Robotic Cystectomy with Intracorporeal Urinary Diversion

Review of Current Techniques and Outcomes

Tyler M. Thress, MD[a], Michael S. Cookson, MD, MMHC[b,*], Sanjay Patel, MD[c]

KEYWORDS

• Bladder cancer • Cystectomy • Robotic • Intracorporeal • Diversion • Neobladder

KEY POINTS

- Robotic cystectomy is increasing in use nationwide.
- Surgeons are looking toward totally intracorporeal urinary diversion to maximize the minimally invasive benefit of robot-assisted radical cystectomy (RARC).
- There are multiple different methods of performing RARC with intracorporeal urinary diversion.

INTRODUCTION

Radical cystectomy is well accepted as the gold standard for muscle invasive bladder cancer. Incorporation of robotic technology has been shown to offer equivalent oncologic and technical outcomes.[1,2] It seemed that the crux of the operation remained the urinary diversion, with many physicians electing to perform the cystectomy robotically and then opening for a traditional extracorporeal diversion. This approach came under some criticism, which suggested that conversion to extracorporeal diversion did away with any benefit of the robotic approach.[3]

As the use of robotic-assisted radical cystectomy (RARC) increased, surgeons began moving toward totally intracorporeal urinary diversions in an attempt to maximize the benefits of this minimally invasive approach, though the widespread use of this technique has been slow due to the technical complexity of these cases and the increased operative time required. The first RARC with totally intracorporeal urinary diversion was described in 2003.[4] Almost a decade later, a multiinstitutional review revealed that only 3% of robotic cystectomies were being performed with completely intracorporeal diversion.

This article describes the available operative approaches to RARC with intracorporeal diversion techniques and provides analysis of postoperative outcomes.

GENERAL TECHNICAL CONSIDERATIONS

Port Placement

There is a general consensus on port placement for robotic cystectomy with intracorporeal diversion, though small variations exist. Goh and colleagues[5]

Disclosure: The authors have nothing they wish to disclose.
[a] PGY-4, Department of Urology, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA; [b] Department of Urology, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA; [c] Department of Urology, University of Oklahoma Health Sciences Center, 920 Stanton L Young Boulevard, Suite 3150, Oklahoma City, OK 73104, USA
* Corresponding author.
E-mail address: michael.cookson@mac.com

Urol Clin N Am 45 (2018) 67–77
https://doi.org/10.1016/j.ucl.2017.09.009

describe what is perhaps the most common port placement template. The camera is placed approximately 2 finger breadths above the umbilicus with the 3 robotic trocars lateral to and at the level of the umbilicus spaced approximately 8 cm apart from each other. A 15-mm assistant port, used to pass the bowel stapler, is on the lateral abdominal wall opposite the third robotic arm. A 12-mm assistant port is superior to and halfway between the camera port and the first robotic trocar (Fig. 1).

The City of Hope group describes a template that places trocars from the pubic bone as a common reference point. The camera and trocars are all placed within 20 to 25 cm from the pubic bone (Fig. 2).[6] The Karolinska group, Stockholm, Sweden places the camera 5 cm above the umbilicus with the assistant and robotic trocars at the level of the umbilicus (Fig. 3).[7] Pruthi and colleagues[8] place their camera port in a similar fashion, though they place a 12-mm assistant port below the level of the umbilicus in line with the camera port, the robotic trocar, and the anterior superior iliac spine (ASIS) (Fig. 4).

Tan and colleagues[9] place their camera port 5 cm above the umbilicus, with the robotic trocars at the level of the umbilicus on each side. Two assistant ports are placed 5 cm above and 5 cm lateral to each ASIS, with a 5-mm assistant port between the camera port and the right robotic trocar (Fig. 5).

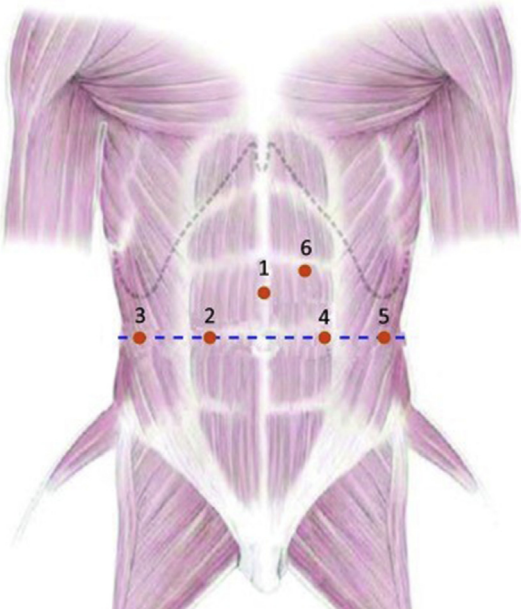

Fig. 1. Goh and colleagues port placement. (*From* Goh AC, Gill IS, Lee DJ, et al. Robotic intracorporeal orthotopic ileal neobladder: replicating open surgical principles. Eur Urol 2012;62:893; with permission.)

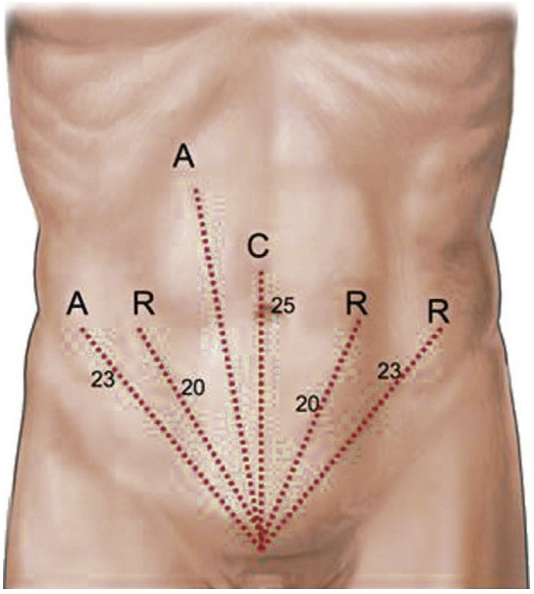

Fig. 2. City of Hope port placement (*A*)assistant trocar, (*R*) = robotic trocar, (*C*)camera trocar. (*From* Chan KG, Guru K, Wiklund P, et al. Robot-assisted radical cystectomy and urinary diversion: technical recommendations from the Pasadena Consensus Panel. Eur Urol 2015;67:425; with permission.)

Bowel Measurement

A premeasured Penrose drain, suture, or umbilical tape can be used to measure the bowel segment that will form the urinary diversion. It is the practice at the authors' institution to measure the bowel using a 20-cm length of umbilical tape marked at 5 cm intervals. When moistened, the tape gently adheres to the bowel and prevents sliding during measuring.

Bowel Manipulation

As is the case in open surgery, careful handling of the bowel is paramount. It is therefore important to use robotic instruments with low grip strength to avoid injury to the bowel during manipulation.

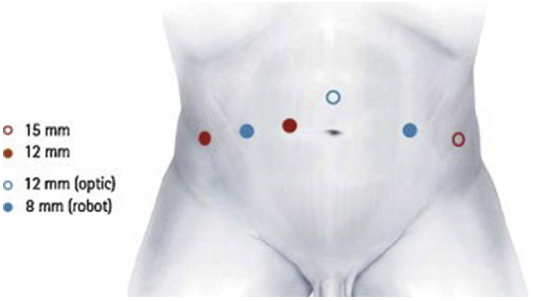

Fig. 3. Karolinska group port placement. (*From* Wiklund NP, Poulakis V. Robotic neobladder. BJU Int 2011;107:1516; with permission.)