P.L.E.A.T.—Preventing Lymphocele Ensuring Absorption Transperitoneally: A Robotic Technique

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OBJECTIVE To reduce the risk of symptomatic lymphocele after robotic pelvic lymph node dissection (PLND), we present a technique, preventing lymphocele ensuring absorption transperitoneally (P.L.E.A.T.), where the peritoneum is "pleated" along its midline, leaving 2 lateral openings and allowing lymphatic fluid to drain away from the pelvis and into the abdomen.

MATERIALS AND METHODS We analyzed a single-surgeon series of PLNDs during robotic radical prostatectomy, comparing 195 "standard" PLNDs (in which the peritoneum was "re-approximated" or left completely open) with 176 cases in which P.L.E.A.T. was performed.

RESULTS In the group without P.L.E.A.T., 8 cases of symptomatic (grade ≥3, according to the Clavien-Dindo Classification) lymphoceles (4.1%) were recorded. Only 1 patient in the P.L.E.A.T. group complained of symptoms because of a lymphocele (P = .039). No patient reported complications because of the procedure.

CONCLUSION The P.L.E.A.T. technique is a fast, easy-to-perform, and safe method of reducing the risk of symptomatic lymphocele after transperitoneal robotic PLND. UROLOGY 110: 244–247, 2017. © 2017 Elsevier Inc.

The formation of a pelvic lymphocele is a complication that may follow robotic pelvic lymph node dissection (PLND). Most cases of lymphoceles are asymptomatic (incidence reaches 30%) and are often an incidental finding during follow-up.[1,2] When symptoms do occur (incidence after robotic PLND 0%-8%, grade ≥3, according to the Clavien-Dindo Classification[3]), they are typically related to compression of surrounding structures (pelvic pain, leg edema, deep vein thrombosis [DVT]).[4]

An injury to the lymphatic vessels is the main causative factor in the formation of a lymphocele. Potential risk factors for its development are surgical approach (laparotomy vs laparoscopy or robotic), number of lymph nodes removed, lymph node status, and type of cancer.

Several studies have shown a lower incidence of lymphocele after robotic radical prostatectomy (RARP) with PLND, by means of a transperitoneal approach rather than traditional open or extraperitoneal approaches. Initial peritoneotomy is probably the main reason for the decreased incidence of lymphocele formation during transperitoneal PLND. The opening created during this approach allows lymphatic fluid to drain away from the pelvis and into the abdomen. Nevertheless, the incidence of lymphocele is also higher than anticipated, in view of the believed protective effect of the transperitoneal approach.[5,6]

The aim of this study was to analyze the incidence to date of symptomatic lymphocele and to assess the protective role of a surgical technique to prevent its formation in a large cohort of patients followed after robotic PLND and transperitoneal RARP for prostate cancer.

We report our experience with P.L.E.A.T. (preventing lymphocele ensuring absorption transperitoneally), a variation of a technique initially reported by Lebeis et al,[7] who introduced a new approach with a creation of a peritoneal flap to prevent lymphocele formation.

MATERIALS AND METHODS

We analyzed a single-surgeon (FDM) series of PLNDs during RARP, comparing 195 "standard" PLNDs (in which the peritoneum was "re-approximated" or left completely open) with 176 cases, in which a "partial" closure of the peritoneum was performed.

The aim of this technique is to create a pathway lined by peritoneum, to direct lymphatic fluid out of the pelvis and into the peritoneal cavity where it can be absorbed; the peritoneum is "pleated" along its midline and fixed to the fibers of the *rectus abdominis* muscles, near the pubis. The P.L.E.A.T. technique, leaving 2 lateral openings, allows lymphatic fluid to drain away from the pelvis and into the abdomen (Fig. 1).

We excluded the first 50 cases of PLND performed by the surgeon FDM from this series: in these cases, we found 4 symptomatic lymphoceles, but because the cooperation with other

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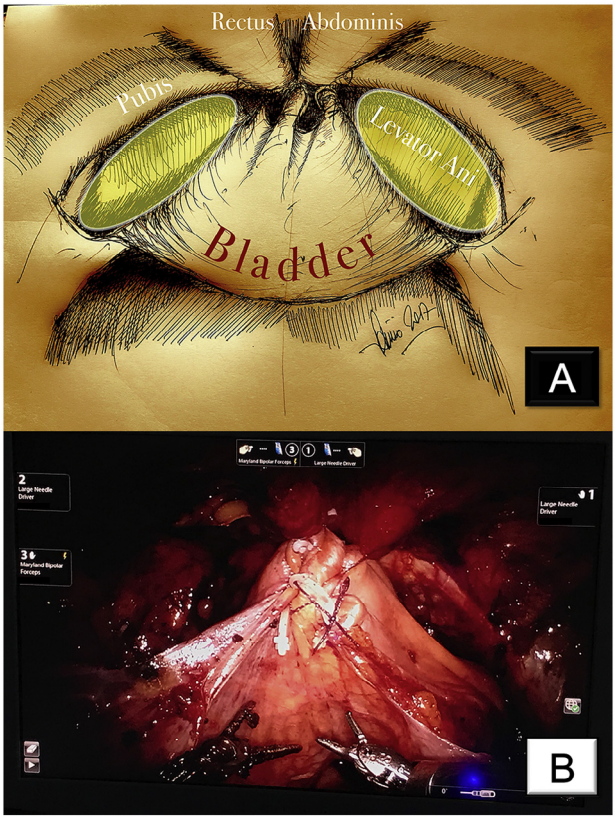

