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EDITORIAL

Surgical treatment for rectal cancer: An international perspective on what the medical gastroenterologist needs to know

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Abstract

Rectal cancer accounts for one third of all colorectal cancers. The age adjusted death rates from colorectal cancer have declined over recent decades due to a combination of colorectal cancer screening, improved diagnostic tests, improved standardized surgical technique, improved medical support, neoadjuvant chemotherapies and radiation treatment or combinations of these. Because of complex treatment algorithms, use of multidisciplinary teams in the management of rectal cancer patients has also been popularized. Medical gastroenterologists performing colonoscopies are frequently the first health care provider to raise the suspicion of a rectal cancer. Although the diagnosis depends on histological confirmation, the endoscopic presentation is almost diagnostic in many cases. In order to meet the patient's immediate needs for information, it is important that the endoscopist has knowledge about the investigations and treatment options that will be required for their patient. The aim of this paper is to describe the modern preoperative investigations and operative procedures commonly offered to rectal cancer patients taking into account perspectives of three colorectal surgeons, practicing in the USA, Europe and Asia.

Key words: Rectal cancer management; Evaluation; Staging; Neoadjuvant; Adjuvant; Surgical treatment; Surveillance

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INTRODUCTION

Rectal cancer accounts for one third of all colorectal cancers and in the USA 41 420 new rectal cancer cases were estimated in 2007[1]. The age adjusted death rate from colorectal cancer has declined over recent decades due to a combination of colorectal cancer screening, improved diagnostic tests, improved standardized surgical technique, improved medical support, neoadjuvant chemotherapies and radiation treatment or combinations of these[2]. Because of complex treatment algorithms, use of multidisciplinary teams in the management of rectal cancer patients has also been popularized[3].

Medical gastroenterologists performing colonoscopies are frequently the first health care provider to raise the suspicion of a rectal cancer. Although the diagnosis depends on histological confirmation, the endoscopic presentation is almost diagnostic in many cases. In order to meet the patient's immediate needs for information, it is important that the endoscopist has knowledge about the investigations and treatment options that will be required for their patient.

The aim of this paper is to describe the modern preoperative investigations and operative procedures commonly offered to rectal cancer patients taking into account perspectives of three colorectal surgeons, practicing in the USA, Europe and Asia.

PREOPERATIVE INVESTIGATION AND STAGING

Perhaps the most basic and informative test in patients with low rectal cancer is a digital examination. For many tumors, this will immediately give the experienced surgeon enough information to determine what treatment will be required. As well as a general health evaluation, such as appropriate cardiopulmonary investigations, the preoperative evaluation includes rigid proctoscopy, endoscopic rectal ultrasound, total colonoscopy, pelvic MRI, CT-scans of the abdomen, liver and lungs. These investigations will help the surgeon and his multidisciplinary team to determine: (1) The patient's health condition and comorbidities; (2) The stage of the rectal cancer; and (3) Which treatment option is best suited to meet the patient's preferences and at the same time be oncologically appropriate.

MEDICAL HISTORY AND PHYSICAL EXAMINATION

The three decisions that should be made initially include: whether the tumor is suitable for local therapy; whether preoperative therapy is required; and whether a permanent stoma is necessary. Severe comorbidities and poor health status can be a relative contraindication to abdominal surgery, whether open or even laparoscopic. A local or palliative approach may then be more reasonable. Accurate preoperative tumor staging is of extreme importance as it determines the indications for neoadjuvant therapy and the possibilities for a local resection versus a radical abdominal procedure. This must be balanced against the patient's preferences while at the same time giving the patients and their family the option to choose an individualized treatment plan with optimal chance for cure.

A patient history of previous pelvic or abdominal surgery will increase the difficulty of a laparoscopic approach, and thereby increases the likelihood of a decision for open rectal surgery. Abdominal wall scars should be noted as they might preclude the optimal stoma placement. Morbid obesity, especially in males, because of more intra-abdominal fat and narrow pelvis compared to females, will also favor open rectal surgery compared to laparoscopic surgery.

