Clinical Case

Radical cystoprostatectomy with ileal conduit using a purely laparoscopic technique


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Abstract  Radical cystectomy is the surgical treatment of choice for non-metastatic muscle-invading bladder carcinomas and for high-grade bladder tumors. With the advances made in laparoscopic techniques, this procedure can be performed completely intracorporeally, with similar results to those of open surgery.

A 40-year-old man was admitted to the emergency service on numerous occasions within the last 3 months due to gross hematuria. He had a past history of chronic heavy smoking. A computed axial tomography scan revealed a lesion conditioning thickening of the left lateral bladder wall and the bladder floor, with no adjacent tissue invasion, regional lymph nodes, or distant metastases. Cystoscopy biopsy reported cancer in situ in both bladder walls and the fundus. Radical cystoprostatectomy plus ileal conduit was performed through the completely intracorporeal laparoscopic technique. Surgery duration was 389 min, intraoperative bleeding was 1,200 ml, there were no complications, and hospital stay was 15 days. The histopathologic study reported high-grade papillary urothelial carcinoma with penetration into the muscularis propria and adjacent adipose tissue, pT3aN2M0.

Laparoscopic radical cystoprostatectomy with ileal conduit is a feasible option in the adequate clinical context. It requires experience in minimally invasive surgery and patient follow-up to increase the number of cases and to know the long-term results.

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Introduction

Urothelial carcinoma of the bladder is the second most frequent malignant neoplasia of the genitourinary tract and represents approximately 1-3% of all diagnosed tumors. Its prevalence is 3 to 5-fold greater in men and its incidence increases in patients above 50 years of age. It is the fifth main cause of death by cancer in older patients.5-3

The most accepted hypothesis in relation to its development is the interaction between genetics and the environment. Exogenous factors are smoking and contact with aromatic amines and nitrosamines. Coffee, artificial sweeteners, analgesics, radiotherapy, and chemotherapy are other less directly related agents. Chronic inflammatory processes and bladder stones and diverticula are also risk factors, especially for squamous cell tumors.1-4

Radical cystectomy indications are: carcinoma in situ, tumor with high-grade differentiation invading the lamina propria, tumor invading the superficial or deep muscle, and perivesical tissue invasion. Cystectomy can also be evaluated when neighboring structures are compromised.

Radical cystectomy in men consists of en bloc elimination of the bladder, prostate, seminal vesicles, and proximal vas deferens. In women, the operation is an evisceration of the anterior pelvis and includes extirpation of the bladder, uterus, Fallopian tubes, ovaries, and the anterior wall of the vagina. Removal of the urethra is indicated in men when surgical margins are positive or there is neoplastic infiltration of the urethra in the prostatic parenchyma, and in women when the tumor is in the bladder neck or urethra. Extensive bilateral lymphadenectomy that involves the extirpation of the lymph nodes located in the obturator fossa and the external, internal, and common iliac arteries is recommended at the time of cystectomy for the purpose of improving the study and promoting a possible therapeutic action in cases of lymph node micrometastases.5-4

Thanks to the development and accumulation of experience in the laparoscopic approach over the last decade, the procedure has been refined and the necessary skills for performing laparoscopic radical cystectomy have been acquired. The oncologic and functional results are similar to those of open surgery,7-8 plus the patient has the theoretical postoperative advantages of laparoscopy, when compared with the open approach. Among the advantages of laparoscopic surgery over conventional surgery are a smaller incision with the consequent reduction in pain and need for postoperative analgesia, reduced blood loss and a lower blood transfusion rate during the intervention, the possibility of a more precise dissection due to improved visualization of the anatomic structures, shorter hospital stay, and a faster reincorporation into normal daily activities.9-12

Case presentation

A 40-year-old man had a past history of alcoholism, drinking 5 l of beer every weekend since he was 15 years old.

He presented with intermittent hematuria of 3-month progression.

Upon physical examination he was alert and cooperative. He had adequate skin and tegument coloration and he was obese. There were no cardiopulmonary alterations, palpation revealed no abdominal masses, no pain, the costovertebral angle percussion was negative, and he had no edema.

Preoperative laboratory results: Hb 14.5; Hct 43.6; platelets 240,000; leukocytes 9.5.

Blood chemistry reported central glucose of 106 mg/dl; urea of 25 mg/dl; creatinine 0.80 mg/dl; PT 15.2 sec; and PTT 26.8 sec with an INR of 0.91.
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Urinalysis reported gross hematuria, leukocyturia, negative nitrites, and no bacteria. The tomography study showed data of bladder cancer with a mass that conditioned thickening of the left lateral wall and the bladder floor, with no infiltration of the adjacent soft tissue, no regional lymph nodes, and no distant metastasis (figs. 2 and 3).

Cystoscopy was performed, revealing an occupying mass in the bladder mucosa that was dependent on the bladder floor and left lateral wall. Biopsies were taken from those sites that reported: Fragment of bladder mucosa with carcinoma in situ and areas of invasion into the subepithelial tissue in the sections of the trigone, right lateral wall, left lateral wall, and fundus. Fragments of bladder dome mucosa had recent hemorrhagic foci and a fragment of the urethra presented with submucosal glands.

The patient is a young man with tomographic T2bN0M0 bladder cancer, in good physical condition with normal serum creatinine and urea levels. The decision was made to perform laparoscopic radical cystoprostatectomy with an orthotopic neobladder using the sigmoid colon.

