



Novel Technique Prevents Lymphoceles After Transperitoneal Robotic-assisted Pelvic Lymph Node Dissection: Peritoneal Flap Interposition

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INTRODUCTION	To determine the efficacy of our novel technique to prevent lymphocele formation after pelvic lymph node dissection (PLND) after robotic-assisted radical prostatectomy (RARP) using the existing peritoneum of the bladder.
TECHNICAL CONSIDERATIONS	We evaluated 155 consecutive patients undergoing RARP with PLND over 24 months. Group A included the first 77 patients with PLND using standard technique (no peritoneal flap). Group B included the subsequent 78 patients (1 patient excluded) with PLND and peritoneal interposition flap. The peritoneal interposition flap is created by rotating and advancing the peritoneum around the lateral surface of the ipsilateral bladder to the dependent portion of the pelvis and fixing it to the bladder itself. A cystogram was performed in 91% of the patients 7-14 days after the surgery. Lymphocele formation rates were compared (based on symptoms, cystogram findings, and radiographic confirmation).
RESULTS	The 2 groups were statistically equivalent in terms of prostate-specific antigen, age, blood loss, body mass index, Gleason score, prostate size, pathology, or heparin use. Lymphocele formation occurred in 9 of 77 (11.6%) group A patients and in 0 of 77 group B patients ($P = .003$). Mean time to lymphocele detection in group A was 30.4 days. Mean follow-up in groups A and B were 383.97 and 379 days, respectively ($P = .91$).
CONCLUSION	Strategic rotation and fixation of a peritoneal flap around the lateral aspect of the bladder during transperitoneal RARP with PLND is a novel technique to prevent lymphocele formation. Given the sample size and single institutional study, a prospective, randomized, multi-institutional trial is planned. UROLOGY 85: 1505–1509, 2015. © 2015 Elsevier Inc.

As urologists have gained more experience with robotic-assisted radical prostatectomy (RARP), the number and complexity of prostatectomy procedures have increased. The 2 most common indications for pelvic lymph node dissection (PLND) are intermediate risk stratification based on the American Urological Association's prostate cancer risk classification (prostate-specific antigen level, 10-20 ng/mL or a Gleason score of 7 or clinical stage T2b)¹ and/or a $\geq 2\%$ probability of lymph node invasion based on nomograms developed at Memorial Sloan Kettering Cancer Center (MSKCC).^{2,3}

Robotic PLND is an established technique to determine nodal status of prostate cancer patients.⁴ Although robotic PLND safety has been determined, complications may occur. Lymphocele formation is the most common

postoperative complication of PLND.^{5,6} Most are clinically insignificant and resolve spontaneously; however, 2%-15% will require percutaneous or surgical drainage.^{4,7-9}

In cases of symptomatic lymphoceles, patients typically present with lower abdominal pain, lower urinary tract symptoms, fevers, lower extremity swelling, or deep vein thrombosis. These symptoms and the treatment of the lymphocele can cause a significant amount of morbidity to the patient. A postoperative cystogram, commonly used to detect anastomotic leak, may demonstrate the presence of a lymphocele as it compresses the bladder and causes distortion of the bladder contour (Fig. 1A). Most patients with a symptomatic lymphocele will require either percutaneous drainage¹⁰ or laparoscopic marsupialization.¹¹

Based on the computed tomography (CT) appearance of lymphoceles (Fig. 1B) and the scarcity of lymphoceles after cystectomy, we hypothesize that the edges of the peritoneum incised just lateral to the medial obliterated ligament reapproximate, thus sealing off the PLND bed from the peritoneal cavity. Additionally, the bladder

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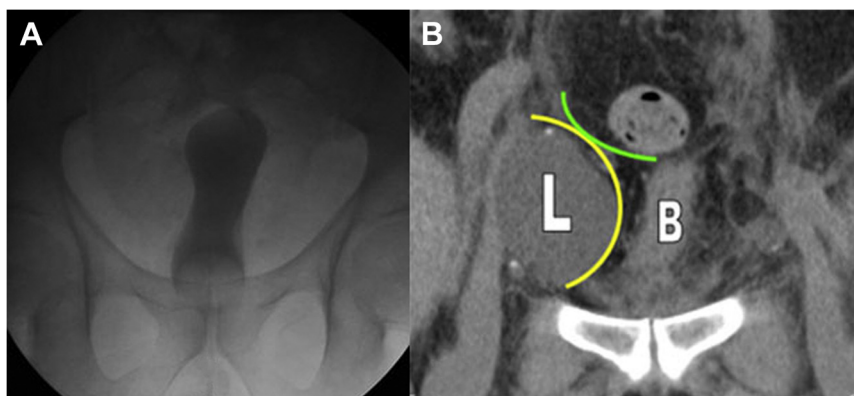


