

## CLINICAL STUDY

# Diagnosis and management of local and locoregional recurrence of colorectal carcinoma

(Local and Locoregional Recurrence of Colon Carcinoma)

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**Abstract:** All intraabdominal forms of recurrence of colorectal carcinoma, other than metastases in the liver, are considered a locoregional treatment failure. Maximum frequency of local recurrence of CRC occurs in the first two years following the initial potentially curative resection. Intensive follow-up in this period is therefore reasonable. It should be based on case history, clinical examination and examination of tumor markers (particularly CEA). Other examinations are indicated only for patients with abnormal findings or during normal annual check-ups.

The salvage surgery for CRC recurrence covers a large scale of surgical performances from limited local resections up to extensive surgery including pelvic exenteration and peritonectomy. The potentially curative resection (R0 and R1) of colorectal carcinoma is a sole confirmed factor that has a direct positive influence on the overall survival of patients (Fig. 5, Ref. 21). Full Text (Free, PDF) [www.bmj.sk](http://www.bmj.sk).

Key words: local and locoregional recurrence of colorectal carcinoma, locoregional recurrence of colorectal carcinoma.

As to the effectiveness of reducing the risk of local recurrence of colon and rectum carcinoma or its distant metastases, the only curative treatment is surgical resection.

A five-year survival rate is generally achieved only in 10–20 % of patients with local recurrence (Abulafi et Williams, 1994). Therefore, early diagnosis of recurrence is one of the most important factors influencing the effectiveness of management and treatment.

The local recurrence (LR) means recurrence of tumor in the original field of operation, i.e. in the site where curative surgery was performed. The field of operation in surgery of colorectal carcinoma covers: the tumor bed, anastomosis, mesenteric lymphatic system, and regional mesenterium, surgical scars, perirectal fat (mesorectum), peritoneum and neighbouring structures.

In addition to its local recurrence (10–30 %), colon and rectum carcinoma is most frequently presented by distant metastases in the liver (>30 %) and lungs (20–30 %) (Abulafi et Williams, 1994; Turk and Wanebo, 1993). Apart from metastases in the liver, all intraabdominal forms of recurrence of colorectal carcinoma are considered a locoregional treatment failure. The probable mechanism of local recurrence of colon and rectum carcinoma include non-radical excision of the tumor and lymphatic

nodes, and implantation of tumor cells to the bed of the original tumor.

LR causes morbidity that significantly impairs the patients' quality of life, and eventually may lead to exitus. According to literature data, the locoregional failure in treatment of colorectal carcinoma (CRC) represents the cause of death in almost 30 % patients (Gilbert et al, 1984). The symptoms of local recurrence of CRC include abdominal pain, bowel obstruction, perforation, hemorrhage, discharge from the rectum, as well as septic complications (Galandiuk et al, 1992). LR of colorectal carcinoma occurs in carcinomas of rectum and sigmoid colon more frequently than in other segments of colon.

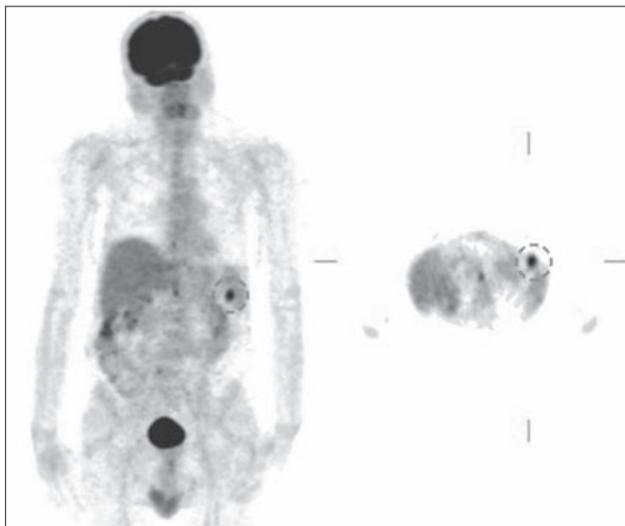
However, recurrence in these locations may be diagnosed earlier as it is accessible by digital examination and rectosigmoidoscopy, as well as due to earlier manifestation of the disease. In respect of rectum, it is determined by the limited space of the pelvis.

