

# A hybrid technique of lap perineal pelvic lymphadenectomy after open radical perineal prostatectomy in localized carcinoma prostate: Our initial experience

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**Cite this article as:** Masood PF, Gahlawat S, Goel HK, Sharma U, Guleria K, Sood R. A hybrid technique of lap perineal pelvic lymphadenectomy after open radical perineal prostatectomy in localized carcinoma prostate: Our initial experience. *Turk J Urol.* 2021; 47(5): 386-391

## ABSTRACT

**Objective:** The major disadvantage of radical perineal prostatectomy (RPP) is the difficulty to perform pelvic lymphadenectomy via the same incision. Open retropubic, mini laparotomy, and transperitoneal laparoscopic pelvic lymphadenectomy as an adjunct to open RPP have been tried but need change in patient position and separate incision, thereby decreasing the acceptability of this procedure. Open RPP followed by a lap perineal pelvic lymphadenectomy via the same perineal incision is a hybrid technique that is aimed to decrease morbidity of lymphadenectomy.

**Material and methods:** Patients of low and intermediate risk localized carcinoma prostate with a Partin score of >5% were taken for this procedure. After completing prostatectomy part of RPP, lap perineal pelvic lymphadenectomy was performed via same incision using single incision laparoscopic surgery port.

**Results:** We performed this new hybrid technique in eight patients. Bilateral lymph node dissection required an additional mean time of 35 minutes. A total of 68 nodes were retrieved from eight patients with a median number of eight nodes (range: 6-12). None of our cases had any complications related to lymphadenectomy. Bilateral lymph node dissection was feasible in seven patients, and in one patient, it could be done on one side only.

**Conclusion:** Sandwiching lap perineal pelvic lymphadenectomy between prostatectomy part of RPP and urethra-vesical anastomosis (by open approach) is a safe, reproducible, and feasible approach to pelvic lymphadenectomy compared to lymphadenectomy from other routes with simultaneous reduction in the operative time, patient morbidity, and discomfort. Ease of doing lymphadenectomy from same incision can increase the acceptability of this excellent procedure.

**Keywords:** Hybrid technique; lowsley retractor; perineal pelvic lymph node dissection; radical perineal prostatectomy; SILS port.

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**Submitted:**  
26.05.2021

**Accepted:**  
01.09.2021

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Available online at  
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## Introduction

Radical perineal prostatectomy (RPP) was the first surgery described for prostatic carcinoma.<sup>1</sup> RPP lost its eminent status after Walsh's description of anatomic radical retropubic prostatectomy (RRP) in 1982.<sup>2,3</sup> RPP is a valid approach for obese patients,<sup>4</sup> prior pelvic surgery, prior pelvic radiation,<sup>5</sup> hernia repairs, renal transplantation, and pelvic/abdominal vascular bypass graft cases, as the

perineal dissection in such cases is through virgin perineal tissue. The perineal approach permits excellent exposure of the apex and facilitates an exact anastomosis of the urethra, reducing the risk of postoperative urinary incontinence when compared with RRP.<sup>6,7</sup> RPP with only a slight technical modification offers outcomes similar to RRP.<sup>8</sup> Its advantages include decreased pain, blood loss, lower morbidity, convalescence, and shorter hospital stays.<sup>9</sup> One of the drawbacks with

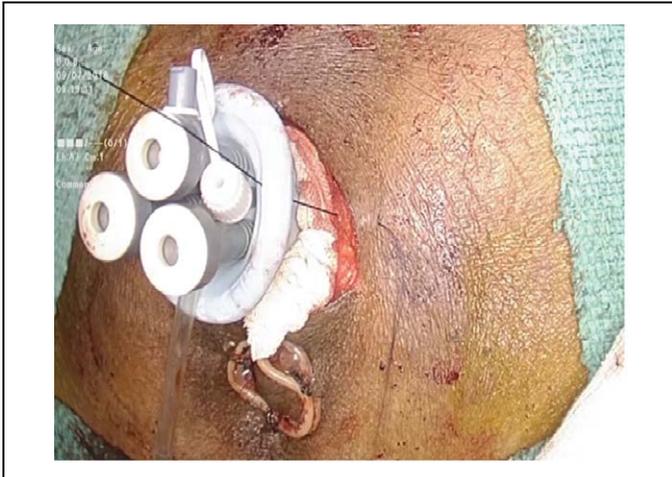


Figure 1. SILS port sutured to skin.

