Introduction

Bladder cancer (BC) is a significant global health threat (1) with more than 30,000 deaths per year (2). It is also one of the most costly cancers from diagnosis to death (3). Pelvic lymph node dissection (PLND) and radical cystectomy (RC) followed by urinary diversion is established as the gold-standard treatment for BC invading the bladder muscle (MIBC) and for non-muscle-invasive BC refractory to transurethral resection of the bladder (TUR-B) and/or intravesical instillation therapies. Since the morbidity and possible mortality of this surgery are relevant, care must be taken in the preoperative selection of patients for the various organ-sparing procedures (e.g., bladder-sparing, nerve sparing, seminal vesicle sparing) and various types of urinary diversion. The patient's performance status and comorbidities, along with individual tumor characteristics, determine possible surgical steps during RC. This individualized approach to RC in each patient can maximize oncological safety and minimize avoidable side effects, rendering 'standard' cystectomy a surgery of the past.

Is bladder sparing a viable alternative to RC in MIBC?

The goal of bladder preservation in MIBC is to avoid morbidity and potential mortality in RC without compromising oncological outcomes. Several bladder-sparing options exist: TUR-B alone, partial cystectomy, radiotherapy, chemotherapy alone, or multi-modality therapy. Among these options, trimodal therapy involving maximal TUR-B followed by cisplatin-based chemotherapy and radiotherapy is the most widely accepted strategy (12). While bladder sparing is the only option in patients who are unfit for surgery due to medical comorbidities [with poor 4-year overall survival (OS) rates of 30–42% (13-15)], its value in medically operable patients has not yet been
defined due to the lack of randomized controlled trials comparing RC with bladder-sparing therapies. However, the reported 5-year cancer-specific survival (CSS) rates of 50% to 60% (16-18) and 5-year OS rates of 36% to 52% (18-21) are poor when compared to the cystectomy outcomes in centers of excellence reporting 5-year CSS of 83.5% (22) and 5-year OS of 68% (23). Moreover, patients fit for surgery and treated by bladder preservation are rigorously selected, with exclusion criteria such as hydronephrosis, carcinoma in situ (CIS), or impossibility to perform a maximally safe TUR-B, and thus are positively selected compared with the population undergoing primary RC (12). Bladder sparing in medically operable patients, therefore, does not seem to be an equivalent treatment option. In fact, bladder-sparing procedures may only delay RC. Since studies have shown worse survival rates if RC is delayed for more than 3 months (unless the delay was for neoadjuvant chemotherapy) (24,25), prolongation of the interval between diagnosis and RC due to attempted bladder sparing may negatively impact treatment outcome.

**Does anesthesia impact outcomes after RC?**

One of the key factors affecting optimal outcome following RC is individualized optimization of anesthesia aimed at reducing blood loss, lowering postoperative complications, and improving functional results of orthotopic bladder substitution (26-29). These goals can be achieved mainly through the use of continuous administration of norepinephrine peri- and postoperatively, thus facilitating restrictive deferred intraoperative fluid management (30,31). Additionally, thoracic epidural analgesia leads to a need for minimal opioids peri- and postoperatively, thus accelerating recovery of bowel function and postoperative recovery (29) and reducing postoperative catabolism (32), pulmonary complications due to better diaphragmatic function (27), postoperative stress/inflammatory response, and cardiovascular morbidity in high-risk patients (28,33). It is important, however, to screen patients for contraindications for thoracic epidural analgesia, such as bleeding disorders or anticoagulation, since the possible complications (e.g., neuraxial hematoma and abscess) can be serious, inflicting permanent harm such as paraplegia. If a patient has contraindications for thoracic epidural analgesia, less effective alternatives such as preperitoneal or transversus abdominis plane blocks can be considered (34).

In conclusion, individualized anesthesia is part of personalized cystectomy and its importance should not be underestimated.

