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Management of Locally Recurrent Rectal Cancer

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1. Introduction

The treatment of colorectal cancer, that presents considerable health problem, still has a lot of space for improvement. The overall recurrence rate for this disease is between 8 and 50% according to literature dat**a** (Das, Skibber et al. 2006; Kaiser, Kang et al. 2006). The risk for recurrence is highest in the first two years postoperatively (Juhl G 1990; McCall JL 1995; Micev M 2000; Krivokapic Z 2004).

Local recurrence is defined as growth of adenocarcinoma in the pelvis after a previous resection for rectal cancer. Involvement of the ovaries is regarded as distant metastases, unless continuous overgrowth is noted.

For rectal cancer the risk of local recurrence is estimated to be somewhere between 5 and 40% (Kjeldsen, Kronborg et al. 1997). With the improvement of the surgical technique and use of neoadjuvant and adjuvant therapy the incidence of locally recurrent disease is expected to be around 10% (Rothenberger and Wong 1985).

Other, most common sites of metastatic disease are liver and lung (Tepper JE 2003). The best treatment results in the terms of surgery are achieved with solitary lesions. Radical surgery for liver and lung metastases is well accepted, on the other hand, aggressive surgery for local recurrence is often controversial despite the fact that median survival without treatment is usually 6-7 months not mentioning refractory pain, obstruction and other accompanying complications. Also, approximately 50% of local recurrences are restricted to the pelvis. However, the number of patients that can be resected for cure is less than 50 % (between 30 and 40 %) and median survival of these patients varies from 21 to 36 months (Gagliardi, Hawley et al. 1995).

In this chapter we`ll try to deal with different aspects of diagnosis and management of rectal cancer local recurrence, the most dangerous, difficult and unpleasant possible outcome of surgical treatment.

2. Risk factors associated with local recurrence

Many risk factors have been identified as predictors of rectal cancer local recurrence. Factors as tumor features, patient constitution and surgeons ability and knowledge often play a crucial role in genesis of local recurrence.

Tumor stage is, apparently extremely important risk factor (Kim, Kim et al. 2009). Poor differentiation, lymphovascular and perineural invasion are also associated with this phenomenon. Besides this, lower, bulkier, macroscopically infiltrating tumors as well as the presence of mucinous component are to be blamed for local recurrence (Choen AM 1990).

Patient constitution affects genesis of local recurrence in two ways.

First group of patient related factors is anatomical one; narrow, "male" pelvis and obesity can in some cases make surgery extremely demanding, thus compromising its oncological quality. As the evidence for this may serve the fact that tumor irresectability is earlier suspected and diagnosed in male patients (Law WL 2000).

Second group of factors contains all those which can negatively affect immunological status of a patient- immunodeficiency disorders, advanced age or any other non-related serious conditions.

Surgeons experience and caseload is tightly related to the percentage of local recurrence. Surgeons with more than 10-12 rectal cancer cases per year have significantly lower number of patients with local recurrence. We can find evidence for this in many published trials. In Stockholm trial, for example local recurrence was 4 versus 10% when comparing high and low-volume surgeons. Surgeons with proper training more frequently performed sphincter saving procedures and administered neoadjuvant therapy (Martling A 2002).

In terms of surgeons influence on local recurrence we`ll discuss some aspects including surgical management of rectal cancer as well as some quality measurements of operation itself.

Surgical options available for treatment of rectal cancer are anterior resection, abdominoperinal resection (APR), local excision along with transanal endoscopic microsurgery and in some cases Hartmann`s procedure.

All surgical modalities concerning abdominal approach have in the essence same basic rules, well proven in numerous studies published in the past twenty years. Those are total mesorectal excision (TME), with proper distal and lateral clearance (circumferential margin of resection-CRM), high ligation of inferior mesenteric artery, removal of the intact limfovascular "baring" segment and correct visualization and preservation of pelvic vegetative nerve structures.

There`s no doubt that TME is nowadays well established method of rectal cancer treatment. Principals postulated by Bill Heald in 1982. are very well known by all rectal cancer surgeons and include meticulous sharp dissection between mesorectal and endopelvic fascia following avascular, areolar "holy" plane under direct control of vision (Quirke P 1986; MacFarlane, Ryall et al. 1993).

