

RECTAL CANCER MANAGEMENT AND TREATMENT

Introduction

The treatment of rectal cancer has had a dramatic evolution in the last decade. While previously most patients with rectal cancer required permanent colostomies (an opening at the skin with a bag for stool drainage), today fewer than 10% of patients even with very low rectal cancers require permanent colostomies. This change has resulted from a better understanding of rectal cancer behavior, the use of radiation and chemotherapy in conjunction with operative intervention, better staging tools (test that help us find where the cancer may have spread) and, most importantly, new surgical techniques. **The decision-making process can be extremely complicated. In our practice this process is tailored to the individual patient.** This typically begins with a presentation at a multi-disciplinary conference which includes a colon and rectal surgeon, an oncologist, radiation oncologist as well as a radiologist to review all data accumulated prior to treatment. We typically follow NCCN (National Comprehensive Cancer Network) guidelines. The following information is presented in order to assist our patients to better understand the actual process.

Anatomy and Physiology

The purpose of the rectum is to store stool, like a reservoir, prior to defecation. It extends from the sigmoid colon (lowest part of the colon) to the anus where it joins the sphincter muscles. These anal muscles are the control mechanism for defecation and continence, giving us the ability to control solid, liquid and gas at socially acceptable times. The rectum is approximately 15-18 centimeters or about 8 inches long. We generally divide it into 1) lower third 0-6 centimeters from the anus, surrounded by the sphincter muscles, which are responsible for maintaining continence-our ability to hold gas and stool; 2) middle third, 7-12 centimeters from the anus; and 3) upper third (13-18 centimeters from the anus). The low and middle portions of the rectum are outside of the abdominal cavity in the pelvis and are therefore surrounded by bone.

The rectum is composed of three main layers. The **mucosa** is the inner lining of the rectum similar to the soft lining in your mouth. The **submucosa** is the tough lining just outside of the mucosa. The outer most part of the rectum is the **muscularis propria** or muscular wall of the bowel, that is responsible for propelling the stool forward. It is on the inner lining of the rectum that polyps and cancers start to grow

Outside of the rectum and behind it lies the mesorectum. This is a fat pad that contains the lymph glands, as well as the main blood vessels that go to and from the rectum. The lymph glands are part of the immune system. Just as a cold can result in swelling of the lymph glands under your chin, the lymph glands in the mesorectum can swell from spread of a rectal cancer. Cancer cells can also enter the blood stream through small veins in the submucosa, which lead back to the larger veins of the mesorectum. These in turn drain into even larger veins that pass branches to the liver and lung.

Evaluation of Rectal Cancer

Your initial evaluation will include a thorough medical history and physical exam. The physical exam will determine important characteristics of the tumor such as:

- Distance from anus and the sphincter muscles
- Size and % of the circumference of the rectal wall involved
- Mobility (freely moveable or fixed to surrounding tissues)

This initial evaluation will allow us to determine whether the tumor is an upper, middle or low rectal cancer, and to determine what additional testing will be needed.

The supplementary tests that we usually send a patient for to obtain more information about the tumor include:

- Rectal Ultrasound/ MRI—used primarily to evaluate low and mid rectal tumors. these tests give us information about the depth of invasion of the tumor as well as lymph node size. If the tumor has clearly penetrated through the outer muscular wall, if the lymph nodes are larger than 1 cm or there is evidence for invasion of the tumor into a nearby structure, then we would recommend radiation and chemotherapy prior to an operative procedure
- Colonoscopy—is an outpatient procedure that gives us a direct view of the entire rectum and colon to evaluate for other polyps and/or tumors in addition to allowing a biopsy (taking a small piece to look at under the microscope) of the tumor to get a pathologic diagnosis
- CAT scan—will be obtained at some point in the evaluation to look for spread of the tumor particularly to the lungs and liver.
- CEA—this is a blood study that serves as a marker to follow recurrence if it is elevated prior to operative intervention

Management of Rectal Cancers

The only chance for cure of a rectal cancer is to remove it surgically. Depending upon the individual circumstances, and based on the workup evaluation, your understanding of the different options, risks, and, benefits, management of your case may be somewhat different from someone else's.

