
Robotic-Assisted Transperitoneal Pelvic Lymphadenectomy for Metastatic Melanoma: Early Outcomes Compared with Open Pelvic Lymphadenectomy



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- BACKGROUND:** In the absence of iliac or obturator nodal involvement, the role of pelvic lymphadenectomy (PLND) for melanoma is controversial, but for select patients, long-term survival can be achieved with the combination of superficial inguinal (inguinofemoral) and PLND. Open PLND (oPLND) is often limited in visual exposure and can be associated with considerable postoperative pain. Robotic PLND (rPLND) is a minimally invasive technique that provides excellent visualization of the iliac and obturator nodes. Outcomes comparing the open and robotic techniques have not been reported previously for patients with melanoma.
- STUDY DESIGN:** We reviewed our experience with rPLND for melanoma and compared clinical and pathologic results with oPLND. We evaluated operative times, nodal yield, and short-term oncologic outcomes.
- RESULTS:** Thirteen rPLND (2013 to 2015) (15 attempted, 87% success rate) and 25 oPLND (2010 to 2015) consecutive cases were completed. Pelvic lymphadenectomy was combined with an open inguinofemoral dissection in 8 of 13 (62%) robotic and 17 of 25 (68%) open cases. Median length of stay was shorter in the rPLND group, with 1.0 vs 3.5 days for pelvic-only cases ($p < 0.001$) and 2.5 vs 4.0 days ($p < 0.001$) for combined ilioinguinal cases. Median operative time (227 vs 230 minutes; $p = 0.96$) and nodal yield (11 vs 10 nodes; $p = 0.53$) were not different between rPLND and oPLND.
- CONCLUSIONS:** Robotic PLND offers a safe, effective, minimally invasive approach to resect the pelvic lymph nodes in patients with melanoma, with no significant difference in nodal yield or operative times, but a shorter length of stay compared with oPLND. (J Am Coll Surg 2016;222:702–709. © 2016 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)
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In the absence of biopsy-proven iliac or obturator nodal involvement, the role of pelvic lymphadenectomy (PLND) for patients with melanoma is controversial.¹⁻⁴ Relative indications include radiographic suspicion of pelvic disease; involvement of ≥ 3 inguinal nodes; large (>3 cm) positive inguinal nodes, especially with extracapsular extension of disease; or a pelvic sentinel lymph node (SLN) identified on lymphoscintigraphy that was not sampled in the setting of positive inguinal SLNs (Fig. 1).⁵ In select patients with known or suspected pelvic node involvement from melanoma, long-term survival can be achieved with the combination of inguinal and pelvic node dissections.^{2,6,7} In addition, the relative indications for operative management of pelvic disease can expand as our understanding of long-term outcomes with immune and targeted therapy continues to evolve.⁸

Abbreviations and Acronyms

LOS	= length of stay
oPLND	= open pelvic lymphadenectomy
OR	= operating room
PLND	= pelvic lymphadenectomy
rPLND	= robotic-assisted pelvic lymphadenectomy
SLN	= sentinel lymph node

The open approach to PLND (oPLND) is generally accomplished via a muscle-splitting lower abdominal incision and extraperitoneal dissection. This can be associated with limited visualization, especially for the obturator nodes, and is often associated with considerable postoperative pain. Open PLND typically requires 4 to 6 weeks of convalescence and can be complicated by wound infection, ileus, or incisional hernia.⁹ Postoperative pain can also limit early ambulation and contribute to increased risks of deep venous thrombosis, although the complications of oPLND are poorly characterized. Anecdotally, patients and providers might avoid or defer oPLND due to concerns about pain and prolonged recovery after open surgery.¹⁰

The robotic-assisted transperitoneal approach to PLND (rPLND) is a well-described procedure used for staging and treatment of urologic and gynecologic malignancies.^{11,12} For these indications, laparoscopic and robotic assistance allows for excellent exposure and visualization of the pelvis, and minimizes postoperative pain, complications, and convalescence time.¹³ Robotic PLND is accomplished via a transperitoneal approach using 5 ports and provides improved visualization of both the iliac and obturator nodes compared with oPLND.¹⁴

The published experience with rPLND for melanoma is limited. In 2010, Sohn and colleagues¹⁵ reported results involving 2 patients with no postoperative complications. In 2013, Pellegrino and colleagues¹⁶ reported results from 4 cases with no complications at 1-year follow-up, and a mean postoperative length of stay of 3.8 days. No previously published series has compared pertinent surgical and quality metrics involving the open approach. In this report, we summarize our experience with rPLND for melanoma at a high-volume center and compare these outcomes with those of a cohort of patients treated with oPLND.

METHODS

We performed a retrospective review of all consecutive cases with the diagnosis of malignant melanoma and a procedure code for pelvic lymph node dissection. For oPLND, we included cases from January 2010 through

October 2015, and for rPLND, we included cases from the beginning of our experience in 2013. An overlapping cohort (historical plus concurrent cases) was used with the goal of increasing sample size and statistical power. The historical cases included before the introduction of rPLND also help to reduce the impact of selection bias, which might be present in the concurrent cases.

Cases were included if they involved PLND alone or were combined with a superficial inguinal node dissection. Hospital records, including patient demographics, oncologic history (tumor location, Breslow depth, and SLNB results), operative notes, intraoperative nursing and anesthesia documentation, pathology reports, hospital records including length of stay (LOS), and clinical and oncologic outcomes were reviewed for each patient. Indication for surgery was determined from the preoperative clinic notes and/or operative reports. Operating room (OR) time was calculated as the difference between “in room” and “out of room” time, and surgery time was calculated as the difference between “incision” and “close” time. Estimated blood loss was obtained from the anesthetic record.

Preoperative evaluation and indications for surgery

Decisions to proceed with PLND and the operative approach were made by the treating surgeon after discussion at a multidisciplinary cutaneous tumor conference. Obese patients were more likely to be considered for rPLND, and patients with earlier extensive abdominal or pelvic surgery were more likely to be consigned to oPLND. Preoperative staging was performed using CT or whole-body PET/CT and brain MRI. All rPLNDs were performed by 1 of 2 surgical oncologists (AAS and JSZ). Open PLND was performed alone or in combination with a superficial inguinal lymph node dissection by 1 of 3 surgical oncologists (AAS, JSZ, or VKS). Patients were administered preoperative antibiotics and antithrombotic prophylaxis with sequential compression devices and postoperative low molecular weight heparin. All superficial inguinal dissections were performed via an open technique; when in the same operative setting, these were performed before oPLND or after completion of the rPLND.

Technical details of robotic pelvic lymphadenectomy

After induction of general endotracheal anesthesia and placement of a Foley catheter, the patient was placed in low-lithotomy position. The Da Vinci robot (Intuitive Surgical) was docked in standard fashion, with the column positioned between the patient's legs. Access to the peritoneal cavity was obtained in the supraumbilical

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