Reducing time from colon cancer surgery to initiation of adjuvant chemotherapy: pilot project

Barbara Melosky, MD
Renata D'Alpino Peixoto, MD
Ahmer A. Karimuddin, MD
Manoj J. Raval, MD, MSc
Carl J. Brown, MD, MSc
Adam Meneghetti, MD, MHSC
P. Terry Phang, MD

Accepted Aug. 27, 2019

Correspondence to:
B. Melosky
BC Cancer Vancouver Centre
600 – 10th Ave W
Vancouver BC V5Z 4E6
BMelosky@bccancer.bc.ca

DOI: 10.1503/cjs.000219

Summary

Surgical resection followed by adjuvant chemotherapy is the standard of care for patients with stage III colon cancer. To shorten the time interval between surgery and chemotherapy in patients with colon cancer, we instituted a standardized referral pathway. Evaluation of the intervention demonstrated that referring our patients with colon cancer to a medical oncologist earlier in the treatment process increased the number of patients in whom chemotherapy was initiated within 8 weeks compared with historical controls. These results support early medical oncology referral at institutions where delays in adjuvant chemotherapy initiation exist.

The standard of care for patients with stage III colon cancer is surgical resection followed by adjuvant chemotherapy.[1] Most clinical trials require patients to start adjuvant therapy within 8 weeks from surgery. The British Columbia (BC) Cancer Gastrointestinal Tumour Group cancer management guidelines for colon cancer are even more stringent, recommending adjuvant chemotherapy as close to 4 weeks postoperation as possible. Adherence to this 8-week time frame can be difficult in clinical practice. A population-based study from our institution determined that adjuvant chemotherapy was initiated beyond the recommended 56 days in 54% of the patients with stage III colon cancer, with a median time to adjuvant chemotherapy (TTAC) of 58 days.[2] The study concluded that process-related delays, including delays in assessment by medical oncologists (MOs), and wait lists to initiate chemotherapy were responsible for the extended TTAC, rather than patient or disease-related factors. This is consistent with the findings of 2 studies from Ontario, Canada,[3,4] and emphasizes that efforts are needed to improve timely referral, expedite triage of referrals and reduce chemotherapy wait lists.

Prior to our pilot project, BC patients presenting with colon cancer typically saw their surgeon 3–4 weeks after surgery, at which point their pathology was reviewed. Patients with a diagnosis of stage III or high-risk stage II colon cancer were then referred to an MO if appropriate, with the appointment booked 4 weeks later. The time interval between the MO consultation and the start of infusional chemotherapy was typically 2 weeks, including central venous access device insertion, while oral therapy was started the day after MO consultation.

The aim of this pilot quality-improvement initiative was to reduce the time between surgery and adjuvant chemotherapy, specifically focusing on the interval between surgery and the MO appointment. The underlying hypothesis was that implementing a standardized referral form would shorten the time between surgery and adjuvant chemotherapy (when indicated) to less than 56 days (8 weeks). Starting in July 2013, the nurse practitioners/surgeons used a standardized referral form

to book the MO consultation preoperatively, scheduling it to take place 4 weeks after the presumed/scheduled surgery date. Patients included in the pilot were those diagnosed with colon cancer undergoing curative-intent surgery. Patients diagnosed with metastatic disease and patients not undergoing surgery were excluded. This initiative was limited primarily to patients referred to St. Paul's Hospital for surgery, followed by chemotherapy at the BC Cancer Vancouver Centre, a collaboration between the MOs at BC Cancer and surgeons at St. Paul's Hospital and Vancouver General Hospital in Vancouver, BC.

We evaluated the pilot with 100 patients who had surgery for colon cancer between December 2013 and January 2017. Data were obtained by reviewing patient records, pathology and operative reports. We captured the date of surgery, the date the referral was sent to the MO, the date of the MO appointment, adjuvant chemotherapy (yes/no and start date), and the number and status of resected nodes. Patient demographics and treatment course for the 100 evaluated patients are shown in Table 1 and Figure 1, respectively.

Key finding

Referring our patients with colon cancer to an MO earlier in the treatment process increased the number of patients in whom chemotherapy was initiated within 8 weeks. Of the 61 patients who were referred to an MO, 53 (87%) had a referral within 6 weeks after their surgical date. Of these 53 patients, 26 had stage I or II cancer, 1 of whom received adjuvant chemotherapy. Of the 23 patients who received adjuvant chemotherapy, 19 (83%) started adjuvant chemotherapy in less than 8 weeks, as compared with 54% as per local historical data.[2] Only 4 patients (17%) started chemotherapy after 8 weeks. Reasons why patients were excluded from an MO consultation or didn't receive adjuvant chemotherapy are shown in Figure 1.

