Straight and colonic J-Pouch reconstruction after low anterior resection

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Purpose: A complication after restorative rectal surgery with a straight anastomosis is low-anterior resection syndrome with a postoperatively deteriorated anorectal function. The colonic J-reservoir is sometimes used with the purpose of reducing these symptoms. An alternative method is to use a simple side-to-end anastomosis or a coloplasty. Material and Methods: Three-hundred fiftyseven patients with rectal cancer undergoing total mesorectal excision (TME). Three-hundred (84.0%) received a low anterior resection with primary anastomosis and colo-rectal anastomosis n=194 (64.6%) or colo-anal anastomosis n=106 (35.3%). A colonic pouch using the descending colon was created in 24 patients and in 75 patients respectively. Surgical results and complications were recorded. Patients were followed with a functional evaluation at 6 and 12 months postoperatively. Results: Patient characteristics in both groups were very similar regarding gender, age, tumor level, and Dukes’ stages. A large proportion of the patients received short-term preoperative radiotherapy (72%). There was no significant difference in surgical outcome between the 2 techniques with respect to anastomotic height, perioperative blood loss, postoperative complications, hospital stay or pelvic sepsis rates except the anastomotic stricture rate in the colonic J-Pouch group after coloanal anastomosis (p<0.02).

Conclusions: These data show that either a colonic J-pouch or a straight anastomosis performed on the descending colon in low-anterior resection with TME are methods that can be used with similar expected surgical and functional results.

Key words: rectal cancer, anterior resection, colo-anal anastomosis, colonic pouch

INTRODUCTION

More than 40,000 cases of rectal cancer occur annually in the United States, and more than 50,000 cases in Europe. Approximately 5 to 30% of these patients will go on for recurrence after curative resection. Thus rectal cancer has become a very common malignancy. Abdominoperineal resection (APR) was previously considered the method of choice in surgery for tumors in the lower third of the rectum. The surgical management of rectal cancer is now at an exciting stage. Resection of the primary tumor, sphincter preservation and the retention of sexual function has received a great deal of attention. The introduction of total mesorectal excision (TME) in tumors of the middle and lower third of the rectum results in low anastomoses with good oncological results. But anterior resections (AR) of mid and low rectal tumors were often reconstructed with a straight coloanal anastomosis. Unfortunately, many of these patients suffer from the Anterior Resection Syndrome. The use of a colonic reservoir or pouch to mitigate these symptoms was described in 1986. Various clinical trials have demonstrated that a J-pouch appeared to have better functional outcomes and it is not at an increased risk of anastomotic complications when compared to a straight coloanal anastomosis. The initially described J-Pouch reservoir was approximately 8-12 cm long, formed on the descending or sigmoid colon. Now the recommended size of the reservoir has successively decreased to about 5-6 cm. Approximately 25% of these patients are not suitable for a colonic J-pouch because of a obesity or narrow pelvis. There are two approaches. An 8 to 10 cm long antimesenteric colotomy is initiated 5 cm from the cut end of the descending colon and extended proximally. The colotomy is closed in a transverse direction and an end to end anastomosis is then performed.