CRM is proven to be one of the most important predictive factors for genesis of local recurrence. Many published studies proved that tumor involvement of CRM is a sole pathohistological variable that influences local recurrence and survival. Lateral clearance of less than 1mm (positive CRM) means significantly higher chance for recurrence (3,5 times greater risk) and doubles the risk of poor survival. CRM status is very accurate in predicting local recurrence. In 75% of cases with positive CRM local recurrence is inevitable. In 38,2% of patients with local recurrence CRM was positive, and in only 10% the situation was opposite. Following this, 5-year survival s also severally affected (72 versus 29% comparing positive and negative CRM) (Quirke and Dixon 1988; Birbeck KF 2002; Nagtegaall ID 2002). CRM in the context of APR is being carefully evaluated, and as a consequence, more extensive APR with en-bloc resection of the levator muscles and mesorectum has been recently introduced (Holm, Ljung et al. 2007). This technique results in lower risk of involved CRM and fewer intra-operative bowel perforations (West, Finan et al. 2008).

Distal clearance has been a matter of debate in era of dramatically increased percentage of sphincter saving procedures. Old "5cm rule" is nowadays a part of surgical history. Papers by Madsen and Williams (Williams, Dixon et al. 1983; Madsen and Christiansen 1986)

initially showed that distal propagation of tumor deposits is infrequent. This evidence enabled significant increase of oncologically safe sphincter saving procedures. In favor of this goes a fact that cases were intersphincteric resection with complete or partial internal sphincter removal was performed local recurrence rates were similar to those achieved in patients were APR was the only solution (Heald RJ 1997).

The type of local recurrence considerably varies depending on the nature of original procedure.

After anterior resection, local recurrence can be anastomotic, or localized elsewhere in the pelvis.

It is very uncommon to find a recurrence originating from mucosal suture line, it almost always originates from the bowel wall or from a point within the pelvis when we call it perianastomotic one (Selvaggi, Cuocolo et al. 2003).

Favorable aspect of this recurrence type is that, contrary to the one seen after APR, it provides more options for follow-up (digital, endoscopical examination, biopsy). Additionally, this type of recurrence often becomes symptomatic earlier than one found after APR. Genesis of local recurrence in this case can be found in biology of the initial tumor, tumor stage, and most importantly in surgical technique. Concerning the tumor stage, for example, we can clearly demonstrate its impact on percentage of local recurrence- stage I of the disease, according to TNM classification has 5-year recurrence rate of around 10%, stage II, approximately 24% and stage III about 41% (Manfredi S 2001).

Concerning the impact of initial surgery on the type of local recurrence, it is interesting to note that recurrences after operations where proper TME was not conducted are much more amenable to salvage surgery, with notably better results (Williams, Dixon et al. 1983; Madsen and Christiansen 1986). This can be explained with longer period needed for recurrent tumor to infiltrate surrounding structures, because of still existing mesorectal "envelope". Infiltration of surrounding structures, especially pelvic sidewall makes salvage surgery much more difficult. Of course, another important fact is that local recurrence is more frequent and rapid in patients were incomplete TME was performed (Quirke P 1986; Bergamaschi R 2001; Krivokapic Z 2002).

Surgical treatment of local recurrence is much more difficult after APR (MacFarlane, Ryall et al. 1993) and more frequent (Friel CM 2002). Curative surgical treatment in these cases is possible in much lower percentage. Several factors contribute this. Usually, APR is conducted in patients with bulkier, more advanced tumors. Surgical options are limited in attempted salvage surgery; normal pelvic anatomy is much more violated. Additionally, follow-up of these patients is inadequate (MacFarlane, Ryall et al. 1993). Asymptomatic period is much longer (no apparent bleeding or obstruction) and physical examination is limited. In females, vaginal examination (especially endovaginal ultrasound) can be useful in detection of local recurrence. On the other hand, in males, we can only perform imaging methods (CT, NMR, and PET scan).

