Anastomotic leak after anterior rectal resection for cancer is one of the most dangerous complications of the procedure. Protective stomy is a way to avoid life-threatening consequences of this complication. The procedure is still under evaluation.

The aim of the study was to evaluate the usefulness of forming a protective stomy as part of anterior rectal cancer resection on the basis of an analysis of the authors' material.

**Material and methods.** In 2008 – 2009, we treated 111 patients with rectal cancer. Thirty-two of those patients received preoperative radio(chemo)therapy. Eighty-four patients (76%) underwent resection of the primary tumour. In 20 patients (24%), we performed abdominoperineal or abdominosacral resection; in 6 (7%) cases the Hartmann procedure was used and in 58 (69%) cases anterior rectal resection was performed. In 53 of 58 cases, the resections were assessed as curative and in 5 as palliative. In 18 of 58 (31%) patients, anterior resections were defined as low anterior resections. Twelve (67%) of these patients were subjected to preoperative radio(chemo)therapy. Two of 58 patients, who underwent anterior resection, had been treated by stomy creation before the radical procedure. One of them required neoadjuvant radiotherapy. In the second patient with the stomy, we restored the intestinal continuity during the primary tumour resection. Among the remaining 40 patients, only one underwent protective stomy creation during the resective procedure. This patient did not require preoperative radiotherapy.

**Results.** We have not found any clinical indications of anastomotic leak in the analysed group of 58 patients subjected to anterior rectal resection for cancer.

**Conclusions.** Our modest experience reaffirms our conviction that anterior rectal cancer resection does not require routine protective stomy creation, also when low anterior resection follows preoperative radiotherapy.

**Key words:** rectal cancer, defunctioning stoma

The first colostomy operations performed to relieve cancer-related intestinal obstruction date back to late 18th century (1). Since that time, the idea of forming a stomy as a way to decompress the dilated intestine, change the direction of stools passage and relieve the distal colon still remains valid. One of the indications for ileo- or colostomy is low anterior rectal resection for cancer (2). Patients with a tumour positioned in the 1/3 lower or middle part of the rectum usually receive preoperative radio(chemo)therapy, which affects the quality of tissues in the operative field (3, 4). The main complications of anterior rectal resection include anastomotic leak which occurs in up to 26% of cases (2, 5). Temporary relieving stomy favours healing of the pelvic anastomosis. It reduces the risk of clinically serious leak.
Protective stomy as a complement to anterior rectal resection

symptoms, although it has no effect on the leak incidence. Furthermore, temporary stomy reduces perioperative mortality risk (6, 7, 8). Since the stomy is sometimes a source of complications and unpleasant sequelae, affecting the quality of life, a decision on the necessity for stomy creation is usually left at the surgeon’s discretion (9, 10, 11). Many authors recommend routine stomy creation with low anastomoses (7, 8, 12, 13). The basic factors which contribute to the decision on stomy creation during anterior rectal resection are poor general clinical status of the patient, low tumour location in the pelvis and long duration of surgery (2, 12). Because in the Oncologic Surgery Department of the Gdynia Centre of Oncology we exceptionally rarely consider stomy creation during anterior rectal resection, we decided to evaluate the usefulness of this procedure on the basis of an analysis of our patients.

MATERIAL AND METHODS

In 2008-2009, 111 patients with rectal cancer underwent surgery in the Oncologic Surgery Department of the Gdynia Centre of Oncology. They were patients with a tumour located within 20 cm from the rectal margin or slightly more than 20 cm from the rectal margin if the anastomosis after tumour resection was below the peritoneal reflection. Eighty-four patients (76%) underwent resection of the primary tumour. Thirty-two of those patients received preoperative “long” radio(chemo)therapy (45-54 Gy in 2Gy fractions) or “short” radiotherapy (5 x 5 Gy). Among the patients whose tumour was resected, in 20 (24%) cases the Miles procedure was used and in 6 (7%) cases the Hartmann procedure was used. In 58 (69%) patients, anterior rectal resection was performed. Routinely, the distal stump was closed with the use of a linear stapler and anastomosis was performed with the use of a circular stapler introduced from the anus. Only exceptionally, as in the case of an easily accessible stump in the pelvis below the tumour or after a faulty use of a linear stapler, the distal stump was closed manually, with a purse-string suture. In 6 patients, a faeces reservoir was formed by the J-pouch method or with “side to end” anastomosis, leaving a colon stump ca 4 cm in length beyond the anastomosis. The presence of colonic diverticula favoured a decision on manual creation of the anastomosis, usually of the “side to end” variation.

