Sphincter Preservation in Rectal Cancer Management

Dear Physicians,

In this issue of the “Outcomes in Oncology”, Dr. David Beck, a leading colorectal cancer specialist and surgeon of the Ochsner Cancer Institute describes the clinical scope of colorectal cancer in our society today and the therapeutic opportunities for the rectal cancer patient offered by their group. He and his associates have established themselves as one of the eminent colorectal cancer treatment teams in the Gulf South and North America. The message of this newsletter further focuses upon the successes their colorectal cancer team has had in “sphincter preservation surgery”, as opposed to “permanent colostomy” in the management of rectal cancer. Dr. Beck also describes the groundbreaking laboratory research efforts of the colorectal cancer treatment team at Ochsner. Exciting insights into the relationship of the colorectal cancer cell and its local lymph node environment are being identified by Ochsner’s scientists and clinician investigators which may lead to more individualized and personalized care for the colorectal cancer patient.

These are very exciting times at the Ochsner Cancer Institute. The innovative treatment activities and the research breakthroughs of our colorectal cancer treatment team here are just a few examples of Ochsner working to provide unique treatment opportunities for patients in our region.

As our stated mission, the purpose of the “Outcomes in Oncology” newsletter series is to provide the health care professionals of the Gulf South with timely and accurate accounts of important cancer problems that they may encounter in their daily practices.

Thank you for participating in this important educational effort provided by the Ochsner Cancer Institute.

Sincerely,

Rodney J. Landreneau, M.D.
Medical Director, Ochsner Cancer Institute
Sphincter Preservation for Rectal Cancer

Colorectal cancer is the third most common solid organ cancer and the second most common cause of cancer-related mortality in the United States with over 150,000 new cases each year.\(^1\) Rectal cancer accounts for about one-third of this disease burden. It is estimated that in 2014 there will be over 40,000 new cases of rectal cancer in the U.S., accounting for over 8,000 deaths.\(^2\)

Since Miles’ original description of an abdominal perineal resection (APR) requiring a permanent colostomy for rectal cancer in the 1920s, the management of rectal cancer has undergone significant change.\(^3\),\(^4\) The procedure described by Miles was performed with limited visualization using blunt dissection with little attention to anatomy. This resulted in a bloody operation with autonomic nerve dysfunction and a high incidence of local recurrence and permanent colostomy. While current treatment goals are ultimately the same as in the past, to cure the cancer (reduce local recurrence), newer techniques, including multimodality therapy, have allowed surgeons to restore and maintain GI function and optimize the patient’s quality of life. This latter positive outcome involves preserving sphincter function and avoiding a permanent colostomy.

In a 2005 review of a National Inpatient Sample (20 percent) of rectal cancer operations performed from 1988 to 2003, \(^5\) 41,631 rectal cancer procedures were performed. Overall only 39.7 percent of the patients had sphincter preservation surgery. As shown in Figure 1, the rate of sphincter preservation increased over the time period to 48.3 percent in 2003. However, a second review published in 2011, looked at 2003–2004 hospital discharge data from 11 states.\(^6\) In this study, 7,519 protectomies were performed by 2,588 surgeons. During that two year period, 50 percent of the surgeons performed only one protectomy. The 51 percent of patients who had a non-restorative procedure were more commonly performed by low volume surgeons. These patients also experienced a longer length of hospital stay and a significantly higher mortality. During that same period (1999–2004), Ochsner colorectal surgeons had an 87 percent sphincter preservation rate and an 83 percent five-year disease-free survival.

EVALUATION

Following the diagnosis, which is usually made with colonoscopic biopsy, patients are staged by a colorectal surgeon to assess tumor characteristics. These characteristics include the height from or involvement of the anal sphincters and the presence of metastatic disease. This involves a CT scan of the chest, abdomen and pelvis to exclude metastatic disease, and either an endorectal ultrasound or a high resolution MRI of the pelvis to allow for surgical planning (Figure 2). PET scans are not utilized unless there is a need to further evaluate potential metastatic lesions on the other imaging modalities.

Multidisciplinary Tumor Board

After a complete staging workup, all rectal cancer patients at Ochsner are presented at a multidisciplinary tumor board (MDT). Members of this committee include the surgical team, a radiotherapist, a medical oncologist, a radiologist and a pathologist. This group will make recommendations on the need for neoadjuvant therapy, eligibility for research protocols and the potential for sphincter preservation.

NEOADJUVANT THERAPY

For tumors that have grown through the rectal wall or involve perirectal lymph nodes, preoperative radiochemotherapy has been shown to shrink rectal tumors, increasing the chances of sphincter preservation, reduce local recurrence and improve overall survival.\(^4\) With this therapy, we can accept a 1–2 centimeter distal margin and a 1 millimeter radial margin of the resected tumor. If tumor shrinkage is needed, the radiotherapy involves 50.40 Gy administered over five weeks and
5-FU as a radiosensitizer. Surgery is planned six–12 weeks after completion of the radiotherapy. If tumor shrinkage is not needed, a shorter course of radiotherapy (20-25 GY over five days) is often considered.

