Feasibility and safety of radical cystectomy under combined spinal and epidural anesthesia in octogenarian patients with ASA score ≥3: A case series

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Cite as: *Can Urol Assoc J* 2015;9(7-8):E500-4. http://dx.doi.org/10.5489/cuaj.2063
Published online July 17, 2015.

Abstract

Introduction: This study evaluated the feasibility and safety of open radical cystectomy (RC) under combined regional anesthesia (CRA) in high-risk octogenarian patients.
Methods: We retrospectively evaluated the medical records of high-risk, octogenarian bladder cancer patients submitted to open RC with CRA. Demographic and clinical data, intraoperative parameters and perioperative and postoperative complications were recorded using the Clavien-Dindo classification.
Results: In total, 14 male and 4 female patients, with a median age of 82.5 years were enrolled. Ureterocutaneostomy was performed in 15 patients and Bricker ileal conduit in the remaining 3. Operative time ranged from 97 to 184 minutes. Five patients were transfused and no major intraoperative complications occurred. Postoperative complications 30 days later included ileus (Grade II) in 3 patients, surgical trauma infection in 1 patient (Grade II), respiratory infection in 2 patients (Grade III), and hydronephrosis with concurrent urinary tract infection in 3 patients (Grade III). No deaths occurred.
Conclusions: Our study showed that octogenarian, high-risk bladder cancer patients with indications for RC can safely undergo the surgical procedure under CRA, without apparent increase in major complications.

Introduction

Radical cystectomy (RC) with pelvic lymphadenectomy remains the most effective and widely used surgical intervention for muscle invasive bladder cancer (MIBC) and is considered the gold standard treatment.[1]

Although improvements in surgical technique, anesthesia, and peri- and postoperative management have reduced the complications and mortality rates previously related with this operation, RC is still associated with a complication rate of about 27% and mortality of 0.8%.[2] Complications are generally due to the operation itself and to the host. The first are related to the extent of surgical ablation and the need of intestinal reconstruction, whereas the second are dependent on the age of the patients and the presence of background comorbid conditions.[3]

To evaluate the risk of surgery, the American Society of Anesthesiologists (ASA) has established the ASA score, depending on patients' comorbidity and physical status.[4] Today it is considered one of the most accepted instruments to classify surgical risk, including bladder cancer patients, candidates for RC.[5] An ASA class of 4 carries an odds risk ratio of 4.2 for perioperative complications, while an ASA class 3 an odds risk of 2.2, respectively.[6]

We evaluated the feasibility and safety of RC under combined regional anesthesia (CRA) in octogenarians with a high ASA score.

Methods

We included octogenarian, bladder cancer patients with an ASA score III-IV who underwent RC under CRA in the Department of Urology, University Hospital of Larissa during the last 5 years. Indications for RC were MIBC and multiple, recurrent and symptomatic, high-grade superficial tumours, non-manageable endoscopically. The present retrospective study was approved by the scientific board.

Cardiovascular, pulmonary and renal function assessment was used to evaluate the presence of comorbidities and determine the need for preoperative medical interventions to improve, or even stabilize, these conditions. Nutritional assessment was also included and corrigible interventions were followed.

Mechanical bowel preparation was performed, according to the fast-tract surgery principles. Normal dinner on the evening before surgery was allowed to all patients and

fasting started at midnight. Medications continued until the day of surgery, except of antiplatelets and anticoagulants which were discontinued, according to the Anesthesia and Pain Medicine Evidence-Based Guidelines.[7]

Five patients who were on oral anticoagulants (4 with chronic atrial fibrillation and 1 with mechanical heart valve) received low molecular heparin according to their weight, with dose reduction, immediately preoperatively (10-12 hours waiting period). All patients received subcutaneously prophylactic low molecular weight heparin, initiated the afternoon of the day of surgery and maintained until discharge from hospital. Compression leg stockings were routinely used. Postoperatively, antibiotic prophylaxis with a third generation cephalosporin was intravenously administered to all patients for 3 days.

Due to extension of the surgical field (from slightly above the umbilicus to the deep pelvis), regional anesthesia was performed at the lower thoracic spine allowing anesthesia and continuous epidural analgesia, maintained for the postoperative period (48 hours) when effective analgesia was still needed.

RC in men was performed through a midline incision extending 2 to 3 cm above the umbilicus. The obliterated hypogastric arteries and the vasa deferentia were ligated and divided. Then the ureters were identified, dissected and divided close to the bladder. The distal parts of the ureters were sent for frozen section. The posterior peritoneum in the cul-de-sac was incised and the plane between rectum and bladder was developed sharply. The Endo-GIA blade (EndoGia Universal, Tyco Healthcare, and ETS Flex Endoscopic Articulating Linear Cutter, Ethicon Inc.) was used to divide the posterior and lateral bladder pedicles to the level of the puboprostatic ligaments and the lateral prostatic pedicles, after the dissection of the endopelvic fascia. The dorsal venous plexus was ligated and the urethra was divided at the apex of the prostate and the whole specimen removed. The same incision was used to perform RC, simultaneous hysterectomy and excision of anterior vaginal wall in female patients. In female patients, stapler devices were not used. A standard bilateral lymphadenectomy was performed in all patients after removal of the bladder. Boundaries of dissection template comprise the genitofemoral nerve laterally, the internal iliac artery medially, Cooper ligament caudally, and the crossing of the ureter at the common iliac artery cranially. Ureterocutaneostomy and Bricker ileal conduit were performed in 15 and 3 cases, respectively.

