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Completeness of operative reports for rectal cancer surgery

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ABSTRACT

Introduction: Synoptic operative reporting has been shown to improve completeness and consistency in surgical documentation. We sought to determine whether operative reports contain the key elements recommended by the National Accreditation Program for Rectal Cancer.
Methods: Rectal cancer operative reports from June–December 2018 were submitted from ten hospitals in Michigan. These reports were analyzed to identify key elements in the synoptic operative template and assessed for completeness.
Results: In total, 110 operative reports were reviewed. Thirty-one (28%) reports contained all 24 elements; all of these reports used a synoptic template. Overall, 62 (56%) reports used a synoptic template and 48 (44%) did not. Using a synoptic template significantly improved documentation, as these reports contained 92% of required elements, compared to 39% for narrative reports ($p < 0.001$).
Conclusions/Discussion: Narrative operative reports inconsistently document rectal cancer resection. This study provides evidence that synoptic reporting will improve quality of documentation for rectal cancer surgery.

Introduction

In the United States, the need for quality improvement in rectal cancer care has been highlighted by recent studies showing gaps in quality of care.[1] These gaps include high rates of positive margins, inadequate lymph node examinations, and inconsistent administration of recommended neoadjuvant treatment.[1–3] In response to this situation, the American College of Surgeons Commission on Cancer (CoC) recently established the National Accreditation Program for Rectal Cancer (NAPRC) to promote a higher standard of care.[4,5] One of the NAPRC's recommendations is to standardize the documentation in operative reports. Previously, synoptic (templated) pathology and MRI reports have been promoted, and this new recommendation for synoptic operative reporting has the goal of setting a comparable standard for operative documentation.[6]

The rationale for standardizing the information in operative reports is to promote consistent adherence to evidence-based care, and to ensure accurate documentation of important surgical and perioperative processes of care. Standardized documentation would also allow for quality assessment through improved data collection. The items in the NAPRC operative template include cancer staging, treatment, tumor location, completeness and extent of resection, additional surgical details, and photography of the specimen. The surgeon-assigned total mesorectal excision (TME) grade is another important measure that can be encouraged through the use of synoptic operative reports (SOR). Overall, the processes documented in SOR are key to quality in rectal cancer care.

Currently, it is unclear to what extent surgeons are documenting key information in operative reports. In 2004, a Canadian group found that the majority of traditional narrative reports for rectal cancer surgery were incomplete with respect to TME quality, details of the operative procedure, local and metastatic assessment, and preoperative treatment.[7] Another Canadian study later demonstrated that completeness of these reports is significantly improved when using synoptic operative report templates for documentation compared to narrative reports.[8] However, in the United States the quality of reports is unknown. Given the increased implementation of electronic medical record systems, it may be the case that more complete or even synoptic operative reports have already been adopted.

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In this context, we sought to determine extent to which current rectal cancer operative reports contain the key elements recommended by the NAPRC. We analyzed operative reports from nine hospitals in the state of Michigan. We hypothesized that certain elements, such as the surgeon's TME grade, would be incomplete in a significant proportion of reports. This study provides a useful baseline for performance on this NAPRC standard.

Methods

Overview

This study was reviewed and approved by the University of Michigan Institutional Review Board. We prospectively collected operative reports from hospitals participating in the Michigan Surgical Quality Collaborative (MSQC). These reports were analyzed for inclusion of the elements from the NAPRC operative report template (Table 1). All data was abstracted by a single reviewer with independent verification performed by a second reviewer with surgical training.

Study population and data source

The MSQC is a 70-hospital collaborative in the state of Michigan, encompassing all the hospitals performing major surgery in the state. The MSQC maintains a clinical registry of general, vascular, and gynecologic surgery procedures, collecting a random sample of cases that includes 50,000 patients per year, as previously described in further detail.[9] The MSQC also designs, implements, and evaluates quality improvement initiatives across participating hospitals. Past initiatives have targeted surgical site infection after colectomy, the use of enhanced recovery protocols after abdominal surgery, and postoperative opioid prescribing.

The present study was part of a larger quality improvement and research project aimed to promote total mesorectal excision grading by surgeons and pathologists after rectal cancer operations. Ten hospitals that performed rectal cancer operations volunteered to participate in the study. These hospitals include both small and large hospitals, as well as community and academic practices. Each month, a trained nurse data abstractor or research assistant collected the operative reports for all rectal cancer cases performed at each hospital. Reports were de-identified of patient and surgeon data and submitted to the coordinating center.

