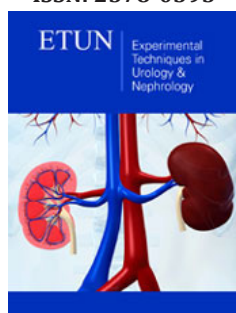


A Novel Strategic Clipping Technique in Pelvic Lymphadenectomy to Safely Avoid Routine Pelvic Drainage Placement During Laparoscopic Radical Prostatectomy

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Abstract

Purpose: To safely avoid the routine placement of a pelvic drain after laparoscopic radical prostatectomy (LRP), a novel strategic clipping technique during pelvic lymphadenectomy (PLND) is presented to primarily decrease postoperative lymphatic leakage.

Material and Methods: We performed 76 LRP in which pelvic drainage was not placed. We described a novel technique in PLND and evaluated results and postoperative complications.

Results: Only one patient (1.31%) presented a complicated lymphocele that required percutaneous drainage under computed tomography guidance and antibiotic therapy. There were no cases of urinoma or anastomotic stricture.

Conclusion: The performance of a strategic clipping technique during the PLND associated with a bladder neck preservation and absence of urinary leakage allowed us to safely avoid the placement of a pelvic drain after the LRP.

Keywords: Prostate cancer; Radical prostatectomy; Pelvic lymphadenectomy; Pelvic drainage

Introduction

The active treatment (surgery or radiation therapy) is recommended for the localized prostate cancer [1]. Placement of a pelvic suction drain following a laparoscopic radical prostatectomy (LRP) is considered routine, however, there is limited evidence on the real benefit of a routine pelvic drainage [2]. The presence of lymphatic metastases is a prognostic factor of relevant importance in prostate cancer. Pelvic lymphadenectomy (PLND) is the most reliable tool when staging lymphatic involvement compared to available imaging studies and also prolongs survival in patients with lymph node metastasis [3]. The perioperative complication rate after laparoscopic PLND is approximately 4-20% and the lymphocele formation is the most frequent [4]. The subclinical lymphocele rate ranges from 27-30% [5], although most of them usually occur asymptotically, the presence of abdominal pain with fever or sepsis may suggest the presence of lymphoceles that require percutaneous drainage [6]. The most frequent reasons for the placement of a routine drainage were PLND, an inaccurate anastomosis between the urethra and urinary bladder and intraoperative factors (bleeding). However, it has been associated with surgical site infections, pain at the drain site, bleeding, arteriovenous fistulae, pseudoaneurysms and retained foreign bodies requiring reoperation [7]. To safely avoid the routine placement of a pelvic drain after LRP, a novel strategic clipping technique during PLND is presented in order to primarily decrease postoperative lymphatic leakage.

Materials and Methods

Following institutional review board approval, we used retrospectively our institutional database to identify 182 patients who underwent LRP from November 2016 to October 2019. One hundred six patients were excluded from the analysis (placing a postoperative drain) because did not present de inclusion criterial. There were 76 cases in which drain was not placed and we performed the novel technique in our PLND and represent the patients

included in our study. We performed a 5 port transperitoneal technique with the modifications of the Walsh technique [8]. Bladder neck preservation with careful dissection was performed when possible and the urethrovesical anastomosis was performed using the Van Velthoven technique with 2 continuous barbed sutures [9]. At the end of it, approximately 100ml of saline solution was instilled through a urethral catheter into the bladder to check for the presence or absence of urine leakage. The extended PLND

was performed under the novel strategic clipping technique which consists of placing polymer clips (Hem-O-Lok) in previously selected strategic areas: the bifurcation of the primitive iliac artery, the distal limit of the iliac lymph node package, distal and proximal limits of the obturator lymph node package and visible adenopathy (Figure 1 & 2). The Hem-O-Lok clip is a nonabsorbable polymer clip with lock-engagement feature as well as teeth within the jaws, all of which may provide greater security.