Patient age and gender, ASA score and transfusion requirement, operative time and pathological tumor stage, need for intensive care or cardiac monitoring and duration of hospitalization, and perioperative minor and major complications were evaluated. All complications were further classified according to Clavien Dindo classification system of surgical complications.[8] The ASA score was determined exclusively by the attending anesthesiologist, independently of the surgical team.

Results

Eighteen patients (4 women and 14 males), with a median age of 82.5 years (range: 78–86) were enrolled. ASA score

Table 1. Demographic and clinical data and preoperative parameters and interventions

Patient no.	Gender	Age, years	Preoperative classification of bladder cancer	Preoperative chemotherapy	Preoperative interventions	ASA score
1	Male	78	Muscle invasive	Yes	Bilateral nephrostomies placement	3
2	Female	83	Muscle invasive	No	—	4
3	Male	83	Muscle invasive	No	—	3
4	Male	81	Muscle invasive	No	—	3
5	Male	84	Muscle invasive	No	—	4
6	Female	81	Non-muscle invasive	No	Blood transfusion due to anemia	3
7	Male	80	Muscle invasive	No	—	3
8	Male	81	Muscle invasive	Yes	—	3
9	Male	83	Muscle invasive	No	—	3
10	Male	83	Non-muscle invasive	No	Blood transfusion due to anemia	4
11	Female	82	Muscle invasive	No	—	4
12	Male	86	Non-muscle invasive	No	—	3
13	Male	85	Muscle invasive	No	—	3
14	Male	80	Muscle invasive	Yes	—	4
15	Male	82	Muscle invasive	No	—	3
16	Male	85	Muscle invasive	No	—	4
17	Male	83	Muscle invasive	No	—	3
18	Female	80	Muscle invasive	No	—	3

ASA: American Society of Anesthesiologists.

Table 2. Intraoperative parameters and perioperative and postoperative 30 days complications

Patient no.	Operative time, min	Transfusion	Type of diversion	Hospital, days	Complications	Clavien–Dindo grade	Postoperative pathological stage
1	97	—	UC	5	—	—	pT2
2	120		UC	14	Ileus	GII	pT3
3	112	—	UC	9	UTI, hydronephrosis	GIII	pT2
4	100	—	UC	7	—	—	pT2
5	108	—	UC	12	—	—	pT2
6	119	600 mL	UC	8	—	—	pT1
7	115	—	UC	8	UTI, hydronephrosis	GIII	pT3
8	115	—	UC	8	—	—	pT3
9	104	—	UC	9	—	—	pT3
10	117	300 mL	UC	9	Surgical wound infection	GII	pT1
11	102	600 mL	UC	7	Ileus	GII	pT2
12	111	—	UC	6	—	—	pT1
13	116	—	UC	8	UTI, hydronephrosis	GIII	pT3
14	120	900 mL	UC	13	Respiratory infection	GII	pT2
15	1170	—	UC	9	—	—	pT3
16	169	—	BIC	10	Respiratory infection	GII	pT2
17	153	—	BIC	8	—	—	pT2
18	184	1200 mL	BIC	9	Ileus	GII	pT2

UC: ureterocutaneostomy; BIC: Bricker ileal conduit; UTI: urinary tract infection.

was 4 in 6 patients and 3 in the remaining 12 patients (Table 1). Preoperative blood transfusions were needed in 2 patients with hemoglobin levels of <8 g/dL. Bilateral percutaneous nephrostomies were inserted in 1 patient before surgery to treat renal failure due to obstructive uropathy. Three patients with MIBC received cisplatin-based combination neoadjuvant chemotherapy (Table 1).

In total, operative time ranged from 97 to 184 minutes (median: 115.5) and no major intraoperative complications occurred. The number of lymph nodes removed ranged from 4 to 22 (median 12). Intraoperatively, transfusion was required in 6 patients, and median blood requirement ranged from 300 to 1200 mL. After surgery, all patients were transferred directly from the recovery room to the general urology floor, with no need for the intensive care unit.

Regarding early postoperative complications (30 days), prolonged paralytic ileus (defined as the inability to pass flatus for longer than 5 days) occurred in 3 patients. Ileus resolved with nasogastric tube insertion and bowel rest. Abdominal wound infection occurred in 1 patient and was corrected under local anesthesia and antibiotic administration. Respiratory infection, treated with antibiotics, was diagnosed in 2 patients.