He was hospitalized one day prior to surgery. Intestinal preparation was begun with an oral evacuating solution and cleansing enemas. A triple lumen central catheter was placed for strict fluid management prior to the procedure. Intravenous antibiotic therapy with ertapenem (1 g/iv/24 h) was administered. Anti-thrombosis prophylaxis was carried out with low molecular weight heparin (40 mg/s.c.) 12 h before beginning the operation. After midnight, the patient suspended all oral food intake. The procedure was begun with the patient in the adequate forced Trendelenburg dorsal decubitus position and the trocars were placed with the Hasson technique: a 10 mm umbilical port, a 10 mm port at the right iliac fossa, a 5 mm port at the right flank, a 5 mm port at the left iliac fossa, and a 5 mm port at the left flank (fig. 1). The pneumoperitoneum was insufflated with 12 mmHg. The dissection of the retrovesical space was begun. Once the adherences at the left parietocolic level were freed, a horizontal incision on the peritoneum at the level of the base of the rectovesical sac (base of the pouch of Douglas) was made. At this level, blunt dissection continued in the distal direction toward the prostatic apex, sectioning the layer posterior to Denovilliers’ fascia and advancing between the prerectal fat to the seminal vesicles (fig. 4). The vascularization of the seminal vesicles was identified laterally and hemostasis was carried out with...
beginning at the level of the superior vesical artery. From that moment, coagulation and sectioning of all the vascular branches were carried out (superior vesical, inferior and vesicoprostatic) using a bipolar forceps (Ligasure).

Afterwards, proximal dissection was performed up to locating the ureter above its intersection with the iliac vessels, and continued until the ureter was completely freed. It was cut close to its intramural segment, taking care to place Hem-o-lok at the end of the specimen to prevent urine leakage, and at the proximal end of each ureter. The last centimeter of ureter was resected for histopathologic study. While performing the dissection of the ureter at the level of the iliac vessel intersection, the presence of multiple lymph nodes of up to 2 cm in diameter were observed, resulting in a change of surgical plan. It was decided to perform an ileal conduit and then continue with a lymphadenectomy.

Lymph node dissection was performed after the exeresis of the pelvic cavity specimen. It was begun at the level of the external iliac vein at its medial edge and continued in a caudal direction up to the position of the femoral ring and cranially over the iliac bifurcation. The tissue above both iliac vessels should be extirpated. Lymph node dissection extended to the common iliac lymph nodes and then to the presacral and preaortic lymph nodes. The genitofemoral nerve should be identified laterally and the obturator nerve medially and inferiorly to serve as limits for the dissection.

The ileal conduit was made by taking 30 cm of terminal ileum at 20 cm from the ileocecal valve and an optimum vascular arcade was identified that did not compromise the irrigation of the bowel segment to be defunctionalized. This segment was defunctionalized between two 75 mm endoGIA staple lines and bowel transit continuity was reestablished through a side-to-side anastomosis closed with a 75 mm endoGIA staple line.

Ureterointestinal anastomosis was performed by catheterizing both ureters with open end ureteral stents that were 70 cm long. The ureteral mucosa was fixed to the intestinal mucosa using 3-0 Vicryl. These catheters were exteriorized through the anterior wall of the ileal conduit and the anterior abdominal wall through a counterincision. The working port incision in the right iliac fossa was then widened and the specimen that was previously placed in a bag made by the surgical team was extracted. Through the same incision site the stoma was matured at the distal end of the ileal conduit and the surgical procedure was concluded.

**Results**

Surgery duration was 389 min and intraoperative bleeding was 1,200 ml. A transfusion of 2 units of packed red blood cells was administered and there were no complications.

On the first postoperative day the patient’s vital signs were normal: HR 100 bpm, RR 18 bpm, BP 130/80 mmHg, temperature 36°C Celsius, and diuresis of 95.8 ml/h. The trocar wounds were clean, peristalsis was present, and there was a serosanguineous Blake drain output of 150 ml. Control hemogram: leukocytes 17.4, neutrophils 88.8%, Hb 10.8 g/dl, Hct 32.5%, platelets 283,000. Blood chemistry: glucose 284 mg/dl, urea 48 mg/dl, BUN 22 mg/dl, creatinine 5.6 mg/dl.
2.12 mg/dl, normal serum electrolytes. On the second postoperative day blood pressure was 110/70 mm/Hg, diuresis of 83.3 ml/h, there was a serosanguineous Blake drain output of 30 ml, clean wounds, and adequate pain control. The patient began to eat on the fifth postoperative day and was released from the intermediate care unit. He started to walk on the ninth postoperative day and due to his adequate progression was released from the hospital, asymptomatic, on the 15th postoperative day.

The histopathologic report on the 21st postoperative day stated: high-grade urothelial carcinoma in all the mucosa with penetration into the muscularis propria and the adjacent fatty tissue and the presence of 3 lymph nodes, the largest of which was 2 cm. T3aN2M0.

Conclusions

Despite the technical difficulties of this procedure in both the open and laparoscopic approach, the surgical result of this case was encouraging and showed the benefits characteristic of minimally invasive surgery. 

Laparoscopic radical cystoprostatectomy with ileal conduit is a feasible option in the adequate clinical context. It requires experience in minimally invasive surgery and patient follow-up to increase the number of cases and to know the long-term results.

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Conflict of interest

The authors declare that there is no conflict of interest.

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