

2. TOTAL MESORECTAL EXCISION

Recommendation: Total mesorectal excision should be performed for all patients with middle and low rectal cancers. This includes a complete excision of the rectum and all the pararectal lymph nodes within the mesorectum.

Type of Data: Retrospective comparison of prospective cohorts from randomized controlled trials and from prospective nonrandomized and retrospective studies.

Grade of Recommendation: Strong recommendation, high-quality evidence.

Rationale

Total mesorectal excision (TME) of rectal cancer leverages existing tissue planes to perform a complete resection of the tumor and the associated draining lymph nodes.⁹ By maintaining the intact fascia propria of the rectum and operating in the space between the mesorectum and the presacral fascia, the surgeon can achieve a resection with a negative margin, while simultaneously preserving neurovascular structures and minimizing morbidity.

After introduction of the technique of TME, the Stockholm Colorectal Cancer Study Group examined the impact of the implementation of a surgical training program for TME on the operative and oncologic outcomes of their patients.¹⁰ Members of the group compared outcome data from two prior randomized trials to a trial of patients treated after deployment of training workshops on the TME technique. The data revealed significantly better oncologic outcomes in patients treated with TME. Specifically, local recurrence rates (14% and 15% vs. 6%, respectively) and the percentage of cancer-related deaths (16% and 15% vs. 9%, respectively) were both lower in patients who underwent TME. Additionally, TME was associated with a 50% higher rate of sphincter preservation.¹⁰

Similarly, the Dutch Colorectal Cancer Group compared outcomes between conventional surgery and TME in patients undergoing curative treatment for rectal cancer on prior randomized clinical trials. Focusing strictly on the impact of surgical approach by excluding patients who received neoadjuvant radiotherapy, the authors demonstrated lower local recurrence rates with TME compared with conventional resection (9% vs. 16%, respectively). Furthermore, the type of surgery was an independent predictor of local recurrence on multivariate analysis.¹¹

As shown in several studies, a complete mesorectum resulting from performing a TME in the proper tissue plane results in lower rates of local and distant recurrence than resection with an incomplete mesorectum.^{12,13} Pathologic assessment of the surgical specimen therefore can and should provide direct feedback to the operating surgeon regarding the quality of the operation (Fig. 4-3).

Technical Aspects

TME begins by identifying the posterior plane at the level of the sacral promontory. This is the easiest location at which to identify the areolar tissue plane along the posterior aspect of the fascia propria of the rectum. It further allows for the identification of the superior hemorrhoidal vessels, the ureter, and the hypogastric nerve trunks. Once this plane is established, the dissection continues posteriorly with division of

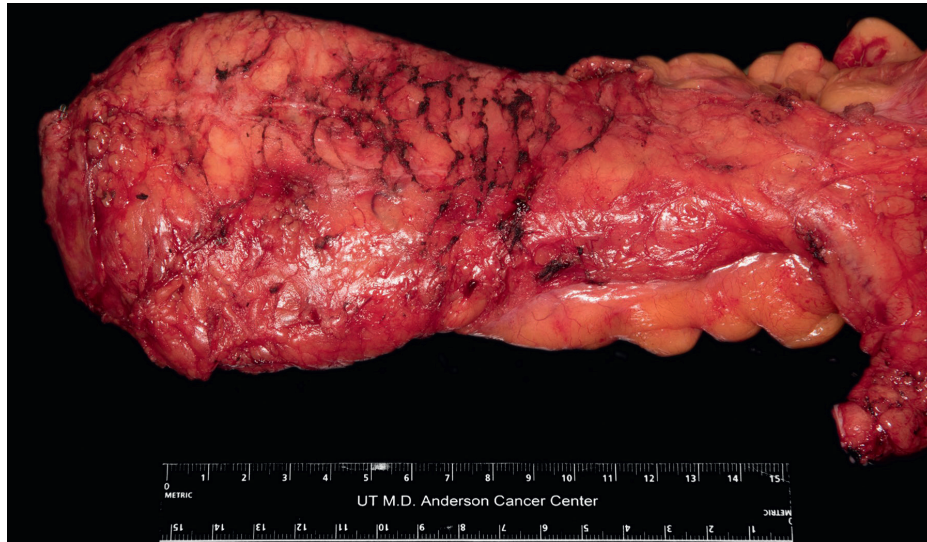


FIGURE 4-3 Photograph of a resection specimen demonstrating a complete mesorectal excision.

