

STENTING AND DECOMPRESSION IN OBSTRUCTIVE COLORECTAL CANCER - IS THIS A REAL ADVANCE IN THE MODERN COLOPROCTOLOGY?

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ABSTRACT

The aim of the study is stenting and decompression (non-operatively and operatively) in case of obstructive colorectal cancer and if they are really an advance in the modern coloproctology. The stenting as palliation is effective in 90% of the cases and most patients have no obstruction until they die from the metastatic disease. The stenting is attractive and alternative method for colonic decompression for obstructive colorectal cancer (CRC), which helps the bowel preparation for further planned oncological resection. The stenting is useful for high-risk patients and candidates for laparoscopic resection. The emergency surgery is avoided in 94% of the patients. The stents can be used for protection of colorectal anastomoses, avoidance of stenosis after mucous resection, the optimization of treatment allowed for planned laparoscopic resections. The complications after stenting of the colon are: migration 11%, perforation 4.5%, tumor ingrowth 12%; the clinical success was 85% to 100%, mortality from 0% to 2%, primary perforation 0%, mortality after re-stenting 5%. Primary stenting followed by surgery is the future. Preoperative stenting may benefit the postoperative results after the consecutive surgery. The aim is to establish the cases in which stenting improves the course of the disease in comparison to emergency surgery. Today stenting and decompression of obstructive colorectal cancer are seen as huge advance in the modern coloproctology.

Key words: colonic stent, colorectal cancer obstruction, colorectal cancer, emergency surgery, minimally invasive surgery

The colorectal cancer is the third most frequent neoplastic disease worldwide. The colonic cancer is more frequent than the rectal: in the high-risk populations the proportion is 2:1, as in the low-risk countries it is approximately 1:1. In Europe alone 250 000 new cases of colorectal cancer are diagnosed yearly - about 9% of all neoplastic diseases. The incidence is increasing with urbanization and industrialization and is less frequent in Western and Northern Europe in comparison to Eastern and Southern Europe (25).

Generally the incidence rate is increasing in countries where the overall risk of colonic cancer is low, as in the countries with high risk it has stabilized and the morbidity is decreasing, especially in younger groups.

Approximately 70% of the patients with colonic cancer are over 65 years of age and it is very rare under 45 years of age (2/100 000 yearly) (25).

The overall rate of the cases with rectal cancer in the European Union is about 35% of all colorectal cancer cases,

15-25/100 000 yearly. The mortality is 4-10/100 000 yearly and is lower for the female gender (2010) (25).

The aim of the study is stenting and decompression (non-operatively and operatively) in case of obstructive colorectal cancer and if they are really an advance in the modern coloproctology.

The self-expandable stents are applied in the following cases:

1. For palliative procedures for incurable patients - 25% of the patients have incurable metastatic disease on the first examination. The aim is to overcome the obstruction and to alleviate the pain-syndrome, for which the stenting is the ideal non-invasive procedure.

The stenting as palliation is effective in 90% of the cases and most patients have no obstruction until they die from the metastatic disease (14).

The advantages are avoidance of surgery, significantly lower mortality and morbidity, avoidance of ostomy (14). From 169 patients (from 1999 to 2006) with malignant obstruction 160 patients were stented. 95% of the obstructions were resolved only this way. In the palliative group the stents were placed for 45 days or until complications occur (Mayo Clinic).

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More than 7% of the patients with colorectal cancer develop complications as local tumor growth in the course of their treatment. The obstruction from recurrence of the local disease can develop on the place of resection and in patients in IVth stage, treated non-operatively by chemo- and radiotherapy.

The stenting is attractive and alternative method for colonic decompression for obstructive colorectal cancer (CRC), which helps the bowel preparation for further planned oncological resection. The stenting is useful for high-risk patients and candidates for laparoscopic resection. The emergency surgery is avoided in 94% of the patients.

Perforation due to stenting is a problem due to the peritoneal contamination (dissemination) of tumor cells.

34 patients with CRC have been studied, who are compared to 15 extra-colonic cancers in the pelvis - 94% vs 20% was the success rate in stenting for CRC and extra-colonic pelvic tumors. 5% of the extra-colonic cancer developed at least one complication. Worst results were achieved in the group with extra-colonic tumors and radiotherapy remains a predictor of complications in case of CRC (4).

