Total prostatectomy and lymph node dissection may be done safely without pelvic drainage: an extended experience of over 600 cases

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Objectives: Routine placement of a pelvic drain may be avoided after total prostatectomy, traditionally known as "radical retropubic prostatectomy", with lymph node dissection (TP/LND). From our experience with 846 patients, we contend that patient safety and efficacy is not compromised by selectively omitting a pelvic drain.

Materials and methods: TP/LND was performed in 846 patients with clinically localized prostate adenocarcinoma. Patient demographics, clinical and pathological data were recorded and relevant data was analyzed. After the prostate was removed and the anastomotic sutures tied, saline was instilled into the bladder through the urethral catheter. If there was no significant leakage, hemostasis was adequate, and there was no injury to adjacent organs, a drain was omitted.

Results: A drain was omitted in 624 (74%) of the 846 patients. The postoperative complication rates were compared between those with (D+) and without (D-) a drain. In the latter group, there were 24 (4%) immediate postoperative complications without a significant difference between the two groups (D+, 6%; D-, 4%; p = 0.25). When comparing the incidence of urinary retention, hematuria, anastomotic stricture, pelvic fluid collections, hematuria, and thrombolic events, there was no significant difference between patients with and without a drain.

Conclusions: The morbidity of TP/LND is low when performed by an experienced surgeon. When the urethrovesical anastomosis is watertight and hemostasis is assured, a pelvic drain may be omitted without compromising patient safety and efficacy.

Key Words: lymph node dissection, pelvic drain, prostatectomy

Introduction

Total prostatectomy (TP) is a curative treatment modality for managing men with localized prostate

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Address correspondence to Dr. Mark S. Soloway, Department of Urology, University of Miami School of Medicine, P.O. Box 016960, Miami, FL 33101, USA cancer.¹ Pelvic drain placement has long been considered the standard of care in order to collect any fluid including urine, blood, or lymph. Concomitantly, it is also a cause of postoperative pain and serves as a nidus for infection. The necessity of routine drain placement has been questioned in many other surgical fields.²⁻⁶ We were the first to question and describe the omission of a pelvic drain following TP.⁷ We have since updated the analysis to support our claim that a pelvic drain may not be necessary after TP.⁸ Here we extend our analysis to assess the role of a pelvic drain after total retropubic prostatectomy with lymph node dissection (TP/LND).

Materials and methods

From January 2002 to April 2008, TP/LND was performed by a single surgeon on 846 patients with clinically localized adenocarcinoma of the prostate. Patient data including age, clinical stage, prostatespecific antigen (PSA) levels, biopsy Gleason score, bladder neck preservation, estimated blood loss, and postoperative complications were recorded.

Most of our patients undergo a modified pelvic lymph node dissection. The TP was performed using a modified Walsh technique.9 Based on patient age, potency, Gleason score, clinical stage, patient preference, and ease of separation from the prostate, the neurovascular bundles were identified and preserved. Whenever possible, the bladder neck was preserved by meticulous dissection and protection of the circular muscle fibers. The anastomotic technique consisted of seven interrupted 2-0 chromic catgut or poliglecaprone 25 sutures. The integrity of the anastomosis was assessed by instilling approximately 75 cc of sterile saline through the urethral catheter into the bladder. Indications for drain placement included anastomotic leakage, inadequate hemostasis, and injury to adjacent structures. If indicated, a 7 mm Jackson-Pratt closed suction drain was placed through an additional skin incision in the left lower quadrant. A 20F urethral catheter was left in place postoperatively. Sequential compression devices were used throughout and after the procedure for thromboembolic prophylaxis.

The pelvic drain was removed when drainage was less than 50 cc over the 8 hours immediately before removal. This was almost always on postoperative day 1. The vast majority of patients were discharged from the hospital on postoperative day 1. All patients received a 7-10 day course of an oral quinolone, and the urethral catheter was removed on postoperative day 7 or 8. Routine pelvic imaging was not performed; however, any postoperative surgical or interventional radiology procedures were recorded. The primary endpoint of this study was the incidence of postoperative complications. Postoperative complications were analyzed for those with (D+) and without (D-) a drain after TP/LND.