Figure 1. (A) Postoperative cystogram in a patient who had bilateral lymphoceles. Note the hourglass shape of the bladder from the extrinsic compression. (B) Borders of a lymphocele. The yellow line outlines the lymphocele cavity. Medial lymphocele wall abuts perivesical adipose tissue. The lateral wall is the pelvic sidewall. Superiorly is the overlying peritoneum, indicated by the green line. B, bladder; L, lymphocele.

forms the medial wall of a lymphocele cavity. Therefore, we proposed that sliding a peritoneal surface between the lateral wall of the bladder and the lymphadenectomy bed might prevent lymphoceles from forming in this location. Instead of allowing the bladder to scar over the lymphadenectomy bed, thereby necessitating fenestration of the peritoneum when the lymphocele occurs, we developed a novel technique at the time of PLND to preemptively create a peritoneal window using the existing peritoneum overlying the bladder. Our hypothesis was that our technique should prevent the bladder from excluding the lymphadenectomy bed, allowing a pathway for continuous drainage of lymphatic fluid into the peritoneal cavity and thus prevent lymphocele formation.

METHODS

Data were reviewed using our institutional review board–approved prospectively collected radical prostatectomy database. The study consisted of 155 consecutive patients who underwent RARP with PLND during a 24-month period. We created the peritoneal interposition flap in 78 sequential patients and retrospectively compared it with the previous 77 patients. Patients were included if they had biopsy-proven prostate cancer with intermediate- or high-risk features according to the D’Amico risk stratification and were candidates for concurrent PLND.¹² Exclusion criteria included prior prostate irradiation. Preoperative CT, magnetic resonance imaging, or bone scans were obtained on a case-by-case basis. All patients received 5000 IU of subcutaneous heparin before the surgery began, and intermittent leg compression devices were used during the entire operation.

All operations were performed at a single institution by 2 surgeons. PLND was performed either bilaterally or unilaterally based on the surgeon’s discretion at the beginning of the case and patients were not excluded if only a unilateral dissection was performed. At a minimum, an obturator PLND with defined boundaries (pubic bone, lateral side wall, obturator nerve, and external iliac vein) was completed. A combination of electrocautery and Hem-o-lok clips (Teleflex Medical) were used. All PLNDs were performed by senior staff. At the end of the procedure, a single Jackson-Pratt drain was placed for all patients.

Of the 155 consecutive patients, 154 were included. In the first 77 patients (group A), PLND was performed and then the RARP was completed. No peritoneal flap was created.

In the subsequent 77 patients (group B), PLND and RARP were completed using the exact same technique and materials as the previous group, but we created the peritoneal interposition flap at the end of the case. The peritoneal flap, developed by dropping the bladder from the abdominal wall, was used after completion of the vesicourethral anastomosis (Fig. 2A). This flap uses the redundant peritoneal surface that usually covers the preperitoneal space, and this is entered when dropping the bladder down. The flap (Fig. 2B point A) was brought to the most dependent portion of the pelvis (posterior and caudal) and fixed to the lateral aspect of the bladder (Fig. 2B point B) using interrupted VICRYL sutures (Ethicon). At least 2 sutures were placed, with additional sutures placed as needed, so that the peritoneal surface would face the adjacent lymph node bed. This flap covered the perivesical adipose tissue, thus preventing contact with the PLND bed (Fig. 2C; additional [Supplementary Video](#)). The flap is completed at this point if performing it unilaterally. Otherwise, it is repeated on the other side in the exact same fashion. Additionally, the apex of the flap is secured to the ventral perivesical adipose tissue when both sides have a flap created to anchor them in place. The tissue used for the flaps does not need to be split, and there is more than enough tissue to complete the flap on both sides. The pneumoperitoneum can be reduced to ensure that the perivesical fat does not come in contact with the lymphadenectomy bed once the sutures have been placed. Theoretically, this window prevented the bladder from scarring over the lymphadenectomy bed and allowed for continuous egress of lymphatic fluid into the peritoneal cavity to be reabsorbed if a lymph “leak” occurs.

Postoperative management was not different between the 2 groups. All patients continued on 5000 IU subcutaneous heparin every 12 hours until discharged from the hospital. On postoperative day 0, patients were instructed to ambulate and were not given anything by mouth. On postoperative day 1, patients were given a clear liquid diet, the Jackson-Pratt drain was removed, and patients were transitioned to oral pain medication with home discharge, if criteria were met.

Patients were seen for follow-up in 7–12 days after surgery, and the majority (140 of 154 patients, 91%) had a cystogram to assess for any signs of leak or evidence of a lymphocele. If no

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