Limitations

Booking the MO appointment before surgery/pathology review may result in too many patients with early-stage cancers (stage I or low risk stage II) being referred unnecessarily and may cause wait lists for patients with stage III and high-risk stage II cancers to increase. During our initiative, the triage nurse/surgeons learned to cancel the MO appointments ahead of time. While 29 patients had their appointments cancelled, the MO saw 31 patients who didn't receive adjuvant chemotherapy. We argue that these extra appointments were not a waste of MO resources, as a discussion regarding the benefits and harms of adjuvant chemotherapy can be fruitful for patients with stage II colon cancer and is necessary for those who ultimately decline treatment. An alternative practice to limit the number of cancelled or unnecessary appointments would be to initiate the MO referral at the time of the patient's discharge from the hospital or when the pathology report is available; however, this may lead to delays longer than 4 weeks between the surgery and MO consult.

Another study limitation is that the initiative was limited to select surgeons operating out of St. Paul's Hospital and Vancouver General Hospital.

A third key limitation is the underlying assumption relating a shorter interval between surgery and chemotherapy to an improvement in patient outcomes. Studies demonstrating that intervals of more than 8 weeks between surgical resection and the start of adjuvant chemotherapy are associated with worse overall survival in colorectal cancer are largely retrospective and influenced by the fact that patients with poorer outcomes were probably not candidates for chemotherapy. There is also uncertainty about the optimal postresection window, beyond which chemotherapy has no survival benefit. Despite the lack of definitive data, we prefer to err on the side of caution and adhere to a shorter treatment interval.

Conclusion

This article describes the implementation of a relatively simple and inexpensive strategy to expedite MO referral and consultation for patients with colon

Table 1. Demographic and clinical characteristics of patients included in the evaluation (*n* = 100)

Characteristic	No. of patients*
Sex, %	60% M/40% F
Age,yr, mean (range)	67.6 (30–90)
Type of surgery	
Right hemicolectomy	43
Left hemicolectomy	20
Anterior resection	36
Subtotal colectomy	1
Cancer stage	
1	33
2	21
3	40
4	2
Unknown/not cancer	6
Nodes resected	
Median (IQR)	18 (13–29)
Mean ± SD	21 ± 11.3
Nodes involved	
Median (IQR)	0 (0–2)
Mean ± SD	2 ± 5.1

F = female; IQR = interquartile range; M = male; SD = standard deviation.
*Unless indicated otherwise.

