ACTA MEDICA LITUANICA. 2005. VOLUME 12 No. 4. P. 25–29

Restorative proctocolectomy for familial adenomatous polyposis and ulcerative colitis

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Aim of the study was to evaluate results of restorative proctocolectomies performed at the Colorectal Unit of III Abdominal Surgery Department at the Vilnius University Hospital Center Branch and Surgical Clinic of Oncology Institute of Vilnius University in 1996–2005.

Patients and methods. A total of 24 restorative proctocolectomies have been performed, operated or assisted by the same surgeon (N.E.S.). Ten patients were female and 14 male, age range 17–67 years, mean 34 years. Seven patients suffered from UC (one had stage III rectal cancer), 17 from FAP (7 with colorectal cancer: stage II – 4, Stage III – 3). In 12 cases ileal pouch anal anastomosis was performed using double stapling technique and in the other 12 after rectal stump mucosectomy handsewn anastomosis has been performed.

Results. Operating time ranged from 4 to 7.5 hours, mean 6 hours. In-hospital stay ranged from 11 to 35 days, mean 19 days. There was no postoperative mortality. 7 (29.2%) patients developed complications, and 2 (8.3%) were reoperated on. Complications included bowel obstruction, left ovary abscess, right calf compartment syndrome, suture insufficiency, wound abscess, urinary bladder dysfunction and deep vein thrombosis.

Conclusion. Our experience suggests restorative proctocolectomy to be a safe procedure for patients with familial adenomatous polyposis and ulcerative colitis. Prophylactic restorative proctocolectomy for familial adenomatous polyposis demands careful rectal stump mucosectomy and handsewn ileal pouch anal anastomosis.

Key words: restorative proctocolectomy, ulcerative colitis, ileal pouch anal anastomosis, familial adenomatous polyposis

INTRODUCTION

Since 1978, restorative proctocolectomy (ileal pouch anal anastomosis (IPAA)) became a method of choice for surgical treatment of patients with familial adenomatous polyposis (FAP) and ulcerative colitis (UC). However, attempts to remove the whole colorectum with diseased mucosa and to leave the normal defecation route preserved are old. The first report was done by Ravitch (1), who proposed proctocolectomy with distal rectal mucosectomy and straight ileo-anal anastomosis. Even though his surgical results were good, not many surgeons at that time could demonstrate favourable results, and it did not become very popular. The idea was somewhat reborn in 1977, when Martin (2) proved again the safety of this surgical procedure. In any case, the problem was there – too many bowel movements per day. A new option had to be proposed. Parks in 1978 presented a paper with distal ileal pouch (so-called S type) anastomosis to anal canal. Afterwards, other shapes of the reservoir were implemented: J (4), H (5) and W (6). Regardless from the type of the reservoir, the aims are the same: to form a reservoir for the accumulation of feces, and to form an antiperistaltic wave to diminish the number of bowel movements. Table 1 illiustrates the evolution of pelvic ileal pouch procedures.

METHODS

Restorative proctocolectomy has been widely described. In Lithuanian medical literature it has been in detail discussed by Prof. V. Zykas (7) who was the pioneer of this procedure in our country. However, several aspects need to be stressed:

– when mobilizing the right colon, blood vessels should be tied very close to the serosa, so that the marginal artery is preserved, and later the terminal

branch for superior messenteric artery, the right colic artery and ileocolic artery are ligated, and the distal ileum will be supplied from the middle colic artery via the terminal branch;

– in all cases of familial adenomatous polyposis (rectal cancer is not present) and in the cases of ulcerative colitis when the rectal wall is not too fragile, rectal dissection from the minor pelvis should be in a 'close shave' fashion, so that pelvic autonomic nerves could be safely preserved; in cases of rectal cancer or in cases of UC with a very fragile rectal wall, dissection should be done in a total mesorectal excision fashion;

– we have implemented two types of mucosectomy of the distal rectum. After the rectum is dissected just above the level of the pelvic floor, the colorectal specimen is removed. When using eversion mucosectomy, it is necessary to do an approximately 1 cm of intersphincteric dissection from above, so eversion could be successfully achieved. When performing endoanal mucosectomy, very low dissection is not needed. In both cases, all rectal mucosa from the rectal stump is removed starting from the dentate line; later, ileal pouch will be sutured at this level to the very dentate line.

