

3-Piece Inflatable Penile Prosthesis Placement Following Radical Cystoprostatectomy and Urinary Diversion: Technique and Outcomes

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ABSTRACT

Background: After radical cystoprostatectomy (RC), postoperative erectile dysfunction (ED) is a common consequence with multiple contributing etiologies. The inflatable penile prosthesis (IPP) offers patients a definitive treatment option when ED is refractory to medical therapies. Because of the hostile postoperative anatomy of these patients, a careful surgical approach is necessary for successful outcomes and to avoid adjacent organ injury. To date, there is no series describing the outcomes of 3-piece IPP placement in patients with urinary diversions.

Aim: To present contemporary outcomes and a description of our technique in placing a 3-piece IPP for postoperative ED in patients with a history of RC with orthotopic neobladder, ileal conduit, or continent cutaneous diversion.

Methods: We retrospectively reviewed 80 patients who underwent primary placement of a 3-piece IPP (AMS 700; American Medical Systems Inc, Minnetonka, MN, USA) after RC and urinary diversion from 2003 through 2016. 79 patients underwent RC in their treatment of urologic malignancy (71 for bladder cancer, 8 for prostate cancer) and 1 underwent RC for refractory interstitial cystitis. An infrapubic approach was used in most patients, with reservoir placement in the lateral retroperitoneal space through a counterincision medial to the anterior superior iliac spine. Patient demographics, perioperative data, and postoperative outcomes including prosthetic infection and mechanical failure were examined and statistical analysis was performed.

Outcomes: Rates of device infection, revision surgery, and reservoir complications.

Results: After mean follow-up of 53.9 months (6.5–150.7 months), 4 patients developed infection of the prosthesis that required explantation. 3 of those patients underwent successful IPP reimplantation. 5 patients required revision surgery (pump replacement, n = 3; pump relocation, n = 1; cylinder replacement for cylinder aneurysm, n = 1) for mechanical failure. No statistically significant associations were found between infection and comorbidities, urinary diversion, exposure to chemotherapy, radiation, or presence of an artificial urinary sphincter.

Clinical Implications: The 3-piece IPP is an effective treatment option for medication-refractory ED that can be placed safely in patients with all forms of urinary diversion.

Strengths and Limitations: This study represents the 1st series that describes a successful technique and long-term outcomes of patients with urinary diversion. It is limited by its single-surgeon, single-center experience and lacks validated patient satisfaction data in follow-up.

Conclusions: The 3-piece IPP, with reservoir placement in the lateral retroperitoneum, can be implanted successfully in patients with all forms of urinary diversion without a significant increase in infectious complications, reservoir erosion, or mechanical failure. **Loh-Doyle J, Patil MB, Sawkar H, et al. 3-Piece Inflatable Penile Prosthesis Placement Following Radical Cystoprostatectomy and Urinary Diversion: Technique and Outcomes. J Sex Med 2018;XX:XXX–XXX.**

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Key Words: Erectile Dysfunction; Inflatable Penile Prosthesis; Urinary Diversion; Bladder Cancer

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INTRODUCTION

Radical cystoprostatectomy (RC) is the current standard treatment for men with localized, muscle-invasive, or refractory high-risk non—muscle-invasive bladder cancer. Although successful in achieving its intended oncologic outcomes, RC can cause significant erectile and sexual dysfunction that can have a significant impact on a patient's quality of life.¹ Despite being the gold standard treatment option for refractory erectile dysfunction (ED), there are no series describing the outcomes of 3-piece inflatable penile prosthesis (IPP) placement in patients with a history of RC with urinary diversion. We present a description of our technique and long-term outcomes of 3-piece IPP placement after RC and orthotopic neobladder (NB), ileal conduit (IC), or continent cutaneous diversion (CCD).

INDICATIONS FOR PROCEDURE

The 3-piece IPP offers patients with ED after cystectomy a definitive treatment option when refractory to conservative measures, such as the vacuum erection device, oral medications, intraurethral suppository, and intracavernosal injection therapies.