According to data in literature, more than 60 % of CRC recurrences occur in the first two years following the potentially curative resection (Andreola et al, 2001). Intensive follow-up in this period (in intervals of 3–6 months) is therefore reasonable.

## Methods and results

At our surgical department, the intensive follow-up of patients performed in 3-month intervals within the first two years after the potentially curative surgery for CRC is based on case history, clinical examination (abdominal, vaginal, digital) and

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**Fig. 1.** FDG-PET. Recurrence of carcinoma of colon transversum in omentum minus.

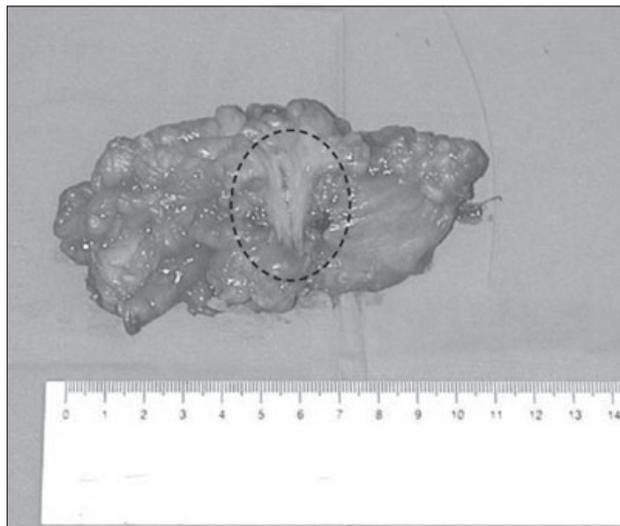
examination of tumor markers (particularly CEA). Other examinations (ERUS, US of liver, X-ray of chest, irigography, colonoscopy) are indicated only for patients with abnormal findings or during normal annual check-ups.

In case that recurrence of the colorectal carcinoma is suspected, we do not hesitate to apply the available radiologic and endoscopic examinations, as well as other diagnostic methods (see above + CT, MRI, and also FDG-PET and PET-CT) in an effort to detect recurrence at the stage of resectability. All these examinations have their pros and cons.

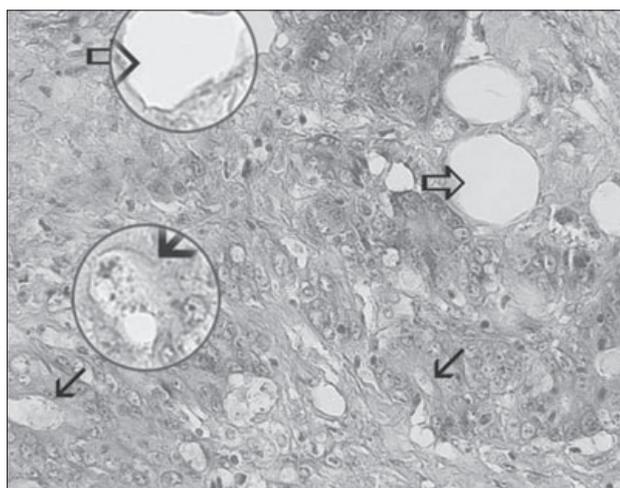
In addition to the currently available common diagnostic imaging methods, the diagnosis of asymptomatic recurrence of carcinoma of the colon is frequently based on FDG-PET or even PET-CT, which are usually indicated in the event of unexplainable repeated rise in tumor markers. Even according to our experience, they often enable the detection of recurrence of carcinoma at the stage of resectability (Figs 1, 2a and 2b).