the areolar tissue between the visceral mesorectal fascia and parietal presacral fascia down to the pelvic floor (Figs. 4-4 and 4-5). Defining the posterior plane enhances the visualization of the lateral mesorectal plane. Dissection along these planes will include the division of the middle rectal vessels. Care should be taken during lateral dissection to identify the hypogastric nerve trunks, which run posterolateral to the mesorectum and medial to the endopelvic fascia. Injury to these nerves will result in retrograde ejaculation and impaired bladder accommodation.

Lastly, the anterior plane of dissection proceeds posterior to the vagina or prostate. In a male patient, the anterior dissection can occur anterior or posterior to Denonvilliers' fascia. Determining whether to include Denonvilliers' fascia with the specimen is guided by the location of the rectal cancer. An anterior rectal tumor in the mid- to low rectum will often require resecting Denonvilliers' fascia with the specimen. It is relevant to consider the appropriate anterior plane because the autonomic nerves are at risk of injury, terminating in the urogenital organs in the anterolateral location of the dissection. The autonomic nerves run along the lateral aspect of the pelvis and coalesce at the neurovascular bundles, which run along the posterolateral aspects of the prostate. They are at greater risk of injury with a plane of dissection anterior to Denonvilliers' fascia or during the distal rectal dissection along the posterior aspect of the prostate gland. They are also commonly injured during dissection around the seminal vesicles. Overly aggressive use of cautery when bleeding is encountered along the seminal vesicles will often result in injury to the *nervi erigentes*, resulting in erectile dysfunction (Fig. 4-6). The circumferential dissection continues down to the pelvic floor with exposure of the bare rectum at the level of the anorectal ring. To accomplish this distal dissection, the surgeon must divide the retrorectal (Waldeyer's) fascia to completely expose the bare rectum and provide adequate mobility for a low anastomosis.

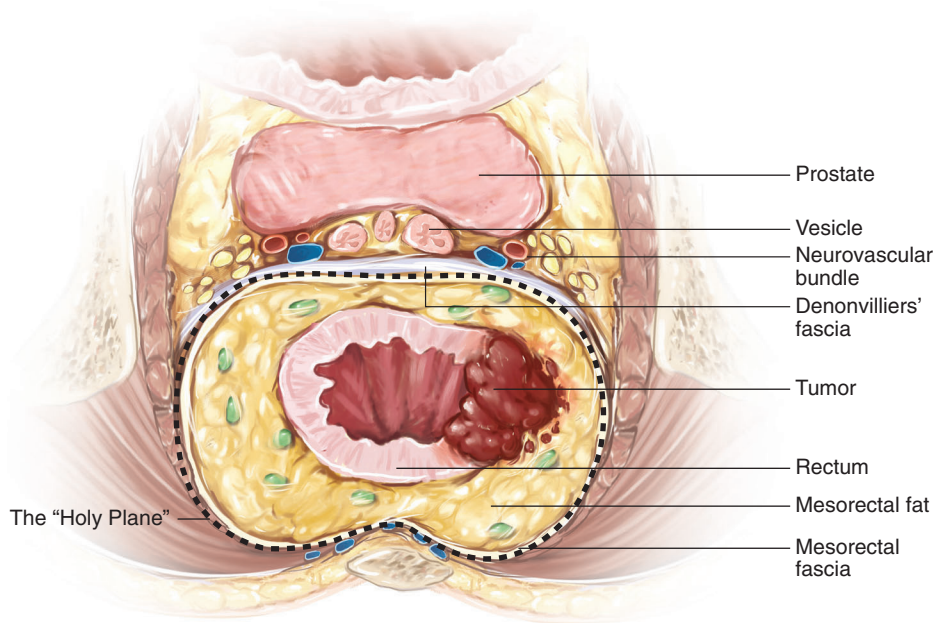


FIGURE 4-4 This illustration shows the cross-sectional relationship between the mesorectum and the surrounding neurovascular bundles. The neurovascular bundles are at risk of injury during anterolateral dissection.

