

## Rectal Cancer: Progress over the Past Two Decades

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There are four major goals in the treatment of a patient with rectal cancer: a) local control; b) long-term survival; c) preservation of anal sphincter, bladder and sexual function; and d) optimal quality of life. To understand the management of rectal cancer and in order to achieve these goals, it is essential that the surgeon be familiar with the pathology. Treatment decisions must be made based on the perceived pathologic extent of the disease. The aim is to predict as accurately as possible the extent of disease in each individual patient. Information concerning the depth of tumor invasion in the rectal wall, involvement of regional lymph nodes, and the presence of distant metastasis are of crucial importance when planning a curative rectal cancer resection.

In order to determine the extent of the tumor as accurately as possible and to properly tailor treatment for individual patients, preoperative staging methods are required. It is important to precisely identify the early-stage tumors that are suitable for treatment by surgery alone and the locally advanced tumors that require preoperative neoadjuvant therapy. Currently, staging can be performed by digital rectal examination, endorectal ultrasound, computed tomography, positron emission tomography scan, or magnetic resonance imaging. ERUS has emerged as an important pretreatment imaging modality for local staging, with superior tumor staging accuracy over CT [1]. It is accurate for tumor staging in 62–92% and for nodal staging in 64–88% [2]. A high resolution MRI with a phased-array coil allows visualization of the entire tumor, its anatomic disposition in any plane extramurally, and its relationship to the circumferential margins [3]. It has moderate accuracy for predicting the tumor stage of rectal cancer; however, the clinically more important circumferential resection margin can be predicted with high accuracy and consistency, allowing preoperative identification of patients at risk of recurrence who will benefit from preoperative radiotherapy, more extensive surgery, or both [4]. The main problem is that MRI is generally regarded as an expensive modality.

Local control of malignant solid neoplasms is based on removal of the primary tumor and its vascular and lymphatic drainage. This surgical principle constitutes the rationale for

radical surgical resection of colorectal malignancies. In the past two decades, major improvements have been achieved in the surgical treatment of rectal cancer following the introduction of total mesorectal excision. The goal of TME is the excision of the rectum along with its blood vessels and surrounding lymph nodes within an intact visceral fascial envelope. Preserving the integrity of the mesorectal fascial envelope and obtaining a negative radial margin are the key elements in minimizing pelvic recurrence. In studies of conventional surgery involving blunt dissection, local recurrence rates have averaged 30%, with 5 year survival rates of 27–42%. Several studies evaluating TME, with minimal use of adjuvant therapy, reported local recurrence rates of 4–8% and 5 year disease-free survival rates of 70–80% [5,6]. Another important point to stress is that by strictly adhering to the principles of TME with autonomic nerve preservation, maintenance of urinary and sexual function can be achieved in the majority of patients.

Radical surgical resection is the mainstay in the treatment of rectal cancer; however, after surgery alone the rates of locoregional failure are high. Based largely upon the results of two large multi-center randomized trials, a National Institutes of Health-sponsored consensus conference in 1990 recommended postoperative combined modality therapy for patients with transmural rectal cancer and/or node-positive disease (T3/T4 and/or N1) with no distant metastases (stage 2 and stage 3) [7-9]. The local control and overall survival improvement resulting from the administration of adjuvant postoperative chemoradiotherapy generated enthusiasm for evaluating preoperative combined chemoradiation in the treatment of locally advanced rectal cancer. There is growing evidence that preoperative chemoradiotherapy and TME have an additive effect on improving local recurrence rates [10]. The German Rectal Cancer Study Group, in a large prospective randomized trial, compared preoperative versus postoperative chemoradiotherapy in the treatment of clinical stage 2 and 3 rectal cancer [11]. There was a significant reduction in local recurrence rate (6% vs. 13%) between the two groups, although no difference in overall survival was found.

In this issue of IMAJ, Zhou et al. [12] report the results of their recent study. They show that high dose preoperative radiotherapy and TATA (transanal abdominal transanal radical proctosigmoidectomy) as a sphincter-preserving method was feasible and efficient in Chinese patients with distal rectal cancer. During a median follow-up of 70 months, the 5 year survival rate was 88%.

ERUS = endorectal ultrasound  
 TME = total mesorectal excision  
 T = tumor (staging)  
 N = nodal (staging)

Neoadjuvant treatment offers several potential advantages: facilitation of resection because of tumor shrinkage, reduction of risk of small bowel toxicity, improvements in functional results because of a non-irradiated neorectum, increase in patient tolerance, and enhancement of biologic response to treatment. Another potential advantage is that it can lead to clinical and pathologic disappearance of the tumor. The rate of pathologic complete response varies between studies, ranging between 3% and 30% [13,14]. Some authors have shown that a pathologic complete response is associated with lower local recurrence and improved survival [15,16]. Zhou's team [12] reported that the 5 year survival rate for those tumors down-staged to pathologic T0 or to pT1 was 100% and no local recurrence was observed at a median follow-up of 70 months.

Several studies have demonstrated that surgeon-specific experience as measured by procedure volume has a significant impact on survival for patients with rectal cancer, most probably because of the greater technical complexity of rectal cancer resections. Conceivably, high-volume surgeons perform more meticulous pelvic dissections incorporating sharp mesorectal excisions that facilitate negative circumferential margins and thereby reduce local failure rates [17-19].

To conclude, the modern treatment of rectal cancer combining TME with preoperative chemoradiotherapy results in excellent local tumor control. It is now widely accepted and has become the recommended standard therapy for patients with stage 2 and 3 rectal cancer. Surgeon-specific experience as measured by procedure volume can have a significant impact on survival for patients with rectal cancer.

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