However, by neither of these methods false positivity can be avoided. We have seen this ourselves for several times. As an example, we present the medical history of a 72-year old male who originally underwent segmental resection of the sigmoid colon due to G2 mucinous adenocarcinoma. Based on palpation, CT and PET-CT findings detected three months after the operation, we suspected an implantation metastasis in the right mesogastrium (Fig. 3). Second-look operation was performed, and we really found a pathologic resistance in mesocolon of the caecum. Macroscopically it appeared as recurrence of carcinoma (Figs 4 and 5a). However, the histologic examination eventually proved that it actually was fat tissue with pyogenic granular tissue and huge granulomatous reaction of the surrounding suture material, with no signs of tumor growth (Fig. 5b).

Explanation: The aim of first operation was to solve the sigmoid colon tumor penetrating through the entire bowel wall in the incriminated site. As it adhered to the mesocolon of the caecum, we partially resected it “en bloc” with the tumor, and the



**Fig. 2a.** Operative specimen of recurrence of carcinoma of colon transversum from omentum minus.



**Fig. 2b.** Detail of tubular formations of adenocarcinoma (thin arrows) created by atypic cells with irregular nuclei and protruding plasmasomes, in the upper part of the picture, the fat tissue cells (hollow arrows, HE, x200).

resulting defect therein was closed with individual sutures. We may add that the CEA serum levels and Ca 19-9 tumor markers were repeatedly normal.

## Discussion

Local and locoregional recurrence of colorectal carcinoma is affected by several factors that are related to the patient, primary tumor, and surgical treatment.

Patients over 50 years may already have their immunologic and nutritional conditions distorted. However, gender is generally of no prognostic importance.

In case of local recurrence, mainly the stage of primary tumor applies. The incidence rate of recurrence of carcinomas at

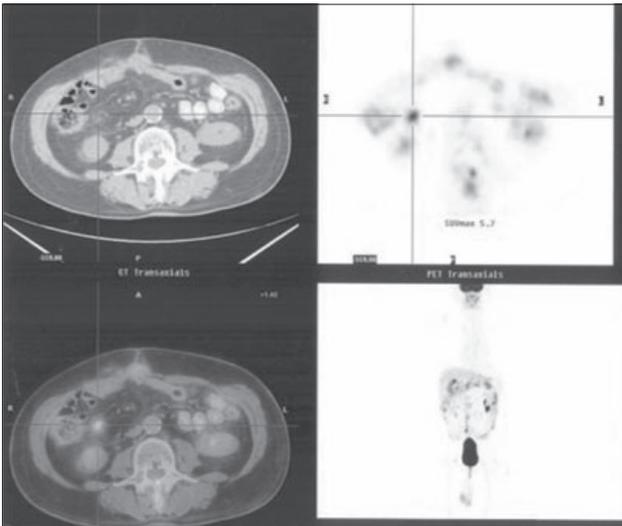


Fig. 3. PET-CT fusion. Suspected locoregional recurrence of carcinoma of colon sigmoideum in the right mesogastrium.

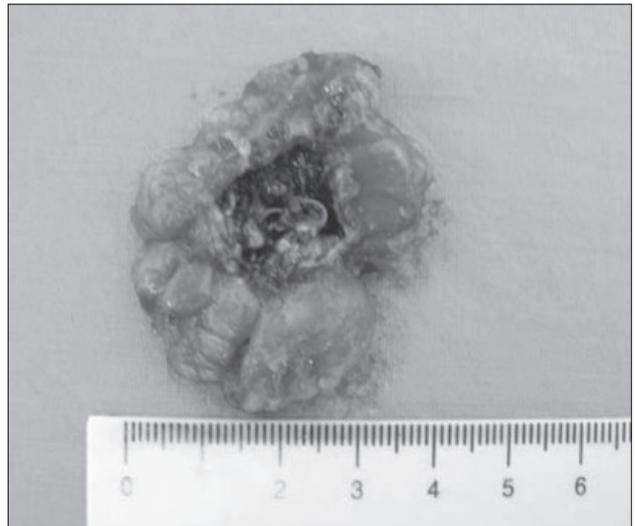


Fig. 5a. "Locoregional recurrence" of carcinoma of the colon sigmoideum in the mesocolon of caecum. Operative specimen.