The stenting as palliation in case of IVth stage CRC - 233 patients with synchronous metastases from CRC and unresected primary tumor have been treated with Oxaliplatin or Irinotecan with triple chemotherapy with or without Bevacizumab on their first treatment. 16 patients (7%) have been successfully operated for exacerbation or perforation of the primary tumor; 47 patients (20%) underwent planned colonic resection and metastasectomy. The chemotherapy and number of complications after palliative stenting is a matter of discussion (4).

The complications are more frequent after Bevacizumab - with and without - 35% and 25%, respectively. It increases the risk of perforation three times after stenting and 25% for late complications. From 130 patients with malignant obstruction 101 were suitable for palliation - the success rate was 88% for the first stent and 9% for the second one. The rate of complication was 20% and that of migration - 20% (4).

In a study of 168 patients stented as palliation quick effect was observed in 96.4%, 41 (24.4%) suffered late complications - perforation 9%, occlusion 9%, migration 5%, erosion or ulceration 2% (E. Bonin et al.).

In patients with lower obstructions the results were better (4).

In another study of 123 patients on 50 of them was placed a stent - less complications were observed, 0% deceased, the postoperative lethality of 73 patients was 8.5% (4).

There is no ideal non-invasive method for malignant colonic obstruction (E. Bonin et al.).

The stents can be used for protection of colorectal anastomoses, avoidance of stenosis after mucous resection, the optimization of treatment allowed for planned laparoscopic resections (4).

The complications after stenting of the colon are: migration 11%, perforation 4.5%, tumor ingrowth 12%; the clinical success was 85% to 100%, mortality from 0% to 2%, primary perforation 0%, mortality after re-stenting 5%. The limited number of studies (with small number of patients, non-randomized) show decrease of morbidity, mortality

and rate of colostomies. It is considered that the tumor perforation to the colonic wall may lead to dissemination of tumor cells which may change the stage from curable to incurable disease. Randomized study compared the effect of preoperative stenting vs. emergency surgery for acute malignant left-colon obstruction. In Netherlands were studied 25 hospitals (2007-2009) with 98 patients, of which 47 were stented and 51 underwent emergency surgery. Attention deserves the high level of perforation - about 20% (9 of 47 patients), described in the stented group (median 5% described in past studies) (16).

The stent as palliation requires definition of the risk and benefits:

- may cause necrosis due to pressure;
- may perforate the colonic wall;
- migration;
- late complications, which are expected.

The palliative surgery can be used with certainty, especially in the absence of ascites, because the postoperative results are clear - no morbidity and mortality is observed (10).

2. As "bridge to surgery" for patients with potentially respectable disease (obstructive colorectal cancer). The first step is emergency stenting with quick decompression of the colon with following planned resection of the colon with primary anastomosis.

In a non-randomized study the stenting with laparoscopic resection is compared with single stage emergency open surgery with intraoperative lavage of the colon; 25 days after stenting the primary anastomosis was achieved in all patients and colostomy was performed only on one patient. The postoperative complications in the stented group was 5.9% vs. 31.4% ($p < 0.034$) (4).

In acute malignant obstruction of the right colon the stent has low contribution, because right hemicolectomy is possible even in unprepared bowel with ileo-coloanastomosis, but the stenting allows for planned surgery even in high-risk patients (4).

Retrospectively 35 patients with malignant obstruction of the left colon and resection after stenting were compared to 350 planned operations for non-obstructive cancer of the left colon. No perforation was observed in the stented patients, as well difference in the clinico-pathological characteristics. The stenting decreases the 5-year survival - 38.4% vs. 58.6% and the 5-year disease free survival - 48.3% vs. 75.5%. Nowadays no difference is observed after preoperative stenting considering the oncological results (4).

In two publications about stenting the results are as follows: in the first - 29 series of patients with 598 patients and the second - 54 studies with 1198 patients. The rate of technical failure was high in case of malignant obstruction of colon descendens and the proximal segments of the colon in comparison to the rectosigmoid colon. The lethality was 0.6% (7 patients), mostly related to perforation; 6 patients were in the palliative group (22).

Unlike the randomized study from Netherlands for patients with incurable CRC, the study was canceled due to four late perforations due to the stent and three deceased patients out of 10.

The stenting is used as bridge to planned surgery and alternative to the emergency surgery, although the advantages of this method are not certain (25 hospitals in Netherland), especially because of the risk of tumor dissemination, caused by perforation (12).