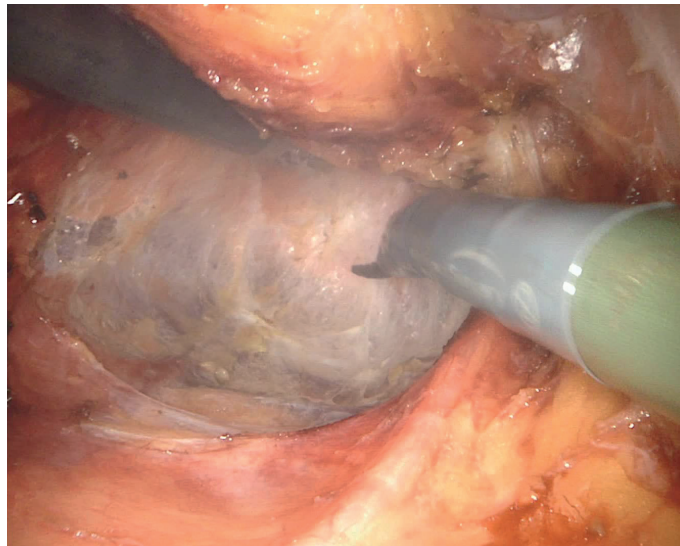


FIGURE 4-5 Photograph depicting the posterior mesorectal plane between the fascia propria of the mesorectum and the presacral fascia. Note the avascular plane, which is easily developed with sharp dissection.

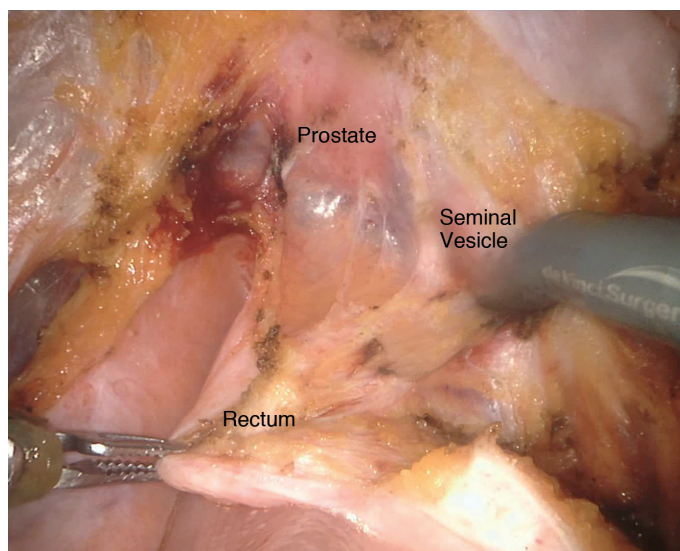


FIGURE 4-6 Photograph depicting the anterior dissection plane within Denonvilliers' fascia behind the prostate gland. The seminal vesicle is seen along the tip of the cautery.

3. LYMPH NODE DISSECTION

Recommendation: Standard lymphadenectomy should include pararectal lymph nodes included in the total mesorectal excision specimen. Removal of internal iliac or obturator lymph nodes should also be considered if clinically involved or in patients who have not received preoperative radiotherapy.

Type of Data: Several retrospective observational studies and a prospective randomized trial in which patients with identified lymphadenopathy were not treated with neoadjuvant chemoradiotherapy.

Grade of Recommendation: Weak recommendation, moderate-quality evidence.

Rationale

In a standard TME resection, the lateral extent of the dissection is the fascia that envelops the lateral portion of the mesorectum and adheres to the pelvic sidewalls. In a lateral lymph node dissection (LLND), the lymph node tissues are also resected from the common, external, and internal iliac arteries and are completely dissected from the obturator fossa while the ureter and obturator nerve are preserved.¹⁴ The role of LLND has historically been controversial.

Although relatively standard in Japan, this modification of the standard TME is not commonly utilized in North America or Europe. Because there has been significant controversy regarding its utility, Fujita et al¹⁵ undertook a randomized controlled trial to confirm that TME alone was not inferior to a TME combined with LLND. In this trial,