**Is pelvic lymphadenectomy mandatory—and how extensive should it be?**

To draw the conclusions first: any kind of PLND is better than none, an extended PLND is better than a limited, but a super-extended has no benefit over an extended PLND (35). Already in 1982 DG Skinner reported that a meticulous PLND can make a difference, namely by decreasing the rate of local recurrence and even achieving a cure in some lymph node (LN)-positive patients (36). However, it is the patient with limited, in most cases microscopic, involvement of a few LNs who has the best chance of long-term survival (36).

Although recent dynamic LN mapping studies revealed that lymphatic drainage of the bladder is complex and individually coined, PLND should be performed bilaterally because cross-over lymphatic drainage is common (40%) (37,38). Roth et al. (37) provide strong evidence that a limited PLND (encompassing only the external iliac region and obturator fossa) removes only about 50% of all primary lymphatic landing sites compared to a 90% nodal clearance rate with an extended PLND (up to the mid–upper third of the common iliac vessels and including the areas medial and lateral to the internal iliac vessels). This finding was confirmed by a survival analysis in a cohort of 668 patients operated at two academic urology centers (39). The use of an extended PLND resulted in a more than twofold better 5-year recurrence-free survival rate for patients with ≤pT3 pN0-2 disease compared to patients in whom the LNs were removed only in a limited field (extended PLND 49%, limited PLND 19%) (39). It could be concluded from this that the higher the proximal template (i.e., the more extended the PLND), the better the outcome. But is it really worthwhile to remove the remaining 8% to 10% of potential lymphatic landing sites located cephalad to the mid-upper third of the common iliac vessels (37)? In fact, a super extended PLND did not show a survival benefit compared to an extended PLND (40)—most probably because the occurrence of positive LNs higher than the endopelvic region is characteristic of systemic disease which cannot be cured by more extended surgery. A superextended PLND is, however, associated with higher morbidity, especially due to the possible harm to sympathetic nerve fibers crossing the bifurcation of the aorta. The mandatory extent of PLND has further been investigated by Roth et al. (38). In another dynamic mapping study they could show that the lateral bladder wall does not have lymphatic drainage to the contralateral internal iliac region, which is—on the medial side—another potential spot for harm to the autonomic nerves (38). The latter observation
was confirmed by a patho-anatomical study by Kiss et al. (41), who did not find metastases in contralateral internal iliac lymph nodes in unilateral tumors of the lateral bladder wall. Therefore, the location of the tumor within the bladder appears to influence the extent of lymphatic drainage, thus underscoring the need to individually modify the extent of PLND as part of RC.

**Should nerve sparing be attempted?**

Already in 1982, Walsh and Donker (42) pointed out that preservation of the dorsolateral neurovascular bundle during prostatectomy is important to avoid erectile dysfunction and improve postoperative continence. The significant aggressiveness of BC together with the decades-long limited knowledge regarding the relevant basic neurofunctional anatomy may account for the failure to further evaluate nerve sparing procedures during RC. Autonomic nerves comprised of sympathetic and parasympathetic fibers pass the pelvic plexus (43,44). The parasympathetic system is thought to be responsible for relaxation of the proximal urethra and erectile function, while the sympathetic system controls the tonus of the urethra at rest (42,45-48). Autonomic denervation has been shown to affect the proximal part of the sphincter plexus, causing intrinsic sphincter deficiency (49). Clinical data showing a positive influence of nerve-sparing prostatectomy on erectile function and urinary continence accord with intraoperative findings after electrical stimulation (50). These findings have finally found application in attempts at nerve-sparing during RC as a means of maintaining or improving urinary continence in patients with orthotopic bladder substitution (51). Autonomic nerve sparing, however, not only improves the chance of continence after orthotopic bladder substitution, but also has a positive effect on postoperative erectile function (52,53). While the benefit of autonomic nerve sparing for continence in orthotopic bladder substitution may be greater in the elderly due to their generally weaker urethral sphincter complex, it appears to be even more efficient if performed bilaterally. However, individual factors such as the extent and location of the BC within the bladder, and thus the feasibility of nerve sparing from an oncological point of view, determine if unilateral (on the side contralateral to the tumor) or even bilateral nerve sparing may be attempted.