RPP is that lymphadenectomy cannot be conducted through the same incision, hence limiting its use to low-risk disease where lymphadenectomy can be avoided.

Open perineal pelvic lymph node dissection (PLND) after an RPP has been tried, but the results have not been reproducible. It is a difficult approach as the surgeon has to work in a narrow, limited, and deep operation field.<sup>10</sup> Minimally invasive techniques, such as laparoscopic and mini-laparotomy pelvic lymphadenectomy, are well described and provide comparable information, but they require a change in the patient's position and additional incision, which increases the operative time and morbidity.

We hereby describe a novel hybrid approach to pelvic lymphadenectomy using SILS port via the same perineal incision. This hybrid technique not only increases the scope of RPP but has inherent advantages. This can be a platform where future robotic perineal pelvic lymphadenectomy can be applied in same fashion.<sup>11</sup>

#### Main Points

- RPP with perineal lymphadenectomy using SILS port can be an alternative option to pelvic lymphadenectomy, and a second access for lymph node dissection is not needed.
- It is safe, feasible, and is not associated with increased operative time and perioperative complications.
- It can be a valid approach for obese patients' prior pelvic surgery, prior pelvic radiation, hernia repairs, renal transplantation, etc. as the perineal dissection in such cases is through virgin perineal tissue.

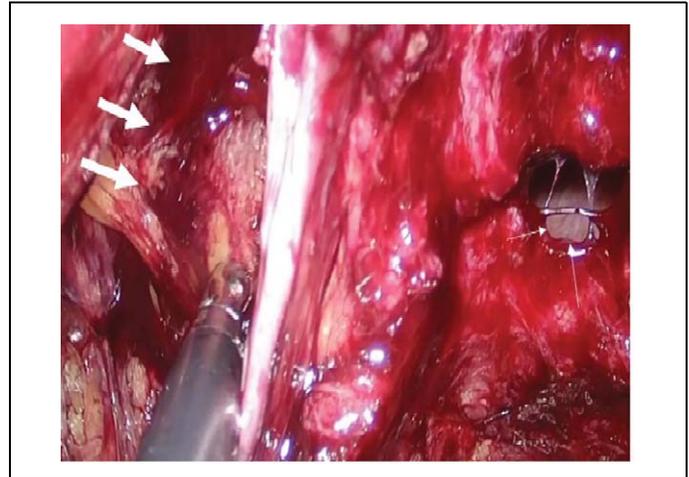


Figure 2. Resected bladder neck (thin white arrow) and the creation of the perivesical space (thick white arrows).

## Material and Methods

After obtaining ethics committee approval from Guru Gobind Singh Indraprastha University, New Delhi (No. 362(38/2019)/IEC/PGIMER/RMLH 8064) and an informed written consent, this study was done on eight patients with low/intermediate risk localized carcinoma of prostate with a Partin score of  $>5\%$ . Patients with a history of abdomino-perineal resection, history of radiation, stricture urethra, and those who cannot tolerate exaggerated lithotomy position were excluded.

## Surgical Procedure

All patients were operated on regular operating tables in exaggerated lithotomy position. Prostatectomy part was performed in the usual fashion of open RPP using standard Young's supra-sphincteric approach using a self-retaining system (Omni tract) and Lowsley retractor. After the prostate is removed, the endopelvic fascia was incised and bladder pushed medially. Posterolateral vesical space was created by blunt dissection using a balloon device. After the creation of perivesical space bilaterally, SILS port was introduced via the same perineal incision and fixed to skin with sutures (Figure 1). Laparoscopic instruments were introduced via SILS port, and under magnified vision, the perivesical space was created (Figure 2). Iliac vessels, obturator nerve, and bladder were identified (Figure 3). Vein is traced upward till the ureter is identified (Figure 4). Bladder is pushed to one side, and the pelvic lymph node dissection was carried within the specified boundary after the proper identification of obturator nerve, iliac vessels, genitofemoral nerve, and ureter (Figures 5 and 6), leaving them bear