If the patient has a low rectal cancer, careful palpation of the groin lymph nodes is mandatory. Finding of one or several enlarged, hard and painless lymph nodes in the groin will ultimately lead to focus on palliative treatment once the finding is verified by MRI or biopsy. Excision (removing whole lymph nodes) should be considered after preoperative irradiation therapy including the affected groin.

Information about the benefits and limitations of the various surgical methods available, including the laparoscopic approach compared to the open operation should be given by the operating surgeon. However, most patients would also expect the medical endoscopist to have a brief overview and knowledge of the most common preoperative investigations and operative procedures performed in the treatment of rectal cancer. Frequently, the endoscopist receives questions about chemoradiation therapy or is involved in the diagnosis and treatment of its side-effects.

DIGITAL RECTAL EXAMINATION (DRE)

Despite the limited sensitivity and specificity of DRE, until recently the whole treatment plan was based upon its performance. Important information can still be gained from a correctly performed digital examination. What is the condition of the anal sphincters? Can the tumor be reached? If yes, is it occlusive? How much of the circumference is involved? Is it fixed to the surrounding tissue or can it be freely moved? What is the distance from the dentate line to the lower border of the tumor? Can the upper edge be reached?

By this simple examination the size, mobility and location of the cancer can be assessed. Before any decisions about treatment are made, the information gathered from DRE has to be confirmed by more objective means.

ENDOSCOPIC INVESTIGATIONS

A colonoscopy is used to rule out the presence of synchronous polyps and cancers in the rest of the colon with a reasonably high accuracy[4]. The findings of multiple polyps in a patient under the age of 50 should alarm the endoscopist of a hereditary colorectal cancer. A detailed family history of cancer is warranted and referral to genetic consultation should be considered. In patients with familial cancer syndromes, the planned operation is a total colectomy. A colectomy with ileorectal anastomosis is used for patients with hereditary non-polyposis colon cancer (HNPCC), and those with familial adenomatous polyposis (FAP) and fewer than 20 rectal polyps. Patients with FAP and more than 20 rectal polyps should undergo proctocolectomy and ileoanal anastomosis.

When the patient with rectal cancer meets the surgeon at the outpatient clinic, both transanal endoscopic rectal ultrasound (TRUS) and rigid proctoscopy will be performed. The diagnostic accuracy for TRUS is dependant on the experience of the operator, and the stage and location of the tumor. Because of limited reach, large tumors in the upper rectum are not suitable for rectal ultrasound. Occluding tumors that cannot be passed with the transducer are also not amenable for this examination. TRUS is most accurate for early rectal cancers in the distal half of the rectum, and is particularly valuable in assessing the T-stage. The limited penetration depth of 7 MHz ultrasound waves makes it difficult to access the N-stage with high precision, with most studies showing accuracy of 70%-75%[5]. Three dimensional rectal ultrasound imaging seems to improve the staging properties[5]. Thus, for making a decision about whether local resection is possible the results of TRUS are of significant importance.

MRI OF PELVIS

Because standard protocols can be used, and because it is less operator dependent, MRI has become the standard for preoperative stage assessment of rectal tumors[5]. With its high resolution and accuracy MRI can give information about T-stage and N-stage as well as distance to planned resection margins, especially lateral or circumferential margins within the pelvic cavity. MRI may also be used for the assessment of response to preoperative neoadjuvant chemoradiation treatment (CRT).

CT SCAN OF LIVER AND LUNGS

CT scans of liver and lungs are performed to rule out the presence of metastatic disease. Resectable liver metastasis can be removed in a one stage operation or as a second operation 3 mo after the primary rectal cancer surgery. Multiple metastases in both liver lobes or hilar lymph node involvement are signs of incurable disease. However, some of the new forms of chemotherapy have such excellent response rates that these patients may become surgical candidates after reassessment.

BLOOD TESTS

After the diagnosis of colorectal cancer, the carcinoembryonic antigen (CEA) level is measured in a simple blood test. The result of the CEA does not have any implications for the treatment, but increased levels are associated with poorer prognosis[6]. After resection of the cancer, elevated CEA levels should return to normal or metastatic disease should be suspected. CEA levels > 50 are very suggestive of liver metastases. In the surveillance program a three-fold increase in CEA level should alert the surgeon to search for local recurrence or metastatic disease[7].