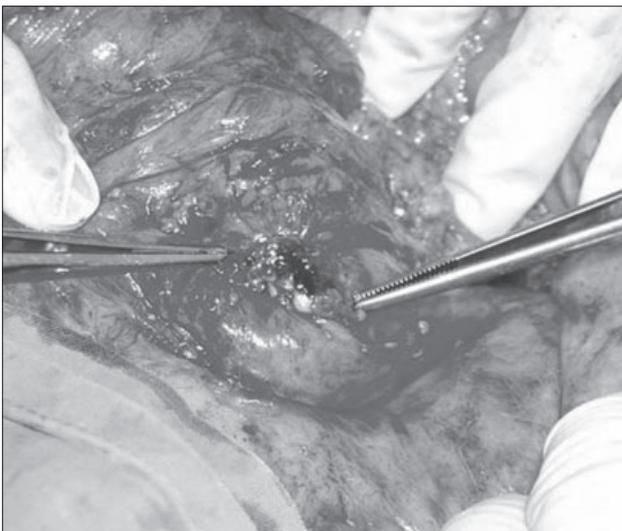


Fig. 4. "Locoregional recurrence" of carcinoma of the colon sigmoideum in the mesocolon of caecum. Intraoperative fining.

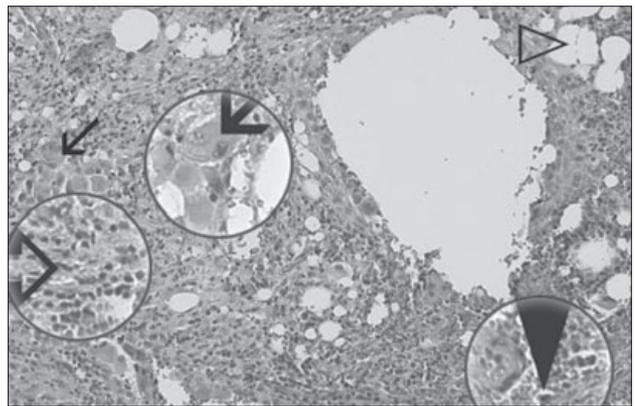


Fig. 5b. Detail of inflammation infiltrate in excision from the mesocolon. The fat is regressively changed (hollow triangle arrow) with created free fat pools. Individual elements of the histiocytes type may be clearly seen (thin arrows) or lymphocytes and plasmocytes (hollow arrows). On the right and in the low part of the figure, fresh haemorrhages (full triangle arrow). No structures of adenocarcinoma. (HE; x100).

the Dukes C stage is higher than that of carcinomas at the Dukes B stage (Kraemer et al, 2001). Other tumor specific factors include perforation of tumor and dispersal of tumor cells, increased number of tumor-infiltrated lymphatic nodes, bowel obstruction by tumor, low differentiated carcinomas with polypoid or exophytic morphology, invasion of tumorous cells into blood and lymphatic vessels, and perineural invasion (Andreola et al, 2001; Garcia-Valdecasas et al, 1991; Kraemer et al, 2001; Ueno et al, 2001).

The effect of blood transfusion on recurrence of the colorectal carcinoma has been studied for long time, but the immunosuppressive effect thereof on increased incidence rate of recurrence has not been clearly defined yet. According to several studies, there exists a potential risk of increased recurrence rate and worsened survival in patients who received perioperative blood

transfusion (Busch et al, 1993; Heiss et al, 1994; Chung et al, 1993).

However, the results of metaanalyses show that the actual causal relationship between the perioperative blood transfusion and the increased incidence of recurrence of the colon carcinoma is rather doubtful (Barillari et al, 1996; Vanvakas, 1995).