Results

TP/LND was performed on 846 consecutive patients from January 2002 to April 2008. The mean patient age was 60 ± 7.6 years (median: 61, range: 35-88). Patient characteristics are shown in Table 1. Mean follow-up was 22 ± 19.4 months (range: 4-76). Estimated blood loss was 424 ± 275 ml (median: 380). No patient

TABLE 1. Patient characteristics

	Drain	No drain	Total
No. of patients (%)	222 (26)	624 (74)	846
Mean age in years (± SD)	62 (7)	60 (8)	60 (8)
Mean PSA in ng/ml (± SD)	8 (8)	7 (9)	8 (9)
Clinical stage (n [%]) T1 T2 T3	155 (70) 60 (27) 7 (3.2)	408 (65) 190 (30) 26 (4)	563 250 33
Mean biopsy Gleason score (± SD) PSA = protein-specific a	7 (1) ntigen	6 (1)	6 (1)

received a homologous transfusion. One hundred thirty-nine of 846 patients (16%) received salvaged blood from the cell saver.

A drain was not placed in 624 of the 846 patients (74%). Table 2 lists the indications for a pelvic drain. Bladder neck preservation was performed in 788 (91%) patients. Of the 788 patients who underwent bladder neck preservation, 186 (24%) had a pelvic drain and 602 (76%) did not. Of the 58 patients without preservation of the bladder neck, 36 (62%) had a drain. If the bladder neck was not preserved, there was a significantly greater chance of a drain being placed (p < 0.005; Table 3).

TABLE 2. Indication for pelvic drainage

Indication	No. of patients
Non-water-tight anastomosis	216
Rectal injury	1
Inadequate hemostasis	5
Total	222

TABLE 3. Bladder neck and drain status

	Drain (n = 222)	No drain (n = 624)	Total
No. bladder neck preservations (%)	186 (24)	602 (76)	788
No. without bladder neck preservation (%)	36 (62)	22 (38)	58

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TABLE 4.	Lymph node	dissection	(LND)	and	drain
status					

	Drain	No drain	Total
LND			
Right (%)	8 (22)	28 (78)	36
Left (%)	3 (25)	9 (75)	12
Bilateral (%)	211 (26)	587 (74)	798
Total	222	624	846

Bilateral lymph node dissection was performed in 798 (94%) patients, of whom 211 (26%) had a drain and 587 (74%) did not, Table 4. Differences were not significant for patients who had bilateral pelvic lymph node dissection and those who had unilateral pelvic lymph node dissection (p = 0.84). The mean number of lymph nodes retrieved from the pelvic lymph node dissection was 6.

No significant difference was found in number of complications between those with and without the drain (p = 0.25), Table 5. The immediate postoperative complication rate was 4% (37 patients).

Fifteen patients developed urinary retention after catheter removal on day 7. A catheter was reinserted, and the bladder decompressed and drained for an additional week. Seven of these patients had a drain, and eight did not. All 15 patients voided without difficulty after this episode. Pelvic fluid collections, which may have consisted of urine (urinoma) and/or lymph (lymphoceles), were found in two patients who did not have a drain inserted intraoperatively. One of the patients required cystoscopy guided reinsertion of the catheter using a dilator placed over a guide wire on postoperative day 13. Catheter was removed 6 days later and the patient was able to void well. The second patient had percutaneous drain insertion under computerized tomography guidance on postoperative day 3. Drainage stopped 2 days later with subsequent drain removal. Two patients with a drain placed at the time of surgery developed fluid collection in the pelvis. A percutaneous drain was placed and removed later without incident. There was no recurrence. No statistical difference between the two groups was found with regard to pelvic fluid collection (p = 0.28). A symptomatic hematoma causing edema occurred in two patients who had a drain, but was treated conservatively without intervention. The remaining four patients with hematomas whom did not have a drain placed were also managed conservatively.

Ten patients developed hematuria. The mean time to manifestation of hematuria was 25 (\pm 15.4; range 8-51) days. All occurred after catheter removal. An anastomotic stricture was documented in one patient with drain placement. The stricture was managed with an incision of the anastomosis, and it did not recur.

