Larach Jose (Orcid ID: 0000-0001-5242-9456)
Kong Joseph (Orcid ID: 0000-0002-1392-2480)
Waters Peadar (Orcid ID: 0000-0003-2947-9206)
Heriot Alexander (Orcid ID: 0000-0001-9846-8776)

Are we doing enough to assess surgical quality in advanced colon and rectal cancer?

Warrier, Satish K.[1,2] MS, MBBS, FRACS
Larach, José T.[1,4] MD
Kong, Joseph CH. [1] MS, FRACS
Waters, Peadar S.[1] MB Bch BAO MD FRCSi
Smart, Philip J.[2,3] DMedSc, FRACS
McCormick, Jacob J.[1,2] MBBS, FRACS
Heriot, Alexander G. [1,2] MD, MBA, FRACS, FRCS

[1] Division of Cancer Surgery, Peter MacCallum Cancer Centre, Victorian Comprehensive Cancer Centre, Melbourne, Australia
[2] General Surgery and Gastrointestinal Clinical Institute, Epworth Healthcare, Melbourne, Australia
[3] Department of Surgery, Austin Health, Melbourne, Australia
[4] Department of Digestive Surgery, Pontificia Universidad Católica de Chile, Santiago, Chile

Corresponding Author & Reprints: Mr Satish Warrier, Division of Cancer Surgery, Peter MacCallum Cancer Centre, 305 Grattan Street, Melbourne, Victoria 3000, Australia
Telephone Number: +61 3 8559 5000, Fax Number: +61 3 8559 7379

Email: satish96101@yahoo.com

Conflict of interest: The authors declare that they have no conflict of interest

Words: 824 excluding references
References: 13

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/ans.16471

For three decades now, there has been a concerted effort to improve the care of colorectal cancer patients. Notable was the 27 percent local recurrence rate observed in the non-radiation arm of the Swedish rectal cancer trial(1)and while this finding spurred the increased use of preoperative radiation, it also highlighted the need for systematic surgical quality control. The popularisation of total mesorectal excision (TME) by Heald(2), whereby the entire mesorectum and surrounding fascial envelope was excised en bloc without disrupting lymphatics, defined the start of an era where objective measurement of surgical quality could be achieved, both immediately, by way of specimen inspection and long-term, by comparison of local recurrence rates. Many surgical quality improvement initiatives have been instituted in the ensuing decades to reflect this philosophy. Such initiatives include systematic outcomes audit and reporting, centralisation of complex surgical care, formal scoring and pathological grading of the TME specimen, as well as operative photographs of the surgical specimen for peer review at multidisciplinary team meetings (MDT)(3–6). These quality measures are currently practiced at best variably at an institutional level.

The concept of surgical quality is not new in cancer and is based on the premise that surgical outcomes should be standardised against a defined set of benchmarks. The simplest reporting of this is via qualified prospective audits. For colorectal cancer in Australia and New Zealand, the Binational Colorectal Cancer Audit (BCCA) was established. Data collection began in 2007, and captures 25% of patients undergoing colorectal cancer surgery in Australia and New Zealand. Efforts to increase case capture are underway, but require jurisdictional buy in. Models such as the Queensland Cancer Alliance, with 100% case capture via linkage to EMR, mortality and MDT datasets are currently established but require binational uptake. The basic dataset captures patient demographics, radiological and pathological stages of cancer, treatment pathways, clinicopathological outcomes and most importantly surgical and oncological outcomes such as anastomotic leak, mortality, local and distant recurrence. These datasets enable clinical research projects, allow for unit Key Performance Indicator (KPI) benchmark reporting and can guide clinical practice.

In advanced colorectal cancer surgery there is a paucity of data surrounding quality outcome measures. These cases require the most technically challenging procedures, and are the most likely to benefit from standardised surgical approaches as well as from clear guidelines for quality metrics. There is currently a lack of concrete surgical and pathological guidelines in many of these highly specialised fields. A prime example is lateral pelvic side-wall lymph nodes. There is current debate about the role of lateral pelvic sidewall clearance and several authors have attempted to define indications for clearance based on current data(7–9). This data is difficult to interpret as there is currently no defined standard of care for dissection technique and minimal nodal clearance. Adopted from the East, the authors would suggest photographic evidence of the obturator foramen with the fascia and nerve

present, clear views of the external iliac artery and vein, and internal iliac vessels completely exposed. A minimum harvest of 6-8 lymph nodes on each side could be deemed minimum number to constitute an appropriate oncological clearance(10). Similarly, as complete mesocolic excision (CME)(11) is being adopted by Western colorectal units for colon cancer, complete visualisation of the superior mesenteric vein (SMV), with clear views of the gastrocolic trunk and pathological evidence of an intact mesocolic window could be considered a minimum standard for right colon cancer resection. Currently, efforts to examine quality measures in right-sided colon cancer resections are being made(12,13).