Local excision alone, for rectal cancer is oncologically insufficient operation. Local recurrence and salvage surgery for it are frequent. Authors report salvages surgery rates in these conditions of 22 up to 100% (Cuthbertson and Simpson 1986; Suzuki, Dozois et al. 1996; Lopez-Kostner, Fazio et al. 2001). For patients in stage I disease in carefully selected indications local excision can be a therapy of choice. In recent years, with the introduction of preoperative chemoradiotherapy, this approach gains ground in the treatment of T1 and T2 tumors. Several retrospective case series and a small prospective study suggest that chemoradiotherapy before local excision reduces recurrence to a level comparable with TME (Kim, Yeatman et al. 2001;

Borschitz, Wachtlin et al. 2008; Lezoche, Baldarelli et al. 2008). Yet complications induced by neoadjuvant therapy combined with complications from local excision itself cast certain doubt on this approach. More large, prospective, randomized studies are needed to justify this strategy. In the case of non radical local excision, immediate salvage surgery is an option. Results of this type of surgery are excellent, better than after surgery for existing recurrence, unfortunately still less favorable than after initial radical resection (Killingback M 2001).

In any way, after local excision, close follow-up is mandatory using endorectal ultrasound every two months for up to 4 years.

Neoadjuvant treatment of rectal cancer is therapeutic modality, now well proven and administered worldwide. Combined with TME further reduces the percentage of local recurrence. In the Dutch trial (Wiggers, Mannaerts et al. 2003) good results were achieved. After TME alone local recurrence was 8,2% and after TME combined with preoperative radiotherapy was 2,4%. Nevertheless, in a number of studies (Holm, Cedermark et al. 1994) interesting fact was noted, namely, survival in patients with local recurrence, after preoperative radiotherapy was reduced. It was explained with the fact that those recurrences were more frequently associated with distant metastases and with limited possibilities for further irradiation as a part of multimodality treatment. There is now solid evidence that preoperative chemoradiotherapy is able to downstage rectal tumours. In around 8–30% of cases, this can lead to complete response. Some data suggest that local control can be significantly improved and this may lead to improved long-term survival in this group of patients (Capirci, Valentini et al. 2008).

3. Follow-up

To justify the treatment of recurrent disease, including, of course local recurrence, there has to be a proof that all measures taken actually improve survival of these patients. Without proper follow-up the treatment of recurrence can`t be optimally effective.

The indiscriminate use of all tests available is expensive. In order to reduce costs, we have to have in mind specific patterns of recurrence and to stratify patients according to the risk groups. Parameters in stratification are stage of the disease, invasion of other structures, tumor fixation and grading, mucionus component of a tumor and adjuvant treatment. It would be very useful to include surgeon as a risk factor, but the extent of this influence is very difficult to assess (Seow-Choen 2002).

Additionally, follow-up is important for discovering metachronous tumors and other malignancies. Discovering early metachronous lesion is rewording and cost effective.

There are a number of studies that dealt with the problem how to administer a proper test at optimal moment.

It has been noted by some authors (Polk Jr and Spratt Jr 1971) that follow-up is appropriate if you tend to identify 2-3% of patients with recurrence per visit. They recommended this regimen for two years and to follow patients at 6 month intervals for additional 3 years. Over 90% of recurrences are discovered in first 5 years of follow-up.

Others state that patient should be followed-up for three years and divided into risk groups (Kraemer M 2001).

4. Detection of local recurrence

During follow-up, most relapses when discovered are locally advanced or combined with disseminated disease. Majority of patients with local recurrence is discovered in first two

years of follow-up. Small number of these is fit enough, with resectable recurrence and no distant metastases.

Earliest possible detection of local recurrence is usually achieved by a set of tests that usually include physical examination, CEA and Ca 19-9 measurements, endoscopy and imaging (CT, NMR, ERUS and FGD-PET scan) (Beart RW 1983; Carlsson U 1983).

Usually, only one of these tests raises doubt that local recurrence may be present.

The first sensitive test to determine the presence of recurrence is to listen to the patient.

Symptoms of local recurrence usually are pelvic pain, with or without irradiation to lower extremities, rectal bleeding and change in bowel habits. Some authors tend to classify patient into groups, according to symptoms- S0 asymptomatic, S1 symptomatic, no pain, S2 symptomatic with pain (Hahnloser D 2003).

Significant number of patients (around 50%) is asymptomatic, despite existing local recurrence.

