curative resection rate of patients was significantly lower in patients with obstructing right colon carcinoma when compared with nonobstructing carcinoma (59%; 72%; $P = 0.042$, Pearson chi-square test).

Table 1
Characteristics of 256 patients who underwent curative resection

	Obstruction	Nonobstruction	*P* value
Number of patients	35 (14%)	221 (86%)	
Age	59.03 ± 14.20	61.18 ± 13.05	0.379*
Sex (M/F)	27/8	151/70	0.292†
Location			0.912‡
Cecum	9 (26%)	67 (30%)	
Ascending colon	12 (34%)	76 (34%)	
Hepatic flexure	7 (20%)	37 (17%)	
Transverse colon	5 (14%)	34 (15%)	
Synchronous	2 (6%)	7 (3%)	
Tumor stage			0.251†
I	2 (6%)	35 (16%)	
II	18 (51%)	110 (50%)	
III	15 (43%)	76 (34%)	

* Two-sample *t* test.
† Pearson chi-square test.
‡ Fisher's exact test.

Patient characteristics are summarized in Table 1. There was no significant difference in age, sex, tumor location, or pathological stage between the two groups.

Of 35 obstructed patients treated with curative resection, 17 patients had tumor recurrence, including 5 patients with local recurrence and 14 patients with distant metastases (Table 2). Of 221 nonobstructed patients treated with curative resection, 48 patients had tumor recurrence, including 12 patients with local recurrence and 39 patients with distant metastases. The overall recurrence and distant metastasis rates were significantly higher in obstructed patients when compared with nonobstructed patients. Although there was a trend toward higher local recurrence rate in obstructed patients, the difference was not statistically significant.

The overall long-term crude survival curve of patients with right colon carcinoma is illustrated in Fig. 1. Obstructed patients had significant lower 5-year crude survival rate than nonobstructed patients (36%, 77%, $P = 0.00001$, log-rank test). The 5-year cancer-specific survival rate was also significantly lower in obstructed patients than nonobstructed patients (46%, 83%, $P = 0.0001$, log-rank test). Furthermore, significant differences between the obstructed

Table 2
Overall, local, and distant recurrence after curative resection

	Obstruction	Nonobstruction	*P* value
Local recurrence	5 (14%)	12 (5%)	0.065*
Distant recurrence	14 (40%)	39 (18%)	0.002†
Overall recurrence	17 (49%)	48 (22%)	0.001†

* Fisher's exact test.
† Pearson chi-square test.

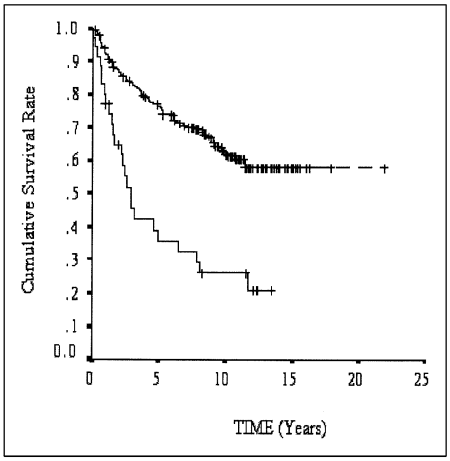

Fig. 1. Overall long-term crude survival of patients who underwent curative resection ($P = 0.00001$). (**Dashed line** = nonobstruction; **solid line** = obstruction; + = censored.)

and nonobstructed patients were observed for overall patients as well as for stage-matched patients ($P < 0.05$, log-rank test).

Cox's regression hazard model was used to assess the influence of obstructing carcinoma on the survival. As shown in Table 3, obstructing carcinoma and tumor stage were both independent prognostic factors for long-term survival.