Statistical analysis

The template used for data abstraction was based on the NAPRC required elements, with the addition of four measures – clinical stage, delivery of neoadjuvant therapy, type of mesorectal excision, and TME grade (Table 1). Elements from the template were manually abstracted from each operative note and verified. Descriptive statistics were calculated for completeness of each element. Reports that were narrative only were compared to reports that included any synoptic template for completeness using Chi-square tests (for inclusion of individual elements) and Student's t-tests (for percent of elements completed).

Results

From June to December 2018, we collected 110 operative reports from 10 hospitals. One hospital participating in the quality improvement project did not have rectal cancer cases during this time period. We collected procedure, surgical modality, clinical stage, and other surgical characteristics from the operative reports, summarized in Table 2. Six sites submitted fewer than 10 reports, and the remaining four submitted 11, 15, 24, and 32 reports each. The number of submitted reports ranged from 8 to 19 per month. Out of the 10 hospitals, three did not use a synoptic template in any submitted reports. For the remaining seven hospitals, three hospitals used a synoptic template in over 70% of submitted reports; adoption of a synoptic template ranged from 17% to 100%. Based on the abstracted operative reports, it is apparent that some hospitals incorporated the templates using automated drop-down options while others dictated the information into their operative notes.

All reports included narrative information, while 62 (56%) of reports also used a synoptic template of varying length. Overall, 31 (28%) reports contained all 24 required elements; all of these reports used a synoptic template and were from three hospitals.

The most commonly documented elements included: type of reconstruction (98%), surgical modality (98%) and procedure name

Table 1
Required elements and response options for standardized synoptic operative report.

Element	Response Options
ASA score	I; II; III; IV; V
Case status	Elective; urgent (obstructed; bleeding; perforated)
Operation	LAR; APR; TPC; local excision
Modality	Open; laparoscopic; hand-assisted laparoscopic; robotic; TES
Location of tumor within rectum	High; middle; low
Height of lower edge of tumor from anal verge 0–20 cm	0–20 cm
Mobilization of splenic flexure	Yes; no
Level of ligation of inferior mesenteric artery	IMA; SRA; none
Level of ligation of inferior mesenteric vein	High; low; none
Level of rectal transection distal to distal edge of tumor (distal margin)	0–20 cm
Type of reconstruction	Stapled end-end; stapled end-side; handsewn end-end; handsewn end-side; colon J-pouch; ileal pouch-anal anastomosis; coloplasty; none
Anastomotic testing method(s)	Rectal air infusion under pelvic fluid; rectal instillation of betadine, indigo, or other fluid; palpation; observation of circular stapler rings only; none
Creation of stoma	Yes (ileostomy; colostomy); no
En bloc resection	Yes (bladder; vagina; prostate; ureter; small intestine; sacrum; other); no
Metastectomy	Yes (liver; peritoneum; other); no
Completeness of tumor resection	R0; R1; R2
Intraoperative complications	Yes (ureter injury; rectal perforation; enterotomy; vascular injury; other); no
Blood transfusion	Yes; no
TME photographed	Yes—in pathology report; yes—in operative report; no

Table 2
Characteristics of the cases.

	N (%)
Clinical T Stage	
Tx or T0	2 (2)
T1	0 (0)
T2	8 (7)
T3	56 (51)
T4	14 (13)
Not included	30 (27)
Clinical N Stage	
Nx	1 (1)
N0	28 (25)
N1	24 (22)
N2	24 (22)
Not included	33 (30)
Clinical M Stage	
M0	49 (44)
M1	4 (4)
Not included	57 (52)
Operation	
Low anterior resection	76 (69)
Abdominoperineal resection	28 (25)
Pelvic exenteration	2 (2)
Total proctocolectomy	1 (1)
Not included	3 (3)
Surgical Modality	
Open	15 (14)
Laparoscopic/Hand-assisted laparoscopic	19 (17)
Robotic	68 (62)
Tumor Location	
High Rectum	15 (14)
Middle Rectum	27 (25)
Low Rectum	42 (38)
Not Included	26 (24)
Surgeon's TME Grade	
1 (Incomplete)	7 (6)
2 (Near Complete)	28 (25)
3 (Complete)	35 (32)
Not Included	40 (36)

(97%), testing method of the anastomosis when applicable (93%), and inferior mesenteric artery ligation (92%). The least commonly documented elements were the patient's American Society of Anesthesiologists (ASA) classification (46%), the patient's clinical M stage (48%), completeness of the tumor resection (51%), and whether a blood transfusion had been required (52%). In addition, only 38% of reports included photographs of the specimen. The frequency of each element is reported in Fig. 1.