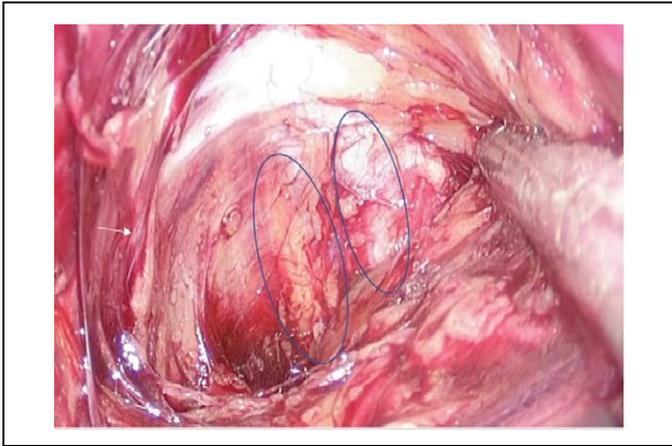


Figure 3. Peri-vesical dissection up to the Iliac vessels (blue circle) and the lateral pelvic wall (white arrow).



Figure 5. Lymph node packet being dissected of the obturator nerve (orange).



Figure 4. Lymph node dissection along the major vessels (iliac vein-white arrow).

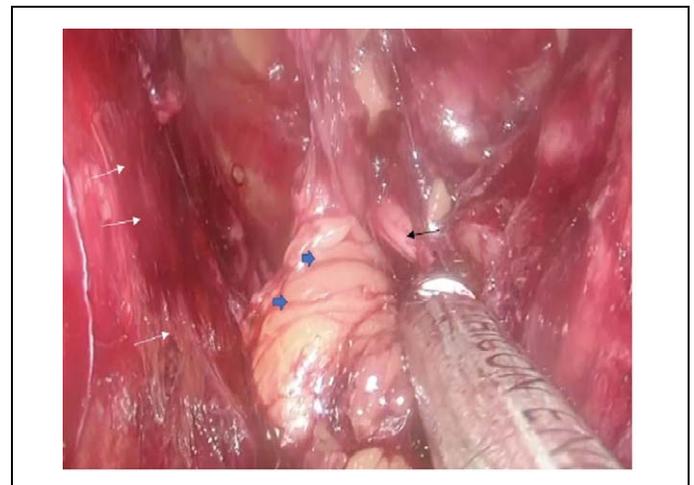


Figure 6. Lymph node packet retrieval (blue arrow), obturator nerve (black arrow), and the lateral pelvic side wall (white arrows).

open (Figure 7). After completing lymph node dissection on one side, nodal specimen of that side was retrieved perineally after removing the SILS port. SILS port was reapplied, and same steps were repeated on the other side. After the completion of lymphadenectomy of the other side, SILS port was removed, specimen retrieved, and all the three specimens were sent for histopathology (Figure 8). Urethro-vesical anastomosis was performed using interrupted vicryl 4-0 sutures. A drain catheter was placed, and levators were reapproximated, without tension. Wound was closed in three layers. Postoperatively, X-ray pelvis was done for the depiction of extent of pelvic lymphadenectomy. Drain was removed when the output was <30 mL/24 hours. Catheter was removed on postoperative day 14.

## Results

The patient characteristics are given in Table 1.

RPP required a median operative time of 190 minutes including median operative time of 35 minutes for lymphadenectomy. The median number of lymph nodes removed from the eight patients were 8 (range: 6-12), and total number of nodes retrieved were 68. No major bleeding or complications like lymphocele occurred. One patient had perineal wound infection that was managed conservatively. Nerve preservation was



Figure 7. After lymphadenectomy with bearing open of iliac vessels (white arrow) and ureter (red arrow).



Figure 8. Prostatectomy with lymphadenectomy specimen.

not done in any of the case. None of our patients had rectal injury. The operative outcomes are given in Table 2.