Discussion

Total prostatectomy, or as most call it a radical retropubic prostatectomy, has been shown to be curative, increasing survival in patients with localized prostate adenocarcinoma. Since the procedure's original description in the early 1980's, drain placement has been considered the standard of care.¹⁰ Over the past few decades, the management of prostate cancer has transformed tremendously with time and technological advancement. While increasing the detection of indolent prostate cancer, serial PSA levels and transrectal ultrasound guided biopsies of the prostate have allowed for earlier diagnosis and treatment of pathologically confined disease, especially in younger patients.¹¹

	Drain (n = 222)	No drain (n = 624)	p value	
Urinary retention (%)	7 (3)	8 (1)	0.07	
Hematuria (%)	1 (0)	9 (1)	0.24	
Anastomotic stricture (%)	1 (0)	0 (0)	0.09	
Pelvic fluid collection (%)	2 (1)	2 (0)	0.28	
Hematoma (%)	2 (1)	4 (1)	0.69	
Thromboembolic event (%)	0 (0)	1 (0)	0.55	
Total	13 (6)	24 (4)	0.25	

TABLE 5. Postoperative complications

Because of low risk of metastatic disease, lymph node dissection (LND) may be avoided in patients with low PSA levels, Gleason score 6 and low tumor volume. However, LND is routinely performed by some because of the uncertainty of the final tumor grade.¹² The added morbidity of the procedure includes the risk of lymphocele. In our experience, lymph node metastasis was found in only seven patients (0.7%).

There is low morbidity associated with TP/LND in the hands of an experienced surgeon. Common complications include erectile dysfunction, urinary incontinence, anastomotic leakage, prolonged lymph drainage, rectal injury, symptomatic lymphocele, pelvic abscess, or hematoma. These are found in less than 2% of all cases.^{13,14} Because routine postoperative imaging is not performed, the incidence of asymptomatic lymphoceles is not known.

Prophylactic usage of drains in abdominal and pelvic surgery has been questioned. We previously reported the omission of a pelvic drain after TP.^{7,8} Smaller series have shown that under similar conditions, drain placement may be avoided in both open and robotic TP with similar frequency of complications.¹⁵ Other fields such as general surgery, gynecology, spinal surgery, have not reported a statistically significant difference in complication rate with and without drain placement.^{2-4,16,17} Intraperitoneal drains have been shown to be avoidable after colon resection for cancer on prepared bowel, perforated duodenal closure, open and laparoscopic cholecystectomy, liver resection, radical hysterectomy, pelvic and retroperitoneal lymphadenectomy, and lumbar spinal fusion surgery.⁵ Routine pelvic drainage is unnecessary for management of extraperitoneal bladder perforations, and adds another source of morbidity.¹⁸

Placement of a Jackson-Pratt drain may directly lead to complications such as hematoma, infection, pain at the drain site, inferior epigastric artery injury and fracture of the drain on removal.⁸ This may necessitate another surgical procedure. The drain is a foreign body, and thus may theoretically serve as a nidus for infection.¹⁹ Reports have described fracture of the drain on removal and retention of drain segments and suture. We have observed four instances, which necessitated another trip to the operating room. Niesel et al contend that the drain has been found to be the cause of postoperative pain in 24% of patients undergoing TP.¹⁹

Pelvic drain placement is indicated in three situations: inadequate hemostasis, injury to an adjacent structures, and anastomotic leakage. The most common indication is anastomotic leakage (97%). Morey et al reported that a pelvic drain can be omitted following

TP for benign prostatic hypertrophy.²⁰ Fibrin sealant was applied over the closed prostatic capsule and a three way catheter was used for continuous bladder irrigation. A drain was not used, and no complications were reported.

We believe that the benefit of omitting the drain outweighs the slight increased risk of complications needing later drain placement. However, the surgeon must use his or her clinical judgment to analyze the risks and benefits of omitting the drain. It has been shown that provider volume of TP correlates with favorable outcomes. Hospitals with high volumes show decreased morbidity and mortality, and surgeons who perform TP commonly have fewer long-term complications.²¹ Thus, the surgeon must feel comfortable performing the procedure and must be comfortable with the level of hemostasis, the integrity of the anastomosis, and the safety of surrounding structures.

We recognize the limitations of our study. The study was nonrandomized and retrospective. Our assessment of early complications was based upon clinical symptoms and not objective tests such as pelvic ultrasound or cystography. Our intent was to reaffirm our contention that a pelvic drain may be avoided after TP, and to extend our claim to include TP with LND.

Conclusion

In accordance with our prior reported experience and those of recent studies from other surgical specialties, our results demonstrate that a pelvic drain may be avoided in many cases. A drain may be omitted after TP with LND if the bladder neck is preserved or satisfactorily reconstructed, if there is minimal to no extravasation, if hemostasis is ensured, and if there are no injuries to adjacent structures. If these criteria are met, morbidity is not increased and patient safety and efficacy is not compromised in omitting a drain after TP/LND.

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