Role of local excision in the management of rectal cancer: what does the future hold?

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Why is the treatment of rectal cancer such a controversial issue for colon and rectal surgeons? Perhaps we believe it is the disease (and treatment) and that truly separates us from general surgeons. Many colon and rectal surgeons can quote their personal local recurrence and survival rates (and perhaps even their anastomotic leak rates) for rectal cancer. However, I imagine few can quote their patients' FISI scores, fecal and urinary incontinence rates, and sexual dysfunction rates. We often pride ourselves on our ability to cure rectal cancer, and many believe the more radical the operation the better, but we rarely talk about the functional consequences our patients must suffer as a result of the operations we perform. Many surgeons believe if they accurately perform a radical resection, with a complete total mesorectal excision, and achieve negative resection margins (and provide appropriate (neo) adjuvant therapy) if a patient subsequently develops recurrence, it is due to the disease process, and nothing more could have been done. Yet if a local excision (with or without neoadjuvant therapy) was performed for an appropriately staged tumor, and negative resection margins achieved, and a patient develops recurrence, then an inadequate operation was performed, and a more radical resection would have prevented that recurrence. Surgeons consider that a personal failure, rather than a consequence of the disease process. I am certain that it is not that simple. "Bigger" is simply not always "better," and "bigger" operations essentially always have "bigger" complications and "bigger" functional consequences. More radical treatments for rectal cancer may, in certain circumstances, result in higher

disease-free survival, but not in improvements in overall survival, and certainly not a better functional result, and subsequent quality of life. In selecting treatment options, one must understand multiple important factors regarding the tumor and the patient in which it resides.

Regarding patient factors: (1) some patients wish to do "everything possible" to minimize any risk of tumor recurrence, while others want to avoid a colostomy "at all costs." (2) Some patients' anorectal function is poor enough that a radical resection resulting in a permanent colostomy will result in the best chance for cure and provide the best functional outcome. (3) In others even a well-performed low anterior resection for a mid or proximal tumor will result in an unacceptable deterioration in anal function and significantly impact quality of life. (4) Finally, in some individuals with significant comorbidities curing the cancer may be an unnecessary goal as life span is already severely limited.

Regarding the tumor: (1) Location is everything; proximal rectal tumors are very different from distal tumors. (2) Accurate tumor staging is often difficult prior to surgical resection. Differentiating T₁ from T₂ lesions is impossible for MRI and difficult for endorectal ultrasound. Even radiologists experienced in MRI evaluation of rectal cancer find it difficult to differentiate between advanced T₂ lesions and early T₃ cancers. (3) Diagnostic imaging, both MRI and endorectal ultrasound are little better than "flipping a coin" when predicting metastatic lymphadenopathy associated with early rectal cancers [1, 2]. Large lymph nodes may look worrisome but are often benign, while up to 50 % of metastatic lymph nodes are less than 5 mm and missed on both MRI and ultrasound. As one critically evaluates the literature, particularly when comparing radical to local surgical treatment there is subtle, unintentional, selection bias that is ubiquitous, incredibly important, and rarely

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mentioned. Authors compare, commonly retrospectively, patients undergoing local excision for T₂ (lymph node status estimated by inaccurate imaging with a 50 % false negative rate) N₀, with individuals following radical TME, pathology staged T₂N₀ (with microscopic evaluation of regional nodes). In these studies authors often implicate occult lymph node metastases as responsible for local recurrence following local excision [3, 4]. If this is truly the case, (which is likely) then many patients in the local excision group are truly T₂N₊. As we compare local with radical resection, it is important to realize a percentage of patients in any “local excision group” truly have Stage III rectal cancer (stage underestimated since no regional lymph nodes were excised) while no patients in the radical resection group are Stage III (since they have been accurately staged based on final pathologic evaluation of the resected specimen). Therefore, oncologic results are unfairly biased toward radical resection. As illustrated in the preceding sentences, it is often inaccurate staging that leads to recurrence in the local excision group rather than inadequate treatment.

Treatment options and surgical decision making are very different for proximal rectal tumors when compared to those in the distal rectum. The treatment of proximal rectal cancer is relatively simple as most proximal rectal cancers behave more like colon cancers. Essentially all early-stage proximal rectal cancers should be treated with radical resection without neoadjuvant or adjuvant chemotherapy or radiation. Rare individuals may benefit significantly from local excision. Questions centered on fecal incontinence, urgency, and diarrhea will often elicit occult diminution in anorectal function, particularly in older adults. In these individuals, a radical operation which significantly decreases rectal capacity and capacitance may transform a marginally continent patient into one “homebound” by bowel issues. All of the recommended treatments have some impact on anorectal function, urinary or sexual function, mobility, and subsequently effect quality of life. It is our duty as specialists in the treatment of rectal cancer to help patients sort through all these complex options and select the treatment or combination of treatments that are most likely to accomplish the patient’s goals.

For distal rectal cancer options increase and become more complex, and must be individualized. Inherent in any of these treatment decisions is the honest admission of the limitations of accuracy in staging tumor penetration in the rectal wall and more importantly the presence of metastatic lymph nodes within the mesorectum. Approximately 20–30 % of T₂ rectal tumors will be associated with metastatic mesorectal lymph nodes. Many of these lymph nodes are small, 40–50 % less than 5 mm and are commonly missed on staging studies. Therefore, one in ten, to one in eight patients with T₂ rectal cancer will have

unidentified lymph node metastases. This must be considered in any treatment decision. Biopsy results and MRI or EUS features help estimating the likelihood of nodal involvement. Unfortunately, many of the tumor-related characteristics capable of predicting lymph node metastasis will only be available on final pathologic evaluation of the resected specimen.