Fifty-three of 58 anterior resections were curative. In 5 patients they were performed with palliative intent, following the rules as in the case of a radical operation. In the group of 58 patients undergoing anterior resection, in 18 (31%) cases the tumour was located less than 8 cm from the anal margin. In these patients the anastomosis was always located below the peritoneal reflection and the procedure was defined as low anterior resection. In 40 (69%) patients, the tumour was located more than 8 cm from the anal margin. In 12 of these 18 patients (67%) subjected to low anterior resection, preoperative radio(chemo)therapy was used (in two cases it was classified as “short” and in ten cases as “long”). Two of 58 patients, who underwent anterior resection, had been treated by stomy creation before surgical treatment of the primary tumour. In a female patient, stomy was formed before “short” radiotherapy preceding low anterior resection. The stomy was reversed after 6 months. In a patient with stage IV disease, with a tumour located 18 cm from the anal margin, anterior resection was performed along with reversal of sigmoid stomy formed before initiation of chemotherapy. During this concurrent operation, also thermal ablation of hepatic metastases was performed. This patient was not treated by radiotherapy.

In the group of patients with the tumour located > 8 cm from the anal margin who underwent anterior resection (n=40), only in 1 stomy was formed during this operation, as a reaction to an intraoperatively-diagnosed anastomotic leak. In this patient, radiotherapy was not used. Each intraoperative leak test involved air insufflation through a drain introduced through the anus to the anastomosis area and observation of the potential gas leak from the operative field filled with a liquid. The leak site was sutured manually. There were more incidents of intraoperative detection of a leak in the anastomosis, not only in the patient in whom stomy was formed concomitantly with tumour resection. The leak sites were sutured until a retest with air indicated anastomosis integrity. If an attempt of closing the leak site failed, repeated anastomosis performance was considered. When this option
was not selected, abdominoperineal or abdominosacral resection or Hartmann procedure was performed.

RESULTS

We have not found any clinical indications of an anastomotic leak postoperatively in any of 56 patients subjected to anterior rectal resection without stomy (including the female patient who died on day 4 due to cardiac complications). The median duration of postoperative hospitalization was 5 days (tab. 1).

DISCUSSION

A leak in an anastomosis after anterior rectal resection for cancer worsens the prognosis and increases the postoperative mortality risk and the risk for permanent stomy creation (2, 7, 11, 14). It is emphasised in the literature that leaks may be found even in a perfect anastomosis (7, 11). Despite the progress in surgical techniques supported more and more sophisticated equipment, we still cannot indicate a specific method which would be preferable in prophylaxis of anastomotic leaks after anterior rectal resection (2, 7). The risk of leak in an anastomosis made mechanically, with the use of staplers, is comparable to the risk observed after manual anastomosis (15). Almost all anastomoses in our material were made mechanically.

We operated on patients who underwent intestinal cleansing on the day preceding the surgery. In randomised studies, this preparatory procedure was not found to have any effect on the anastomotic leak incidence (16). However, it is sometimes recommended before low anterior rectal resection procedure (11, 12). Preoperative radiotherapy was found to favour complications in the anastomosis, and that is why some authors recommend routine intestinal stomy creation in patients after neoadjuvant radiotherapy (3). Preoperative radiotherapy was used in almost 2/3 of our patients who underwent low anterior resection without stomy creation. Despite this procedure, we did not observe any clinically overt leak symptoms. Clinical studies do not reveal a correlation between drainage of the anastomosis area and the risk of leak (17). We have always left a drain in pelvis minor near the anastomosis and removed it usually two days after the operation. We believe that, apart from removing the excess of liquid masses mixed with extravasated blood from pelvis minor, the drainage allows to effectively recognise consequences of such phenomena as ureter cut or a rapidly increasing haematoma. Literature reports consistently emphasise the usefulness of intraoperative leak tests of the anastomosis, e.g. by air insufflation into the intestines, which we adopted in our Department (2, 18).