If your tumor is an **upper rectal cancer**, this would be treated by an operation called an **anterior resection**. This procedure requires an abdominal incision and removal of the part of the rectum involved with tumor as well as a) the lymph glands that can potentially be involved with tumor spread, along with b) the blood vessels supplying that portion of the rectum. The most important part of this surgery is to remove an adequate amount of rectum on either side of the tumor. In almost all cases if this situation presents in our practice, the bowel is hooked back together. Only extenuating circumstances, that would have an adverse impact on your health, would cause us to have to give you a colostomy. If the tumor is associated with positive lymph nodes, or has unfavorable

characteristics (poor differentiation, penetration through the outer wall of the rectum, lymphatic or vascular invasion) we would recommend further evaluation by an oncologist for additional treatment with chemotherapy.

If during the workup you are found to have a **middle rectal** or **low rectal cancer** with the following characteristics:

- A fixed tumor,
- A poorly differentiated tumor, or
- A tumor that on rectal ultrasound or MRI has penetrated through the muscularis propria (T3 lesion) then, we would recommend pre-operative radiation and chemotherapy. This typically takes about 4-5 weeks to complete. An additional 8-10 weeks is necessary to wait until we can perform the surgery to allow for swelling to subside.

If on the other hand,

- The tumor is mobile
- The tumor is well or moderately well differentiated
- The tumor is an earlier lesion not penetrating through the muscularis propria (T1 or T2) then, we would more likely proceed with operative intervention and determine a need for radiation and or chemotherapy after surgery.

Tumors that have some characteristics of both sets above would be more likely to fall into the guidelines for the first group, but again each person is individualized. Once you are evaluated and you either do or do not receive pre-op treatment, the operative procedure for a mid rectal cancer follows.

Mid rectal cancers are somewhat more complex to treat than upper rectal cancers, because of the confines of the bony pelvis. In addition, in females the tumor is in close proximity to the uterus and upper vagina, and in males it is in close proximity to the seminal vesicles and prostate. Unlike upper rectal cancer and colon cancer, mid rectal tumors can recur locally in the pelvis so it is important to do a meticulous dissection. In our practice evaluation and treatment plans focus on preventing this possibility. The surgical procedure performed for mid rectal cancers is called a **Low Anterior Resection**. An adequate margin which is at least 2 centimeters below the cancer, along with lymph glands and the blood supply to the area are removed. Again, in our practice, unless there are extenuating circumstances that make it unsafe to hook the bowel back together, the chances for a permanent colostomy are very low. Depending upon the final pathologic staging of the tumor, additional treatment with chemotherapy and radiation may be indicated.

Management of **low rectal cancers** has the greatest complexity and includes all of the above mentioned tests for evaluation, in addition, to a continence history and evaluation of your sphincter muscles. If you are found to have poor sphincter muscle control or have previously had documented problems with continence, or are found to have a low

rectal tumor less than 2 centimeters from the anus, your best treatment option for both cure and quality of life may be a permanent colostomy. If on the other hand, you do not have continence problems, and the cancer is at least 2 centimeters above the anus, then other factors will impact the decision for the type of procedure we can recommend.

If the tumor is mobile, small, not ulcerated and on the ultrasound the cancer has not penetrated through the submucosa or part of the rectal wall, then this could be managed by local excision. This means cutting out the tumor along with a 1centimeter margin of surrounding rectal wall through the anal opening. Although this does not remove the lymph glands, the probability that the lymph glands are involved is very low in this situation. Once the tumor is removed, a pathologist will look at it under the microscope and determine the exact depth of penetration into the rectal wall as well as the aggressiveness of the tumor cells themselves. If the tumor invades the full thickness of the rectal wall or if the cells appear very aggressive, further treatment with radiation and chemotherapy and/or abdominal surgery may be recommended.