Recommendations for a healthy 52 year old with a T₂N₀ mid-rectal cancer will be much different from recommendations for an 82 year old with multiple comorbidities.

Treatment options are as follows:

1. Radical resection
2. Local excision alone
3. Local excision with postoperative chemoradiation
4. Neoadjuvant chemoradiation followed by local excision
5. Chemoradiation followed by “watch and wait” observation

For individuals whose primary goal is “the best oncologic result regardless of functional consequences” radical resection is the best treatment option. Radical resection has been associated with local recurrence rates one half of those associated with local excision in some studies. However, radical resection will come at a cost. In most patients disease-free survival is similar to local excision, and overall survival is also identical. In addition, the functional consequences of even a successful radical resection will result in a permanent stoma up to 30 % of patients. Incontinence rates following low anterior resection range between 15 and 40 %. Sexual and urinary dysfunction ranges widely but has been reported to be between 40 and 60 % [5, 6].

For individuals more interested in organ preservation and anorectal function two less radical options are available, local excision (most commonly combined with chemoradiation [7]) or primary chemoradiation followed by careful observation [8]. Regarding local excision, multiple techniques have been described to remove rectal tumors transanally. Historically, this was the first method used for surgically treating rectal cancer but was abandoned due to high local recurrence rates and poor survival. What has been learned over the last century is that not all surgical techniques of local excision are equivalent. Local excision should remove the tumor in one piece, presenting an intact specimen for pathologic evaluation, with negative surgical margins. Any local technique which attains this goal should produce equivalent results. Recent improvements in techniques for transanal excision have consistently shown that in most surgeons’ hands traditional transanal excision is inferior to newer techniques [9, 10]. For that reason, if transanal tumor excision is planned, an advanced technique with rectal insufflation, magnified

vision, and precise surgical instrumentation should be used. Transanal endoscopic microsurgery (TEM) is most well studied and most commonly used, but newer techniques such as transanal minimally invasive surgery (TAMIS) and others can also be used but have not been studied extensively. These advanced techniques have been shown to result in less specimen fragmentation and lower positive margin rates when compared to traditional transanal excision. I do feel that an advanced technique with improved visualization, combined with facilitated meticulous dissection should be used, regardless of which platform is chosen.

Histopathologic evaluation of the primary tumor provides clues as to the presence of metastatic regional nodes. Adverse histologic factors such as lymphovascular invasion, poor differentiation SM III submucosal invasion all increase the risk of lymph node metastases. “Response to radiation” after neoadjuvant treatment can provide information regarding persistent mesorectal lymphadenopathy. Read et al. evaluated radical rectal resections following neoadjuvant chemoradiation and identified regional metastatic lymph nodes associated with primary tumor stage as follows: T₀-0 % LN, T₁-2 %; T₂-23 %; T₃-47 %; T₄-48 %.

In planning local excision, patients should understand the following: (1) Final pathologic may dictate further treatment, including radical resection. (2) For any radical resection following local excision, successful colorectal anastomosis is more difficult and in some cases abdominal perineal resection may be required (particularly following traditional transanal excision). (3) Complications and functional impairment will be significantly less than following radical resection.

Authors approach

Based on review of available data and personal experience, I have arrived at the following algorithm for the local excision of rectal cancer: All proximal rectal cancers should be treated by radical resection unless patient comorbid conditions preclude abdominal surgery. These individuals will do well with anterior resection, with minimal morbidity and little change in bowel, bladder, or sexual function. Rarely local extension into surrounding organs may require neoadjuvant chemoradiation therapy.

For distal rectal cancer local excision should be limited to T₁ and T₂N₀ (preoperatively) staged rectal cancer. For individuals with T₃ lesions, local excision should be performed only for individuals with significant comorbidities or patient refusal to undergo radical resection. For T₁ lesions with no adverse histologic features on final pathologic evaluation, local excision (using an enhanced platform such as TEM) alone is appropriate. If adverse

histologic features are identified on final pathologic evaluation patients should have chemoradiation postoperatively, or alternatively radical resection. For T₂ lesions identified preoperatively, patients should have neoadjuvant chemoradiation with reassessment of tumor 4–6 weeks following completion of treatment. If there has been minimal response to treatment, radical resection is most appropriate as recurrence will be common in these patients following local excision. If the patient has had a significant clinical response, TEM or TAMIS resection of residual tumor is appropriate. For individuals with complete clinical response, local excision of tumor bed had been recommended. However, this is often associated with prolonged healing times and significant postoperative discomfort and drainage. Careful observation according to “watch and wait” protocols may be appropriate (OPRA trial centered at MSKCC is currently evaluating this approach), are associated with significantly less morbidity, and may produce equivalent oncologic results.

Rectal cancer is a complex disease, and we lack the ability to accurately stage patients prior to excisional treatment. Inaccuracy in pretreatment staging leads to challenges in selecting appropriate treatment. As imaging and perhaps other modalities evolve, treatment options will become easier. Currently local excision, with the use of advanced transanal techniques in experienced hands, often provides equivalent local recurrence, and equal overall and disease-free survival in properly selected patients. Local excision is clearly associated with lower costs, shorter hospital stays, decreased morbidity and mortality, and improved functional results. For these reasons, local excision of rectal cancer will continue to play a significant role in the management of early rectal cancer.

Compliance with ethical standards

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

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of study formal consent is not required.

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