## Discussion

There has been a renewed interest in the RPP technique in recent years due to various reasons. First, the research of Weldon & Tavel in the late 1980s demonstrated that nerve sparing techniques could also be applied to the perineal approach.<sup>12</sup> Second, the issue of lymph node dissection can be circumvented in selective cases with the development of pre-

**Table 1. The Patient Characteristics**

Median age, years, range	65 (61-71)
Median BMI, kg m <sup>-2</sup>	22.7 (19.2-25.5)
Median prostate volume, cc, range	42 (35-45)
Median PSA, ng mL <sup>-1</sup> , range	10.1 (6.2-14)
Median Gleason score, range	7 (6-7)
Median IIEF-5 score, range	19.5 (18-22)

BMI: body mass index; PSA: prostate specific antigen; IIEF: International Index of Erectile Function.

**Table 2. Operative Outcome**

Total number of nodes retrieved	68
Median no. of lymph nodes retrieved	8 (6-12)
Number of positive lymph nodes	0
Median total operative time (including lymphadenectomy), minutes	190 (180-210)
Median operative time for lymphadenectomy, minutes, range	35 (30-45)
Wound infection	1
Lymphocele	0
Rectal injury	0
Transfusion	1
Positive surgical margins	1
Number of patients continent at 6 months	6 (75%)
Number of patients continent at 12 months	7 (87.5%)
Median IIEF-5 score at 12 months	8 (5-9)
Biochemical relapse at 12 months	1 (12.5%)

IIEF: International Index of Erectile Function.

dictive models such as the Partin tables, Kattan, Briganti, MSKCC, and Roach nomograms.<sup>13</sup> Patients at low risk for pelvic lymph node metastases can be identified preoperatively and safely excluded from pelvic lymph node dissection. Simultaneous pelvic lymph node dissection through same perineal incision has been reported. Third, RPP offers outcomes similar to RRP, the standard approach for the treatment of localized prostate cancer.<sup>8</sup> Fourth, the procedure provides a small incision, perfect access to the prostate (especially the apex), urethra, and neurovascular bundles, omits large muscles and vessels, and yields excellent cosmesis. The operation time is short, while vesico-urethral anastomosis is “surgeon-friendly”—easy, very precise, fast, and watertight. The procedure is successful even in cases that are hardly suitable for

other prostatectomies, such as cases in obese patients,<sup>14</sup> patients after large abdominal operations or transurethral procedures, and those with a large prostate. RPP is also Retzius sparing in which there is preservation of endopelvic fascia, puboprostatic ligaments, and anterior urethral support, avoidance of the accessory pudendal arteries and dorsal veins, and no need for mobilization of urethra; all contribute to the higher rates of postoperative continence and erectile potency.<sup>15,16</sup>

Pelvic lymphadenectomy used to be the Achill's heel of open RPP. There have been many approaches to circumvent this problem like open retropubic, mini laparotomy, transperitoneal laparoscopic, and robotic pelvic lymphadenectomy, all having their pros and cons. It was followed by pelvic lymphadenectomy by open perineal approach that was later expanded to robotic perineal pelvic lymphadenectomy, but hybrid approach has never been tried.

Open perineal pelvic lymphadenectomy involves transperineal access of the retropubic area, which requires the exaggerated lithotomy position. However, this position exerts considerable stress on the lower back and imposes a significant additional gradient for the perfusion of the lower limbs.<sup>17</sup> Complications of this position include compartment syndrome, neuropraxia, lower back strain, venous air embolism, and rhabdomyolysis.<sup>18–20</sup> There are considerable vision problems and back straining for the assistant also as he cannot see the operative field due to limited space and awkward position during assistance. We have taken care in our technique by using a lower exaggerated lithotomy position utilizing allen stirrup for laparoscopic perineal lymphadenectomy, thereby reducing complications both in the patient and surgeon (surgeon as well as assistant).