Other blood tests such as electrolytes, hemoglobin, and albumin are frequently taken to assess the patient's general condition. A low serum albumin indicates poor nutritional status or deranged liver function and is associated with increased frequency of postoperative complications including anastomotic leaks.

MULTIDISCIPLINARY TEAMS

The complexity of individualized and highly specialized preoperative investigations and neoadjuvant treatment plans has evolved into the need for multidisciplinary teams. These teams are now being used in many institutions to ensure patients are appropriately placed on multidisciplinary care pathways. The results of the preoperative investigations and the clinical information about the patient are reviewed in the presence of dedicated specialists in medical oncology, gastrointestinal radiology and colorectal surgery. In the same meeting the pathology report of previous cases can be presented by a pathologist. The accuracy of the preoperative investigations, critical reevaluation of indications for adjuvant treatment, adjuvant treatment response as well as a judgment of the quality of the surgery performed can be discussed in relation to the pathological TMN stage and resection margins presented in the pathology report.

NEOADJUVANT TREATMENT

There is an important debate going on among surgical and oncological experts in rectal cancer treatment regarding the use of pre- or post operative radiation with or without chemotherapy in order to reduce rates of local recurrence and improve survival. Best evidence seems to support preoperative radiation in order to reduce local recurrence and at the same time reduce the side effects of radiation[8-10]. Adding chemotherapeutic agents to increase tumor radiosensitivity has been shown to be beneficial in improving local control, but was reported to have no effect upon survival[11]. Most centers nowadays have included preoperative chemoradiation therapy in their multimodality treatment options. However, there are still discussions about what gives best oncological results: short term radiation with 25Gy given in daily fractions of 5Gy and surgery the following week, or long term radiation treatment with chemotherapy in daily fractions of 1.8Gy five days per week, 50.4Gy in total, followed by surgery 4 to 6 wk later[12]. The latter treatment option probably has the advantage of down staging of the tumor and thereby increases the possibilities of a sphincter saving procedure, particularly in advanced low rectal cancers[13]. The connection between preoperative chemoradiation and achievement of uninvolved circumferential resection margin (CRM) is uncertain[14,15].

The long term follow up of the European Organisation for Research and Treatment of Cancer (EORTC) trial 22921 that compared adjuvant fluorouracil-based chemotherapy to no adjuvant treatment in patients with resectable T3-4 rectal cancer, reported no beneficial effects of adjuvant chemotherapy if the cancer did not respond to the preoperative radiation or chemoradiation therapy[16].

The role of postoperative radiation has recently been limited to inadvertent tumor perforations intraoperatively or involved resection margins if irradiation treatment was not given preoperatively. Intraoperative radiation therapy (IORT) can be given in cancers locally invading the pelvic side walls[17]. The definite role of postoperative chemotherapy for rectal cancer remains unclear[10].

However, the situation is even more complicated. Current discussion is not just about which is the best treatment, but also which patients should receive such treatment. Generally accepted international treatment guidelines are yet to be developed. Some countries recommend preoperative radiation or chemoradiation to almost all rectal cancer patients[11,18], whereas others recommend neoadjuvant chemotherapy to all patients with stage Ⅱ and Ⅲ rectal cancer[19]. Finally, others argue for a more selective neoadjuvant treatment policy offering it only to patients with preoperative MRI showing threatened CRM (nearest tumor tissue < 3 mm from predicted CRM) or for tumors in the lower half of the rectum[3,20-22].

SURGICAL TREATMENT OF RECTAL CANCER

Surgery is the only method to offer cure for rectal cancer. Rectal cancer surgery performed either as a minimally invasive or as an open procedure has four goals[23]: (1) To cure the patients and give long term survival; (2) To give local control and avoid local recurrence; (3) To preserve normal defecation-, bladder- and sexual functions when possible; (4) To maintain or improve the patients quality of life.

