

Basic geriatric principles for colorectal surgeons: how to optimize assessment and care of the elderly in the perioperative period

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ABSTRACT

Background: The majority of patients with colorectal cancer are older. For surgeons dealing with older patients, it is important to recognize patients that are frail and have an increased risk of complications and mortality. In this review, we will go through pre-treatment assessment, peri-operative management, as well as discharge planning and rehabilitation.

Methods: This review is based on searching the literature for studies regarding colorectal cancer, frailty, cognition, patient preferences and geriatric assessment as well as the academic and clinical experience of the authors.

Results: In the pre-treatment assessment, surgeons need to consider capacity to consent, patient preferences, frailty and life-expectancy, risk of complications, and whether the patient can be optimized before surgery. Then, the patient and treatment options should be discussed at a multidisciplinary team meeting. When the patient is admitted for surgery, discharge planning should start immediately, and if complications such as delirium or falls occur, the patient should be co-managed with geriatric services.

Conclusion: Frail older adults with colorectal cancer need a tailored approach from pre-treatment assessment until discharge after surgery, and co-management with a geriatrician is recommended. If this is not possible, surgeons treating frail older patients may improve care by adapting some geriatric principles.

Introduction

Colorectal cancer is a disease mainly affecting older adults. It is a truly life-limiting condition, and the tumor may cause complications such as bleeding, stenosis, or perforation. The indication for surgery is thus evident. Elective surgery is generally safe when considering perioperative mortality, which is less than 4%, even in older patients(1). Post-operative morbidity, however, is high in frail patients, usually exceeding 50% when complications are assessed prospectively(2-4). In treating older patients with colorectal cancer, surgeons should take note of two critical points: (1) to look beyond chronological age when evaluating the risk associated with colorectal surgery and (2) to be able to uncover frailty in the individual patient.

Frailty is defined as a state of increased vulnerability towards stressors due to a multisystem reduction in reserve capacity(5). A frail older patient with colorectal cancer will have increased risk of postoperative complications, functional decline, and short- and long-term mortality(2, 6-8). Frailty is more prevalent with increasing age, but high chronological age does not necessarily equal frailty. In addition, it is crucial to reveal whether the patient has cognitive impairment, because this will influence all steps of the treatment trajectory, starting with decision-making capacity. Ethical issues at the end of life and in those with dementia are challenging and important parts of treating older patients with colorectal cancer.

In this review, we discuss opportunities for optimizing decision-making and care in the perioperative period, by using basic geriatric principles which can be incorporated in standard colorectal cancer care. This includes the following main points:

A. Pre-treatment assessment

1. Establish whether the patient has decision-making capacity
2. Find out about patient preferences regarding treatment goals and prioritize outcomes
3. Assess life expectancy without cancer – frailty, comorbidity, and functional status
4. Assess risks of complications from surgery (short and long term)
5. Presurgical optimization/prehabilitation
6. Discuss at the multidisciplinary team (MDT) meeting

B. Perioperative management: prevention of delirium and functional decline

C. Discharge planning and rehabilitation

Scope of this review

Our review focuses mainly on frail patients; fit older adults with colorectal cancer should in general be surgically treated in the same way as younger patients and rarely need input from a geriatrician.

Emergency surgery is associated with high postoperative mortality and morbidity in colorectal cancer, particularly in older patients. In short, emergency surgery should be avoided. In the emergency setting there is often limited time to assess patients, and surgery may be performed on a vital indication. The principles we discuss in this paper will therefore be less relevant in the emergency setting, except for postoperative care.

Pretreatment assessment

In the work-up of an older patient with cancer, gathering information on who your patients is and what matters to them should be given as much priority as is given to tumor staging and biology. The pretreatment assessment should include the following six steps.

1. Establish whether the patient has decision-making capacity

All treatment should be provided with the informed consent of patients. With increasing age, the risk of dementia is higher. For example, the prevalence of dementia in people over the age of 85 years in Europe is approximately 20%, and rises to nearly 40% in people over the age of 90(9). Studies from the US find that the prevalence of mild cognitive impairment in people aged 80-84 years is about 25%(10).

