

Revisiting rectal cancer management in British Columbia

A high local recurrence rate for rectal cancer has been reduced with the help of new clinical practice guidelines.

ABSTRACT: An audit of data from 1996 found a high rate of local recurrence in patients treated for rectal cancer in British Columbia. The Colorectal Surgical Tumour Group of the Surgical Oncology Network of the BC Cancer Agency addressed the high rate of local recurrence with treatment strategies of short-course pre-operative radiation and total mesorectal excision. Education sessions were given for surgeons, oncologists, and pathologists. Initial outcomes following implementation of this management plan indicate a reduction in local recurrence in BC. Issues identified that require further improvement include facilitation of pre-operative MRI staging and strategies to decrease high positive resection margin rates for distal third rectal cancer location. This communication to the BC medical community completes the feedback loop for this quality improvement project using a multidisciplinary approach.

In 1996 a high local recurrence rate for rectal cancer was identified in an audit of outcomes for patients treated for rectal cancer in BC.¹ Pelvic recurrence at 4 years occurred in 16% of rectal cancer patients for all stages and in 27% of Stage 3 patients. In contrast, local recurrence from colon cancer is estimated at 5% to 10%.

Factors contributing to a higher rate of local recurrence after surgical resection of rectal cancer than after resection of colon cancer include more difficult surgical anatomy in the pelvis compared with the abdomen, nonstandardized technique for resection of the rectum, and poor adherence to international standards in the provision of adjuvant radiotherapy.

Management plan

Having recognized this significant problem for rectal cancer patients, the Colorectal Surgical Tumour Group of the Surgical Oncology Network (SON) of the BC Cancer Agency designed a management plan aimed at standardizing care across the province and reducing local recurrence. The plan included an outcomes review to define the problem, strategy development to address the problem, an education program for specialists, implementation of the strategy including an information campaign to raise

awareness among family doctors, outcomes analysis using data from patient follow-up, and provision of feedback to participating specialists and family physicians.

Step 1: Outcomes review

Our review of 1996 rectal cancer management in BC¹ determined that only about 10% of operative reports included statements that the rectal cancer was resected with clear gross radial margins and that all mesorectal lymph nodes were removed in keeping with the tenants of oncological surgical resection. Only about 50% of pathology reports assessed whether radial margins were histologically free of cancer. The mean number of lymph nodes identified at pathology evaluation was 6 instead of 12, the minimum recommended for accurate staging.

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Adjuvant radiation was given to about 50% of eligible patients with Stages 2 and 3 disease.

Step 2: Strategy development

After recognizing these management deficiencies, we recommended a new surgical technique, total mesorectal excision (TME), for excision of the rectal cancer and all mesorectal lymph nodes within an intact mesorectal fascial envelope.² Local recurrence rates at 10 years for curative resections using TME were reported to be as low as 4%. A new protocol for preoperative short-course radiation recommended by Pahlman and colleagues in Sweden reduced local recurrence to 11% from 27% after follow-up for a minimum of 5 years.³ The combination of short-course preoperative radiation and TME resulted in a 2-year local recurrence of 2.4% in a Dutch national trial.⁴ On the basis of this and other studies, the clinical guidelines for rectal cancer management in BC (see **Figure**) were changed to recommend short-course preoperative radiation for Stages 2 and 3 rectal cancers followed by surgical resection using TME. The guidelines also include preoperative clinical staging using CT, MRI, and endorectal ultrasound in order to recommend preoperative radiation where appropriate. Guidelines for pathology reporting include assessment of the radial resection margin and examination of at least 12 lymph nodes. The recommendations were not changed for long-course preoperative chemoradiation for clinically fixed tumors and lesions having predicted close resection margins or for adjuvant postoperative chemotherapy for Stage 3 cancers.⁵

Step 3: Education program

To implement the new treatment strategies, we designed an education program for surgeons, pathologists, and radiation oncologists involved in the

1. Diagnosis is made on biopsy obtained during sigmoidoscopy or colonoscopy.
2. Preoperative clinical stage is determined by CT (abdomen, pelvis) to assess distant spread (clinical stage M) and by MRI (pelvis) or endorectal ultrasound to assess local invasion (clinical Stage T and N, and predicted radial resection margin).
3. Preoperative radiation is indicated for clinical Stages 2 and 3 (T3-4, N1-2).
 - a. Short-course preoperative radiation over 5 days is recommended for mobile lesions with clear predicted radial resection margins.
 - b. Long-course preoperative radiation (with concurrent chemotherapy) over 5 weeks is recommended for clinically fixed lesions or for close/involved predicted radial resection margins in order to maximize tumor shrinkage prior to surgery.
4. Postoperative adjuvant chemotherapy over 4 to 6 months is given for clinical Stages 2 and 3 lesions.
 - a. Postoperative adjuvant radiation is given for clinical Stages 2 and 3 lesions if radiation is not given preoperatively.
5. Surveillance is recommended in Stages 2 and 3 patients for 5 years: office visits for rectal examination and carcinogenic embryonic antigen testing every 3 to 4 months for 3 years, then every 6 months for years 4 and 5; liver imaging (ultrasound or CT) every 6 to 12 months in the first 3 years, then annually for years 4 and 5; chest X-ray every 6 to 12 months; colonoscopy at year 1 and year 4, then every 5 years thereafter. Flexible sigmoidoscopy every 6 to 12 months should also be considered.