The best way to achieve goal number 1-cure and long term survival; and goal number 2-local control and avoidance of local recurrence, is by means of major surgery. However, this has its price and considerable efforts have been made to reduce the negative impact of rectal resections upon goals number 3-to preserve normal defecation-, bladder- and sexual functions and goal number 4-to maintain or improve the patients quality of life.

Functional disturbances such as impotency, retrograde ejaculation, urinary retention or disturbed urinary bladder function as well as defecational problems or formation of a stoma have negative impact on quality of life after surgical treatment. One of the main steps during the dissection of the mesorectum is to identify and preserve the hypogastric and parasympatic pelvic nerves and thereby preserve functions. Functional disturbances are still a problem after rectal cancer surgery in about 20% of the patients[24]. Table 1 shows a summary of abbreviations that are commonly used in the surgical treatment of rectal cancer.

Table 1 Vocabulary for rectal cancer treatment

	Treatment
Anterior resection	Resection of rectum with an anastomosis above the pelvic peritoneal reflection.
Low anterior resection	Resection of rectum with an anastomosis below the pelvic peritoneal reflection.
TME	Total mesorectal excision. The fatty tissue which contains the draining lymph nodes surrounding the lateral and posterior part of the rectal tube, are dissected down to the pelvic floor and resected. The hypogastric nerves are preserved.
PME	Partial mesorectal excision. The mesorectum is divided 5 cm below the cancer and rectum transected. PME is performed for cancers located in the upper rectum and rectosigmoid junction.
TEM	Transanal endoscopic microsurgery. A specially constructed proctoscope with an attached microscope permits local resection of premalignant lesions and selected cases of early rectal cancer up to 20 cm from the anal verge.
TAE	Transanal excision. Lesions in the lower third of rectum can be resected transanally.
APR	Abdominoperineal resection. Low rectal cancers that cannot be resected with a sphincter-saving procedure are resected with perianal tissue and the anal channel en block with the whole rectum and mesorectum.
Adjuvant	Additional treatment (chemotherapy, radiation therapy or chemoradiation) given after surgical resection.
Neoadjuvant	Preoperative treatment.
CRT	Chemoradiation treatment. Chemotherapeutic drugs, typically 5′-fluorouracil and/or leucovorin are given in order to increase cancer cells sensitivity to the radiation. CRT is frequently offered to patients preoperatively (neoadjuvant) in order to reduce the chances for local recurrence and improve survival.
Intersphincteric resection	The upper part of the internal anal sphincter muscle is resected continuously with the lower rectum in order to preserve anal function and avoid colostomy in cases of ultralow rectal cancer.
CRM	Circumferential resection margin is the distance in mm from the mesorectal fascia (the resection plane) to the nearest tumor growth.
DRM	Distal resection margin.

Local resections

Local resections are performed transanally using both specially developed instruments and sutures to expose the rectal mucosa (transanal excision, TAE), or the operation might be performed endoscopically using a microscope to improve visualization through a specially designed proctoscope to secure access and instrumentation of the tumor (transanal endoscopic microsurgery, TEM). Local resections would be the operation of choice if only goals 3 and 4 were to be considered. Early rectal cancers treated with local resections have been reported to be associated with unacceptably high local recurrence rates of up to 40%[25], and should only be offered to carefully selected patients, or to those who otherwise would need a permanent end stoma[26]. For patients with severe comorbidities or with extremely high risk from anesthesia and abdominal surgery, a local resection procedure can be the optimal solution despite its limitations regarding local recurrences. Studies are underway in which the results of combining chemoradiation therapy and TEM will be determined[27].

Studies of the mesorectum in rectal cancer have shown that 10% of early rectal cancer (T1) has micrometastasis in mesorectal lymph nodes, and close to 20% have local lymph node metastasis in T2 cases[28]. Performing local resections that leave metastatic lymph nodes is undoubtedly likely to increase local recurrence rates, although the exact risk has yet to be evaluated and the risk is likely dependent on the exact individual tumor stage biology.