**Should seminal vesicles be preserved?**

In men, the role of seminal vesicles in sexual behavior has not yet been documented. However, recent results of mouse experiments suggest that seminal vesicles have a significant effect on the sexual activity of male mice (54). Together with clinical observations that men report stronger sexual desire after seminal vesicle-sparing RC than after removal of the seminal vesicles, this finding raises the question whether seminal vesicle removal at RC should be mandatory. Several reports on simultaneous postero-inferior prostate capsule, vasa deferentia, and seminal vesicle preservation in RC with orthotopic bladder substitution found a postoperative improvement in sexual function and urinary continence (55,56). Minimizing surgical dissection in this manner reduces potential harm to the autonomic nerves, especially the autonomic nerve fibers of the pelvic plexus. The long-term oncological and functional results in these reports (55,56) were excellent (daytime continence and potency rates of up to 95%) and clearly superior to previously reported outcome data from a large series of men undergoing ileal bladder substitution following RC, in which 22% reported having erections without and another 15% with medical assistance (57). However, a meta-analysis of seven prostate-sparing RC series comprising 306 patients with organ-confined (≤ pT2) BC found a systemic recurrence rate twice as high as for standard RC (58). There is controversy therefore regarding the oncological safety of prostate- and/or seminal vesicle-sparing RC. The controversy is even greater because the rate of concurrent prostate cancer and/or occult transitional cell carcinoma (TCC) of the prostate is as high as 48% (59-62), which is especially concerning since local recurrence of BC is lethal in most patients. BC location in the bladder neck or trigone as well as CIS were found to be associated with occult TCC in the prostate (60). As a consequence of the high prevalence of occult prostatic malignancies, RC with removal of the entire prostate but sparing of the seminal vesicles (together with the prostate capsule adjacent to the neurovascular bundle) was introduced. Recently published data show good oncological control and favorable functional outcomes (63). However, maximal local cancer control requires a restrictive selection of patients; patients should not have BC on the side ipsilateral to where seminal vesicle sparing is attempted, or on the trigone/bladder neck. Furthermore, prostate resection biopsies must be free of TCC. For BC located solely in the anterior bladder wall, bilateral seminal vesicle sparing is recommended.

In conclusion, seminal vesicle sparing is an increasingly popular option for individualizing RC to maximally improve postoperative functional outcomes and oncological safety,
especially in patients with a strong desire to preserve libido and potency and with favorable tumor characteristics.

**What type of urinary diversion—continent or incontinent?**

Careful selection of patients is crucial for successful urinary diversion of whatever type (incontinent, continent cutaneous, orthotopic, rectosigmoid). Age is not a factor affecting whether a diversion can be done or not (64). The choice of urinary diversion depends mainly on performance status and preexisting comorbidities (65). All types of orthotopic bladder substitution by intestinal segment require careful patient selection. Preoperative biopsies from the distal prostatic urethra (male) or the bladder neck (female) should be negative except for CIS, which can be treated postoperatively by BCG instillations (66). Evidence of BC in these biopsies would prohibit sparing of the urinary sphincter from an oncological point of view, which is indispensable in continent orthotopic urinary diversions. Additionally, candidates for orthotopic substitution should be continent, physically and mentally able to adapt to and function with an orthotopic bladder substitute, and must be willing and able to participate in an active postoperative reeducation program and adhere to a strict follow-up regimen (57). A glomerular filtration rate of at least 50 mL/min is mandatory for continent reservoirs since the kidneys must compensate the metabolic acidosis following incorporation of bowel in the urinary tract (67). Candidates for a continent urinary diversion should also have normal liver function (risk of hyperammonemia if the reservoir becomes infected), and should not have undergone any previous major bowel resection in the ileocecal area (risk of vitamin B12 deficiency) (67-69).