With respect to surgical/oncologic details, 63% of reports included the surgeon's grade of the mesorectal excision (incomplete, near complete, or complete). The majority of reports were complete regarding details about the tumor and the surgical margins: 76% included the location of the tumor within the rectum, 72% explicitly mentioned the distance from the anal verge to the lower edge of the tumor, and 60% included the distance between the tumor edge and the distal margin.

Comparison between narrative and synoptic report completeness

None of the narrative-only reports included all 24 required elements, while 31 (50%) of the reports using a synoptic template were complete ($p < 0.001$). On average, reports that were narrative-only included 39% of required elements, while reports with a synoptic template included 92% of the elements ($p < 0.001$). Elements that were most often present in both narrative-only and synoptic reports included operation (94% of narrative-only vs. 100% of synoptic, $p = 0.046$), surgical modality (96% vs. 100%, $p = 0.105$), type of reconstruction (96% vs 100%, $p = 0.105$), and the anastomotic testing method (92% vs. 94%, $p = 0.706$). Reports using a synoptic template were more likely to include details about the patient's preoperative history (e.g., TNM stage, ASA class, tumor location), technical details (e.g., splenic flexure mobilization, inferior mesenteric vessel level), or details about the specimen quality (e.g., TME grade).

Discussion

In this analysis of rectal cancer operative reports from multiple institutions across the state of Michigan we find that the majority of reports were incomplete with respect to key clinical and technical elements. Fewer than one-third of the reports included all NAPRC required elements. Those most commonly omitted include the patient's ASA classification, the clinical M stage, and the macroscopic completeness of tumor resection. Additionally, the TME grade was documented in fewer than two-thirds of the reports. Adoption of a synoptic report did improve completeness; however, adoption rates of the synoptic template were variable over the seven out of 10 hospitals that began using it. This study of the documentation of rectal cancer quality measures reveals considerable gaps in the adherence to NAPRC guidelines and emphasizes the need for efforts that promote adoption of a synoptic operative template to improve documentation completeness.

In 2004, fewer than 50% of narrative operative reports (NOR) for rectal cancer resections contained the key surgical quality measures as determined by the Canadian Cancer Surgery Working Group.[7] Our study demonstrates that completeness in operative reports has not improved in the last 15 years. Improvement in surgical documentation has been successfully demonstrated in other surgical specialties with the use of synoptic SOR.[8,10–13] That said, we continue to see poor uptake in community care settings.[14] Furthermore, operative report documentation is not routinely taught in surgical training, which may contribute to their inconsistencies.[15,16] However, adoption of SOR does not require substantial training and ensures that essential information will be included in all operative notes. Implementation of synoptic reporting is particularly feasible given the widespread adoption of electronic healthcare records (EHRs). EHRs afford surgeons the opportunity to use "drop down menus" which encourage accuracy and completeness in a time efficient manner.[13] Additional work focused on identifying the barriers to high-quality documentation or synoptic template use would help identify targets for further interventions to improve adherence.

There are many arguments in favor of SOR beyond the benefits to patient care through improved documentation. For example, SOR provide a means to measure adherence to quality measures for surgical procedures. Incomplete narrative operative reports do not offer the same opportunity. Synoptic documentation of these measures can be used to assess individual surgeon performance and facilitate secondary data collection and usage through quality improvement databases.[8] In addition to improving accuracy and speed of data abstraction, SOR also have the ability to bring certain quality measures to the surgeon's attention. There is evidence to suggest that surgeons who received TME grades improved their specimen quality over time.[17,18] Rectal cancer quality measures, such as TME grade assignment, have particularly low adherence rates.[19] The synoptic reporting, however, serves as a reminder of each measure that must be included in order to perform a high-quality resection and may encourage adherence. Finally, adoption of SOR for rectal cancer resections will prepare hospitals for NAPRC accreditation. In this context, the use of SOR itself will be recognized as an indicator of high-quality care and its adoption will be necessary for hospitals to achieve accreditation status.

