Srp Arh Celok Lek. 2015 Mar-Apr;143(3-4):158-161
ОРИГИНАЛНИ РАД / ORIGINAL ARTICLE
DOI: 10.2298/SARH1504158M
UDC: 616.35-006.6-089

Comparison of Functional Outcome of Colonic J-Pouch and Latero-Terminal Anastomosis in Low Anterior Resection for Rectal Cancer

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SUMMARY

Introduction Functional results after low anterior resection for rectal cancer are an issue of increasing attention among colorectal surgeons and others interested in this subject. The consensus on ideal reconstruction type has not been achieved to date, although the number of papers on this subject has been published in recent years.

Objective We conducted a prospective, parallel group study comparing latero-terminal with colonic J-pouch anastomosis in terms of defecatory function in patients undergoing stapled low colorectal/coloanal anastomosis.

Methods A total of 80 patients were included in this study with either latero-terminal or colonic J-pouch anastomosis. Defecatory function was evaluated using the modified version of MSKCC questionnaire 6, 12 and 24 months after the operation. Fecal continence was evaluated using the Wexner continence score.

Results In both groups, trend towards improvement was registered in all measured variables in all three control intervals. This can apply to bowel frequency, urgency, night soiling, fragmentation and incomplete evacuation. However, the difference was not statistically significant, and when reviewing the trend of results we can note that in the J-pouch group steady state has not been reached even after 24 month control.

Conclusion This trial did not reveal any significant differences in defecatory function 6, 12 and 24 months after low anterior resection (LAR) between patients with a latero-terminal anastomosis and those with colonic J-pouch anastomosis. Our results did not confirm superiority of colonic J-pouch over the latero-terminal anastomosis

Keywords: low anterior resection; stapled anastomosis; colonic J-pouch; defecatory function; rectal cancer

INTRODUCTION

Functional outcome after low anterior resection (LAR) of the rectum is an issue of great importance for colorectal surgeons as well as for patients with rectal cancer. In order to alleviate the symptoms of "low anterior resection syndrome" a number of technical modalities has been introduced into surgical practice. Most commonly used are a latero-terminal anastomosis and colonic J-pouch – anal anastomosis. Since its introduction in 1986 by Lazorthes et al. [1] and Parc et al. [2] it has been argued that colonic J-pouch anastomosis is better option and a number of studies have demonstrated the advantage of this type of reconstruction [3-13].

OBJECTIVE

In most papers a short term functional outcome was the primary endpoint. In this article we attempted to compare defecatory function in 3 separate time intervals in order to evaluate the "medium" term outcome, and to determine potential advantages or disadvantages of these two most popular reconstruction methods.

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METHODS

Between January 2000 and December 2004, a total of 80 patients with middle third or low rectal cancer were enrolled in the study. All operations were performed by the same surgical team. Forty patients were in each arm of the study. Nor pre or postoperative radiotherapy was administered.

Operative technique

After mobilization of the left colon, the inferior mesenteric artery (IMA) was divided just about 1 cm distal from the origin. Much of the sigmoid colon was preserved and used as the neorectum, but in some cases it was necessary to mobilize the splenic flexure. The rectum was mobilized down to the level of the anorectal junction following all the postulates of total mesorectal excision [14]. All vegetative nerves were preserved, except in rare cases of tumor invasion. The anal canal was closed 2-4 cm above the dentate line using a TA 30 linear stapler, and the rectum was transected. In the pouch group, colonic J-pouch, around 70 mm in length, was constructed using the sigmoid

colon with the use of the GIA stapler. When a latero-terminal anastomosis was performed, the anvil of the circular stapling device was placed 3–4 cm from the end of the divided bowel. The end of the divided bowel was closed with a linear stapling device. Low colorectal anastomosis was carried out using the circular stapler No 31 or 33 in both groups. In all patients, a diverting ileostomy was created and closed approximately 2 months after the operation.

Clinical assessment

Tumor and anastomosis height were measured by digital examination and rigid proctoscopy. A questionnaire about defecatory function was completed by patients, with minimum assistance of medical staff, 6, 12 and 24 months following ileostomy closure. The feedback form was a modified version of MSKCC questionnaire asking patients to quantify the frequency of bowel movements, urgency, night soiling and painful evacuations. Also, the degree of incomplete evacuation, constipation and fragmentation was investigated. To quantify the level of fecal continence, the Wexner continence score was used [15].

Statistical analysis

Standard methods of descriptive and inferential statistical analysis were employed as well as functional statistical analysis adapted to the type and nature of analyzed data.

RESULTS

Age, gender, tumor height, anastomotic height, and Dukes' classification did not differ significantly between the two groups (Table 1).