Total mesorectal excision (TME)

Heald and coworkers standardized the approach to rectal cancer by performing a TME with sharp dissection in the avascular plane surrounding the mesorectum with preservation of the hypogastric and parasympathetic pelvic nerves[29]. They reported a 5-year recurrence rate of 5%-7% or lower, depending on the cancer stage, without the use of neoadjuvant treatment, showing the importance of adequate surgical quality upon local recurrence. By contrast, traditional rectal cancer surgery with blunt dissection and ignoring the importance of an intact mesorectum with adequate tumor resection margins,

has yielded local recurrence rates of 30% or higher[30]. The benefits of the mesorectal dissection technique have been confirmed in several European countries after introduction of training programs and national consensuses of TME as the standard operation method for rectal cancer[11,18,31]. It has been documented that cancers located in the upper rectum do not need to be removed along with all the fatty tissue surrounding the rectum (mesorectum) down to the pelvic floor[32]. They do need a TME-like radial margin, but can be resected with a 5-cm distal margin to the cancer, ie a partially mesorectal excision (PME), without compromising the oncological result. This helps minimize some of the functional disturbances seen after a coloanal anastomosis.

The development of suturing devices with stapled circular anastomosis has also made the formation of anastomoses in the lower pelvis feasible, reducing the need for permanent stomas. However, the reported rates of anastomotic complications still vary considerably between surgeons[33]. It is common practice to protect the lowest anastomosis, especially after radiation treatment, with a temporary diverting loop ileostomy. The ileostomy is normally closed after 8 to 12 wk.

The low anterior syndrome describes the functional disturbances that may be seen after rectal cancer surgery. Improved defecation function can be achieved by anastomosing a colon J pouch to the top of the anal channel or to the top of a short rectal remnant[34].

Laparoscopic mesorectal excision

Laparoscopic resection of the rectum has not gained the same international acceptance as laparoscopic colon surgery. However, it has proven to be technically feasible and safe with no more or perhaps fewer complications than after open rectal surgery[35,36]. Low anterior resection (LAR) technically performed as laparoscopic TME or PME has the same oncological outcome when compared to traditional open rectal surgery[37-40]. For patients, laparoscopic surgery gives benefits regarding reduced postoperative pain, shortened postoperative ileus with faster bowel recovery after surgery, improved abdominal cosmesis, fewer wound infections, less postoperative small bowel obstruction and ventral hernias[41,42]. For the health care providers the benefits are shorter hospital stay and reduced overall costs[43] and thereby more effective use of health care recourses.

Because of the technical challenges of laparoscopic pelvic surgery a standardization of the technique is important to reduce the rate of conversion and improve the operating team performance. The learning curve for laparoscopic mesorectal resection is higher than commonly stated for other laparoscopic procedures[44]. This has probably contributed to the centralization of laparoscopic rectal resections to high volume hospitals with trained and experienced surgeons.

Abdominoperineal resection (APR)

About one third of rectal cancers are located in the distal third of the rectum. Traditionally this tumor location has led to an APR and a permanent colostomy. A frequency of 30% or more of APR has therefore been reported in many series[45]. However, improved surgical technique and neoadjuvant CRT have made it possible to perform low resections and stapled or handsewn coloanal anastomosis[46]. For the ultralow rectal cancers, intersphincteric resection and a handsewn colonic J-pouch anastomosis can be performed with good oncological results[47]. Increased focus on sphincter saving surgery has reduced the frequency of APR to around 10% or less in some hands. Some authors even regard the frequency of APR as a surrogate marker of the surgical quality in rectal cancer treatment[48].

Hartmann's procedure

The Hartmann's procedure is a rectosigmoid resection where the bowel continuity is not restored by an anastomosis. Instead the proximal colon is diverted as an end colostomy and the distal rectum, or sometimes just the anal canal, is left behind as a pouch (Hartman's pouch). This procedure is performed in selected rectal cancer patients, such as those with preexisting fecal incontinence, or unacceptably high risk after an anastomotic complication.

Loop ileostomy

A loop ileostomy can be performed to divert the flow of stool until the anastomosis has healed. The ileostomy does not reduce the rate of anastomotic leakage but it will limit the infectious consequences and mortality of the leakage[49]. In cases with obstructive symptoms from the cancer, a loop ileostomy can relieve symptoms before preoperative chemoradiation therapy is initiated, as well as reducing the risk of complications associated with emergency surgery by converting emergency cases into later elective surgery.