Physical examination may reveal palpable mass in the pelvis. Digital examination may reveal recurrence amenable to surgical treatment.

A list of symptoms, together with physical examination can detect recurrence in 21% of cases (Sugarbaker PH 1987).

CEA represents a glycoprotein oncofetal tumor associated antigen being expressed by more than 90% of colorectal adenocarcinomas, but it is not increased in the serum of more than 90% of patients (Cutait, Alves et al. 1991). As a marker, CEA is used to monitor treated patients for recurrent disease. The European Society for Medical Oncology (Van Cutsem and Kataja 2005; Van Cutsem, Oliveira et al. 2005) proposes CEA determination every 3–6 months for 3 years and every 6–12 months in year 4 and 5 after surgery, if initially elevated. Interestingly, it is stated that clinical, laboratory, and radiological examinations are of unconfirmed help and shall be limited to patients with suspicious symptoms. Sensitivity of this test ranges from 43 to 98% and specificity ranges from 70 to 90% (Sugarbaker PH 1987). It is difficult to ascertain what level of CEA assay should be considered as abnormal. Some define this as tree progressively rising CEA values, with at least one value over 10ng/ml (Sugarbaker PH 1987).

Currently CT scan is the preferred method for diagnosis of local recurrence (Abir, Alva et al. 2006). This examination may provide useful anatomical information. In some comparable studies CT correctly diagnosed recurrent rectal cancer in 76% of the cases (Blomqvist, Holm et al. 1996). Nevertheless, results of this examination should be taken with caution because of a significant percentage of false positive results (Sugarbaker PH 1987). In recent years, use of MSCT showed initial promising results, notably better than those achieved with regular CT scan (diagnosed pelvic recurrence in range between 82 and 97%) (Blomqvist, Holm et al. 1996).

Magnetic resonance imaging (MRI) is one of the leading imaging modalities for detection of pelvic recurrence. It is highly recommended method, due to its excellent soft-tissue resolution, providing detailed information. Compared to CT scan the distinction of recurrent cancer in presacral scar is more accurate, but still with limitations (Hughes K 1997). Routine use of MRI in follow-up is not justified (Titu, Nicholson et al. 2006). MRI should be reserved for selective patients, with suspicion rose using some other diagnostic modalities.

Fluoro-deoxy-glucose positron emission tomography (FDG-PET scan) is an accurate modality for detecting pelvic recurrence in rectal cancer patients (Fukunaga, Sekimoto et al.