For exenterative and peritoneal cancer centres, guidelines may be easier to implement as evidence for best practice matures. While most high-volume centres publish and report R0 and CC0 rates for exenterations and peritonectomies individually, no formal quality assurance forum exists to benchmark contemporary results between units and refine best practice. This could be adopted under the auspice of the BCCA. For peritoneal centres a minimum CC0 rate for high volume peritoneal malignancy could be benchmarked. Within pelvic exenteration units an across the board R0 rate of greater than 80 percent is suggested as an initial benchmark, with the caveat that pelvic exenteration work is variable in complexity. Further breakdown by procedure-type for the higher volume units should have suggested R0 rates greater than 90% for the central compartment while maintaining a lower acceptable R0 rate for the lateral compartments and for high posterior recurrences. Clearly documented pre-operative MDT discussion with high-quality imaging and re-staging scans should approach 100%.

The benefit of ongoing collaboration between high-volume quarternary units in Australia and New Zealand will ensure that both countries report ongoing clinical excellence for complex colorectal cancer work, and that these techniques in selected forms (such as anterior exenteration, distal sacrectomy and CME) are promulgated more widely. It would facilitate contemporaneous discussion of complex cases, review R0 rates and highlight pitfalls in a real time manner. This remains an uncharted territory and would provide greater oversight, whilst maintaining the high-quality standard already reported binationally.

Authors' contribution

Warrier, Satish K. – Conceptualisation, writing, supervision, project administration

Larach, Jose T. - Writing and investigation

Kong, Joseph CH. - Writing

Waters, Peadar S. - Writing

Smart, Philip J. - Writing and conceptualisation

McCormick, Jacob J. - Writing and conceptualisation

Heriot, Alexander G. - Conceptualisation

References

1. Påhlman L. Improved survival with preoperative radiotherapy in resectable rectal cancer. N Engl J Med. 1997;336(14):980–7.
2. Heald RJ. A new approach to rectal cancer. Br J Hosp Med. 1979;22(3):277–81.
3. Nagtegaal ID, Van de Velde CJH, Van Der Worp E, Kapiteijn E, Quirke P, Van Krieken JHJM. Macroscopic evaluation of rectal cancer resection specimen: Clinical significance of the pathologist in quality control. J Clin Oncol. 2002;20(7):1729–34.
4. Burton S, Brown G, Daniels IR, Norman AR, Mason B, Cunningham D. MRI directed multidisciplinary team preoperative treatment strategy: The way to eliminate positive circumferential margins? Br J Cancer. 2006;94(3):351–7.
5. Bosch SL, Nagtegaal ID. What is “good quality” in rectal cancer surgery? the pathologist’s perspective. Recent Results Cancer Res. 2014;203:41–6.
6. Tersteeg JJC, Gobardhan PD, Crolla RMPH, Kint PAM, Niers-Stobbe I, Boonman–de Winter LJM, et al. Improving the quality of mri reports of preoperative patients with rectal cancer: Effect of national guidelines and structured reporting. Am J Roentgenol. 2018;210(6):1240–4.
7. Ogura A, Konishi T, Cunningham C, Garcia-Aguilar J, Iversen H, Toda S, et al. Neoadjuvant (chemo)radiotherapy with total mesorectal excision only is not sufficient to prevent lateral local recurrence in enlarged nodes: Results of the multicenter lateral node study of patients with low ct3/4 rectal cancer. J Clin Oncol. 2019;37(1):33–43.
8. Ogura A, Konishi T, Beets GL, Cunningham C, Garcia-Aguilar J, Iversen H, et al. Lateral Nodal Features on Restaging Magnetic Resonance Imaging Associated with Lateral Local Recurrence in Low Rectal Cancer after Neoadjuvant Chemoradiotherapy or Radiotherapy. JAMA Surg. 2019;154(9).
9. Peacock O, Chang GJ. The Landmark Series: Management of Lateral Lymph Nodes in Locally Advanced Rectal Cancer. Ann Surg Oncol. 2020;27(8):2723–31.
10. Peacock O, Limvorapitak T, Bednarski BK, Kaur H, Taggart MW, Dasari A, et al. Robotic lateral pelvic lymph node dissection after chemoradiation for rectal cancer: a Western perspective. Colorectal Dis. 2020; Online Ahead of Print; Available from: http://www.ncbi.nlm.nih.gov/pubmed/32892473
11. Hohenberger W, Weber K, Matzel K, Papadopoulos T, Merkel S. Standardized surgery for colonic cancer: Complete mesocolic excision and central ligation - Technical notes and outcome. Colorectal Dis. 2009;11(4):354–64.
12. Benz S, Tannapfel A, Tam Y, Grünenwald A, Vollmer S, Stricker I. Proposal of a new classification system for complete mesocolic excison in right-sided colon cancer. Tech Coloproctol. 2019;23(3):251–7.

13. Garcia-Granero A, Pellino G, Giner F, Frasson M, Albalat IG, Sánchez-Guillén L, et al. A proposal for novel standards of histopathology reporting for D3 lymphadenectomy in right colon cancer: The mesocolic sail and superior right colic vein landmarks. Dis Colon Rectum. 2020;450–60.