PATIENTS

Over a period of 9 years (July 1996 to July 2005), a total of 24 restorative proctocolectomies have been performed, operated or assisted by the same surgeon (N.E.S.) at the Colorectal Unit of III Abdominal Surgery Department at the Vilnius University Hospital Center Branch and Surgical Clinic of Oncology Institute of Vilnius University. There were female and 14 male, age range 17–67 years, mean age 34 years. Seven patients suffered from UC and 17 from FAP. One patient in the UC group had Duke C rectal cancer; he had undergone subtotal colectomy and ileorectal anastomosis 20 year prior to rectal cancer diagnosis. Seventeen patients from the FAP group were from 14 unrelated FAP families. Seven (41.2%) patients of 17 with FAP were operated on in the presence of colorectal cancer (3 female and 4 male, age 26–47 years, mean 37 years). Four had single cancers (3 rectal, one sigmoid), and 3 synchroneous cancers. Two patients had cancers in the sigmoid and rectum, and one had 4 synchroneous cancers: in the sigmoid, descending and transverse colon. Related to stage, 3 FAP patients had Duke C and 4 patients Duke B colorectal cancer. Of 7 patients in the FAP group with colorectal cancer, 4 were probands and 3 follow-up cases. One patient in the FAP group with colorectal cancer (synchroneous rectal T2N0 and T4N1 sigmoid cancer) underwent simultaneous resection of the short distal ileal segment due to tumor penetration.

Table 1. **Evolution of restorative proctocolectomy with regard to ileal pouch shape**

Author	Year	Type of operation
Ravitch MM	1948	Straight ileoanal anastomosis
Martin LW	1977	Straight ileoanal anastomosis
Parks AG	1978	S pouch
Utsonomiya J	1980	J pouch
Fonkalsrud EW	1980	H pouch
Nichols RJ	1985	W pouch

In our series, only J pouch has been done.

In 12 cases, ileal J pouch anal anastomosis has been performed using the double-stapling technique, and in the other 12 handsewn anastomosis after rectal stump mucosectomy (10 partial eversion technique, 2 – endoanal mucosectomy) was used.

The operating time ranged from 4 to 7.5 hours, on an average 6 hours.

RESULTS

In-hospital stay ranged from 11 to 35 days, mean 19 days. There was no postoperative mortality. Seven (29.2%) patients developed complications, and 2 (8.3%) were reoperated on. Complications and their treatment and outcome are delineated in Table 2.

Table 2. **Complications after restorative proctocolectomies (n = 24)**

Patient's age, sex	Diagnosis	Complication	Treatment
67, female	UC	Suture insufficiency	Transanal drainage
29, male	UC	Wound infection	Wound opened
40, male	UC and Duke C rectal cancer	Bowel obstruction	Conservative
23, male	FAP	Left calf compartment syndrome	Fasciotomies
35, female	FAP	Abscess of left ovary	Abscessotomy
26, female	FAP and Duke C colorectal cancer	Urinary bladder dysfunction	Conservative
47, female	FAP and Duke B colorectal cancer	Deep vein thrombosis	Conservative

DISCUSSION

It is worth noting that of the 24 patients who underwent restorative proctocolectomy, only two (8.3%) were reoperated on: one patient developed left ovarian abscess, and one was operated on for compartment syndrome of the right calf. The other 5 patients with complications were handled conservatively. No patients from our series necessitated permanent stoma for any reason, nor had we any case with pouch malfunction. We do think that these results are due to a very detailed and careful preparation for this new for us type of surgery. Even though 5 from our 17 proctocolectomies for FAP (only two prophylactic operations) were done without mucosectomy (4 of them were among the first pouches for FAP), we strongly stress that all prophylactic restorative proctocolectomies for FAP should be done with mucosectomy and handsewn ileal pouch anal anastomosis. If removal of rectal mucosa from the rectal stump in FAP cases is fully justified, there is but more space for discussion in cases of ulcerative colitis. A standard double-stapling technique allows anastomosis to be created appr. 2 cm from the dentate line. Earlier investigations showed anal transitional anastomosis to be 0.89 cm (8), more recent ones very illustratively showed it to be just of 0,45 cm (9). It means that in cases with a standard stapled anastomosis some of the diseased mucosa will be left behind. This is very important for the follow-up. It should be also noted that there are authors suggesting stapled techniques allowing anastomosis at the level of the dentate line, removing part of the internal sphincter with no distinct damage to continence (10, 11). Total eversion techniques might cause certain postoperative incontinence (12), so we used a partial eversion technique. It is probably worth accepting that endoanal mucosectomy may be related also with a less optimal continence function (13–15), even though some authors demonstrated the safety of this manipulation (16). In our last two cases, endoanal mucosectomy was succesfully applied and is our strategy for the future.