While the ileal conduit and cutaneous diversions are established options for urinary diversion (although both have considerable complication rates), orthotopic bladder substitution is now commonly used in both sexes (65,70,71). The type of urinary diversion does not affect oncological outcome (65). Therefore, factors such as patient comorbidities and tumor characteristics determine the type of urinary diversion, which in turn greatly influences how RC is performed (e.g., nerve sparing, seminal vesicle preservation).

**Open or (robot-assisted) laparoscopic cystectomy?**

Robot-assisted RC has emerged as an alternative to open RC based on its potential to reduce blood loss, the transfusion rate, and the need for postoperative analgesia, and patients’ quicker recovery of bowel function (72-74). Since the first experience with robot-assisted RC was reported in 2003 (75), a number of investigators have reported case series (76-79). However, the absence of long-term oncological and functional outcome data, and a possible selection bias in laparoscopic and robot-assisted laparoscopic RC series make it difficult to compare open versus laparoscopic and robot-assisted laparoscopic RC. Although feasible, laparoscopic and robot-assisted laparoscopic RC is thus still considered experimental (65). Open RC therefore remains the gold standard treatment for MIBC and for non-muscle-invasive BC refractory to TUR-B and/or intravesical instillation therapies due to the thorough characterization of long-term oncological outcomes (80).

**Conclusions**

Every patient who needs RC must be offered the best possible cancer surgery. This surgery, however, should not be the cause of unnecessary comorbidities. For this reason, each patient should be carefully assessed prior to RC with regard to key factors such as performance status, comorbidities, indications for or against specific procedures, and individual tumor characteristics. During RC close attention must be paid to those surgical details which vary from patient to patient, rendering every cystectomy an individual ‘work of art’.

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**Footnote**

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**References**

1. Dinney CP, McConkey DJ, Millikan RE, et al. Focus on bladder cancer. Cancer Cell 2004;6:111-6.
2. Ploeg M, Aben KK, Kiemeney LA. The present and future burden of urinary bladder cancer in the world. World J Urol 2009;27:289-93.
3. Botteman MF, Pashos CL, Redaelli A, et al. The health economics of bladder cancer: a comprehensive review of the published literature. Pharmacoeconomics
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of invasive bladder cancer by cisplatin and radiation in patients unsuited for surgery. JAMA 1987;258:931-5.

16. Gogna NK, Matthews JH, Turner SL, et al. Efficacy and tolerability of concurrent weekly low dose cisplatin during radiation treatment of localised muscle invasive bladder transitional cell carcinoma: a report of two sequential Phase II studies from the Trans Tasman Radiation Oncology Group. Radiother Oncol 2006;81:9-17.

17. Peyromaure M, Slama J, Beuzeboc P, et al. Concurrent chemoradiotherapy for clinical stage T2 bladder cancer: report of a single institution. Urology 2004;63:73-7.

18. Rödel C, Grabenbauer GG, Kühn R, et al. Combined-modality treatment and selective organ preservation in invasive bladder cancer: long-term results. J Clin Oncol 2002;20:3061-71.

19. Hussain SA, Stocken DD, Peake DR, et al. Long-term results of a phase II study of synchronous chemoradiotherapy in advanced muscle invasive bladder cancer. Br J Cancer 2004;90:2106-11.

20. Krause FS, Walter B, Ott OJ, et al. 15-year survival rates after transurethral resection and radiochemotherapy or radiation in bladder cancer treatment. Anticancer Res 2011;31:985-90.

21. Efstathiou JA, Spiegel DY, Shipley WU, et al. Long-term outcomes of selective bladder preservation by combined-modality therapy for invasive bladder cancer: the MGH experience. Eur Urol 2012;61:705-11.

22. Culp SH, Dickstein RJ, Grossman HB, et al. Refining patient selection for neoadjuvant chemotherapy before radical cystectomy. J Urol 2014;191:40-7.