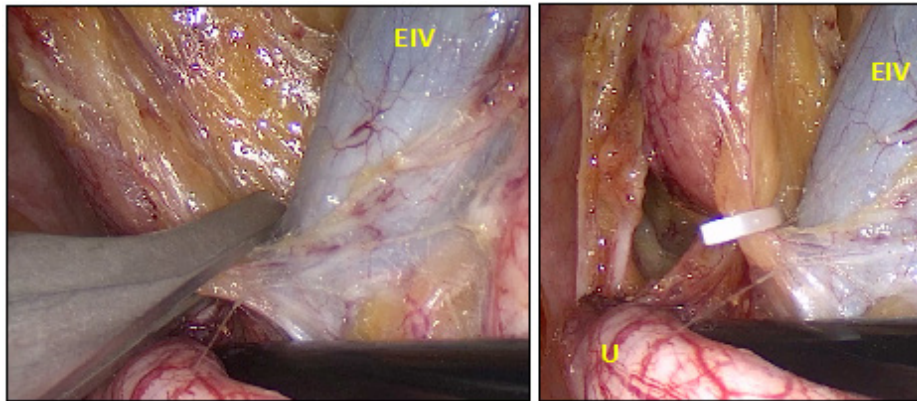


Figure 1: Proximal clipping with polymer clip.
U: Ureter
EIV: External iliac vein

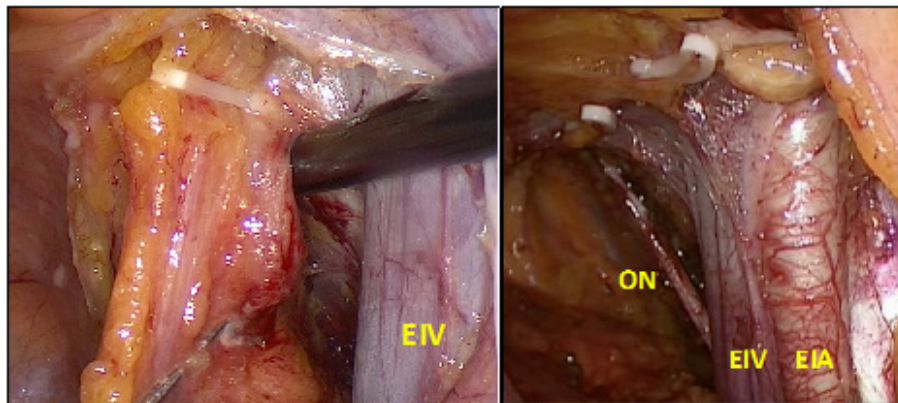


Figure 2: Distal clipping with polymer clip.
ON: obturator nerve
EIV: External iliac vein
EIA: External iliac artery

The placement of a pelvic drain was omitted when the following criteria were met:

1. Bladder neck preservation
2. Absence of urine leakage
3. PLND with strategic clipping of lymphatic vessels

We consider these three points as fundamental and essential and were the inclusion criterion of this study. Those patients in whom these points were not performed were excluded. Routine imaging studies were not performed except in the presence of symptoms and all patients were discharged between the second and third

day after admission. Catheters were removed on postoperative day 10 or 12 and we do not perform cystography before catheter removal.

Results

Routine placement of a pelvic drainage was avoided in 76 patients. The mean patient age was 61 years (range: 51-72) and the mean follow-up was 14±3.7 months (range: 2-34). (Table 1) lists patients characteristics. Bilateral extended PLND was performed in all patients using the technique described and the mean number of lymph nodes retrieved from the dissection was 14 (range: 7-22). Estimated blood loss was 200ml (range: 70-600) and no patient

received a homologous transfusion. All the patients were followed up in the postoperative period. Only one patient (1.31%) presented a complicated lymphocele that required percutaneous drainage under computed tomography guidance and antibiotic therapy. There were no cases of urinoma or anastomotic stricture, and most common postoperative complications are shown in (Table 2).