Neither peritoneal incisions of the small bowel mesentery nor Utsonomiya's manouvre – ligation of one branch of the small bowel vessels (17) – are enough to achieve a good length for the same handsewn ileo-anal anastomosis after rectal stump mucosectomy, but in many instances it may be sufficient for double stapled anastomosis at the level of the pelvic floor. Thus, our experience suggests that only preservation of the marginal artery of the right colon and ligation of the ileocolic, right colic and terminal branch of the superior messenteric artery may allow a safe tension-free anastomosis. It is quite striking to read a recent cadaveric study on the differences between the elongation of small bowel mesentery by ligating either the superior messenteric artery or the ileocolic artery (authors even propose resection of up to 20 cm of the terminal ileum!), while selected ligation of both in our experience is so much superior that small bowel resection is not necessary (18) . This in turn may allow a one-stage operation with no temporary fecal diversion, but we think our experience should be more sound to start doing so. But we should note that a number of authors have already clearly demonstrated the safety of the one-stage procedure (19, 20), and some of them even showed clear benefits of the one-stage procedure over two-staged (21). But as usual, the clear answer is yet to be given: some think temporary stoma is related with a large number of complications (22), while others in a very large study of 1504 patients show temporary stoma to be safe enough (23). Laparoscopic (24) or laparoscopically assited (25) restorative proctocolectomy is another step to go, but demanding a better developed laparoscopic colorectal surgery in Lithuania on the whole.

In comparison with the largest series in the world, our results are very comparable both in the number of complications and reoperation rate (25–29). Our next step is a thorough evaluation of the functional results, frequency of pouchitis and changes in ileal reservoir related to time after surgery.

CONCLUSION

Our experience suggests restorative proctocolectomy to be a safe procedure for patients with familial adenomatous polyposis and ulcerative colitis. Prophylactic restorative proctocolectomy for familial adenomatous polyposis demands a careful rectal stump mucosectomy and handsewn ileal pouch anal anastomosis.

Received 18 July 2005
Accepted 18 October 2005

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REKONSTRUKCINË PROKTOKOLEKTOMIJA SERGANT OPINIU KOLITU IR ÐEIMINE ADENOMINE POLIPOZE

Santrauka

Tikslas. Iðanalizuoti rekonstrukciniø proktokolektomijø, atliktø Vilniaus universiteto ligoninës Santariðkiø klinikos Centro filiale bei Vilniaus universiteto Onkologijos institute, rezultatus.

Pacientai ir metodai. Operuojant ar asistuojant tam paèiam chirurgui (N.E.S.) 1996–2005 m. atliktos 24 rekonstrukcinës proktokolektomijos. Operuota 14 vyrø ir 10 moterø, amþius – 17–67 metai, vidurkis – 34 metai. Septyni ligoniai sirgo opiniu kolitu (ið jø vienas – III st. tiesiosios þarnos vëþiu) ir 17 – ðeimine adenomine polipoze (ið jø 7 ligoniai – storosios þarnos vëþiu: 4 – II st., 3 – III st.). Dvylikai atvejø „J“ formos klubinës þarnos rezervuarui sujungti su iðange buvo naudojami automatinio siuvimo aparatai, o kitais 12 atvejø, atlikus mukozektomijà iki dantytosios linijos, jungtis suformuota rankine siûle.

Rezultatai. Vidutinë hospitalizacijos trukmë – 19 dienø (nuo 11 iki 35 d.). Operacijos truko nuo 4 iki 7,5 val., vidutiniðkai 6 valandas. Pooperaciniø mirèiø nebuvo. Septyniems ligoniams (29,2%) pooperacinë eiga komplikavosi: atsirado sàauginio þarnø nepraeinamumo epizodas (1), siûlës nesandarumas (1), kairës kojos giliøjø venø trombozë (1),

deðinës blauzdos pozicinio uþspaudimo sindromas (1), susilaikë ðlapimas (1), susidarë pilvo ertmës pûlinys (pioovaras) (1), supûliavo þaizda (1). Tik du (8,7%) ligoniai dël komplikacijø (pozicinio uþspaudimo sindromo ir pilvo ertmës pûlinio) hospitalizacijos metu operuoti dar kartà.

Išvados. Mûsø duomenimis, rekonstrukcinë proktokolektomija buvo saugi operuojant serganèiuosius ðeimine adenomine polipoze ir opiniu kolitu. Ðeimine adenomine polipoze sergantiems ligoniams rekonstrukcinës proktokolektomijos metu bûtina paðalinti visà tiesiosios þarnos gleivinæ iki dantytosios linijos.

Raktaþodþiai: rekonstrukcinë proktokolektomija, opinis kolitas, *ileum* rezervuaro jungtis su iðange, ðeiminë adenominë polipozë