Comments

Several studies provide descriptive data regarding the prognosis of patients with the obstructing colorectal cancer. A reduction in long-term survival has been demonstrated using univariate or multivariate analysis in some reports [17–20]. Multivariate analysis by other investigators, however, showed that obstruction was not an independent prognostic factor [21,22]. A lack of clear definition of obstruction and the different selection criteria in the past different studies may have complicated the assessment of the influence of obstruction on colorectal cancer outcomes. In fact, most studies analyze all colorectal cancers without distinguishing between the subsets of colon and rectal cancer. In the present study, only patients with the right colon carcinoma that received one-stage operation were included in the analysis. Obstruction was defined as total absence of flatus or bowel movements for at least 1 day.

Table 3
Univariate and multivariate analysis for prognostic factors

	Univariate *P* value	Multivariate *P* value
Age	0.1495	0.750
Sex	0.8191	0.387
Tumor location	0.0677	0.750
Tumor stage	0.00001	0.0001
Obstruction	0.00001	0.0001

Obstructing colorectal cancer tends to be locally advanced, and liver metastasis is not uncommon [4,5,13,23,24]. Emergent operation is often required in patients with obstructing colorectal cancer, which contributes to lower curative resection rate and poorer survival. Serpell et al [23] demonstrated a lower curative resection rate of patients who had obstructing tumors (50.7%) compared with patients who had nonobstructing tumors (70.6%), which is consistent with our series.

Previous studies using multivariate analysis have demonstrated that survival of patients with obstructing colorectal cancer was significantly related to pathological variables and less strongly related to the clinical variables [24,25]. After curative resection in our patients with right colon carcinoma, however, the crude and cancer-specific survival rates for patients with obstruction were significantly lower than for patients without obstruction. Furthermore, there was no significant difference in the distribution of age, sex, tumor location, and TNM stage. These data are consistent with reports from previous studies [23,24]. Kaufman et al [26] reported that advanced disease could not completely account for the poor prognosis associated with obstructing colorectal cancer. When adjusted for stage, there was a significant difference in survival between obstructed and nonobstructed patients, suggesting that factors other than tumor stage were associated with patient outcome [5,26]. In our series, the presence of obstruction was also associated with poor overall and stage-matched survival in patients with right colon carcinoma.

Our results suggest that presentation with obstruction is an independent prognostic factor. Nickell et al [27] speculated that large bowel wall permeability increases with obstruction, with subsequent facilitation of lymphatic metastasis of malignant cells. Korenaga et al [28] believed that the poor prognosis of patients with large bowel obstruction might result from the inherent high potential of obstructing tumors to metastasize through the lymphatics or spread to the visceral peritoneum at the time of diagnosis. Serpell et al [23] conjectured that another undetected factor adversely affected the relationship between the tumor and host resistance, resulting in poor prognosis.

In our series, the overall recurrence and distant metastasis rates were significantly higher in obstructed patients than in nonobstructed patients. Although there was a trend toward higher local recurrence rate in obstructed patients, the difference was not statistically significant. To our knowledge, our study is the first to describe independent prognostic factors in the subpopulation of right colon carcinoma patients without perforation. We conclude that obstruction and tumor stage were independent prognostic factors for patients with right colon carcinoma without perforation and that the long-term prognosis of patients with right colon obstructing carcinoma is poor.

References

[1] Ohman U. Prognosis in patients with obstructing colorectal carcinoma. Am J Surg 1982;143:742–7.

[2] Irvin TT, Greaney MG. The treatment of colonic carcinoma presenting with intestinal obstruction. Br J Surg 1977;64:741–4.

[3] Umpleby HC, Williamson RC. Survival in acute obstructing colorectal carcinoma. Dis Colon Rectum 1984;27:299–304.

[4] Gennaro AR, Tyson RR. Obstructive colonic cancer. Dis Colon Rectum 1978;21:346–51.

[5] Phillips RKS, Hittinger R, Fry JS, Fielding LP. Malignant large bowel obstruction. Br J Surg 1985;72:296–302.

[6] Feng Y, Hsu H, Chen S. One-stage operation for obstructing carcinomas of the left colon and rectum. Dis Colon Rectum 1987;30:29–32.