There are some clinical warning signs suggestive of cognitive impairment that the surgeon should be aware of:

- the patient does not know why he/she is seeing you (despite referral for cancer treatment) or does not remember that he/she has cancer despite having been informed of the diagnosis previously
- the patient automatically defers to a caregiver when asked a direct question (also known as the “head-turning sign”)
- the caregiver takes the lead in the conversation rather than the patient
- the patient repeatedly asks the same questions
- you get a feeling that your information is not getting through to the patient

It is advised to verify what patients have understood about their disease and the different treatment options before making a final decision. In our opinion, a short screening for cognitive impairment is necessary in patients over the age of 70. A useful tool for this is the Mini-Cog, consisting of a clock-drawing test and remembering three words, which takes approximately three minutes to administer(11). If the Mini-Cog indicates possible impairment, further cognitive testing should take place including assessment of decision-making capacity. In case of limited capacity, caregivers need to be involved in the consent process.

Cognitive impairment and dementia are not contraindications for surgical treatment, but represent factors that should be considered when developing the treatment

strategy because they affect prognosis as well as treatment planning and surveillance of patients during the treatment trajectory(12).

2. Find out about patient preferences and treatment expectations

The goal of treatment for colorectal cancer is curing the disease while minimizing complications and loss of function in the short and long term. The majority of older patients seems to be willing to undergo burdensome treatment in order to prolong their life, but not at the cost of their cognitive or physical function, especially when declines lead to dependency(13). Furthermore, different patients may have different goals, regardless of their age. Some patients may want to live at whatever cost in order to attend the wedding of their granddaughter, while others are less willing to undergo burdensome treatment that implies a long recovery period.

Therefore, it is mandatory to discuss the patient's goals before planning treatment to make sure treatment is carried out according to the patient's, and not primarily the surgeon's, preferences. A tool that has been suggested is the Health Outcome Prioritization Tool which asks the patient to consider treatment options in terms of their effects on four outcomes – length of life, physical and cognitive function, and symptoms(14). In many cases, the patient consults family and friends regarding treatment options. This is especially important when the patient has cognitive impairment which makes it challenging for them to weigh risks and benefits and remember information. In such cases, it is advisable that the patient brings caregivers to the consultation.

It is also essential to inquire about the patient's and caregiver's expectations regarding treatment risks and benefits as well as their self-perceived health(15), so that any misinformation or incorrect assumptions about the risks or benefits of treatment and the patient's ability (or lack thereof) to tolerate treatment can be adequately addressed before a decision is made. Many patients will have heard stories about other (older) people who have had cancer treatments and may extrapolate these experiences to their own situation, even when the treatment options and/or health status are quite different. If not asked for their considerations regarding treatment, these assumptions may not be corrected and lead the patient to making choices they would otherwise not have made.

Depression is an important factor that may influence the motivation to receive treatment for colorectal cancer, lead to non-compliance, and is independently associated with postoperative complications(16). Furthermore, depression increases mortality and significantly decreases quality of life. It is a treatable condition that is often under-recognized in older adults because they report depressive symptoms different from younger patients(17). For example, older adults may report more physical symptoms of depression than feeling of sadness. If depression is suspected pre-surgery due to depressed mood, loss of interest, and increased fatigability, we recommend using a validated tool to screen patients, such as the Geriatric

Depression Scale(18). In case this screening is suggestive of depression, the surgeon should refer the patient to the primary care physician or old age psychiatry services for treatment.

3. Assess life expectancy without cancer – frailty, comorbidity, and functional status

Due to the heterogeneity in life expectancy and health status for older adults, it is necessary to assess patients beyond their chronological age. Patients at the age of 70 who have functional and cognitive impairments in addition to several comorbidities may be more vulnerable to adverse outcomes than a fit 85-year old patient with a good functional status. In order to assess a patient's biological age, it is recommended to perform a geriatric assessment (GA). A GA is a systematic evaluation of somatic, functional and psychosocial domains. Performing a GA in older adults with cancer is recommended by the International Society for Geriatric Oncology (SIOG) and the American Society of Clinical Oncology (ASCO)(19, 20). Geriatric assessment may identify vulnerabilities that are important to the cancer treatment, such as cognitive impairment, poor mobility, functional impairment, malnutrition, poorly managed comorbidities, inappropriate drug use, depression, and lack of social support. Furthermore, the GA serves to establish a pre-treatment baseline of functional and cognitive status that is necessary to recognize a decline later on in the trajectory.

Older patients with impairments in the domains of GA may be considered frail if the impairments are across several domains or severe in one domain, such as dementia. The prevalence of frailty among older patients with cancer varies between from 6% to 86%, while the prevalence of pre-frailty is between 13% and 79%(21). These varying prevalences may be explained by different definitions of frailty and different study populations . A systematic review from 2016 found that frail patients undergoing elective surgery for colorectal cancer had higher risks of complications, readmission, longer hospital stay and decreased long-term survival(22). In a systematic review and meta-analysis from 2018, frailty and comorbidity were identified as strong prognostic factors for survival after colorectal cancer(6).