2002) and may have advantages over CT and MRI scan in differentiating scar from viable tumor. The reported accuracy of FDG-PET for pelvic recurrence ranges from 74% to 96% (Gearhart, Frassica et al. 2006). Nevertheless, PET has certain limitations, inability to detect small lesions, mucionus tumors and positive lymph nodes. Radiochemotherapy is also shown to diminish sensitivity and specificity of this method (Moore, Akhurst et al. 2003; Kamel, Cohade et al. 2004; Von Schulthess, Steinert et al. 2006).
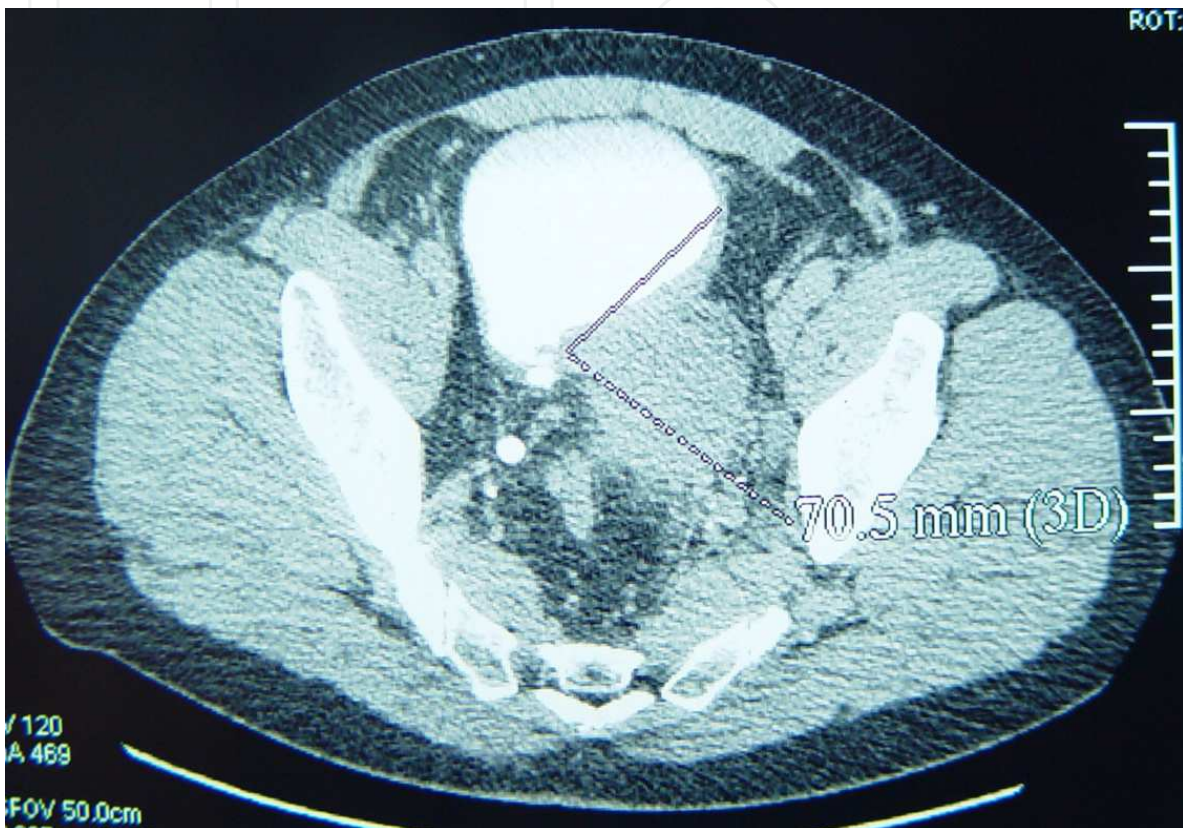

Fig. 1. Pelvic CT scan showing local recurrence with infiltration of urinary bladder

Other diagnostic methods are also available, and in some cases of crucial importance in deciding whether the patient is a candidate for curative procedure: barium enema, full lung tomography, intravenous pyelography (IVP), liver, spleen and bone scintigraphy.

Some new diagnostic tools are being evaluated, for example, carcinoembryonic antigen radioimmunodetection of colorectal cancer recurrence. It is a method compatible to CT scan and potentially can help in avoiding more invasive diagnostic methods (Hughes K 1997). Lechner et al. (Lechner, Lind et al. 1993) report an overall accuracy of 91,6% in detecting recurrent colorectal cancer, which is superior to the results that could be obtained by the means of CT scan and/or endoscopy. Also, immunoscintigraphy detected more lesions in extrahepatic areas, compared to CT scan (Lechner, Lind et al. 1993).

In ideal circumstances a diagnostic laparascopy could provide accurate information, and help in avoiding further, more invasive surgery. However, aside from its invasive nature, sometimes is very difficult to explore all areas of interest, without excessive manipulation.