Figure. Clinical guidelines for rectal cancer management in BC.

Adapted from BC Cancer Agency web site (www.bccancer.bc.ca).⁵

care of patients with rectal cancer. Held in 2002 and 2003, the education sessions consisted of lectures, live surgery with a video link to the audience, and hands-on dissection of the pelvis in cadaver labs. Session topics included preoperative imaging, radiation, and chemotherapy in the preoperative

(neoadjuvant) and postoperative (adjuvant) setting, pelvic anatomy, the surgical technique of total mesorectal excision,⁶ gross pathology of the resected TME specimen, and standardized operative reporting. A parallel course of lectures and live demonstration was held for pathologists, including TME

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specimen processing, gross and microscopic findings, and standardized pathology reporting.^{7,8} World experts from the UK, Sweden, the Netherlands, and the US were invited to teach at the sessions. Favorable feedback from course participants regarding the educational value of the sessions and tests of knowledge retention suggested good knowledge transfer.⁹

Step 4: Implementation with information campaign

Our next step was to implement the treatment plan and to inform family doctors in BC of the new rectal cancer management strategy. This information was transmitted via the *BC Medical Journal* in a two-part theme issue in July-August and September of 2003.¹⁰⁻¹³

Step 5: Outcomes analysis

Data on patient outcomes were collected and analyzed by the Colorectal Surgical Tumour Group of the SON. We audited patients treated with curative-intent major resection of their rectal cancer in the year after the education courses. This group of patients was compared with patients treated in our initial study. The main finding of this audit was a decrease in 2-year pelvic recurrence from 18.2% to 9.2%

for Stage 3 rectal cancers and from 9.6% to 6.9% overall.¹⁴ Use of adjuvant radiation increased to 65%, mostly given preoperatively. Negative radial margins were achieved in 87% of cases. Pathology reporting showed increased assessment of the radial margin to 97% of cases and an average of 12 lymph nodes per case. These improvements were statistically and clinically significant.

Step 6: Feedback

The final step of the quality improvement process involved providing feedback to participants. Ongoing reports were provided to BC surgeons at their annual spring meeting (BC Surgical Society) and to oncologists at their annual fall meeting (BC Cancer Agency), as well as through the SON newsletter. A rectal cancer education course update was held in 2008 that reported on the final outcomes.

Feedback to family doctors in BC will continue to be provided through the *BC Medical Journal*.

Further improvements needed

As with many quality improvement projects, important aspects of care requiring further attention have been identified.

Use of preoperative imaging modalities of MRI and endorectal ultrasound continue to be limited because of resource limitations in BC and because radiologists have not yet adopted a standardized report form for rectal cancer. BC Cancer Agency centres in Victoria, Vancouver, Surrey, Kelowna, and Abbotsford, and soon in Prince George, offer potential for creating rectal cancer care pathways to improve accessibility of MR scanning and radiation. The Colorectal Surgical Tumour Group of the Surgical Oncology Network has preoperative MR imaging on its working agenda and invites radiologists to join the community of family physicians, surgeons, oncologists, and pathologists as integral contributors to the care of rectal cancer patients.

Technical problems with surgical resection of rectal cancer persist in BC. Positive radial margins for rectal cancer location in proximity to the anal sphincter were recorded in 35% of specimens with cancers in the distal-third of the rectum (located less than 5 cm from the anus).¹⁵ Also, the rate of permanent colostomy for distal-third rectal cancer location was not decreased after the education courses. It seems reasonable to recommend that surgeons who operate for rectal cancer less frequently should consider referral of difficult distal-third rectal cancers to subspecialist surgeons in higher-volume centres.¹⁶

Conclusions

Quality improvement in rectal cancer treatment will ideally continue in cycles of assessment, strategy, and execution. We have identified improvements needed in the care of rectal cancer patients and hope to use the recently developed cancer surgeon network to promote these. With a multidisciplinary approach to care, physicians and surgeons continue seeking to improve

patient outcomes. However, limitations in resources and geography pose challenges for quality improvement in our large province. Patient awareness, education, and advocacy will be important drivers in the quest to beat colorectal cancer in British Columbia.

Competing interests

None declared.

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