There are limitations to this study that should be noted. First, the hospitals participating in this study may not be representative of all

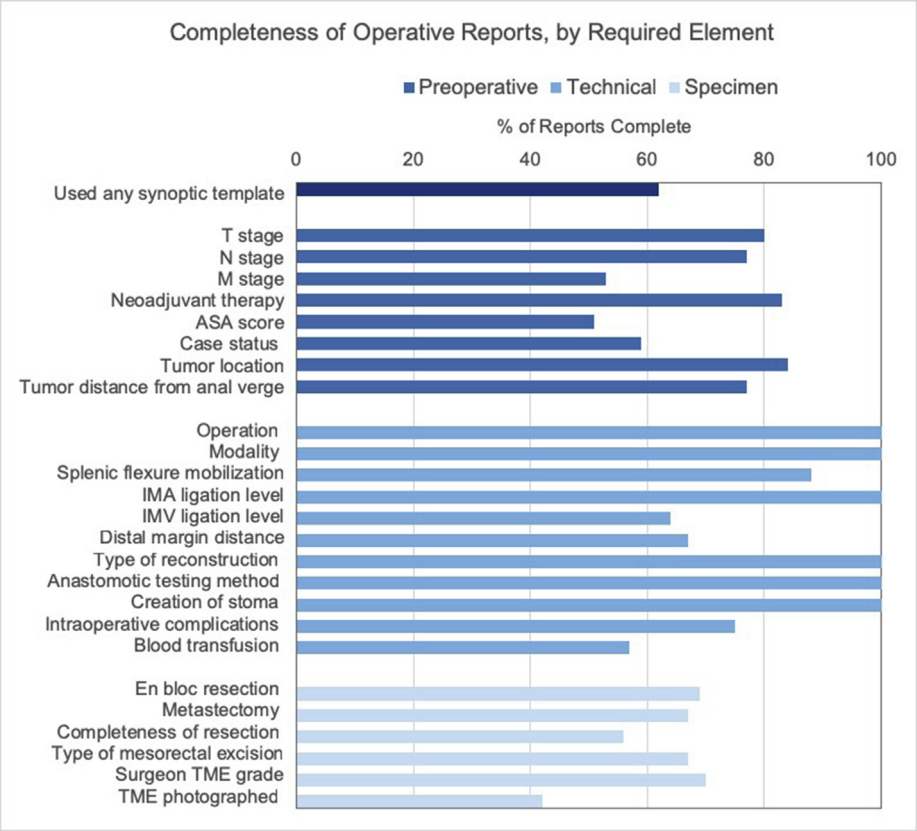

Fig. 1. Operative report completeness by required element.

hospitals, as these hospitals voluntarily participated in a study focusing on improving rectal cancer quality and may be especially committed to quality improvement. Additionally, these hospitals are all involved in MSQC which also suggests a heightened interest in quality improvement efforts. That said, this study demonstrates low rates of operative report completeness even within this self-motivated group, which would suggest that the national rates may be even lower. Second, recognizing the need for SOR in colorectal cancer resections is not a novel concept. This study, however, is the first to our knowledge that considers the key elements highlighted by the NAPRC. Furthermore, our findings provide an accurate portrayal of current rates of adherence to operative note completeness by hospitals likely to pursue accreditation. Finally, while there has been widespread acknowledgement of plans for SOR through the NAPRC accreditation process, there has yet to be formal implementation of the quality measure. As such, we may not see improved adherence to this recommendation until after the accreditation process takes full effect.

Though adoption of SOR has previously been attempted on the national level within specialty centers, it had not been evaluated within community-based practices that more accurately reflect the national landscape of completeness in rectal cancer resection documentation. In that context, we find that while national recommendations have been made for synoptic operative reports, this has not resulted in widespread adoption. In an attempt to improve adoption of this quality measure, we must encourage stakeholder engagement through educational interventions such as instructional videos that demonstrate ease of implementation and that describe ways the additional information provided through SOR facilitate quality improvement efforts. The result of these efforts will improve adoption and undoubtedly lead to superior delivery of rectal cancer care and measurement of surgical performance quality.

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