When all other, non-invasive diagnostic methods fail to confirm the existence of highly possible existence of recurrent tumor, "second look" surgery is indicated.
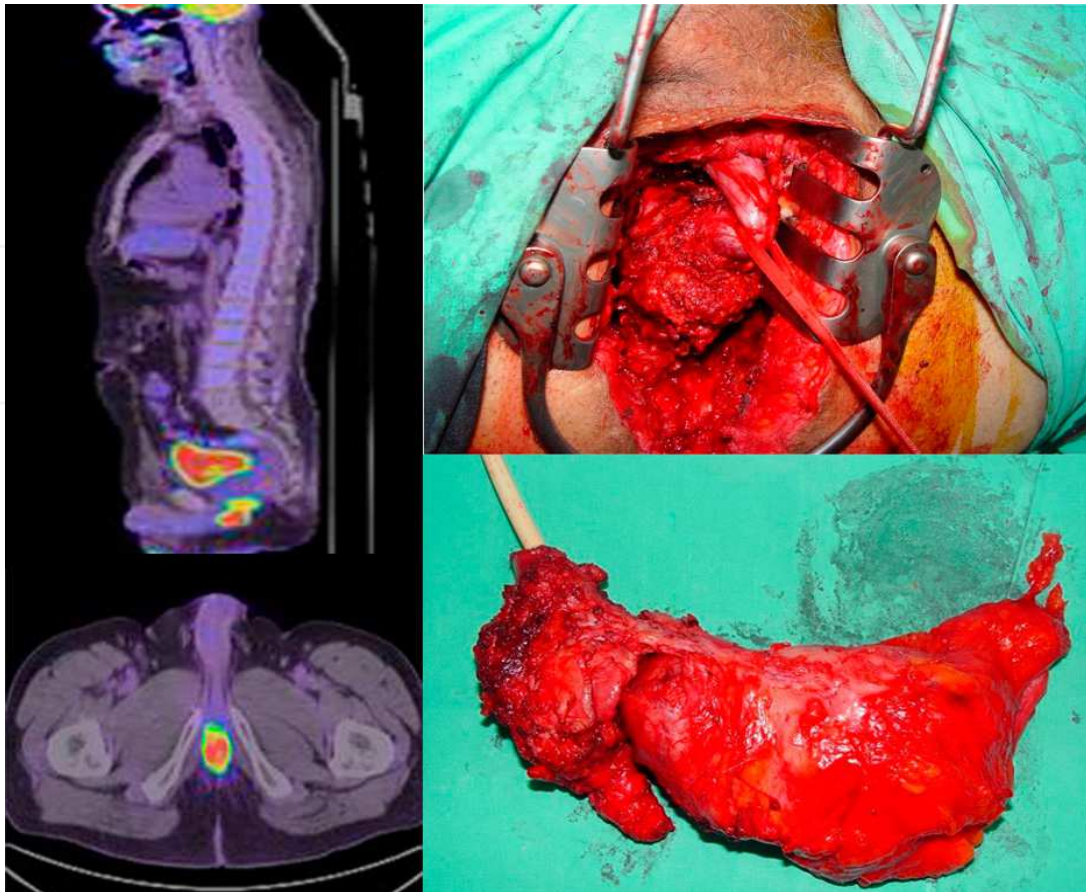
Fig. 2. PET/CT showing recurrent rectal cancer in the base of penis, imaging performed after CRT; intraoperative finding and specimen with visible recurrent tumor

5. Classification of local recurrence

Many authors have tried to classify local recurrence. The Mayo Clinic authors (Suzuki, Dozois et al. 1996) divided local recurrence in terms of level of fixation both in context of site (anterior, sacral, right, or left) and number of points of fixation (F0 non-fixed, F1 fixed to the one side, F2 two sides, and F3 three or more sides). Patients with more extensive fixation presented later and had more complications after salvage surgery and in our practice we tend to employ this classification. Others (Wanebo, Antoniuk et al. 1999) proposed a classification system based on the UICC TNM system (Sobin L (1997 5th edition)); TR 1 and2 -intraluminal local recurrence at the primary resection site; TR3-anastomotic recurrence with full thickness penetration beyond the bowel wall and into the perirectal fat tissue; TR4-invasion into adjacent organs including vagina, uterus, prostate, bladder, seminal vesicles or presacral tissues with tethering but not fixation and TR5-invasion in the bony ligamentous pelvis including sacrum, low pelvic/side walls, or sacrotuberous/ischial ligaments.
Of course, there are many other classifications, but the idea is similar to the mentioned ones.

6. Surgical management of local recurrence

Multimodal therapy is required when managing local recurrence of rectal cancer, a considerable challenge for a surgeon. Contrary to the majority of other locally recurrent tumors in the digestive system, it's possible to radically remove locally recurrent rectal cancer.

As different studies show (Tschmelitsch J 1994; Wiggers T 1996; Bozzeti F 1997) 5-year survival after reresection is 2-13 % of all patients with locally recurrent cancer, both alone and associated with distant metastases. We can say that the goals of this kind of surgery are respectively: palliation of symptoms, a good quality of life and, if possible, cure with low treatment-related complication rate.

The primary goal of surgical intervention is to achieve *en bloc* R0 resection, if it's technically feasible and safe. Radical R0 resection can be attained in 30-60% of cases.