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MATERIALS AND METHODS

From October 1994 to April 2003, a total of 357 rectal cancer patients were treated at the University Clinic of Surgery, General Hospital of Vienna. 163 of the patients had the tumor situated in the lower third of the rectum (45.6%), while 122 cases were located in the middle third (34.5%) and another 71 (19.9%) in the upper third. 274 patients with rectal cancer with no demonstrable metastatic disease (as determined from computed tomography scan or magnetic resonance imaging of the abdomen and plain chest x-rays) were treated with a low-anterior resection. 83 patients suffered from metastatic disease in the liver. Liver resection was performed either synchron (68%) or metachron (32%). Data were analyzed according to the intention-to-treat principle. A standardized rectal resection using TME was conducted, implying sharp dissection in avascular planes down to the pelvic floor. The rectum was divided at the pelvic floor or at a lower level. The inferior mesenteric artery was routinely ligated close to the aorta, the splenic flexure mobilized and the descending colon was transected. A low anterior resection with primary anastomosis was performed in 300 patients (84%) including 33 patients with intersphincteric resection. 99 patients (33%) with primary anastomosis received a J-Pouch. A colorectal anastomosis with pouch was performed in 24 patients (12.4%) whereas a coloanal anastomosis with pouch was done in 75 patients (70.8%). The J-pouch was constructed with a linear GIA 90 stapler introduced trough the apex. The obtained pouch size using this instrument is 8 cm as measured by the vertical staple line. Primary defunctioning stoma was used in 71 patients (36.5%) with colorectal anastomosis and in 103 patients (97%) with coloanal anastomosis. In the pouch group it was given as a short-term regimen (5 Gy for 5 days) in 50 patients with surgery in the following week. 13 patients received chemoradiation with 50 Gy whereas in 36 cases no preoperative treatment was given. 41 patients were treated with APR (11.5%) and in 16 cases (4.7%) a Hartmann procedure was performed. Nonparametric statistics have been used to compare the 2 groups. The Mann-Whitney U test and Fisher exact test was used as appropriate. A value of \( P < 0.05 \) was considered significant.

RESULTS

No significant differences in surgical outcome could be detected between patients operated on with a J-pouch or a straight anastomosis. The median anastomotic level, measured from the anal verge, was 4 cm in both groups. No significant differences were found in the length of the surgical procedure or in blood losses. The median hospital stay was 10 days for both groups. During the follow up period of 201 with a straight anastomosis 22 patients (10.9%) and out of 99 patients 8 patients (8.0%) with a J-pouch developed an anastomotic leakage. The anastomotic stricture rate was 3.5% in the straight group and 2.0% in the pouch group respectively. The anastomotic leakage rate after coloanal anastomosis in the straight group was out of 31 patients in 4 patients (12.9%) and out of 75 patients in 7 patients (9.3%). But the stricture rate was in the straight group 16.1% and 2.7% in the pouch group respectively (\( p < 0.02 \)). Comparing the straight anastomosis group with the J-Pouch group, only the ability to evacuate the bowel in <15 minutes at 6 months reached a significant difference in favor of a pouch. No difference could be found between the groups in the incontinence scores. Furthermore, stool frequency and the combined functional rank score were similar between the groups after 12 months. The ability to differentiate gas from stool was good at an early postoperative stage in both groups indicating a preservation of the sampling sensory function.

DISCUSSION

The functional and surgical outcome was compared between colonic J-pouch and end-to-end anastomosis in low-anterior resection with TME surgery. It was not possible to detect any significant differences in surgical outcome between the groups regarding complications, reoperations, or pelvic sepsis rates, except the lower anastomotic stricture rate in the J-pouch group after coloanal anastomosis (\( p < 0.02 \)). Also, for the functional parameters, there were only minor detectable differences. The data from this study shows that both methods can be used with similar expected surgical and functional results at after 12 months and 24 months. During the entire follow up, only the ability to evacuate the bowel in <15 minutes at 6 months follow-up reached a significant difference. Obviously, these data are of a "retrospective" nature but they give an indication of the habitual anorectal function. Previous studies that compare colonic reservoirs to straight anastomoses commonly include follow up already at 1-3 months. In these and other series, the relative advantage of a colonic pouch over a straight anastomosis has been shown mainly in the early postoperative period. Barrier et al. reported long-term outcomes (4-8 years post-operative) that are very similar between conventional straight anastomoses or colonic pouches. In the present study, the first follow up was performed 6 months after the operation. The main reason for this was to avoid any influence from adjuvant chemotherapy given in the setting of an ongoing trial during the first 6 postoperative months.

Several studies have reported that patients with colonic pouch can experience evacuation difficulties and constipation. This problem has been attributed to the size of the reservoir in human and animal studies and, therefore, smaller pouches have been recommended. Huber and coworkers compared pouch to side-to-end anastomosis in a randomized study. Their conclusion was that the pouch carried a functional advantage especially in the immediate postoperative phase. However, the side-to-end anastomosis was recommended, for functional reasons, instead of a conventional straight anastomosis if pouch construction is technically not possible.

