

# Evolving rectal cancer management in British Columbia

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In this article, I describe the process of evolving the management of care of rectal cancer patients in British Columbia, which was undertaken as a quality-improvement project. The colorectal cancer site committee of the Surgical Oncology Network at the BC Cancer Agency began by recognizing the problem of high rates of local rectal cancer recurrence in an audit of outcomes among patients who received treatment for rectal cancer in 1996.<sup>1</sup> Pelvic recurrence occurred in 16% of patients with rectal cancer of all stages and in 27% of patients with stage 3 cancer. In contrast, local recurrence from colon cancer is estimated at 5%–10%.<sup>2</sup>

Possible factors that contribute to the high rates of local recurrence of rectal cancer include more difficult surgical anatomy in the pelvis compared with in the abdomen, the use of nonstandardized techniques for surgical resection of the rectum, and poor adherence to the provision of adjuvant radiation. Ideally, all operative reports for rectal cancer resection should contain a statement 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 oncologic surgical resection. However, in our audit in 1996, only about 10% of operative reports contained this information and only about 50% of pathology reports assessed whether radial margins were histologically free of cancer. The mean number of lymph nodes reported per case was 6, which is much less than the guideline of 12 lymph nodes that are required for accurate negative staging. Adjuvant radiation was given to about 50% of eligible patients with stage 2 or 3 cancer.

After having recognized this important problem for rectal cancer patients, we undertook a process aimed at improving local recurrence rates. Figure 1 outlines the 6-step paradigm used for quality improvement. In step 1, the problem is identified based on a review of the outcomes. Step 2 involves the creation of a strategy to address the problem. An education program is implemented in step 3 and involves creating buy-in from participating specialists. In step 4, the strategy is implemented, with information awareness by family doctors. Step 5 involves collecting data, including patient follow-up, and step 6 involves providing feedback to the participating specialists and family physicians.

A strategy designed to address the problem was created from reports by surgeons and radiation oncologists using techniques that have been shown elsewhere to decrease local recurrence from rectal cancer.<sup>3</sup> Heald and colleagues<sup>4</sup> championed the oncologically based surgical technique of total mesorectal excision (TME), in which the rectal cancer and all mesorectal lymph nodes are resected within an intact mesorectal fascial envelope. This group reported that local recurrence rates were about 5%. Further support of this surgical technique was provided by Quirke and colleagues,<sup>5</sup> who showed the prognostic importance of achieving clear radial resection margins with intact mesorectal fascia. In a randomized trial in Sweden, preoperative short-course radiation was shown to decrease local recurrence rates to 11% from 27%,<sup>6</sup> and the authors subsequently reported combined outcomes using short-course preoperative radiation and TME surgery.<sup>7</sup> The Dutch Colorectal Cancer Group conducted

a national trial using a combination of short-course preoperative radiation and TME surgery, which resulted in a local recurrence rate of 4%.<sup>8</sup> On the basis of these studies, our rectal cancer management guidelines were changed from postoperative radiation to short-course preoperative radiation for stage 2 and 3 rectal cancer, followed by surgical resection with TME. The guideline included preoperative clinical staging using computed tomography, magnetic resonance imaging and endorectal ultrasonography. Long-course preoperative chemoradiation was still recommended for clinically fixed tumours and lesions with predicted close resection margins. Pathology reporting was recommended to include the assessment of the radial resection margins with examination of at least 12 lymph nodes. The recommendation for adjuvant postoperative chemotherapy for stage 3 cancer was not changed.<sup>9</sup>

With this strategy in place to address the problem, we designed an education program for surgeons, pathologists and radiation oncologists who care for patients with rectal cancer. These education sessions were held in 2002 and 2003. These sessions also established purpose and buy-in from participants. Based on registration for the education sessions relative to the number of surgeons performing rectal cancer surgery in our 1996 audit, we estimated that 80% of surgeons in BC who performed rectal cancer surgery attended these sessions. The education session consisted of lectures, live surgery with an audio–video link to the audience, and hands-on dissection of a cadaver pelvis. Didactic topics included preoperative imaging, radiation and chemotherapy in the preoperative (neoadjuvant) and postoperative (adjuvant) settings, pelvic anatomy, TME,<sup>10</sup> gross pathology of the resected TME specimen, and standardized operative reporting. A parallel course of lectures and live demonstration was held for pathologists and included TME specimen processing, gross and microscopic findings and standardized pathology reporting.<sup>5,11</sup> World experts from the United Kingdom, Sweden, the Netherlands and the United States were invited to teach at the sessions. The participants gave favourable feedback about the educational value of the sessions, and there was high knowledge retention on retesting after the course.<sup>12</sup>

The next step was to inform family doctors in BC about the new strategy. This information was transmitted via the

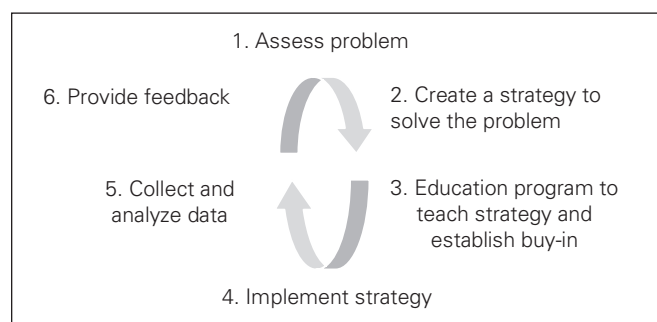


Fig. 1. An example of a quality-improvement paradigm.