**OPERATIVE PROCEDURES**

For the majority of rectal tumors, the surgical options include an abdominoperineal resection (permanent colostomy) or sphincter preservation with a low anterior resection (Figure 3). For both options, the important surgical principles include obtaining clear margins, proximal lymphovascular control (obtain adequate lymph nodes) and removal of the whole meso-rectal envelope or total meso-rectal excision (TME). After a low anterior resection, bowel continuity can be accomplished with either an intra-abdominal anastomosis or with a colo-anal pull-through technique (Figure 4). With low (less than 5 centimeters) intra-abdominal anastomoses or the pull-through techniques, a diverting loop ileostomy is also performed. This is closed in six weeks after a normal rectal contrast study, if no adjuvant chemotherapy is used. Among patients receiving postoperative chemotherapy, ileostomy closure is sometimes delayed until the chemotherapy is completed. The rectal procedures described above can be performed in appropriate patients using laparoscopic or robot-assisted techniques. Ochsner colorectal surgeons lead the Gulf South with their extensive experience in minimally invasive techniques for colorectal surgery. For a small subset of early stage tumors, those that do not invade through the submucosa, local proctoscopic excision may be an option in low risk cancers or in high risk patients.

**OUTCOMES**

The Ochsner Department of Colon and Rectal Surgery reviews patient outcomes on a regular basis. A review of the Ochsner experience is presented in Table 1. The outcome of complex rectal cancer surgery, similar to outcomes for other malignancies, such as esophageal and pancreatic cancer procedures, has been shown to be related to center specialization and volume.

**RESEARCH**

The Ochsner Department of Colon and Rectal Surgery is actively involved in colorectal cancer research. We are active members in NSABP and Alliance (formerly CAL-GB, NCCTP, and ACSOG) Clinical Cancer Cooperative groups of the NCI. In our basic science laboratories, we are studying the interaction between colorectal cancer cells and the lymph node microenvironment as it relates to tumor metastatic potential. The translational research aim is to identify predictive and prognostic biomarkers of lymph node and extra-nodal metastasis, which may allow for more personalized or tailored treatments for colorectal cancer (Figures 5–7).

**SUMMARY**

The surgical treatment for rectal cancer is challenging, but improved outcomes (survival and sphincter preservation) can be obtained by specialized, high volume clinical teams using a multidisciplinary, individualized approach to therapy.

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**Questions or more information**

David E. Beck, M.D. | 504-842-7903

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### Rectal Cancer Experience at Ochsner Medical Center

<table>
<thead>
<tr>
<th>Years</th>
<th>Sphincter Preservation</th>
<th>Survival 5 year</th>
<th>Local Recurrence</th>
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<tr>
<td>1982-1998</td>
<td>66%</td>
<td>77%</td>
<td>7%</td>
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<tr>
<td>1999-2004</td>
<td>87%</td>
<td>83%</td>
<td>6%</td>
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<tr>
<td>2005-2010</td>
<td>83%</td>
<td>79%</td>
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Figure 1. Sphincter preservation for rectal cancer in the US. From Ricciardi R et al Dis Colon Rectum 2007;50:1119-27.

Figure 2. MRI of rectum - sagittal views demonstrating rectal cancer.

Figure 3. Abdominoperineal resection vs. low anterior resection.

Figure 4. Colo-anal pull through.

Figure 5. FDC/HK cells support Colon cancer tumor initiating cell by providing SDF-1 and enhance host angiogenesis. In vitro and in vivo colon cancer tumor initiating cell / lymph node stromal cell co-culture models.

Figure 6. Microvesicles released form GFP-HK lymph nodes cells (green) were taken up by RFP-HT-29 (human colon cancer cells-red, arrows).

Figure 7. Identification of tumor biomarkers in Stage II colon cancers and lymph node metastasis.
Ochsner Awarded New Research Grant From National Cancer Institute

Ochsner Health System has been awarded a National Cancer Institute (NCI) Community Oncology Research Program (NCORP) grant. Only 53 grants have been awarded across the United States, and Ochsner is the only institution in Louisiana, Mississippi and Alabama with NCORP funding within the Community Site category and will receive $3.15 million over the next five years. This grant will allow Ochsner to continue to provide access to cutting-edge clinical trials for cancer patients.

The NCORP funding mechanism replaces the Community Clinical Oncology Program (CCOP) grant (through which Ochsner has been continuously funded since 1983) and the National Cancer Institute Community Cancer Centers Program, creating a new network for early diagnosis, prevention and treatment of cancers.

There are over 160 clinical trials that are currently ongoing at Ochsner, including bone marrow, breast, colon-rectal, prostate, pancreatic, ovarian, uterine, lung, brain and more.

For more information on clinical trials at Ochsner, please visit ochsner.org/cancer or call 504-842-3910.

References
Important Colon Rectal Treatment Protocols at Ochsner Cancer Institute

**CALGB-80702:** A Phase III Trial of 6 versus 12 Treatments of Adjuvant FOLFOX Plus Celecoxib or Placebo for Patients with Resected Stage III Colon Cancer

**STX0112:** Assessment of Overall Survival of FOLFOX6m Plus SIR-Spheres Microspheres Vs. FOLFOX6m Alone as First-line Treatment in Patients With Non-resectable Liver Metastases From Primary Colorectal Carcinoma in a Randomized Clinical Study

**N1048:** A Phase II/III trial of Neoadjuvant FOLFOX, w/ Selective Use of Comb. Modality Chemoradiation vs Preop Combined Modality Chemoradiation for Locally Adv Rectal CA Pts Undergoing Low Anterior Resection w/ Total Mesorectal Excision

To refer a patient, please call the Department of Colon and Rectal Surgery at 504.842.7930. For 24/7 phone consults and/or patient transfers, please call the Regional Referral Center at 1-855-OHS-LINK.