23. Madersbacher S, Hochreiter W, Burkhard F, et al. Radical cystectomy for bladder cancer today—a homogeneous series without neoadjuvant therapy. J Clin Oncol 2003;21:690-6.

24. Chang SS, Hassan JM, Cookson MS, et al. Delaying radical cystectomy for muscle invasive bladder cancer results in worse pathological stage. J Urol 2003;170:1085-7.

25. Sánchez-Ortiz RF, Huang WC, Mick R, et al. An interval longer than 12 weeks between the diagnosis of muscle invasion and cystectomy is associated with worse outcome in bladder carcinoma. J Urol 2003;169:110-5; discussion 115.

26. Wu CL, Cohen SR, Richman JM, et al. Efficacy of postoperative patient-controlled and continuous infusion epidural analgesia versus intravenous patient-controlled analgesia with opioids: a meta-analysis. Anesthesiology 2005;103:1079-88; quiz 1109-10.

27. Ballantyne JC, Carr DB, deFerranti S, et al. The comparative effects of postoperative analgesic therapies on pulmonary
outcome: cumulative meta-analyses of randomized, controlled trials. Anesth Analg 1998;86:598-612.

28. Holte K, Kehlet H. Epidural anaesthesia and analgesia - effects on surgical stress responses and implications for postoperative nutrition. Clin Nutr 2002;21:199-206.

29. Carli F, Mayo N, Klubien K, et al. Epidural analgesia enhances functional exercise capacity and health-related quality of life after colonic surgery: results of a randomized trial. Anesthesiology 2002;97:540-9.

30. Wuethrich PY, Burkhard FC, Thalmann GN, et al. Restrictive deferred hydration combined with preemptive norepinephrine infusion during radical cystectomy reduces postoperative complications and hospitalization time: a randomized clinical trial. Anesthesiology 2014;120:365-77.

31. Wuethrich PY, Studer UE, Thalmann GN, et al. Intraoperative continuous norepinephrine infusion combined with restrictive deferred hydration significantly reduces the need for blood transfusion in patients undergoing open radical cystectomy: results of a prospective randomised trial. Eur Urol 2014;66:352-60.

32. Lattermann R, Carli F, Wykes L, et al. Epidural blockade modifies perioperative glucose production without affecting protein catabolism. Anesthesiology 2002;97:374-81.

33. Svircevic V, van Dijk D, Nierich AP, et al. Meta-analysis of thoracic epidural anesthesia versus general anesthesia for cardiac surgery. Anesthesiology 2011;114:271-82.

34. Jouve P, Bazin JE, Petit A, et al. Epidural versus continuous preperitoneal analgesia during fast-track open colorectal surgery: a randomized controlled trial. Anesthesiology 2013;118:622-30.

35. Bruins HM, Veskimae E, Hernandez V, et al. The impact of the extent of lymphadenectomy on oncologic outcomes in patients undergoing radical cystectomy for bladder cancer: a systematic review. Eur Urol 2014;66:1065-77.

36. Skinner DG. Management of invasive bladder cancer: a misconelusive pelvic node dissection can make a difference. J Urol 1982;128:34-6.

37. Roth B, Wissmeyer MP, Zehnder P, et al. A new multimodality technique accurately maps the primary lymphatic landing sites of the bladder. Eur Urol 2010;57:205-11.

38. Roth B, Zehnder P, Birkhäuser FD, et al. Is bilateral extended pelvic lymphadenectomy necessary for strictly unilateral invasive bladder cancer? J Urol 2012;187:1577-82.

39. Dhar NB, Klein EA, Reutner AM, et al. Outcome after radical cystectomy with limited or extended pelvic lymph node dissection. J Urol 2008;179:873-8; discussion 878.

40. Zehnder P, Studer UE, Skinner EC, et al. Super extended versus extended pelvic lymph node dissection in patients undergoing radical cystectomy for bladder cancer: a comparative study. J Urol 2011;186:1261-8.