*BC Medical Journal* in a 2-part issue in July–August and September 2003.<sup>13–16</sup> Physicians were not asked to change their referral patterns but were recommended to perform preoperative imaging for stage determination and to preferentially use preoperative rather than postoperative radiation.

Data collection and analysis were performed by the colorectal cancer site committee of the Surgical Oncology Network sponsored by the BC Cancer Agency. Patients undergoing curative major resection of rectal cancer during the year after the education courses were included. Data from this group of patients was compared with that of patients treated in 1996 as part of our initial study.

The main finding, presented in this issue of the *Canadian Journal of Surgery*,<sup>17</sup> was decreased 2-year pelvic recurrence (9.2% for stage 3 rectal cancers and 6.9% overall). The use of adjuvant radiation increased to 65%, mostly among patients with stage 2 or 3 cancer and mostly given preoperatively; this was increased from the use of perioperative radiation in 35% of cases before the education sessions and guideline change. Negative radial margins were achieved in 87% of cases. Pathology reporting showed that assessment of radial margins increased to 97% of cases and that lymph node counts increased to 12 per case. These improvements were statistically and clinically significant.

The final step in the quality-improvement process was the provision of feedback to participants. Ongoing reports were provided to BC surgeons at the annual spring meeting of the BC Surgical Society and to oncologists at the annual fall meeting of the BC Cancer Agency. A rectal cancer education course update was held in 2008; this course provided the final outcomes. We will provide feedback to family doctors in BC through the *BC Medical Journal*.

Technical problems with the surgical resection of rectal cancer persist in BC. Positive radial margins for rectal cancer location in the proximity of the anal sphincter (located less than 5 cm from the anus) were recorded in 35% of distal-third cancers.<sup>18</sup> If the rate of positive radial margins for distal-third rectal cancers can be reduced, then the overall local recurrence rate would probably approach 5%. The rate of permanent colostomies for distal-third rectal cancers was not decreased after the education courses.

Figure 2 shows quality improvement as a continuum of

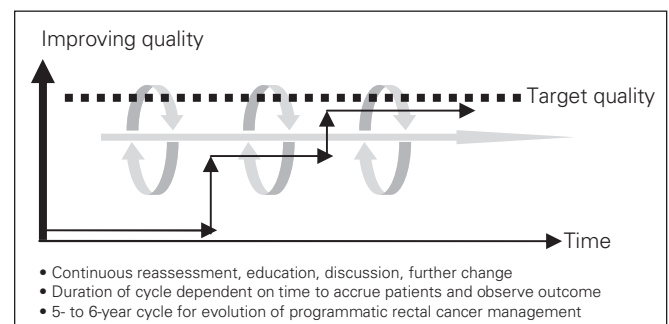


Fig. 2. An iterative forward-motion coil in a quality-improvement paradigm.

assessment, strategy and execution cycles and reassessment to achieve the desired level of quality. Further cycles are required to improve the quality of rectal cancer care. Limitations in resources and geography will probably limit what we can achieve in BC. Patient awareness and education about colorectal cancer are important drivers that will ultimately influence how they are cared for.

One strategy to further improve population outcomes is to restrict rectal cancer surgery to specialized centres. However appealing this may be to subspecialists, there is no definitive evidence or consensus that restrictive management strategies for rectal cancer are effective on a population basis. Such strategies are exclusionist and could provoke political and interpersonal antagonism and deteriorate any good will that has resulted from our strategy to include all surgeons in caring for rectal cancer patients. However, it seems reasonable to suggest that less experienced surgeons should consider referring patients with difficult distal rectal cancers to subspecialist surgeons at higher-volume centres.<sup>19,20</sup> High local recurrence rates for rectal cancer have been reported for populations in Sweden, Norway, the Netherlands and the UK. These European countries have also addressed this issue with strategies of preoperative radiation and TME surgery and have used education programs for their surgeons. There are many publications from North American centres that show their expertise and good outcomes for rectal cancer management.<sup>21,22</sup> However, to date, I am unaware of any publications reporting that other areas in North America have recognized rectal cancer to be a population-level problem. I raise the question of what strategies other centres in Canada and the US have used for the improvement of rectal cancer management for their populations.

**Competing interests:** None declared.

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