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Short Report

The colon shuffle: A modified urinary diversion

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Abstract

Aim: To assess the results of a urinary diversion in patients who already have a colostomy or simultaneously require a (rectum) colon resection. The diversion is created from the distal part of the transected colon with a simultaneously created new colostomy contra-laterally (if necessary). This procedure is known in our institute as the 'colon shuffle'.

Materials and methods: All patients who underwent a colon shuffle in the period of 2003 and 2013 in our institute (Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital) were identified. Comorbidity was scored using the Charlson comorbidity index. Local or systemic treatment prior to surgery was reported (e.g. external beam radiotherapy, systemic chemotherapy). Surgical complications were reported according to the Clavien–Dindo classification.

Results: Twenty-one patients (14 male; 7 female) underwent a colon shuffle procedure in our institute, with a mean age of 61.5 years. The majority (90.4%) of these patients had been subjected to radiotherapy on the pelvic region in the past. Although short-term complications (<30 days) were seen in 52.4% of these patients, major complications such as anastomotic leakage of the bowel and fecal peritonitis were not seen in this high-risk group of patients.

Conclusion: The colon shuffle offers an elegant solution for patients who require a urinary diversion simultaneously with a colostomy or for patients who already have a colostomy from previous surgery.

Keywords: Urinary diversion; Colon conduit; Bladder substitution; Pelvic exenteration

Introduction

Cystectomy and construction of a urinary diversion is a complex procedure with a high risk of complications ranging from 28 to 64%.[1–3] Gastrointestinal complications, related to bowel surgery are most common and may also be severe.[2,3] Anastomotic leakage of the small bowel is the most serious complication. To prevent the risk of small bowel anastomotic leakage, the urinary diversion may be created from the distal part of a colostomy in selected patients who already have a colostomy or patients undergoing surgery necessitating a urinary diversion and a colostomy (i.e. total exenteration) (Figs. 1 and 2). In our institute this procedure is known as 'colon shuffle'.

The present study describes this technique and the outcome of our first cohort of patients.

Patients and methods

All patients who underwent a colon shuffle between 2003 and 2013 in our institute (Netherlands Cancer Institute-Antoni van Leeuwenhoek Hospital) were identified. Comorbidity was scored using the Charlson comorbidity index.[4] Local or systemic treatment prior to surgery was

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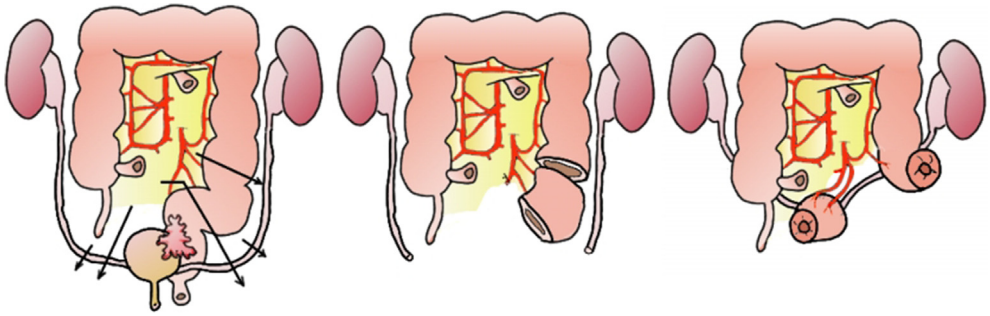

Figure 1. Surgical technique colon shuffle for patients requiring simultaneously urinary diversion and colostomy.

reported (e.g. external beam radiotherapy, systemic chemotherapy). Surgical complications were reported according to the Clavien–Dindo classification.[5] Short term (<30 days) and long term (>30 days) complications were scored separately.

Surgical anatomy of the large intestine

One of the main concerns with creating a colon conduit and a colostomy contra-laterally, is maintenance of adequate vascularization of the bowel segments. The vascularization of the colon originates from two main sources: the superior mesenteric artery supplies the coecum, ascending colon and proximal part of the transverse colon, whereas the inferior mesenteric artery supplies the distal part of the transverse colon, descending colon, sigmoid colon and upper part of the rectum.[6] To create a colon conduit the sigmoid is most useful because of the relatively long mesentery. When the sigmoid is used for colon conduit, preservation of the inferior mesenteric artery and marginal arteries of Drummond is important to provide adequate blood supply. Riolan's arcade, is another vascular arcade present in the colonic mesentery that connects the proximal middle colic artery with the left colic artery. Furthermore mobilization of the splenic flexure of the colon is often necessary.[6]

To be able to create a contralateral colon conduit, the length of the mesocolon is an important limiting factor. Furthermore, due to pelvic irradiation, the sigmoid colon may seem unsuitable at surgery for the construction of a colon conduit due to serious radiation damage. In such circumstances a non-irradiated part of the bowel should be used, for example the transverse colon.

Surgical techniques colon shuffle

The concept of a colon shuffle procedure is useful in two scenario's:

1. The patient requires a urinary diversion and simultaneously requires a (rectum) colon resection with a colostomy. The urinary diversion is created from the distal part of the remaining colon. The ureters were spatulated and anastomosed end-to-end and end-to-side to the colon conduit. Single-J stents were placed in all anastomoses and generally removed after 7 days. The urostomy and colostomy are anastomosed to the skin at the predetermined sites (Fig. 1).
2. The patient already has a colostomy. In this case the colostomy may remain in situ and is converted into a urostomy. The bowel is transsected and a new colostomy is created contra-laterally. The ureters will be anastomosed to the original colostomy loop, thus creating a colon conduit (Fig. 2).

In general followup consisted of laboratory investigations (including sodium, potassium, creatinine, chloride,

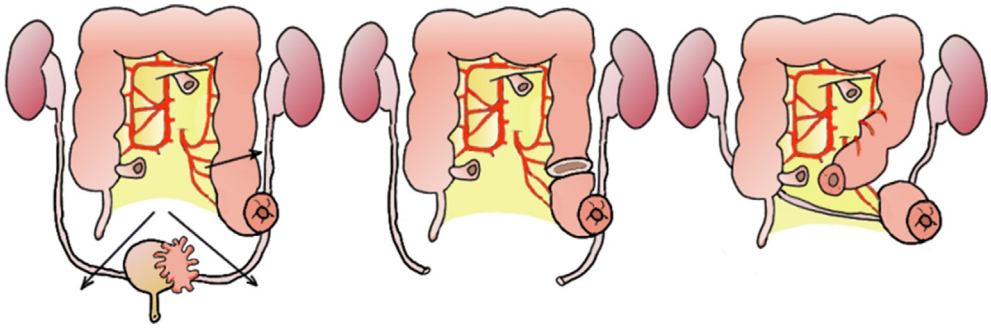

Figure 2. Surgical technique colon shuffle for patients with previous colostomy.