Patients who are fit do not need a GA. In a busy clinical practice, one approach is to screen for frailty rather than submitting all patients to a GA. While there is general consensus on the benefit of screening for frailty prior to surgery, there is no agreement on which tool is best used in an elective setting. In the 2015 SIOG recommendation on frailty screening tools, data on the geriatric-8 (G8) was found to be most robust: it has been extensively studied, with a high sensitivity for frailty with acceptable specificity and it is predictive for various outcome measures(23). However, the performance of a screening tool may depend on the setting in which it is used. In a recent cohort, the identification of seniors at risk (ISAR) performed better than G8 in predicting adverse outcomes of colorectal surgery(24). In a study of

emergency abdominal surgery, the VES-13 had the highest sensitivity and negative predictive value for postoperative complications and mortality(25).

Gait speed and recent falls are also important items to address as part of the screening, as these have been demonstrated to be associated with postoperative complications in colorectal surgery(26). Gait speed can be easily measured by asking the patient to walk 4 meters in their usual pace while the time is recorded. A gait speed of less than 0.8 m/s indicates slowness, and is predictive of poor clinical outcomes such as disability, falls and institutionalization(27). Functional dependency, a geriatric syndrome where a person is not able to live independently and complete basic activities of daily living (ADLs), is a predictor of postoperative complications and increased mortality(4, 8, 16). In addition, a dependent patient requires careful discharge planning starting from the time of admission. Despite being an important predictor of outcomes, functional status is frequently not reported in medical records(28). We recommend three simple questions about ADLs for the surgeon to ask: (1) Do you have trouble getting out of a chair or out of bed?, (2) Is getting dressed difficult for you?, and (3) Do you need help taking a bath or shower? Alternatively, you can ask the patient to take you through a typical day. All pre-operative evaluation notes should include a description of the patient's functional status – both the ability to live independently (ADLs) and objective performance measure such as gait speed. Without this information, it is not possible to recognize functional decline after surgery.

Thus, all older patients due to undergo colorectal surgery should be screened for possible geriatric syndromes and increased vulnerability using the MiniCog for cognition, a frailty screening tool, measurement of gait speed and be questioned regarding falls and functional dependency. If any of these items reveal potential impairments, a more extensive geriatric assessment should be performed prior to surgery.

Who should do this geriatric assessment? Geriatric medicine is performed in a multidisciplinary fashion. Input from geriatricians, geriatric nurses, physiotherapists, occupational therapists, dieticians, and social workers contribute to the comprehensive geriatric assessment (CGA) which highlights the needs and resources as well as the treatment goals for the older individual and forms a plan for interventions and treatment. The plan is then adjusted to the treatment trajectory - either in-hospital, in a day hospital, or by home visits. This method cannot be directly adapted by a busy surgical clinic, nor is it necessary. However, as geriatricians are used to evaluating the functional and cognitive capacity of older adults, they can provide valuable input to surgeons about risks of surgery from the perspective of the individual patient, including the risks of postoperative complications such as delirium and the risk of functional or cognitive decline after surgery.

If possible, we suggest teaming up with your geriatric colleagues to develop a colorectal care pathway for frail older patients. However, as not all hospitals have

access to a geriatrician, alternatives include gaining experience with using the tools yourself and work with your nurses and physiotherapists to establish this pathway.

4. Assess risks of complications from surgery (short and long term)

The risk of postoperative surgical complications following colorectal surgery does not appear to differ greatly with age. However, for non-surgical complications, the risk in older patients exceeds 50%, most commonly cardiopulmonary complications and delirium(29). Patients with pre-existent frailty, functional impairment, and comorbidities generally are at the highest risk of complications(2, 26). Hence, the geriatric assessment can also guide counseling of the patients regarding the risk of surgery, and weighing these risks against the benefits in terms of disease and symptom control.

A recent study showed that the impact of complications in older patients is also significantly higher: while physical and role functioning in younger patients generally return to baseline levels over time, in those aged 75 years or over, complications result in permanent loss of functioning(30). A systematic review from 2015 also showed that both physical and role functioning were significantly affected in older patients after surgery for colorectal cancer resulting in increased care dependence, particularly in frail patients(7).