41. Kiss B, Paerli M, Schöndorf D, et al. Pelvic lymph node dissection can be limited on the contralateral side in strictly unilateral bladder cancer. J Urol 2015. (In Press).

42. Walsh PC, Donker PJ. Impotence following radical prostatectomy: insight into etiology and prevention. J Urol 1982;128:492-7.

43. Baader B, Baader SL, Herrmann M, et al. Autonomic innervation of the female pelvis. Anatomic basis. Urologe A 2004;43:133-40.

44. Baader B, Herrmann M. Topography of the pelvic autonomic nervous system and its potential impact on surgical intervention in the pelvis. Clin Anat 2003;16:119-30.

45. Eichelberg C, Erbersdobler A, Michel U, et al. Nerve distribution along the prostatic capsule. Eur Urol 2007;51:105-10; discussion 110-1.

46. Sievert KD, Hennenlotter J, Laible I, et al. The periprostatic autonomic nerves—bundle or layer? Eur Urol 2008;54:1109-16.

47. Kaiho Y, Nakagawa H, Saito H, et al. Nerves at the ventral prostatic capsule contribute to erectile function: initial electrophysiological assessment in humans. Eur Urol 2009;55:148-54.

48. Alsaid B, Bessed T, Diallo D, et al. Division of autonomic nerves within the neurovascular bundles distally into corpora cavernosa and corpus spongiosum components: immunohistochemical confirmation with three-dimensional reconstruction. Eur Urol 2011;59:902-9.

49. Strasser H, Ninkovic M, Hess M, et al. Anatomic and functional studies of the male and female urethral sphincter. World J Urol 2000;18:324-9.

50. Nelson CP, Montie JE, McGuire EJ, et al. Intraoperative nerve stimulation with measurement of urethral sphincter pressure changes during radical retropubic prostatectomy: a feasibility study. J Urol 2003;169:2225-8.

51. Turner WH, Danuser H, Moehrle K, et al. The effect of nerve sparing cystectomy technique on postoperative continence after orthotopic bladder substitution. J Urol 1997;158:2118-22.

52. Kessler TM, Burkhard FC, Perimenis P, et al. Attempted nerve sparing surgery and age have a significant effect on urinary continence and erectile function after radical cystoprostatectomy and ileal orthotopic bladder substitution. J Urol 2004;172:1323-7.