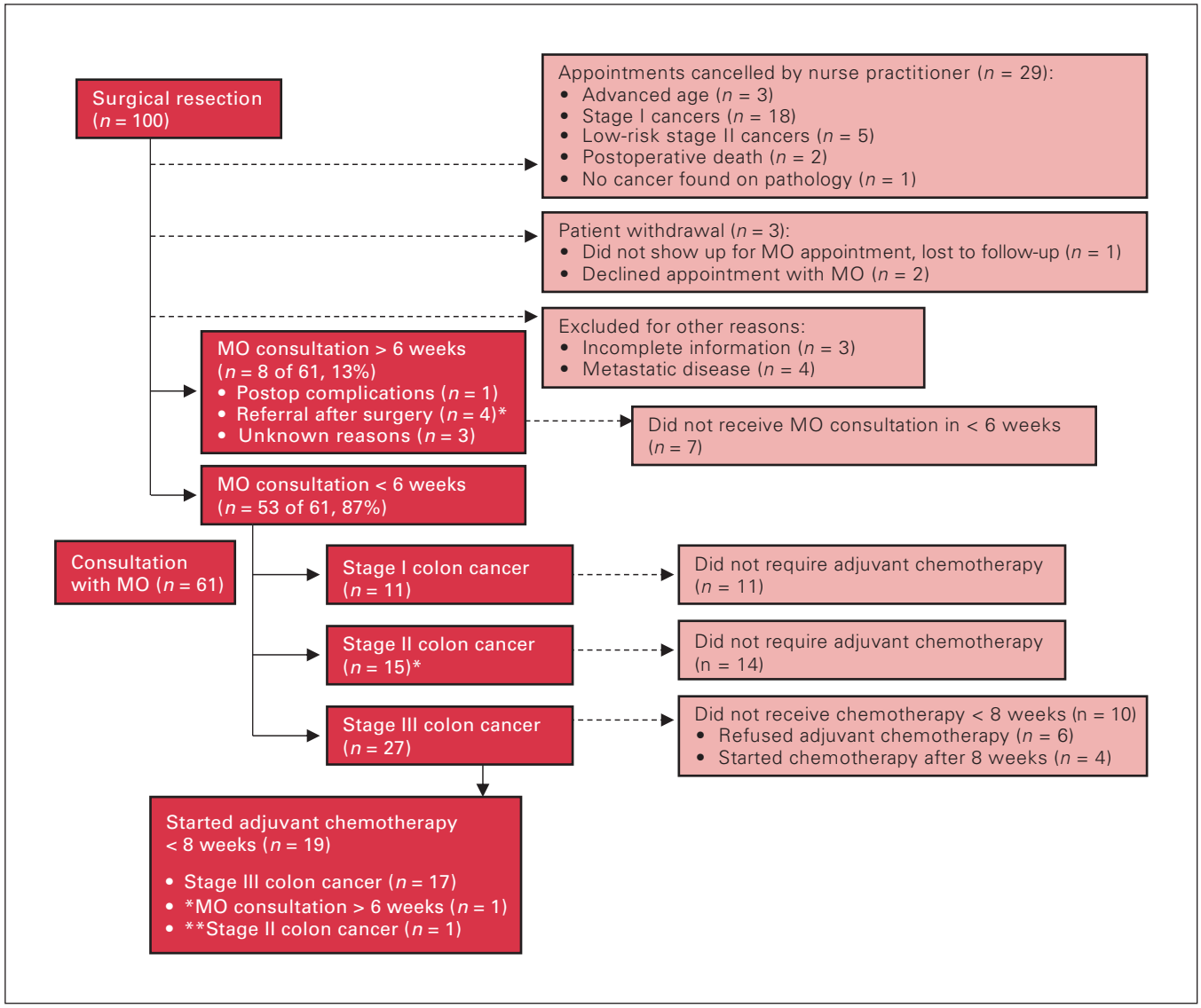

Fig. 1. Treatment course of 100 patients who underwent surgical resection for colon cancer. The flow of patients from surgery to medical oncology consult to adjuvant chemotherapy is shown on the left, and exclusions are shown on the right. MO = medical oncologist.

cancer. This strategy was successfully implemented with a short lead time. The surgeons and the MOs involved were at different institutions, and the institutions were situated in different health authorities. Our strategy could be expanded to other tumour sites and in other health organizations.

Acknowledgement: The authors thank Chrystal Palaty for providing administrative and editing support and creating the figure and the table, Colleen McGahan for conducting the statistical analysis, and Jenn Currie for providing proofreading services.

Affiliations: From the BC Cancer Vancouver Centre, Vancouver, BC (Melosky, Brown); the Hospital Alemão Oswaldo Cruz, São Paulo, Brazil (Peixoto); St. Paul's Hospital, Vancouver, BC (Karimuddin, Raval, Brown, Phang); the Department of Medicine, University of British Columbia, Vancouver, BC (Raval, Brown, Meneghetti, Phang); and the Vancouver General Hospital, Vancouver, BC (Meneghetti).

Competing interests: None declared.

Contributors: All authors contributed substantially to the conception, writing and revision of this article and approved the final version for publication.

References

1. Nelson H, Petrelli N, Carlin A, et al. Guidelines 2000 for colon and rectal cancer surgery. *J Natl Cancer Inst* 2001;93:583-96.
2. Chan A, Woods R, Kennecke H, et al. Factors associated with delayed time to adjuvant chemotherapy in stage III colon cancer. *Curr Oncol* 2014;21:181-6.
3. Ghate K, Burkes RL, Brezden CB, et al. Reasons for delay in time to initiation of adjuvant chemotherapy (TTAC) for colon cancer (CC): analysis from six academic centers in Ontario, Canada. *J Clin Oncol* 2016;34:6541.
4. Wasserman DW, Boulos M, Hopman WM, et al. Reasons for delay in time to initiation of adjuvant chemotherapy for colon cancer. *J Oncol Pract* 2015;11:e28-35.