ENHANCED RECOVERY PROGRAMS

The development of fast track surgery or enhanced recovery programs has dramatically reduced the recovery time and length of hospital stay after colorectal surgery[50,51]. By combining laparoscopic rectal surgery and enhanced recovery programs, hospital stay of 4 d or less can be expected for 90% of the patients[52]. Fast track pathways may include avoidance of preoperative mechanical bowel preparation, drinking of a carbohydrate enriched solution 2 h prior to surgery, use of total intravenous anaesthesia, early postoperative mobilization, avoidance of nasogastric tubes and abdominal drains, early postoperative intake of liquids and solid food, minimizing opiates for pain control and use of bowel stimulating drugs. Effective pain control can be achieved by patient controlled analgesia (PCA) pumps in most cases. Intravenous and urinary catheters are removed on postoperative day one. Using these strategies as a combined pathway leads to early recovery, with low risk for readmission within 30 d[53].

SURGICAL QUALITY

The aim to cure and improve survival as well as number

of lymph nodes in the specimen the surgical quality can be evaluated within a few days. Similarly, many of the important outcomes of early recovery after surgery can only be achieved in patients having high quality surgery. Tumor biology and stage are important prognostic factors, but so is the performance of the surgeon. The importance of the surgical quality can easily be obscured by focusing on short term and long term over all survival, cancer specific survival, long term and short term local recurrence rates, different radiation regimens with or without pre- or post operative chemotherapy, local versus major resections, or laparoscopic versus open technique. Overall local recurrence rates > 10% should lead to concerns about the surgical quality. However, it is rather late to change the technique, when the rates of local recurrence are commonly calculated 3-5 years after surgery.

By using the recommended pathological description[54], TME grading, CRM, distal mesorectal and mural margins as well as number of lymph nodes in the specimen can be evaluated within a few days of surgery. If preoperative MRI showed more than 2 mm distance from tumor to the lateral resection margin, the CRM measured in the specimen should be at least 2 mm. Because of distal spread of tumor cells in mesorectum, a 5-cm distal resection margin is advocated in cases of PME. When performing a TME all the mesorectal fatty tissue is removed, and the surgeon can focus on achieving a safe distal rectal wall resection margin which is shown to be 1 cm or even less in cases with preoperative chemoradiation[55].

If the surgeon repeatedly has tumor involvement in the CRM, too short distal mesorectal resection margins, or involved distal rectal wall resection margin, then his patients will suffer unnecessary local recurrence and shortened survival. Few, if any national colorectal associations have considered the consequences of this and started a certification program for colorectal surgeons who operate on rectal cancer. Development of centers of excellence could also help improve the quality of all aspects of rectal cancer treatment.

The complexity of individualized multimodal treatment plans and the challenges and technical difficulties of open or laparoscopic pelvic surgery, have centralized rectal cancer treatment to high volume institutions, hopefully to the benefit of the patients.

Additionally, there has been no broad discussion in the literature of possible overtreatment by giving neoadjuvant chemoradiation to all rectal cancer patients, since less than 10% of all rectal cancer patients will have local recurrence after optimal surgery alone.

COMPLICATIONS AFTER SURGICAL TREATMENT

The narrow pelvic cavity and the close relations of the rectum to functionally important organs and structures as the hypogastric and parasympathetic nerves, the urinary tract including ureters, bladder and urethra, the seminal vesicles and prostate gland in males, uterus and posterior vaginal wall in females, pelvic and sacral vessels, make rectal surgery technical challenging and risky. Impotency and sexual dysfunctions, bladder dysfunctions, defecational problems including evacuation difficulties, fecal incontinence and urgency significantly add to the mental stress of a recent cancer diagnosis. Stoma problems with fear of malodorous leakage can be socially crippling. An increased focus on quality of life has included preservation of normal defecation-, bladder- and sexual functions and maintaining or improvement of the patient's quality of life as main goals of the surgical therapy for rectal cancer. Still, up to 20% of the patients will experience one or more of the above-mentioned side effects of the surgical treatment[56].