[7] Hughes ESR. Mortality of acute large bowel obstruction. Br J Surg 1996;53:593–4.

[8] Dutton JW, Hreno A, Hampson LG. Mortality and prognosis of obstructing carcinoma of the large bowel. Am J Surg 1976;131:36–40.

[9] Welch JP, Donaldson GA. Management of severe obstruction of the large bowel due to malignant disease. Am J Surg 1974;129:492–9.

[10] Roncucci L, Fante R, Losi L, et al. Survival for colon and rectal cancer in a population-based cancer registry. Eur J Cancer 1996;32A: 295–302.

[11] Halvorsen TB, Seim E. Tumor site: a prognostic factor in colorectal cancer? A multivariate analysis. Scand J Gastroenterol 1987;22: 124–8.

[12] Wolmark N, Wieand HS, Rockette HE, et al. The prognostic significance of tumor location and bowel obstruction in Dukes B and C colorectal cancer. Findings from the NSABP clinical trials. Ann Surg 1983;198:743.

[13] Serpell JW, McDermott FT, Katrivessis H, Hughes ES. Obstructing carcinomas of the colon. Br J Surg 1989;76:965–9.

[14] Fielding LP, Wells BW. Survival after primary and after staged resection for large bowel obstruction caused by cancer. Br J Surg 1974;61:16–18.

[15] Sjodahl R, Franzen T, Nystrom PO. Primary versus staged resection for acute obstructing colorectal carcinoma. Br J Surg 1992;79:685–8.

[16] The SCOTIA Study Group. Single-stage treatment for malignant left-sided colonic obstruction: a prospective randomized clinical trial comparing subtotal colectomy with segmental resection following intraoperative irrigation. Br J Surg 1995;82:1622–7.

[17] Griffin MR, Bergstralh EJ, Coffey RJ, et al. Predictors of survival after curative resection of carcinoma of the colon and rectum. Cancer 1987;60:2318–24.

[18] Ratto C, Sofo L, Ippoliti M, et al. Prognostic factors in colorectal cancer: literature review for clinical application. Dis Colon Rectum 1998;41:1033–46.

[19] Fielding LP, Phillips RK, Fry JS, Hittinger R. Prediction of outcome after curative resection for large bowel cancer. Lancet 1986;18: 904–6.

[20] Steinberg SM, Barkin JS, Kaplan RS, Stablein DM. Prognostic indicators of colon tumors. Cancer 1986;57:1866–70.

[21] Albe X, Vassilakos P, Helfer-Guarnori K, et al. Independent prognostic value of ploidy in colorectal cancer. Cancer 1990;66:1168–75.

[22] Gracia-Peche P, Vasquez-Prado A, Fabra-Ramis R, Trullenque-Peris R. Factors of prognostic value in long-term survival of colorectal cancer patients. Hepato-gastroenterology 1991;38:438–43.

[23] Fielding LP, Stewart-Brown S, Blesovsky L. Large bowel obstruction caused by cancer: a prospective study. BMJ 1979;2:515–7.

[24] Garcia-Valdecasas JC, Llovera JM, deLacy AM, et al. Obstructing colorectal carcinomas: prospective study. Dis Colon Rectum 1991; 34:759–62.

[25] Mulcahy HE, Skelly NM, Husain A, O'Donoghue DP. Long-term outcome following curative surgery for malignant large bowel obstruction. Br J Surg 1996;83:46–50.

[26] Kaufman Z, Eiltch E, Dinbar A. Completely obstructive colorectal cancer. J Surg Oncol 1989;41:230–5.

[27] Nickell DF, Dockery MB. The five year survival rate in cases of completely obstructing annular carcinoma of the descending colon and sigmoid. A pathologic study. Surg Gynecol Obstet 1948;87:519–24.

[28] Korenaga D, Ueo H, Mochida K, et al. Prognostic factors in Japanese patients with colorectal cancer: the significance of large bowel obstruction—univariate and multivariate analysis. J Surg Oncol 1991; 47:188–92.