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Platinum Priority – Bladder Cancer

Editorial by Massimo Maffezzini on pp. 211–212 of this issue

Readaptation of the Peritoneum Following Extended Pelvic Lymphadenectomy and Cystectomy Has a Significant Beneficial Impact on Early Postoperative Recovery and Complications: Results of a Prospective Randomized Trial

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Article info

Article history:

Accepted October 13, 2010

Published online ahead of
print on November 5, 2010

Keywords:

Bladder cancer
Lymph node dissection
Cystectomy
Gastrointestinal recovery
Complications
Postoperative pain



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Abstract

Background: Prolonged postoperative pain and delayed intestinal transit are frequent problems following extended pelvic lymph-node dissection (PLND) and cystectomy.

Objective: To evaluate the impact of bilateral readaptation of the dorsolateral peritoneal layer on postoperative pain, gastrointestinal recovery, and complications following extended PLND and cystectomy.

Design, setting, and participants: Randomized, single-blinded, single-center study of 200 consecutive cystectomy patients.

Intervention: In group A ($n = 100$), lateral peritoneal flaps ventral to the external iliac vessels were bilaterally rotated over the iliac vessels down to the distal obturator fossa and medially fixed to the pararectal peritoneal layer following extended PLND and cystectomy. In group B ($n = 100$), the peritoneal layer was not readapted.

Measurements: Pain according to the visual analog scale (VAS), amount of peridural anesthetics needed, and gastrointestinal activity were assessed on postoperative days 1, 3, and 7. Complications occurring within 30 d following surgery were documented.

Results and limitations: Readaptation of the dorsolateral peritoneal layer resulted in a significant decrease in pain ($p < 0.01$) with concurrent significantly reduced need for peridural anesthetics ($p < 0.01$). Flatulence and first passage of stool as signs of intestinal transit were noted earlier in group A than in group B. Gastrostomy tube and peridural catheter could be removed 1 d earlier in group A than in group B (postoperative days 7 vs 8 and 6 vs 7, respectively). Group A (30%) had fewer complications than group B (56%; $p < 0.001$).

Conclusions: Readaptation of the dorsolateral peritoneal layer after extended PLND and cystectomy resulted in significantly less postoperative pain, earlier recovery of bowel function, and fewer complications in the early postoperative period.

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1. Introduction

Prolonged postoperative pain, delayed intestinal transit, as well as gastrointestinal, pulmonary, and thromboembolic complications are common problems following extended pelvic lymph-node dissection (PLND) and cystectomy. They are related to surgery and not to diversion [1]. Early complications (≤ 30 d after surgery) occur in 20–58% of patients following PLND and cystectomy [1–6]. Among the most frequent complications are gastrointestinal problems, which are reported to affect $\leq 29\%$ of all cystectomy patients without clearly defining whether they comprise small bowel palsy, obstruction, ileus, or constipation.

One reason for this high incidence might be surgery-induced inflammatory reactions that arise between the small bowel and the deperitonealized pelvic wall. This and the ensuing adhesions might reduce bowel peristalsis, cause mechanical obstruction with pain, and, as a consequence, retard the patient's mobilization with an increase in postoperative complications such as atelectasis, pneumonia, deep venous thrombosis, and pulmonary embolism. To overcome this problem, an increasing number of adhesion-reducing agents in the form of site-specific solutions, such as icodextrin and broad-coverage barriers, are becoming available [7–11]. There is, however, some controversy regarding their efficacy.

A more natural approach is to reperitonealize the abdominal cavity during surgery. Retroperitoneal aortic replacement for aneurysm, for example, has been shown to significantly reduce postoperative ileus and the need for postoperative respiratory support, thus shortening the length of stay in the intensive care unit compared with the transabdominal approach [12].

In the present prospective randomized trial we evaluate the impact of bilateral reperitonealization of the dorsolateral pelvic walls with autologous peritoneal flaps on postoperative pain management, gastrointestinal recovery, and complications following extended PLND and cystectomy.

2. Methods

2.1. Patients

Between April 2006 and September 2009, 200 consecutive patients (median age: 67 yr; range: 30–86) scheduled for extended PLND and radical cystectomy due to urinary bladder malignancy were prospectively randomly assigned by a computer-based program into two groups of 100 patients each: one to undergo readaptation of the peritoneum, the other not. Exclusion criteria were bladder cancer higher than cT3 and previous PLND. The study was approved by the local ethics committee and all patients gave their informed consent.