Saito and Murakami made the initial attempt for open perineal pelvic lymphadenectomy in RPP via same incision.<sup>21</sup> They removed a mean of eight lymph node (range: 4–12). Keller et al.<sup>22</sup> performed extended lymph node dissection in the RPP under direct vision via the same incision, hence resolving the major disadvantage of RPP.<sup>22</sup> They could remove a total of 1,710 nodes from 90 patients, with a mean of 19 (range: 8–37). These studies have been single surgeon and single centric and not much have been added to date. Similar studies have been tried, but the results could not be reproduced. We then planned this hybrid approach of perineal lymphadenectomy to open RPP via same perineal incision using SILS port. We could retrieve a total of 68 nodes from eight patients, with a mean of 8.5 nodes (range: 4–12). The lymph node yield was similar to Saito and Murakami<sup>21</sup> but too low compared to Keller et al.<sup>22</sup> There have not been much studies regarding robotic perineal pelvic lymphadenectomy (r-PLND).

Saito and Murakami<sup>21</sup> described an operative time of 20 minutes for pelvic lymphadenectomy, while Keller et al.<sup>22</sup> reported a mean total operative time of 190 minutes, which included pelvic lymphadenectomy. Ramirez et al.<sup>23</sup> in his case series reported a total operative of 210 minutes (range: 180–240) in r-PLND. We reported a mean operative time of 35 minutes for bilateral perineal pelvic lymphadenectomy via this hybrid approach.

Keller et al.<sup>22</sup> observed no major complications during the procedure. The lymphatic vessels were meticulously closed by hemoclips; however, lymphoceles occurred in seven patients (7.8%) and made intervention necessary in four (3.3%) patients. Saito and Murakami did not note any major bleeding from iliac vessels in their series. In our series, no lymphocele was noted. Very low lymphocele formation in our study could be due to low lymph node yield as compared to Keller et al.<sup>22</sup> dissection and meticulous clip application via laparoscopy. Disadvantages being limited space and swording of instruments. This could be circumvented by using SILS system with the added advantage of using flexible instruments. A robot can also be used for the same purposes.

Performing lymphadenectomy via same perineal route using SILS port circumvents the problem of lymphadenectomy in RPP, thereby increasing the spectrum of RPP to intermediate and high-risk disease where lymphadenectomy cannot be avoided.<sup>24–26</sup> It is also a very cost-effective method with costs 40% lower than RRP procedure.<sup>27–30</sup> In view of small learning curve, minimal invasiveness, and good oncological control, urologists from Indian subcontinent should also use it in view of the relative limited resources available.<sup>31</sup>

The limited number of patients is the limitation of our study.

The lap PLND via the same incision of RPP using SILS port after prostatectomy offers a viable surgical alternative to the usual methods of pelvic lymph node dissection and aims at extending the scope of RPP. It is safe, feasible, and efficient and is not associated with an increase in morbidity, operative time, or perioperative complications. Learning curve is short, and major disadvantage of a second access for lymph node dissection can, thus, be resolved. This hybrid technique can be a landmark achievement in expanding the horizon of RPP, and this concept can be further expanded to similar hybrid technique of open RPP with robotic perineal lymphadenectomy.

**Ethics Committee Approval:** Ethical committee approval was received from the Guru Gobind Singh Indraprastha University, New Delhi (No. 362(38/2019)/IEC/PGIMER/RMLH 8064).

**Informed Consent:** Verbal informed consent was obtained from all participants who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept - H.G., V.S., R.S.; Design - H.G., V.S., R.S.; Supervision - H.G., V.S., S.G., R.S.; Materials - P.F.M., H.G., S.G., K.G., R.S.; Data Collection and/or Processing - P.F.M., V.S., K.G., R.S.; Analysis and/or Interpretation - P.F.M., V.S., S.G., K.G.; Literature Search - P.F.M., K.G.; Writing Manuscript - P.F.M.; Critical Review - S.G., R.S.

**Acknowledgement:** The authors would like to acknowledge Dr. Nikhil Khattar for his immense support and guidance in formulating this manuscript.

**Conflict of Interest:** The authors have no conflicts of interest to declare.

**Financial Disclosure:** The authors declared that this study has received no financial support.

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