53. Hekal IA, El-Bahnsaway MS, Mosbah A, et al. Recoverability of erectile function in post-radical
cystectomy patients: subjective and objective evaluations. Eur Urol 2009;55:275-83.
54. Birkhäuser FD, Schumacher C, Seiler R, et al. Occlusion of seminal vesicles increases sexual activity in a mouse model. Eur Urol 2012;62:855-62.
55. Muto G, Bardari F, D’Urso L, et al. Seminal sparing cystectomy and ileocapsuloplasty: long-term followup results. J Urol 2004;172:76-80.
56. Terrone C, Cracco C, Scarpa RM, et al. Supra-ampullar cystectomy with preservation of sexual function and ileal orthotopic reservoir for bladder tumor: twenty years of experience. Eur Urol 2004;46:264-9; discussion 269-70.
57. Studer UE, Burkhard FC, Schumacher M, et al. Twenty years experience with an ileal orthotopic low pressure bladder substitute--lessons to be learned. J Urol 2006;176:161-6.
58. Hautmann RE, Stein JP. Neobladder with prostatic capsule and seminal-sparing cystectomy for bladder cancer: a step in the wrong direction. Urol Clin North Am 2005;32:177-85.
59. Kefer JC, Voelzke BB, Flanigan RC, et al. Risk assessment for occult malignancy in the prostate before radical cystectomy. Urology 2005;66:1251-5.
60. Pettus JA, Al-Ahmadie H, Barocas DA, et al. Risk assessment of prostatic pathology in patients undergoing radical cystoprostatectomy. Eur Urol 2008;53:370-5.
61. Reveiro MP, Cookson MS, Chang SS, et al. Incidence and location of prostate and urothelial carcinoma in prostates from cystoprostatectomies: implications for possible apical sparing surgery. J Urol 2004;171:646-51.
62. Weizer AZ, Shah RB, Lee CT, et al. Evaluation of the prostate peripheral zone/capsule in patients undergoing radical cystoprostatectomy: defining risk with prostate capsule sparing cystectomy. Urolo Oncol 2007;25:460-4.
63. Ong CH, Schmitt M, Thalmann GN, et al. Individualized seminal vesicle sparing cystoprostatectomy combined with ileal orthotopic bladder substitution achieves good functional results. J Urol 2010;183:1337-41.
64. Figueroa AJ, Stein JP, Dickinson M, et al. Radical cystectomy for elderly patients with bladder carcinoma: an updated experience with 404 patients. Cancer 1998;83:141-7.
65. Witjes JA, Compérat E, Cowan NC, et al. EAU guidelines on muscle-invasive and metastatic bladder cancer: summary of the 2013 guidelines. Eur Urol 2014;65:778-92.
66. Varol C, Thalmann GN, Burkhard FC, et al. Treatment of urethral recurrence following radical cystectomy and ileal bladder substitution. J Urol 2004;172:937-42.
67. Mills RD, Studer UE. Metabolic consequences of continent urinary diversion. J Urol 1999;161:1057-66.
68. Racioppi M, D’Addessi A, Fanasca A, et al. Vitamin B12 and folic acid plasma levels after ileocelecal and ileal neobladder reconstruction. Urology 1997;50:888-92.
69. Cosnes J, Gendre JP, Le Quintrec Y. Role of the ileocecal valve and site of intestinal resection in malabsorption after extensive small bowel resection. Digestion 1978;18:329-36.
70. Rouanne M, Legrand G, Neuzillet Y, et al. Long-term women-reported quality of life after radical cystectomy and orthotopic ileal neobladder reconstruction. Ann Surg Oncol 2014;21:1398-404.
71. Bhatta Dhar N, Kessler TM, Mills RD, et al. Nerve-sparing radical cystectomy and orthotopic ileal neobladder reconstruction. Eur Urol 2007;52:1006-14.
72. Wang GJ, Barocas DA, Raman JD, et al. Robotic vs open radical cystectomy: prospective comparison of perioperative outcomes and pathological measures of early oncological efficacy. BJU Int 2008;101:89-93.
73. Guru KA, Wilding GE, Piacente P, et al. Robot-assisted radical cystectomy versus open radical cystectomy: assessment of postoperative pain. Can J Urol 2007;14:3753-6.
74. Raza SJ, Al-Daghmin A, Zhuo S, et al. Oncologic outcomes following robot-assisted radical cystectomy with minimum 5-year follow-up: the Roswell Park cancer institute experience. Eur Urol 2014;66:920-8.
75. Menon M, Hemal AK, Tewari A, et al. Nerve-sparing robot-assisted radical cystoprostatectomy and urinary diversion. BJU Int 2003;92:232-6.
76. Knox ML, El-Galley R, Busby JE. Robotic versus open radical cystectomy: identification of patients who benefit from the robotic approach. J Endourol 2013;27:40-4.
77. Nepple KG, Strope SA, Grubb RL 3rd, et al. Early oncologic outcomes of robotic vs. open radical cystectomy from the robotic approach. J Endourol 2013;27:40-4.
78. Ng CK, Kauffman EC, Lee MM, et al. A comparison of postoperative complications in open versus robotic cystectomy. Eur Urol 2010;57:274-81.
79. Stryn NR, Montgomery JS, Wood DP, et al. Matched comparison of robotic-assisted and open radical cystectomy. Urology 2012;79:1303-8.
80. Ghoneim MA, Abdel-Latif M, el-Mekresh M, et al. Standard cystectomy fits all: truth or myth? Transl Androl Urol 2015;4(3):254-260. doi: 10.3978/j.issn.2223-4683.2015.04.08

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