Some studies used the mean value, while others used the median value to report their findings. There is a lack of standardized questionnaires for the evaluation of functional outcomes, and different time frames for evaluation
were used in different studies. Many instruments used for measuring functional outcomes were not validated in many of the studies. Temporary diversion of fecal stream with the routine use of ileostomy in these studies may have allowed small anastomotic leaks to heal without symptoms. This will lead to underestimation of postoperative complications in these studies. Given these limitations, a colonic J-pouch seems to be at a lesser risk of anastomotic dehiscence from the pooled analysis. This may be due to a reduced blood flow at the site of a straight coloanal anastomosis, as suggested by laser Doppler study of Hallbook et al. Given the small sample sizes, however, these trials provide no convincing evidence of an increased risk of anastomotic leak in straight coloanal anastomosis. One may also argue that the use of descending colon or sigmoid colon for colonic J-pouch reconstruction may lead to differences in the eventual functional outcome. However, comparing sigmoid vs descending colonic J-pouch after total mesorectal excision by Heah et al. has dispelled such concerns, demonstrating similar functional results and overall morbidity. Most specialized centers do use sigmoid colon for pouch reconstruction provided it is healthy and not involved by diverticular disease. Several short- and long-term studies, have demonstrated the functional superiority of the colonic J-pouch over a straight coloanal anastomosis. However, no demonstrable difference in stool frequency was observed in this study at 1 year postoperatively. Evacuatory function was not explicitly assessed in all the trials. Evacuation difficulties are often described either as clustering or fragmentation of stool evacuation. Retrospective analysis comparing pouch sizes has suggested that a pouch more than 10 cm in size is plagued by such problems. Most centers now believe that a smaller pouch size of approximately 5 cm functions adequately as a neo-rectum without troublesome evacuation difficulties. As this can be a potential source of bias, we have therefore limited the analysis to studies describing the use of a pouch size of less than 10 cm. Further, better organized, prospective randomized studies with standardized and validated functional end points for assessment are required to ascertain whether the benefits of a colonic pouch, seen in these retrospective studies, are consistent.

SUMMARY

TERMINO-TERMINALNA I KOLONIČNA J-POUCH REKONSTRUICIJA POSLE NISKE RESEKCIJE REKTUMA


Materijali i metode: 357 pacijenata sa rektalnim karcinomom su operisani sa totalnom mezorektalnom eksezijom (TME). 300 (84.0%) primljeno je sa prednjom niskom resekcijom i primarnom kolo-rektalnom anastomozom n=194 (64.6%) ili kolo-analnom anastomozom n=106 (35.3%). Koloni ni pouch kreiran je kod 24, a de scendentni kolon korišcen je kod 75 pacijenata. Hirurški rezultati i komplikacije su beleženi. Pacijenti su prvenstveno funkcionalnom evaluaciju na 6 i 12 meseci. Rezultati: Karakteristike pacijenata u obe grupe bile su vrlo sличne u odnosu na pol, godine, nivo tumora i stadijum po Dukes-u. Veliki broj pacijenata provedao je kratkotrajnu postoperativnu radioterapiju (72%). Nije bilo značajne razlike u ishodu operacije između ove dve tehnikе sa obzirom na visinu anastomozе, preoperativni gubitak krvi, postoperativne komplikacije, reopearakcije, dužinu boravka u bolnici ili incidencu pelvine sepsе. Osim kod anastomotske strikture kod koloničnih J pouch-a posle kolo-anale anastomozе (p)

Zaključak: Ovi podaci pokazuju da i kolonični J pouch ili anastomozа sa descendentnim kolonom kod prednje niske resekcije rektuma sa TME i metodama koje mogu biti korišćene sa sличnim hirurškim i funkcionalnim rezultatima.

Ključne reči: karcinom rektuma, anteriorna resekcija, kolo-analna anastomozа, J pouch

REFERENCES