A comparison between stenting as bridge to surgery vs. emergency surgery observed that lethality is two to three times higher in patient group with emergency surgery, but this is not statistically significant (small number of cases). The lethality in the group with emergency surgery is 12.1%, as after stenting it is 5.7% (22).

Stenting (30 patients) and emergency surgery (31 patients) were compared in non-resectable obstructive cancer distally from the lineal flexure of the colon with equal age, gender and comorbidity. The stenting was successful in 29 out of 30 patients, lethality after stenting and surgery was 4% and 8%, respectively. In intensive care units the proportion was 1:11 respectively, the median hospital stay was 4:8, respectively, ostomy in 4:15 patients, respectively, the median survival in both groups was insignificant - 107:111 days, respectively (14).

The advantages of stenting are the quick decompression of the colon, the creation of wide lumen, benefits are observed in preoperative preparation and palliative therapy (12).

In stenting as first step to definitive surgery the aim is to change the emergency to planned surgery.

The stenting has characteristic complications: failure 0-20%, perforation 0-13%, migration 0-20%, incomplete resolving of the obstruction 0-29%, early reobstruction with constipation 0-16%, worst results than those without obstruction (17).

The stent leads to better clinical status, seems to decrease lethality, morbidity, the number of colostomy in uncontrolled studies.

The stenting allows correct staging of the disease, avoids surgery in patients with disseminated disease or in those with very advanced primary cancer - in this case the stenting comes as a permanent palliation.

The last is safer, easier, better liquids-food status of the patient in case of undilated colon. The stenting allows staging of the disease and in incurable patients with proven inresectability they remain stented (5,11).

The stenting is contraindicated in peritonitis or perforation, low rectal lesions or lack of obstruction.

Endoluminal and minimally invasive procedures can replace the large volume aggressive surgery (21,9).

Stenting with flexible endoscope or under radioscopic control, performed by endoscopist-surgeon in the future, is perspective.

At least dozen stents are available, which supposes that the ideal device is not yet designed. The stents without coating cannot be easily extracted and therefore are not prone to migration. In contrast - the coated stents migrate easily and end up in the rectum after few weeks after their placement. The aim of the endoluminal stenting is to convert the emergency surgery to elective surgery with intention to treat. Overcoming the obstruction by stenting allows for fluid-electrolyte resuscitation, mechanical bowel preparation, performance of endoscopy before operation and endo-

scopic biopsy when the stent is placed (where the procedure is available).

This technique provides the possibility to discuss new and better treatment of the malignant colonic obstruction (4).

The stenting offers no significant benefits over emergency surgery and may be an alternative although it is not clear how to use it in many cases, due to the risk of tumor dissemination, caused by perforation (12).

Surgery is planned 5 to 14 days after stenting and no later than 4 weeks after stenting (12).

The stents are minimally invasive option; they result in quick and effective colonic decompression and allows the bowel to be prepared for oncological resection. This method is the best choice for high-risk patients and candidates for laparoscopic resection with complete obstruction, because it helps to avoid emergency surgery in 90% of the patients (4,21).

The advances are seen in case of inresectable and disseminated colonic cancer - clearly proven step ahead for temporary colonic decompression in case of potentially radical surgery for colorectal cancer and before definitive surgery. This attractive method is known as "bridge to surgery" is moderately accepted by the surgeons (9).

Primary stenting followed by surgery is the future. Preoperative stenting may benefit the postoperative results after the consecutive surgery. The aim is to establish the cases in which stenting improves the course of the disease in comparison to emergency surgery (9).

The complete obstruction is a risk factor for complications - more difficult decompression than in case of incomplete obturation. Therefore the patient's condition is not the optimal for surgery. This leads to more frequent anastomotic leakage if ostomy is not performed.

It seems that "stenting and single-stage surgery without ostomy in case of obstructive left cancer are the ideal and safe standard" (21).

In case of malignant colonic obstruction remains the question if stenting is really an advance or it deprives the laparoscopic surgeon of work. It is reasonable to study stenting vs. laparoscopic surgery. The theoretical advantages comply with the paradigm for minimally aggressive surgery (21). The laparoscopic colectomy is an effective and radical treatment for colorectal cancer (9,21).

From 1990 Matatoshi Dohmoto, encouraged by the success of stents in other locations, such as esophagus, billiary ducts, is the pioneer in application of stents in case of colonic obstruction.

Today stenting and decompression of obstructive colorectal cancer are seen as huge advance in the modern coloproctology.

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