Palliation can also be a very important goal of re-resection, preferably without extensive surgical procedures, unless disabling complications of sepsis or bleeding are an issue.

The decision for salvage surgery should be brought on the basis of:

- Patients general health-the patient should be fit enough for potentially extensive surgery.
- Necessary surgical expertise should also be available for these operations, which should be undertaken in the specialized centers were a multidisciplinary team is available (Carlsson U 1983).

The most important issue in this matter is to decide when to avoid surgical treatment. The first and most obvious contraindication for surgery is "frozen pelvis", the condition where recurrent tumor involves all structures of the minor pelvis, including the pelvic walls.

The next contraindication is clinical or CT evidence of invasion of the pelvic nerves, lymphatics or veins, or ureters bilaterally (as indicated by the presence of sciatic pattern of pain, unilateral swelling of the lower limb and bilateral hydronephosis, respectively).

Also, evidence of involvement of the lateral pelvic sidewalls and/or upper sacral marrow, above S2 level is an absolute contraindication for surgery (Bergamaschi R 2001).

Every surgical procedure begins with an explorative laparatomy. Peritoneal seeding, unexpected liver metastases and invasion of para-aoric lymph nodes are, in general, contraindications for continuing with a procedure. It is recommended to avoid injury of critical structures before the decision on resectability.

Pelvic recurrences are usually amenable to resection if they are strictly anterior or posterior. Lateral sidewall involvement diminishes a chance for R0 resection, as well as involvement of two pelvic walls simultaneously (fixation degree F2). Recurrent tumor that occurs below S2 level is amenable to resection by distal sacrectomy; unfortunately, the existence of tumor in this location usually excludes R0 resection. Similarly, unilateral tumor involvement of blood vessels distal to the aorta may be resectable, bilateral affection of these structures with the recurrent tumor is a contraindication for radical resection. When prostate or base of the bladder are minimally adherent to the recurrent tumor, and have good function it's preferable to attempt combined external-beam radio therapy (EBRT) with infusional 5-FU, followed by organ preserving resection and intra-operative radio therapy (IORT). The alternative to this is pelvic exenteration. In cases of more advanced disease and the existence of severe postoperative and postirradiational adhesions, this can't be avoided.

Another downside of surgery for recurrent rectal tumor is the problem of intestinal continuity. It's rarely possible or reasonable to create another anastomosis in that kind of surroundings which is at high risk of another relapse. In some series of patients treated for local recurrence (Salo JC 1999) even 93 % of them ended up with permanent colostomy. Nevertheless, sometimes, in highly motivated patients with favorable local findings (mucosal anastomotic recurrence), it's possible to perform a low coloanal anastomosis. To perform a low anterior resection with anastomosis, in these situations, moderate doses of preoperative EBRT and chemotherapy are needed. Unfortunately, usually, a previous low

AR is being converted to an APR, and previous APR to an abdominosacral resection or pelvic exenteration.

If at the end of resection if decided that postoperative EBRT in needed, vascular clips should be placed in the area of peritumoral fibrosis or residual tumor tissue (Gunderson LL 2002).

Extensive procedures employed in treatment of local recurrence carry significant risk. Patients suffer significant blood loss, morbidity, mortality, longer hospital stay and operative time. Postoperative complications also occur: infectious disease (sepsis, intrabdominal abscess, enteric fistula, wound infection), urinary disease (fistulous communications with other organs, stenosis, anastomotic leak), and bowel obstruction (Yamada K 2002). The incidence of complications after abdominosacral resection, for example, according to some authors, is higher than 80%. The commonest are: perineal wound complication (48%) and urinary retention/incontinence, followed by peritonitis, pneumonia, pyelonephritis, and different fistulous communications, respectively (Mannaerts G 2001).

Mortality rates after these complicated procedures are less than 5% (Bergamaschi R 2001).