On the other hand, if the tumor is found to be fixed (stuck to surrounding tissues), large, ulcerated, close to the anal sphincters, or if the ultrasound shows growth through the wall of the rectum or enlarged lymph glands, we will often recommend radiation and chemotherapy before proceeding to surgery. The reasoning behind this comes from research studies that show several advantages:

- Local pelvic recurrence and cure are both improved
- Ability to focus radiation on the tumor itself
- The tumor may shrink thereby making it easier to avoid permanent colostomy
- Fewer complications from other organs being radiated after surgery

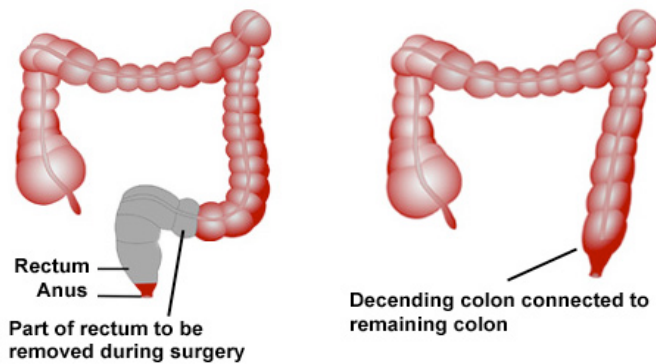
This treatment usually lasts 5 weeks and most patients are able to continue their usual routines during the course of the treatment. Once the radiation is complete an additional 4-5 weeks is required before surgery to allow the complete radiation effect to occur, and for the swelling to subside.

If the tumor is within 2 centimeters (1 inch) of the ano-rectal junction, the margin will not be long enough below the tumor, to cure the patient of his cancer. Therefore, the patient will require a permanent colostomy. This is called an **Abdominal Perineal resection**, and entails removing the entire rectum and anus, leaving behind no sphincter muscle. The colon is then brought out of the abdominal cavity through a small opening in the left lower abdomen. This should not be considered a defeat, but rather performing the proper procedure under the circumstances.

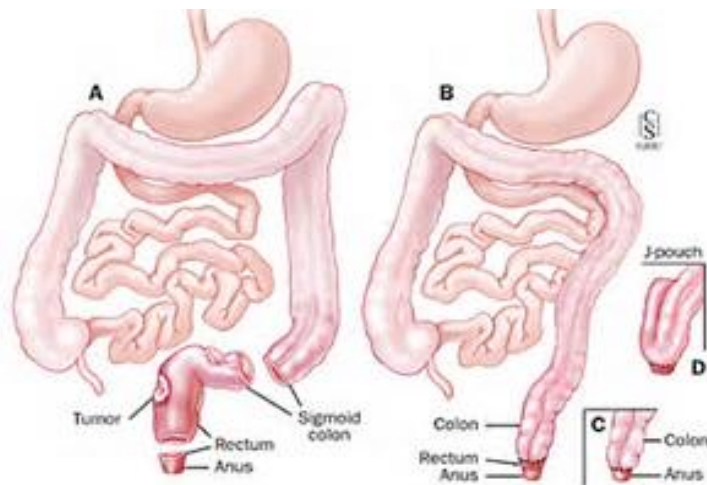
On the other hand, if the bottom of the lesion is above this 2centimeter mark, we are then able to free up the entire rectum down to the pelvic muscle floor. When the rectum is removed at this level, only the anus and the anal sphincter muscles remain. We then perform a **colo-anal hook up**, whereby we create a “**new rectum**” out of the remaining colon by folding it on itself, then opening the common middle wall to make a “J-pouch” which serves as the new storage area for the stool. We then hook this pouch directly to

the anus. We have been performing this type of procedure in our practice for 7 years and have many patients who are available to discuss their outcome with our new patients. Patients can expect excellent continence and an excellent quality of life. This complex surgery requires a temporary ileostomy (bag for drainage of stool, made from small intestine) in order to allow complete healing of the new “rectum”. The ileostomy can be closed in 2-3 months requiring a small incision around the ileostomy and a short hospital stay.

Thank you for taking interest in your treatment. Our best results occur when our patients understand why we are making certain recommendations



Low Anterior Resection (some rectum is retained)



Proctectomy with Colo-Anal Anastomosis (Essentially all rectum removed and colon attached to anus)



Abdominal Perineal resection- Very low cancer, unable to get a margin of resection below the tumor, so entire rectum is removed, with a permanent colostomy