Delirium is an acute confusional state that is a common complication in older patients undergoing surgery. In a recent study in 107 octogenarians from Italy, the incidence of postoperative delirium after fast-track surgery for colorectal cancer was 12%(31), and slowness, defined as increased time taken to complete the Timed-Up-and Go test (TUG) was the most important predictor of delirium. Postoperative delirium is associated with an increased rate of cognitive decline in subsequent years, which exceeds the rate observed for patients with dementia, with a dose-response relationship between delirium severity and long-term cognitive decline(32).

Ommundsen and colleagues found that 33% of frail patients who underwent elective surgery for colorectal cancer were discharged to an institution(3). Similar results were found in a US cohort of patients older than 65 years undergoing elective surgical procedures(33). Predictors of being discharged to an institution in the latter study were functional dependency and slowness.

Patients residing in nursing homes represent a particularly vulnerable population. In Norway, the prevalence of dementia among patients permanently residing in nursing homes is about 80%(34). Two studies have looked at outcomes after surgery for colorectal cancer in nursing homes residents. In a registry-based study of 6822 patients from the US who underwent colectomy, mostly urgent or emergency procedures, the 1-year mortality rate was 53%(35). The rate of sustained functional decline at 1 year was 24%. Predictors of declines in function after surgery were age over 80 years, surgical complications, hospital readmission, and preoperative functional decline. The average decline in functional status from baseline until one

year was greatest in residents with the best baseline ADL function, showing that these patients stand to lose the most functionally. In a different study of nursing home residents undergoing proctectomy for rectal cancer, the operative mortality was 18% after proctectomy with permanent colostomy and 13% after sphincter-sparing proctectomy, while the 1-year mortality after these procedures were 40% and 51%, respectively(36).

When considering that the average remaining life expectancy for a nursing home resident is quite limited, it may therefore sometimes be better to leave a small tumor in situ, particularly when symptoms are limited to iron deficiency and slow developing anaemia, both of which can be resolved with symptomatic treatment.

5. Presurgical optimization – optimization of comorbidities and polypharmacy, and social interventions, and prehabilitation

A recent systematic review showed that in over 72% of patients for whom a geriatric assessment is done, one or more non-oncologic interventions are recommended to optimize the patient's health status prior to the start of treatment(37). Most commonly recommended presurgical interventions addressed nutritional status (in 32% of patients) and polypharmacy (31%).

Many older adults have several comorbidities and use a high number of drugs on a daily basis. For such patients, a critical appraisal of drug use before surgery may be warranted. Internal medicine is a rapidly evolving field, and we suggest to liaise with either a geriatrician or an internist when changing the list of medications. Alternatively, if feasible, this could also be handled by the patient's family physician. It should be kept in mind that using a high number of medications in itself is not always a bad thing – undertreatment is also common in older patients(38).

There is limited data available on the actual impact of GA-based interventions on the postsurgical trajectory: the two studies that assessed the benefit of a presurgical geriatric evaluation found no difference in treatment-related complications including delirium or mortality(39, 40).

Prehabilitation, which is described in a separate paper in this issue of EJSO, takes the optimization of the patient prior to surgery one step further. This is a distinct concept aimed at improving the reserves of patients before surgery and thus improving functional outcomes after surgery. The core elements of prehabilitation are structured exercise, nutritional interventions, and coaching.

6. Discuss at MDT meeting

One of the most important criteria for a successful incorporation of geriatric assessment in care, is that the findings of the assessment are shared with all members of the MDT. As a result, care can be tailored to the individual patient's characteristics and needs and not only to the tumor's characteristics. Studies have

shown that incorporation of information on comorbid conditions, the patient's psychosocial context, as well as priorities and values, greatly increases the likelihood of reaching a treatment decision at a multidisciplinary cancer team conference(41, 42). In a recent qualitative study of how non-cancer information regarding older adults with cancer was presented at MDT meetings, it was found that non-objective, potentially ambiguous general descriptions were commonly used(43). Examples were "fit", "well", and "good" and "very", "pretty", and "quite". The authors found that a common description of the person's overall physical status was "pretty fit and healthy". Because the interpretation of such a description is subjective, strategies to increase discussion of non-cancer items in a more objective manner should be incorporated. In a study of medical decision making during MDT meetings for older patients with colorectal cancer from the Netherlands, the authors found that not all steps from the medical decision making framework were followed(44). They also found a limited use of patient-centered information such as patient characteristics and patient preferences, and a geriatric perspective was often missing. A geriatrician present at an MDT meeting would always ask about functional status, cognition, comorbidity/polypharmacy, patients' goals and values and risk of functional decline from treatment.