POSTOPERATIVE SURVEILLANCE

The medical endoscopist frequently meets rectal cancer patients when they are coming in for colonoscopy, commonly at 6 mo and at 4 years in their postoperative surveillance program. The clinical benefit of a postoperative surveillance program is disputed[57], but there are several considerations. One is to discover signs of cancer local recurrence or metastatic disease. Another is to educate the patient to recognize signs and symptoms of recurrent disease as well as to encourage the patients to cope with the sequelae of treatment. Thirdly, it is an important way to monitor the results and quality of the rectal cancer treatment.

Details of recent development of weight loss despite normal appetite, increased fatigue, changes in bowel habits and vague abdominal discomfort should be questioned at every postoperative consultation. Physical examination, including palpation of the abdomen for any possible mass, surgical scars, the lower edge of the liver and palpation around stomas will be performed. The presence of ventral or parastomal hernias should be recorded, but any suggestions about surgical treatment should be balanced against symptoms, impact on quality of life or other possible benefits and risks. The left supraclavicular fossa (Virchows lymph node) and the groins should be palpated for enlarged lymph nodes. The perineal region should be inspected and palpated and a DRE performed in all cases with a residual anal canal. During DRE the anastomosis should be palpated if within reach and any pelvic mass recognized.

As mentioned earlier, postoperative CEA level should return to normal if elevated preoperatively. In these patients elevated CEA levels can be indicative of local recurrence or metastatic disease.

Unsuspected findings should be verified by CT or MRI scans. PET scan is the most accurate method to rule out presence and the extent of local or metastatic disease[58].

LOCAL RECURRENCE

If a local recurrence is verified, surgical resection must be considered either with curative intent or as a palliative effort. However, the side effects and complications of

any surgery for recurrent disease must not be underestimated. The plan for the investigation is to determine resectability and to assess risks to the patient. Second line chemotherapy is an option, however it is non-curative and with considerable side effects. Most cases of recurrent disease will be discovered between the surveillance controls, and two thirds within two years after surgery.

LIVER METASTASIS

The attitude towards liver metastasis from colorectal cancer has also changed during recent decades. An aggressive approach has been shown to prolong survival and increase chances for cure[59]. Even patients with multiple liver metastases should be considered for liver surgery because combination of surgical resection and ablation (radiofrequency ablation or cryo ablation) after downstaging chemotherapy can be a valuable option for the patient unless there is evidence of systemic cancer disease. Selective hepatic intraarterial chemotherapy and segmental liver embolization are also treatment options in selected cases.

LUNG METASTASIS

Rectal cancer does also spread to the lungs. In an otherwise fit patient with no other signs of metastatic disease, an aggressive surgical approach will prolong survival. Segmental pulmonary resection or lobectomy is advocated for selected patients[60]. Multilobular and bilateral location is a sign of systemic disease and is a contraindication for surgical treatment.

PALLIATIVE SURGERY FOR ADVANCED AND INOPERABLE RECTAL CANCER

Preoperative chemoradiation therapy might downstage a fixed and inoperable cancer to become resectable and even curable. All efforts should be made to resect a rectal cancer in order to avoid the painful and devastating conditions associated with an uncontrollable cancer growth inside the pelvic cavity. Stoma, intestinal bypass, stent, fulguration (burning down the cancer with diathermy) or laser evaporation can give temporary relief from an obstructing rectal cancer or its metastasis.

Large procedures as hemipelvectomy or anterior or total pelvic exenteration with or without combination with intraoperative radiation (IORT) have been performed in order to achieve a R0 resection (all cancer tissue removed) and thereby reduce the chances of local recurrence. Obviously, this has side effects for the patients.

CONCLUSION

The medical endoscopist is not commonly involved in the multidisciplinary teams deciding the treatment plans for patients with rectal cancer. However, the endoscopist frequently is the first health care provider to meet the patient with suspected rectal cancer in the setting of endoscopy for colorectal symptoms or screening, and is frequently the person that performs the postoperative endoscopic surveillance. By having knowledge about the complex investigation plans and treatment options available, the endoscopist can provide important information in order to help the patient to prepare for the coming meeting with the surgeon.

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