



# Outpatient robotic assisted retroperitoneal lymph node dissection

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## ARTICLE INFO

**Keywords:**  
 Robotic  
 Retroperitoneal lymph node dissection  
 Ambulatory

## ABSTRACT

Robotic assisted laparoscopic retroperitoneal lymph node dissection (RPLND) has shorter hospitalizations and less morbidity compared to open RPLND. We describe and demonstrate with video the first report of outpatient robotic RPLND.

## 1. Introduction

Primary retroperitoneal lymph node dissection (RPLND) with an open approach (O-RPLND) remains the gold standard for surgical management of stage I-IIb nonseminomatous germ cell tumors (NSGCT). However, O-RPLND is performed through an incision from the xyphoid to the pubis and has significant morbidity. The pain and potential complications of O-RPLND leads many men to choose chemotherapy as primary treatment.<sup>1</sup> While RPLND overtreats many men with stage I NSGCT who are otherwise candidates for observation, it allows for accurate staging, prevents the >20% relapse rate of men on surveillance, and minimizes exposure to chemotherapy and its related side effects.

Robotic assisted laparoscopic surgery offers a minimally invasive alternative to O-RPLND. Robotic assisted laparoscopic RPLND (R-RPLND) was first performed in 2006,<sup>2</sup> and several academic series demonstrate that R-RPLND has less blood loss, better cosmetic outcomes and shorter hospital stay. Additional advantages of R-RPLND include less morbid laparoscopic incisions and improved magnification and capability to dissect behind the great vessels.<sup>3</sup>

Same day surgery for major urologic operations was first described in 2010 for robotic radical prostatectomy (RARP), and studies demonstrate equivalent safety and higher patient satisfaction for same day RARP vs. inpatient RARP.<sup>4</sup> We extrapolated our same day robotic prostate and kidney surgery experience to perform an outpatient R-RPLND.

## 2. Case presentation

A 21-year-old male presented with a right testicular mass that was incidentally found by the patient during self-exam. His past medical and surgical history were otherwise unremarkable. His family history was

significant for lung cancer (paternal grandmother and grandfather), endometrial cancer (maternal grandmother) and chronic lymphocytic leukemia (maternal grandfather). He denied a history of tobacco use.

A scrotal ultrasound confirmed a 4.5 × 3.5 × 4.1cm heterogeneous solid mass with internal color Doppler flow and microcalcifications in the right testicle. Computed tomography (CT) of the chest, abdomen and pelvis demonstrated no evidence of metastatic disease. His tumor markers were as follows: alpha fetal protein (AFP) 319.6 ng/mL, β human chorionic gonadotropin (β-hCG) 4.9 mIU/mL, lactic dehydrogenase (LDH) 176 U/L.

A right radical orchiectomy was performed via inguinal approach. His AFP normalized to 7.1 ng/mL on postoperative day 50. His orchiectomy pathology came back as malignant mixed germ cell tumor that consisted of teratoma (50%), yolk sac tumor (25%), seminoma (20%), and embryonal carcinoma (5%). Additionally, there was presence of lymphovascular invasion and the margins were negative. Further management options of NSGCT Stage IB (pT2N0M0S0) based on the NCCN guidelines were discussed, including surveillance, RPLND and chemotherapy. The patient elected to proceed with R-RPLND.

A R-RPLND was performed using the Da Vinci Xi robotic platform as previously described (Fig. 1).<sup>5</sup> A right modified template RPLND was performed (Fig. 2A, Video). The operative time was 3h 20 min and the estimated blood loss was 30 mL. There were no complications with procedure and ketorolac was administered prior to extubation. He was discharged from the recovery room 4 h later and after the second dose of intravenous ketorolac with a stable hematocrit.

On post-operative follow up, the patient had return of bowel function on postoperative day one and his pain was well controlled with oral ketorolac and acetaminophen. On postoperative day 14, he also reported that seminal emission was present. Gross pathological examination

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<https://doi.org/10.1016/j.eucr.2022.102192>

Received 26 June 2022; Received in revised form 31 July 2022; Accepted 14 August 2022

Available online 18 August 2022

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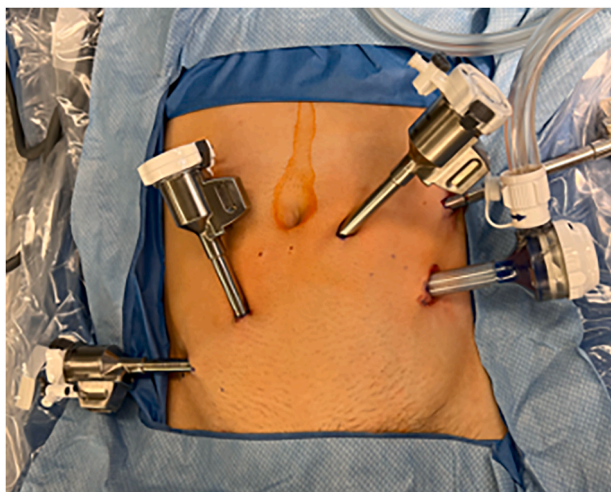


Fig. 1. Port placement for robotic retroperitoneal lymph node dissection.