Today, it is generally accepted that the surgeon's experience and specialized training, adequate number of operations, modern surgical procedures, as well as adequate material/technical equipment of the facility have a significant influence on the results of colon and rectum carcinoma treatment, including the incidence rate of local or locoregional recurrence.

The quality of surgical treatment and recurrence of rectal carcinoma are linked together as associated vessels. Today, only

few challenge the opinion that the surgeon actually acts as a prognostic factor of colorectal carcinoma treatment. This was clearly presented by Porter et al (1998), in their multicentric study by comparing the incidence rate of local recurrence of carcinoma and the specific 5-year survival rate based on the fact whether the surgery was performed by a general or a colorectal surgeon and whether in his professional history he had performed many or few operations (Porter et al, 1998).

The incidence rate of recurrence of the colon carcinoma is given in the range of 2–28 %. The locoregional recurrence covers 3/4 cases, and the rest is represented by a combination of locoregional recurrence and distant metastases in liver and lungs (Bowne et al, 2004).

Recurrence of carcinoma of the colon most frequently occurs in the first two years following the curative resection. According to literature data, recurrence appearing during the latter period accounts for more than 60 % of the total volume of recurrences. Early diagnosis of asymptomatic recurrence, usually based on follow-ups, results in an achievement of 5-yr survival in 30–70 % patients who underwent additional potentially curative resection (Minton et al, 1985; Vassilopoulos et al, 1981).

According to location, four forms of locoregional recurrence in the colon are distinguished:

- perianastomotic,
- mesenteric,
- retroperitoneal,
- peritoneal (dissemination).

The most frequent is the perianastomotic local recurrence and the rarest is the retroperitoneal recurrence. Although the recurrence of colon carcinoma is less frequent than that of rectal carcinoma, it also represents a serious problem. The task and scope of surgical treatment have not been clearly determined so far. R0 resection of recurrence allows achieving the best results in long-term survival of patients. Advanced stage of primary carcinoma and old-aged patients (>75 years) are considered as adverse prognostic factors for survival in patients with colon carcinoma recurrence. The salvage surgery is less probable when mesenteric lymphatic nodes are attacked and there are numerous foci of locoregional recurrence (Bowne et al, 2004).

CEA still remains to be the most important biologic serum tumor marker, and the rise thereof in a group of otherwise asymptomatic patients suggests a recurrence rate of 55–95 % (McCall et al, 1994).

The management of local colorectal carcinoma recurrence is focused on diagnosing the lesions at a stage when radical surgical resection may be performed in order to achieve utmost prolongation of survival of patients. According to the data in literature, radical resection of colorectal carcinoma recurrence may be carried out in 5–47 % cases, of which five-year survival rate is achieved in 5–30 % of patients (Yamada et al, 2001; Polland et al, 1989).

The benefits of radical resection of recurrence in the last period have been augmented by the so-called radioimmuno-guided surgery (i.e. an operation based on a finding from FDG-PET in combination with other imaging methods) (Heriot et al, 2004).

However, the above example documents that similar to other imaging methods, FDG-PET and PET-CT show a particular percentage of false positivity. At the same time, it confirms the importance and value of monitoring the tumor markers for the prediction of colon carcinoma recurrence in followed patients.

## Conclusions

Local and locoregional recurrence of colorectal carcinoma represents a serious problem. Early diagnosis at a stage when radical surgery may be performed brings the best results in the survival rate of patients. CEA remains to be the most important biologic serum marker, and its rise in a group of otherwise asymptomatic patients suggests a high probability of recurrence of the disease. Modern diagnostic imaging methods especially FDG-PET or even PET-CT are useful in cases of unexplained repeated rise of tumor markers. However, similar to other imaging methods, they have a particular percentage of false positivity.

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Received January 27, 2009.

Accepted May 28, 2009.