As shown by clinical trials, intraoperative suturing of the leak site diagnosed in the air leak test favours clinically manifested leak in the anastomosis in the perioperative period (18). On multiple occasions, we manually closed leaking anastomoses with manual sutures and no clinically overt leak occurred afterwards. If the operating surgeon was unable to close the leak site detected in the air test, Hartmann procedure or abdominoperineal or abdominosacral resection was performed in these cases, because creating a second anastomosis at the same site was difficult or associated with risk of tension within the anastomosis. We always use our best effort to create the anastomosis without tension of the walls of the anastomosed intestine. The incidence of abdominoperineal or abdominosacral resections or Hartmann resections in our Department

<table>
<thead>
<tr>
<th>Tested characteristic</th>
<th>mean</th>
<th>median</th>
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<tbody>
<tr>
<td>Age (31 – 89 lat / years)</td>
<td>mean 64.8</td>
<td>median 66</td>
</tr>
<tr>
<td>Sex</td>
<td>women n=24 (41%)</td>
<td>men n=34 (59%)</td>
</tr>
<tr>
<td>BMI</td>
<td>mean 28 kg/m²</td>
<td>median 28 kg/m²</td>
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<tr>
<td>pTNM staging (I- IV)</td>
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<td>II – n=18</td>
</tr>
<tr>
<td>Grading (G1-G3)</td>
<td>G1 – n=4</td>
<td>G2 – n=48</td>
</tr>
<tr>
<td>Number of lymph nodes per specimen</td>
<td>mean 11.6</td>
<td>median 10</td>
</tr>
<tr>
<td>Length of hospitalisation (n=57; 4-13 days)</td>
<td>mean 5,9 days</td>
<td>median 5 days</td>
</tr>
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does not negatively differ from the incidence of these operations at colorectal surgery centres (5, 19, 20). We divided our patient group into those with a tumour located up to 8 cm from the anal margin (n=18) and those with the tumour located >8 cm from the anal margin (n=40). If we assume, as other authors, that low anterior rectal resection is an operation with anastomosis creation in the retroperitoneal part of the rectum (11), most of anterior resections in our material can be classified as such.

As demonstrated by systematic reviews of randomised studies, creation of a relieving stomy during low anterior resection has no effect on perioperative mortality. However, in the cases with clinically overt leak, perioperative mortality was lower among patients after low anterior resection with stomy (11, 14). We observed one death on day 4 post surgery due to myocardial infarction which occurred on day 2 in a 80-year-old female patient, but we did not found any signs of an anastomotic leak in this patient either intaroperatively or in the four-day follow-up period.

We have never used any of the available methods of strengthening and/or temporary protection of the anastomotic line (5, 21). We have always attempted to wrap the anastomosis area in an omentum major flap naturally positioned in the pelvis after surgical creation of such a flap with the appropriate length so as to ensure that it can be extended to pelvis minor.

In the prophylaxis of sequelae and complications of anastomotic leak, relieving stomy can be successfully formed both on the ileum and on the colon, because none of these methods was unequivocally demonstrated to be superior to the other (6, 7, 22). We formed one ileostomy by laparoscopy and two colostomies (one of them we reversed concomitantly with tumour resection) before the main operation. Some authors believe that it is still unclear whether prophylactic creation of a relieving stomy has an actual effect on the incidence of anastomotic leaks in the rectum (7). As shown by a systematic review of randomised studies with respect to the outcomes of low anterior resection, relieving stomy creation favours lower risk of a clinically manifested leak but the authors emphasise heterogeneity of the studies analysed (11). Some authors indicate benefits from stomy creation in view of lower morbidity in patients with expected anastomotic complications. However, these benefits are not so unequivocal because stomy lowers quality of life of those patients who would not have experienced any complications. Stomy creation is also associated with a mortality risk, including the risk of fatal complications mainly related to stomy reversal (9, 23). Stomy reversal means an additional hospitalisation and yet another surgical intervention which has an associated cost (6, 7). However, on the basis of clinical observations it is believed that relieving stomy favours lowering of the risk of reoperation for leak post low anterior resection, which is fairly dangerous for the patient (6, 8, 11, 18). Our modest experience reaffirms our conviction that relieving stomy should not be routinely formed after anterior rectal resection, also in the case of low anterior resection in patients who received preoperative radiotherapy.

REFERENCES


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Adress correspondence: 81-519 Gdynia, ul. Powstania Styczniowego 1