Fig. 2B. Gross appearance of retroperitoneal lymph nodes.

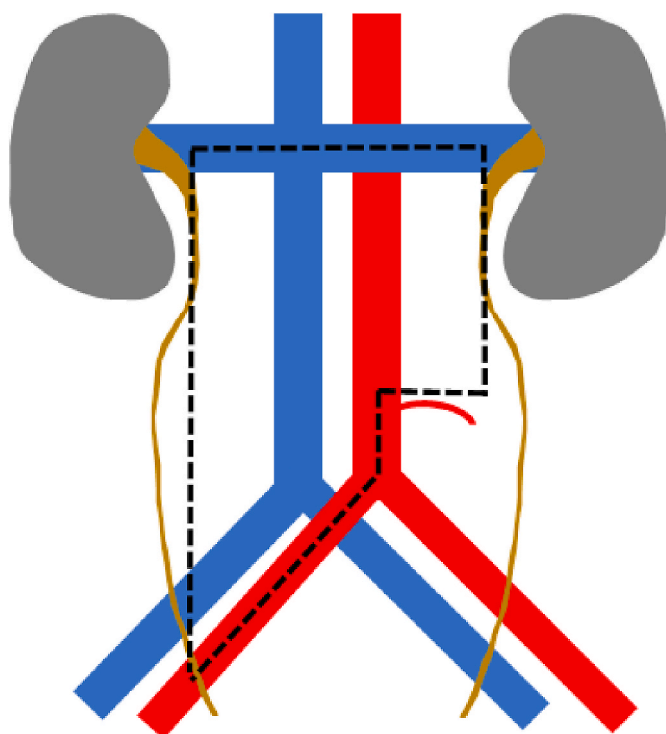


Fig. 2A. Diagram of the right-side RPLND template.

revealed 31 lymph nodes and all were negative tumor (Fig. 2B). Five months after the operation, patient had no evidence of disease on cross sectional imaging.

Supplementary video related to this article can be found at <https://doi.org/10.1016/j.eucr.2022.102192>

### 3. Discussion

We describe the first case, to our knowledge, of primary R-RPLND for stage I testicular cancer performed as an outpatient procedure. RPLNDs were historically performed with an open approach. While O-RPLND has excellent oncologic outcomes, it is accompanied by significant morbidity and a complication rate 7–24%. Blood loss (150–325 cc), postoperative ileus (18%), bowel obstruction, long hospital stays (4–5 days) and large surgical scars make O-RPLND less appealing, especially

when it is performed for early stage testicular cancer, for which surveillance is an acceptable alternative. As such, utilization of R-RPLND is increasing.<sup>3</sup>

R-RPLND had a median hospital stay of 24 hours and was associated with <5% major complications. The operative time for R-RPLNDs ranges from 3 to 5 hours. R-RPLND has the advantage of lower blood loss, shorter length of stay, better cosmetic outcomes and less pain compared to O-RPLND.

In our experience, the main risk factors for delayed discharge after robotic surgery are postoperative pain, nausea/vomiting and comorbidities that require prolonged periods of monitoring. Our protocol for outpatient robotic procedures includes intraoperative administration of ketorolac for pain control with redosing in the recovery room. Additionally, we encourage early ambulation in the recovery room. We obtain postoperative bloodwork a few hours after extubation to allow for equilibration. Patients are discharged home on a clear liquid diet and given instructions to gradually advance their diet.

Our study is limited by the retrospective review of only one case. However, we demonstrate that R-RPLND may be safely offered an outpatient procedure. Additional case experience is needed to better define criteria for post-operative admission vs. discharge. However, given the relatively low 5% rate of severe R-RPLND complications and the absence of a large incision needed for specimen extraction, we believe that outpatient R-RPLND will become commonplace.

### 4. Conclusion

R-RPLND is an established alternative to the open approach for stage I testicular cancer that is associated with relatively shorter hospitalizations. We demonstrate that outpatient R-RPLND is safe and feasible.

### Author contributions

JCH was involved in the clinical evaluation of the patient and performed the operation and follow ups. SPB, AZ and PJJ participated in literature review and wrote the manuscript. All authors read and approved the final manuscript for publication. All authors agreed to be accountable for all aspects of the work.

**Funding**

Jim C. Hu receives research support from the Frederick J. and Theresa Dow Wallace Fund of the New York Community Trust. Jim C. Hu also receives salary support from NIH R01 CA241758 and R01 CA259173, PCORI CER-2019C1-15682 and CER-2019C2-17372 and a Prostate Cancer Foundation Challenge Award. The remaining authors report no further disclosures.

**Financial disclosures**

None.

**Declaration of competing interest**

The authors declare that they have no competing interests.

**Acknowledgements**

We thank our colleagues from Pathology and Radiology for their help with reviewing the patient's specimen and imaging.

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