In some cases, the results of the geriatric evaluation will lead to changes in the treatment plan. In a systematic review including eleven studies on the impact of a geriatric evaluation on multidisciplinary decision making, the initial oncologic treatment plan was altered in 8-54% of patients (median 28%), generally resulting in a less aggressive treatment option(37).

Alternative treatment strategies when standard treatment is not feasible, such as endoscopic treatment, embolization, watch and wait, and stenting, are covered in other papers in this issue of EJSO. When a conservative approach is chosen, it is important to inform the patient, caregivers, and health personnel who take over the responsibility – i.e. the primary care or nursing home physician – about the expected disease trajectory. This includes information about how to deal with tumor-related complications such as bleeding, pain, and ileus. For example – are there occasions when the patient should be readmitted? Advance care planning should also consider level of care and do-not-resuscitate orders.

Perioperative management: prevention of delirium and functional decline

Patients who have experienced a prior delirium, who are care dependent or have cognitive impairment have an increased risk of delirium in the perioperative period. This increased risk should be communicated to the patient and caregiver in order to reduce the stress of experiencing delirium and to improve signaling of prodromal symptoms. In case of increased risk, delirium prevention measures should be taken, which include improving orientation and safety, mobilization and maintaining the day-night rhythm. A recent systematic review and meta-analysis demonstrated that these

multifactorial interventions can reduce the risk of delirium, with an odds ratio of 0.47, 95% CI 0.38-0.58(45).

The development of delirium or falls postoperatively may indicate the presence of complications, which often have an atypical presentation in older patients. For this reason, such symptoms require a broad workup to look for underlying causes, which commonly include infections, disturbances of electrolyte or fluid balance, constipation, urinary retention, myocardial infarction or side effects of drugs or withdrawal thereof.

In addition to seeking out the underlying cause, the delirium itself may require medical intervention. In mild cases, environmental measures similar to the preventive measures are generally sufficient. For more severe cases, it may be wise to seek the advice of a geriatrician in order to manage delirium; the use of drugs is then often necessary, particularly when a hyperactive delirium causes the patient to pose a danger to himself or his surroundings. All drugs used for delirium have side effects and a limited evidence-base. However, in our experience it is occasionally necessary to use haloperidol. In older patients, the dose should be kept low, and the use should only be short term. Haloperidol can be given orally, intramuscularly or intravenously; the latter should only be given if the patient is on constant cardiac surveillance. It is important to know that haloperidol is contraindicated in patients with Parkinson's disease or dementia with Lewy-bodies because of the risk of neuroleptic malignant syndrome and increase of symptoms from Parkinson's disease. Alternatives in these cases are clozapine or quetiapine.

As the patient recovers from surgery, the delirium will generally subside. Haloperidol and other psychopharmaca that were given should not be stopped suddenly, but rather stepwise in the course of a few days to a week (depending on the dose).

Discharge planning and rehabilitation

When an older patient is admitted for elective surgery, discharge planning should start before admission. If the patient is thoroughly assessed before admittance, social intervention may be instated while the patient is waiting for surgery; these could include home-care and medical interventions such as optimization of comorbidities and polypharmacy. Ideally, the patient has been participating in prehabilitation, and is already familiar with the importance of exercise and nutrition before and after surgery.

Older patients often have older partners as well, and the older adult with cancer may be the one who keeps things going at home. Thus, the hospitalization for surgery can lead to worries about a sick or dependent partner and increases the psychosocial stress around surgery. In other cases, the caregiver is overburdened, and as a result, it is not possible to discharge the patient home or patients are readmitted due to care issues, leading to an increase in length of stay. In fact, social interventions are among the most frequent consequences of a preoperative geriatric assessment(37).

Careful planning leads to an improved treatment trajectory for all included parties and most likely saves costs as well.

The goal of rehabilitation in older patients is to maintain function and slow the decline due to surgery. This process should start at admission and continue beyond discharge. In order to maintain functional status, the focus of rehabilitation should be to restore daily living skills and mobility. Bedrest, even for a short period of days, will lead to a rapid loss of muscle mass, which is difficult to rebuild.

Summary and conclusion

Older adults operated for colorectal cancer need a broad approach, especially if they are frail. When frailty is suspected after an initial screening, investing time in the pre-operative evaluation in order to uncover the patient's strength and weaknesses allows for careful tailoring and planning of treatment. Major areas to assess include cognitive function, physical function, comorbidities and social support. We recommend a geriatric assessment to evaluate patients in a structured manner.

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