PREOPERATIVE PREPARATION

All patients had refractory ED that did not respond to conservative treatment and elected for IPP placement for restoration of erectile function. A thorough physical examination and careful assessment of the patient's comorbidities, surgical history, and type of urinary diversion are performed in consultation before surgery. Irrigation of the diversion (CCD, NB), hair removal, and isolation of the stoma (CCD, IC) using sterile dressings are performed before skin preparation and incision. Antibiotic choice does not differ from those without a history of RC and urinary diversion.

INTRAOPERATIVE CONSIDERATIONS

Penile Dissection, Cylinder and Pump Placement

We encounter no discernable differences in the anatomy of the corpora and penis in this patient population and the cylinders and pump can be placed through an approach (infrapubic vs penoscrotal) based on surgeon preference. Through an infrapubic incision, electrocautery is used to dissect through subcutaneous fat tissue and Dartos fascia. The 2 corpora are identified and delineated with a finger-sweep motion. Stay sutures are placed and the corpora are incised. Then, the corpora are dilated with Hegar dilators and measured using the Furlow introducer. The cylinders (with rear tip extenders) are placed in each corpus using a Keith needle and the corporotomies are closed with 3-0 polydioxanone running suture. The quality of the erection is tested using a 60-mL syringe as a surrogate reservoir. Then, attention is turned toward pump placement. A subdartos pocket is developed and the pump is placed inferiorly and in a dependent position

within the scrotum. A shod is placed at skin level and the excess is tubing is cut.

Reservoir Placement

Laterality is chosen depending on the patient's surgical history and type of urinary diversion. To minimize chances of injury to the intestine or urinary diversion, the reservoir is placed in the lateral retroperitoneal space accessed by a separate counterincision 2 cm medial and 2 cm inferior to the anterior superior iliac spine, extending 3 cm inferiorly parallel to the inguinal crease. In a patient with IC diversion, the side opposing the stoma should be used for reservoir placement. In a patient with NB, either side can be used. It has been our practice to use the left lateral retroperitoneum in a patient with CCD. [Figure 1](#) presents the approximate location of reservoir placement. Electrocautery is used to dissect through the subcutaneous fat tissue and Camper fascia. The external oblique fascia is identified and incised 2 cm along the direction of the fibers and stay sutures are placed on each side of the incision. The external oblique and internal oblique muscles are injected with an anesthetic and a curved Mayo scissor is used to spread the muscle atraumatically. Then, the transversalis fascia is bluntly dissected and the retroperitoneum is entered where a space can be easily developed using a finger-sweeping motion. [Figure 2](#) shows the sequential steps used in developing the lateral retroperitoneal space. Then, the reservoir is placed in the space. In each case, an AMS 700 series spherical reservoir (American Medical Systems Inc, Minnetonka, MN, USA) was used. The reservoir tubing is placed at the inferior apex of the fascial incision and the fascia is closed with the preplaced stay sutures. The reservoir is filled and ensured to have no backpressure. Reservoir tubing is tunneled from the lateral retroperitoneal incision to the infrapubic incision with use of a tonsil clamp, just above the external oblique fascia layer ([Figure 3](#)). Excess tubing is trimmed and discarded to minimize redundancy at either incision and to ensure appropriate

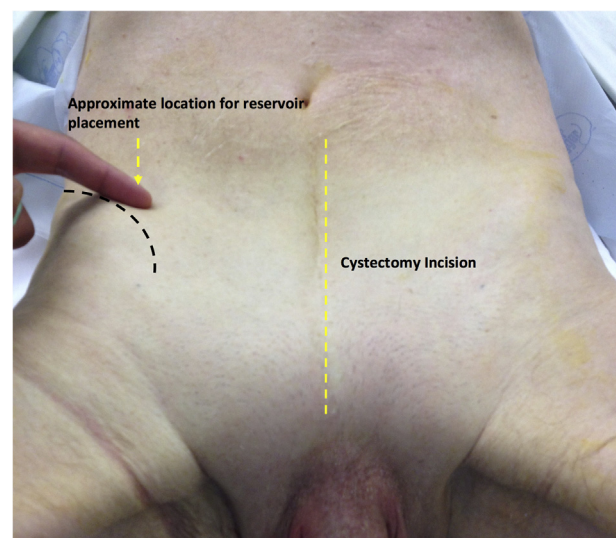


Figure 1. Location of counterincision used for reservoir placement.

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