Table 1

Patients Characteristics	
N	76
Mean age (yr)	61 (51-72)
Mean PSA (ng/ml)	12.72 (2.3-41.5)
ISUP	
1	0
2	28
3	25
4	18
5	5
cT (clinical stage)	
1	64
2	12
pT (pathological stage)	
2	62
3	14
pN (pathological nodes status)	
0	58
1	18
Mean lymph node retrieved	14 (7-22)
Mean estimated blood lose (ml)	200 (70-600)
Follow-up \pm SD (months)	14 \pm 3.7

Table 2

Postoperative complications	
Urinary retention	0
Haematuria	0
Anastomotic stricture	0
Urinoma	0
Lymphocele	1
Haematoma	0
Urinary tract infection	0

Discussion

The placement of a pelvic drain in LRP has been a standard component of the procedure despite not having demonstrated an evidence-based benefit. Savoie et al. [10] were the first to describe the drainage-omission after 85 conventional radical prostatectomies. They reported a single case of a significant urinoma and no case of anastomosis stricture [10]. The same authors update this concept in a more recent publication with 552 patients and showed similar results [11]. Drain placement has

not been shown to prevent complications at the time of another surgeries and is possibly associated with longer operative times, longer postoperative hospital stays and additional drain-related complications [12]. However, there are some studies suggest that a pelvic drain may be required for extended PLND [13]. Despite this suggestion, all our PLND were extended and bilateral. All reports agree that postoperative complications related to the pelvic drainage are uncommon and this is what is shown in our report. The rate of development of a symptomatic lymphocele during PLND depends on the surgical technique. Initially, Fried et al. [14] described a symptomatic and subclinical lymphocele rates of 1% and 30.4% respectively after laparoscopic PLND in 111 patients. In a more recent study, Orviedo et al. [15] reported a 51% development rate of lymphoceles after robot-assisted radical prostatectomy and 15.4% were symptomatic. The authors highlight the protective role of the peritoneum by promoting the lymphatic reabsorption [15]. In the present study, all our LRP were performed trans peritoneally and could lead to a low rate of development of clinical relevance lymphocele [1.31%]. It is important to understanding of the routes of lymphatic drainage. Sobotta et al. [16] described the lymphatic system as being predominantly a network of interconnected capillaries that form lymphatic plexuses composed of stems and trunks with interposition of nodes at the root of the main stems and trunks. These lymphatic vessels drain into the periprostatic subcapsular network from which three groups of ducts originate: the ascending duct from the cranial prostate drains into the external iliac nodes, and the lateral ducts to the internal iliac nodes and the posterior duct drain from the caudal prostate to the presacral nodes. According to lymphography studies, the four main regions for these ducts are: the internal iliac group as the primary region, the obturator nodes as the secondary, the external iliac as the tertiary, and the presacral nodes as the quaternary region [17]. Multiple advantages have been described in the bladder neck preservation technique, especially in terms of urinary continence. Furthermore, a larger bladder neck diameter can result in the need for time consuming, reconstructive tapering, which may increase susceptibility to anastomotic leak as a result of the longer suture line [18]. Postoperative cystography was not performed in any patient of our study. Contrast extravasation was historically described between 67-78% during the first five or eight days and 34% after seven days after conventional radical prostatectomy [19]. Currently, the series show minor results being 12% at 5 days of LRP and 4.6% at 10 days after robot-assisted radical prostatectomy [20]. Limitations of this study include the short-term follow up, however, most complications influenced by drain placement occur within the first few weeks or months after surgery.

Conclusion

In conclusion and in our experience, the performance of a strategic clipping technique during the PLND allowed us to safely avoid the placement of a pelvic drain after the LRP. Until such time, on the basis of the current analysis we have eliminated routine drain use in patients undergoing LRP.

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