2.2. Surgical technique

In group A, the lateral peritoneal layer was incised dorsomedially (Fig. 1a) and mobilized off the external iliac vessels on both sides to maintain large lateral peritoneal flaps (Fig. 1b). Following PLND, cystectomy, and urinary diversion, the peritoneal flaps ventrolateral to the external iliac vessels were rotated over the iliac vessels down to the distal obturator fossa and fixed with a mattress suture to the levator

ani medial and dorsal to the obturator nerve. The medial border of the flap was then readapted and sutured to the rim of peritoneum along the rectum with interrupted 2-0 polyglycolic acid sutures at a distance of approximately 3 cm to prevent postoperative lymphoceles (Fig. 1c). A silicon drain without suction was placed between the vessels and the peritoneum on both sides (Fig. 1c).

In group B, the lateral parietal peritoneum was incised above the external iliac artery (Fig. 1d) without creating peritoneal flaps for readaptation of the dorsolateral peritoneal layer at the end of the operation (Fig. 1e–1f). In these patients, two silicon wound drains without suction were placed: one close to the uretero-ileal anastomosis and one in the region of the urethro-neovesical anastomosis.

2.3. Patient management

Preoperative bowel preparation consisted of two high enemas. All patients had a gastrostomy tube placed that initially was left on drainage. It was removed once the patient passed stool and tolerated closure of the gastrostomy tube without nausea and vomiting for > 24 h; however, for safety reasons, it was not removed earlier than postoperative day 5. To stimulate postoperative bowel function, subcutaneous injections of parasympathomimetic drugs (0.5 mg neostigmine methylsulfate up to six times per day) were administered starting on postoperative day 2 and continuing until bowel activity resumed. Antiemetics were only given on request. Oral diet was initiated with fluids on the day of surgery or on postoperative day 1 and then gradually advanced to solids as tolerated.

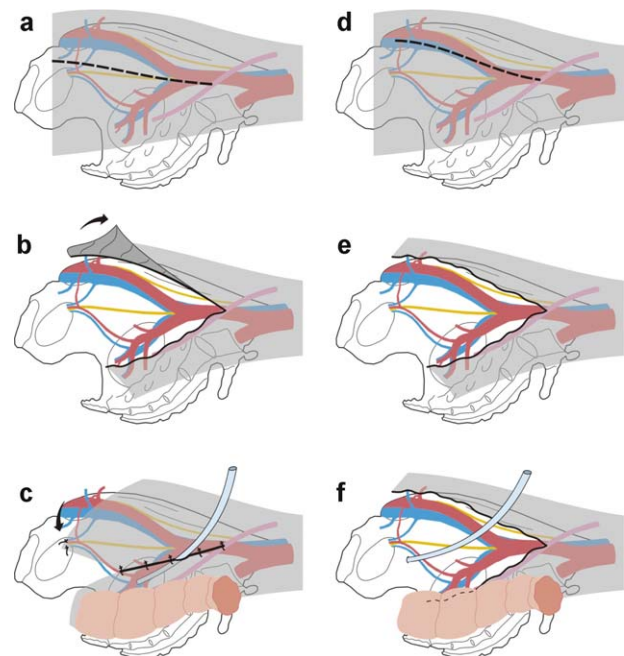


Fig. 1 – (a–c) Surgical procedure in group A with reperitonealization and (d–f) group B without reperitonealization. (a) Incision of the lateral peritoneal layer dorsomedially and (b) mobilization of the peritoneal flaps off the external iliac vessels on both sides. (c) The peritoneal flaps ventrolateral to the external iliac vessels are rotated over the iliac vessels down to the distal obturator fossa. Fixation is to the levator ani medial and dorsal to the obturator nerve and suturing to the rim of peritoneum along the rectum. (c) A silicon drain without suction is placed between the vessels and the peritoneum on both sides. (d–e) Incision of the lateral parietal peritoneum above the external iliac artery is made without creating peritoneal flaps. (f) Two silicon wound drains without suction are placed: one close to the uretero-ileal anastomosis and one in the region of the urethro-neovesical anastomosis.

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