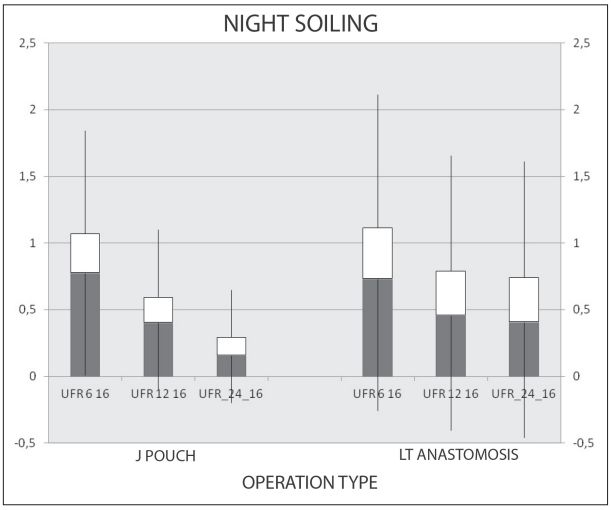
Elderly patients had greater need for additional help and incontinence for gas. In concordance with this, the elderly patients had inferior overall functional outcome, poorer emotional functioning and insomnia. All mentioned observations did not reach statistical significance.

In both groups improvement in measured variables was noted in all three control intervals. This can apply to bowel frequency, urgency, night soiling, fragmentation and incomplete evacuation. The difference was not statistically significant, but we noted that in the J-pouch group results had the trend of improvement even 24 month after the stoma closure while in the LT group they reached a steady state.

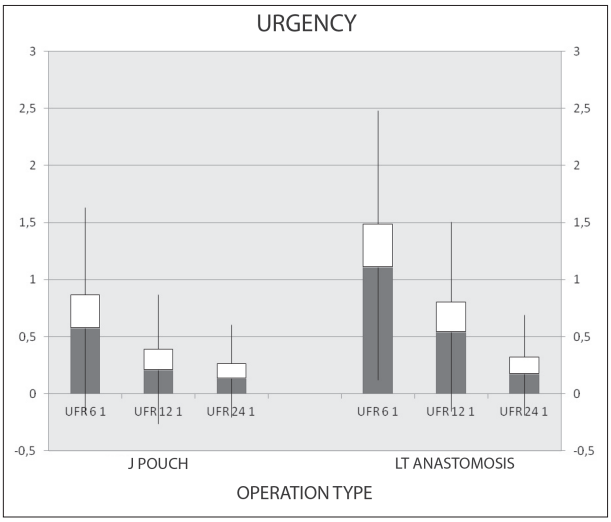
Table 1. Patients' characteristics

Characteristics	J-pouch	LT
Number of patients	40	40
Age, years (range)	55.25 (34–78)	56.4 (35–79)
Sex (female/male)	17/23	10/30
Dukes (A/B1/B2/C1/C2)	2/10/9/12/7	0/14/9/8/9
Level of anastomosis (cm)	2-4	2-4
Diverting stoma	40	40

LT – latero-terminal (anastomosis)



Graph 1. Trends of night soiling in three follow-up intervals



Graph 2. Trends of urgency in three follow-up intervals

Night soiling in the J-pouch group was less dominant compared to the latero-terminal anastomosis and there was a trend of further improvement (Graph 1).

More frequent urgency was noted in the latero-terminal anastomosis group in the first two follow-up intervals, but 24 months after, both groups had similar incidence of urgency (Graph 2).

When measuring constipation, in both groups results were worsened, with slight predominance in the latero-terminal anastomosis group.

Wexner score

According to the Wexner classification, poor result was noted in 3 patients (score 9-20), satisfactory in 7 (score 5-8), good in 11 (score 2-4) and excellent in 59 patients (score 0-1). Incontinence score results were better in the group of patients with J-pouch, but with no statistical significance.

Patients with documented anastomotic complications had significantly worse incontinence scores, probably due to scarring and consequent rigidity of the anal canal.

DISCUSSION

The superiority of colonic J-pouch over the latero-terminal anastomosis was reported by some studies [3-13]. Nevertheless, there are many factors which should be considered when trying to determine the "ideal" method of reconstruction after sphincter saving surgery for rectal cancer.

The number of studies and the difference in methodology confirms the fact that there is no optimal instrument for adequate assessment of postoperative functional results. Many studies dealt with functional outcome up to 2 years after sphincter preserving surgery for rectal cancer in relation to the reconstruction method (termino-terminal, latero-terminal, colonic J-pouch anal anastomosis and transverse coloplasty) [16-19].