7. Adjuvant therapy

It is very difficult to surgically achieve desired aim of the treatment for local recurrence i.e. clear margins of resection for reasons of non existing clear planes disrupted by previous surgery. Preoperative radiotherapy is often administered to patients with local recurrence in order to improve outcome. But since a lot of these patients already received radiotherapy prior to the initial operation; question arises on the matter of possible complications of re-irradiation of tissue within the pelvis. It is usually possible to give a further 30-40 Gy if we can exclude small bowel (Glimelius 2003). Reduction of pain and bleeding was achieved in majority of patients, whereas a response to other pelvic symptoms was not apparent. Unfortunately, the duration of effective palliation is achieved for only about one third of remaining life span of the patient (Wong, Cummings et al. 1998).

Also, complications of this mode of therapy are not to be disregarded.

In conclusion, EBRT and IORT when combined only with R0 resection improve results of therapy (Alektiar, Zelefsky et al. 2000).

Chemotherapy as a component of aggressive treatment approach is recommended, because a local relapse is a prelude of distant metastases in about 50 % of cases (Lybert Ml 1992).

8. Prognostic factors

A number of factor influence the outcome of local recurrence treatment.

Age, gender and the initial stage of primary tumor do not appear to change postresection survival rate (Salo JC 1999). Prior APR, presentation with pain, elevated CEA levels and unresectable disease are adverse factors. Completeness of resection strongly influences survival, which is significantly shorter in R2, than in R0 and R1 cases. R0 resection is, of course, in correlation with the best results.

Patients with prior APR have significantly worse prognosis than those with AR. They more frequently present with pain, elevated CEA levels, and experience longer period between primary and salvage operation. Longer period is explained with no possibility for digital examination, sigmoidoscopoy, or changes in bowel habits. Reported resectability rate after APR is 60% and after AR is 86 % (Salo JC 1999). But on the positive side, in case of resectable

disease, there is no statistically significant difference in postsalvage survival rates between APR and AR, though results after AR tend to be better (Bozzeti F 1997). As mentioned, the best results in salvage surgery are achieved after local excision when the indication for operation is unfavorable patohistological report.

In other cases, the most favorable outcome is achieved with patients who had recurrent disease within the bowel wall (Salo JC 1999).

Many attempts have been made to determine the value of prognostic predictors, for patients planned for curative salvage surgery (St. Marks group, Mayo Clinic group). So far, no consensus was made. The only predictive factor, for now, that appears to be valuable is the tumor diameter larger than 3 cm, and tumor fixation degree 2. However, it can be useful to follow the recommended tests, CEA level of 9 ng/ml, if reached in non-smokers, laparatomy is indicated even if all other tests are negative (Selvaggi, Cuocolo et al. 2003).

9. Conclusion

Recurrent rectal cancer remains considerable therapeutical problem. Without surgery acceptable quality of life or long survival are not to be expected. Salvage surgery for well selected patients is nowadays well established and offers a realistic hope for long survival and possibly cure. Even if no cure is possible, acceptable palliation of symptoms offers good quality of life for these patients.

Close follow-up and early detection of recurrence are conditions for curative salvage surgery. Advanced stage of disease may not always be a contraindication for operative treatment, providing a good surgical strategy and tactics.

Multidisciplinary approach and teamwork are ultimate conditions for success. Besides surgery, which is a dominant method of treatment other modalities of therapy, namely hemoradiotherapy, should be employed.

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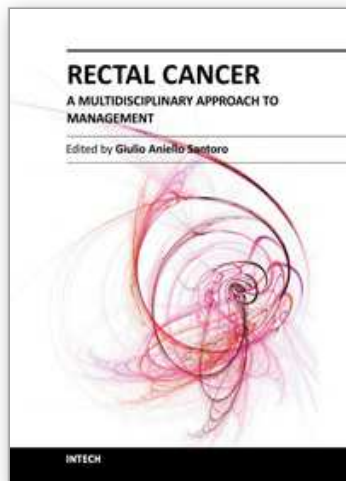
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Dramatic improvements in medicine over the last few years have resulted in more reliable and accessible diagnostics and treatment of rectal cancer. Given the complex physiopathology of this tumor, the approach should not be limited to a single specialty but should involve a number of specialties (surgery, gastroenterology, radiology, biology, oncology, radiotherapy, nuclear medicine, physiotherapy) in an integrated fashion. The subtitle of this book "A Multidisciplinary Approach to Management" encompasses this concept. We have endeavored, with the help of an international group of contributors, to provide an up-to-date and authoritative account of the management of rectal tumor.

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