Hospitalization ranged from 5 to 14 days (median: 8.5). Pathology examination showed pT1 G3 in 3 patients, pT2 in 10 patients and pT3 in the remaining 5 patients. All 18 patients had negative lymph nodes. Thirty-day patient follow-up revealed re-admittance of 3 patients due to hydronephrosis and fever. These patients were treated with ureteral stenting and antibiotic administration (Table 2). All patients were alive at the 16-month follow-up, with no clinically significant complications. Follow-up during this period included ultrasound examination of kidneys, thoracic and abdominal CT scans and laboratory tests, including urine cytology, at 3, 6 and 12 months after surgery.

Discussion

RC remains the most effective oncological treatment for MIBC and refractory superficial bladder tumours. In addition, surgery is still the most valid option to manage cancer complications (such as hydronephrosis and hematuria with resulting anemia) and thus, improves residual quality of life in selected patients.[9]

However, surgical management of MIBC in elderly patients is challenging. Age and comorbidities often render these patients very poor candidates for radical surgery.[10] In the present study, we provide data on the feasibility and safety of radical surgery under CRA in a selected group of high-risk patients.

Radiation therapy is an adequate therapeutic alternative, especially as far as hematuria and pain are concerned. However, bladder and bowel complications, such as post-radiation cystitis or enteritis, can occur. Neoadjuvant chemotherapy can be administered before radiotherapy to improve its efficacy. Nevertheless, patients with ASA score 3 or 4 are not always suitable for radiotherapy with or without neoadjuvant chemotherapy, due to many side effects. It has been reported that radiotherapy acute side effects were found in 47% of patients, with 23% of them re-hospitalized

for a median of 10 days. In the same study, no patients with severe local symptoms, such as urgency, pain and incontinence, improved after treatment, and treatment associated mortality rate was 5%.[11]

In a previous report, RC in octogenarians has been associated with a mortality rate of 4.8%.[12] Additionally, a population-based study has shown that only 1 in 10 octogenarians with MIBC receive the gold standard treatment for this condition.[13] Furthermore, with the steady increase in life expectancy, a parallel increase in all cancers, including bladder cancer, is to be expected. Consequently, elderly patients with MIBC and comorbid conditions will increasingly ask for treatment.

Concerning anesthetic strategy in our study, CRA was chosen because of its important advantages. Regional anesthesia is safe, efficacious, and reduces the risk of postoperative respiratory and cardiovascular complications.[14] In addition, it offers excellent muscle relaxation, and facilitates the return of normal bowel function.[15] Of excellent importance is its role in reducing intraoperative blood loss and in controlling postoperative pain with minimal or no opioid use.[16] Furthermore, perioperative epidural blockade inhibits protein breakdown after cystoprostatectomy, accentuates the stimulating effect of parenteral alimentation on whole-body protein synthesis, and reduces postoperative mortality and morbidity.[17] On the other hand, subarachnoid anesthesia is characterized by faster installation of motor and sensory blockade and significantly less quantity of local anesthetic is used compared to epidural anesthesia. Moreover, epidural catheter enables administration of additional doses of local anesthetic (if needed) and postoperative pain management. A possible pitfall of this technique is the additional need for sedation in stressful patients.

In a similar study, De Nuncio and colleagues reported that extraperitoneal RC with ureterocutaneostomy under spinal anesthesia, was associated with a limited mortality and mobility.[18] Karl and colleagues reported the effectiveness of combined spinal thoracic epidural anesthesia in RC and urinary diversion and the possible association with reduced postoperative risks.[19]

The combination of fast-tract surgery principles (no preoperative fasting and avoidance of mechanical bowel preparation), regional anesthesia use and continuous epidural analgesia, may have contributed to our findings. Stapling devices helped to reduce operative time and blood loss, as we have previously reported.[20,21] Finally, ureterocutaneostomy was selected in most patients due to the rapidity of the technique and the avoidance of intraoperative complications resulting from bowel use, although late complications such as stomal stenosis, urinary tract infections and postoperative urinary tract dilatation in conjunction with renal impairment might occur.

Overall, our study shows that RC remains a valid therapeutic option in the management of high-risk, bladder cancer elderly patients with indications for surgery. RC not only provides sufficient disease control in terms of oncological aspect, but it also serves as a highly effective treatment for bladder cancer-associated complications, such as intractable hematuria or urinary tract obstruction. Bladder cancer complications and the various forms of palliative treatments used to manage them have caused severe distress to patients due to the induced significant deterioration in overall quality of life. According to the present study results, older bladder cancer patients with low performance status or significant comorbidities (a group of patients hitherto usually excluded from surgical intervention) can safely undergo RC with combined spinal and epidural anesthesia and benefit from its advantages.

A possible limitation of our study is the relatively small number of patients included. RC with the combined use of spinal and epidural anesthesia in high-risk, octogenarian bladder cancer patients cannot be considered as a routine surgical operation. Another possible limitation of our study is its retrospective design.

Conclusions

Our study shows that octogenarian, high-risk bladder cancer patients with indications for RC (MIBC or refractory superficial bladder tumours) can safely undergo surgery with the help of regional anesthesia. According to our findings, there is no apparent increase in major complications compared with results of studies conducted in patients with less comorbidities. However, there is a need for more studies to further confirm our results.

Competing interests: The authors all declare no competing financial or personal interests.

This paper has been peer-reviewed.

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