Multiple regression analysis of factors that influence postoperative functional result showed that the frequency of defecation 12 months after surgery is directly related to the level of anastomosis and rectal sensation. This suggests that reservoir function of the rectum is essential in control of stool frequency.

It has been established that stool frequency is directly related to the level of anastomosis in patients where termino-terminal anastomosis was performed. In patients with this kind of anastomosis placed below 4-4.5 cm from the anal verge, there is an increased risk for frequent stools. This can be explained by the fact that instead of the rectum, an organ designated to be a stool reservoir is most commonly descendent or sigmoid colon, with a significantly lower compliance, and therefore inferior reservoir function. [20, 21].

Another reason for functional deficit after these operations is transection of the colonic wall, which itself creates discontinuity in the muscle and nerve network and disturbs „massive movements" of the colon [22-25].

The capacity of the neorectum is of paramount importance for good functional outcome. In the early postoperative period it is apparently superior in J pouch, but with time it increases both in J-pouch and latero-terminal anastomosis [8].

Anastomotic complications, narrow male pelvis and the level of anastomosis are generally considered to be the predictors of poor functional outcome [26, 27].

As an instrument for determining the functional outcome after rectal resection we used a modified MSKCC questionnaire [28]. This instrument was capable of indentifying patients with a poor functional outcome, but using it we were not able to define the difference in relation to the reconstruction type, the level of anastomosis and the duration of postoperative period [28]. However, this questionnaire proved to be in concordance with other comparable instruments and therefore can be considered to be an adequate measure of defecatory function postoperatively.

Our research revealed complexity in assessing the functional outcome after rectal cancer surgery. All factors are multidimensional in essence influenced by objective physiological factors, as well as subjective ones: the level of education, cognitive status, cultural influence and social environment of the patient.

Both groups of patients, during two years of follow-up, showed improvement irrespective of the reconstruction type. Approximately similar degree of improvement was noted in all investigated factors, with no statistically significant difference between the two groups. It is however very important to stress that for definitive assessment and analysis of investigated factors, the follow-up period of two years was insufficient and further follow-up is needed.

CONCLUSION

Based on available literature data and our experience, all in the context of presented results, we conclude the following: total mesorectal excision is the method of choice in the treatment of rectal cancer. Sphincter preserving procedures directly influence the quality of life. Neorectal formation has the aim to diminish the functional deficit, basically by decreasing stool frequency. Patient selection is one of the essential preconditions for optimal functional outcome.

In this research we demonstrated only a slight functional advantage of colonic J-pouch compared to the latero-terminal anastomosis without significant difference. We believe that follow-up period of two years was insufficient to assess long-term functional results and further research with longer follow-up is warranted.

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Поређење функционалних резултата колоничног „J“ резервоара и латеро-терминалне анастомозе после предње ниске ресекције код карцинома ректума

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КРАТАК САДРЖАЈ

Увод Функционални резултати после предње ниске ресекције ректума због карцинома су област која добија на значају и на коју све више пажње обраћају колоректални хирурзи и сви остали заинтересовани за ову проблематику. Не постоји сагласност о идеалном начину реконструкције после ових операција, иако је у последњих неколико година објављен велики број радова који обрађују ову тему.

Циљ рада Урађена је проспективна студија с паралелним групама где су поређени колонични резервоар и латеро-терминална анастомоза у контексту дефекаторне функције код болесника с ниском колоректалном стаплерском анастомозом.

Методе рада У истраживање је укључено 80 болесника код којих је изведена латеро-терминална или анастомоза с колоничним резервоаром. Функција дефекације је процењена помоћу модификоване верзије упитника *MSKCC* шест месеци, годину дана и две године после операције. Фекална континенција је процењена применом упитника *Wexner Continence Score*.

Резултати У обе групе испитаника забележен је тренд побољшања код свих мерених варијабли у три поменута периода клиничког праћења. Ово се односило на фреквенцију пражњења, ургенцију, ноћно влажење, фрагментацију и осећај непотпуног пражњења. Поменуте разлике, међутим, нису достигле статистичку значајност, а сагледавањем тренда кретања резултата закључили смо да стационарно стање није достигнуто ни после 24 месеца у групи болесника с колоничним резервоаром.

Закључак Ова студија није доказала статистички значајну разлику у функцији дефекације шест месеци, годину дана и две године после предње ниске ресекције ректума због карцинома између две посматране групе болесника. Такође, наши резултати нису доказали предност колоничног резервоара као начина реконструкције после ресекције ректума у односу на латеро-терминалну анастомозу.

Кључне речи: предња ниска ресекција; стаплерска анастомоза; колонични „J“ резервоар; дефекаторна функција; карцином ректума

Примљен • Received: 21/10/2014 **Прихваћен • Accepted:** 10/12/2014