Figure 1. **(A)** Drawing and **(B)** intraoperative photo showing bladder peritoneum "pleated" along the midline, leaving 2 lateral openings, according to the preventing lymphocele ensuring absorption transperitoneally (P.L.E.A.T.) technique. (Color version available online.)

surgeons and a nonstandardized technique, we decided to exclude the above cases to avoid any bias because of the initial learning curve. Although including the first 50 cases would have allowed us to increase the level of significance of this study (P value from .038 to .01), it would not have been methodologically correct.

All patients were managed similarly in the perioperative period (ie, same timing for catheter or pelvic drain removal). In view of DVT prophylaxis, we treated all patients with subcutaneous low molecular weight heparin (enoxaparin) at a dosage of 4000 UI/d (modified according to specific risk, renal function, body mass index) and graduated compression stockings. We usually continued enoxaparin administration for 1 month after surgery.

We considered as "symptomatic" any patient who presented with pelvic symptoms such as pelvic fullness, fever, or lower abdominal pain, even if slight, with ultrasound or computed tomography or magnetic resonance imaging feedback showing a lymphocele, according to Kim et al's criteria.[8]

Patients who developed DVT complained of pain, swelling, or discoloration of the affected extremity; diagnosis was confirmed with Doppler or compression ultrasonography.

Statistical analysis was performed with application of Fisher, Mann-Whitney, and Pearson chi-square tests.

RESULTS

The demographic and clinical characteristics of patients in both groups were comparable, as was lymph nodes status (P >.05). There were statistically significant differences in the pathologic staging of cancers (P <.05) and in the median number of lymph nodes removed (5 vs 10 in standard and P.L.E.A.T. groups, respectively; P <.00001) (see Table 1).

The cases of extended PLND (25 vs 35, in standard and P.L.E.A.T. groups, respectively) were not statistically different (P = .064). In the 195 PLNDs without P.L.E.A.T. reconstruction, we found symptomatic lymphocele (grade ≥3, according to the Clavien-Dindo Classification[3]) in 8 cases (4.1%) distributed homogeneously (and not grouped in the first cases). Only 1 patient in the P.L.E.A.T. group complained of symptoms because of a bilateral lymphocele, which required percutaneous drainage (P = .039). Specific data concerning these patients and the management of complications are shown in Table 2. No patient reported either complications related to the procedure or any kind of abdominal or pelvic discomfort.

Comment

The problem of preventing lymphocele after PLND remains an interesting challenge, particularly in cases of extended PLND. Various solutions have been proposed to limit the risk, such as the use of new energy sources, or collagen patches coated with human coagulation factors, which provide rapid and reliable hemostasis by creating a robust fibrin clot adhering to the tissue surface.[9,10]

Considering exclusively surgical techniques, a "peritoneal fenestration" is proposed to prevent the abovementioned complications: this concept has been extensively studied to prevent lymphocele development in renal transplantation and a recent review confirmed its effectiveness.[11]

In fact, during open radical prostatectomy or extraperitoneal RARP, the occurrence of lymphocele is significantly lower with fenestration, and the formation of symptomatic lymphocele requiring surgical intervention was de facto eliminated, without an increase in postoperative morbidity, as documented by Stolzenburg et al.[12]

Nevertheless, although transperitoneal PLND, as opposed to traditional open or extraperitoneal approaches, has shown a lower incidence of lymphocele, it still remains significant[13]: it may be because of spontaneous "re-approximation" of the edges of the peritoneum, incised laterally to the medial obliterate ligaments. In many cases, after release of the pneumoperitoneum after a RARP with PLND, even though the bladder is left "dropped," perivesical fat adheres to the PLND bed, creating a closed space in which lymphatic fluid accumulates. As reported by Lebeis et al, the bladder often forms the medial wall of the lymphocele cavity.[7]

In addition, when the peritoneum is "re-approximated," the final result is similar to an extraperitoneal open or laparoscopic radical prostatectomy.

As previously reported,[14] during RARP we usually perform the Complete Reconstruction of the Posterior Urethral Support reconfiguration, in which, after the creation of a complete support for the urethra, we put a final stitch from the anterior wall of the bladder to the pubis, allowing the bladder, bladder neck, or posterior urethra axis to be prop-