Comparison of Single-docking Robotic-assisted and Traditional Laparoscopy for Retroperitoneal Lymph Node Dissection During Nephroureterectomy With Bladder Cuff Excision for Upper-tract Urothelial Carcinoma

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OBJECTIVE To compare the results of traditional laparoscopy and a simple, single-docking robotic approach for retroperitoneal lymph node dissection (RPLND), nephroureterectomy, and bladder cuff excision.

MATERIALS AND METHODS We evaluated 63 and 37 consecutive patients who underwent laparoscopic and robotic nephrouretectomy with RPLND, respectively, for upper-tract urothelial carcinoma (UTUC).

RESULTS Our robotic approach was associated with improved lymph node procurement (21.0 nodes [interquartile range 16.0-30.0]) when compared with laparoscopy (11.0 nodes [interquartile range 5.5-21.0]) ($P < .0001$). Major blood loss as defined by requiring a blood transfusion was less for the robotic group than for the laparoscopic cohort (8% vs 30%) ($P = .012$). In contrast, the robotic group had longer operative times (5.1 vs 3.9 hours) ($P = .0001$) and longer hospital stays (5.0 vs 4.0 days) ($P = .0002$).

CONCLUSION Our single-docking robotic technique for concomitant RPLND during nephrouretectomy is associated with improved lymph node yield. UROLOGY 87: 216–223, 2016. © 2016 Elsevier Inc.

Nephroureterectomy (NU) remains the standard treatment of upper-tract urothelial carcinoma (UTUC),[1,2] and concurrent retroperitoneal lymph node dissection (RPLND) is increasingly thought to play an important role in management of UTUC.[3] Many efforts have been made to minimize the morbidity of this multiquadrant, multiorgan operation that has historically required a single large incision or 2 separate incisions in order to access the abdominal and pelvic areas.

Several techniques have been described over the years to improve the morbidity of NU.[4-8] The introduction of laparoscopic NU (LNU) represented one of the first substantive efforts to minimize morbidity and was found to have similar oncologic outcomes to open NU.[9] Access to the pelvic portion for excision of the bladder cuff, however, remained difficult with LNU and resulted in a variety of open,[10] endoscopic,[5] and other techniques[11] to complete this portion of the procedure. The advent of robotic assistance afforded a straightforward means to perform an NU completely laparoscopically but was often completed by redocking for the pelvic dissection. Only recently has a single-docking technique for the procedure been described as a simplified approach to the operation.[8,12] To date, however, there are little data on the use of robotic assistance for concurrent RPLND.

The role of RPLND for UTUC has been evolving in parallel with the technique of robotic NU (RNU). Over 50% of UTUC cases are diagnosed in an advanced stage,[13] and regional lymph node (LN) metastasis can be found in over 40% of cases.[14] Although RPLND can be performed with NU for its diagnostic relevance, if not a therapeutic impact, it appears to be infrequently done.[15] One study has suggested that thoroughness of LN dissection (LND), as measured by the number of LNs removed, may indeed be associated with improved outcomes in UTUC.[3] These

Financial Disclosure: *The authors declare that they have no relevant financial interests.*

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Submitted: April 17, 2015, accepted (with revisions): July 27, 2015

http://dx.doi.org/10.1016/j.urology.2015.07.070
0090-4295

preliminary findings parallel the more established literature for bladder cancer (BC).[16,17] In summary, a robust RPLND may play a valuable role in cancer control, and a unified NU-RPLND should be considered in high-risk patients.

Herein, we describe our simplified single-docking technique of RNU with bladder cuff excision and RPLND, and compare the results with the equivalent traditional laparoscopic approach to assess feasibility and efficacy.

METHODS

Patients

After obtaining approval from the Institutional Review Board, we reviewed the medical charts of consecutive patients who underwent LNU from January 2003 to October 2011 and RNU from August 2011 to October, 2014.

Lymphadenectomy Patient Selection and Templates

RPLND was performed in patients with high-grade renal pelvic, and proximal or mid-ureteral UTUC. Pelvic lymphadenectomy (PLND) was also performed if high-grade disease was located in the lower third of the ureter, similar to templates described by Kondo et al.[18] At minimum, RPLND included the hilar and precaval-paracaval-retrocaval regions for right-sided disease (Fig. 1C), and hilar with preaortic-paraaortic-retroaortic tissues for left-sided disease (Fig. 1D). Additional interaortocaval dissection was performed in most right and left cases, but was omitted selectively, such as in the presence of significant atherosclerotic aortic disease, aortic aneurysm, or in the very elderly.

LNU

The laparoscopic technique with lymphadenectomy is the same as previously described by Busby et al.[19] Briefly, a conventional transperitoneal approach was utilized for dissection of the kidney, ureter, and lymphadenectomy, if indicated. The remainder of the procedure was performed through an extraperitoneal Gibson incision, including dissection of the distal ureter, bladder cuff, ipsilateral PLND (if indicated), and specimen extraction.

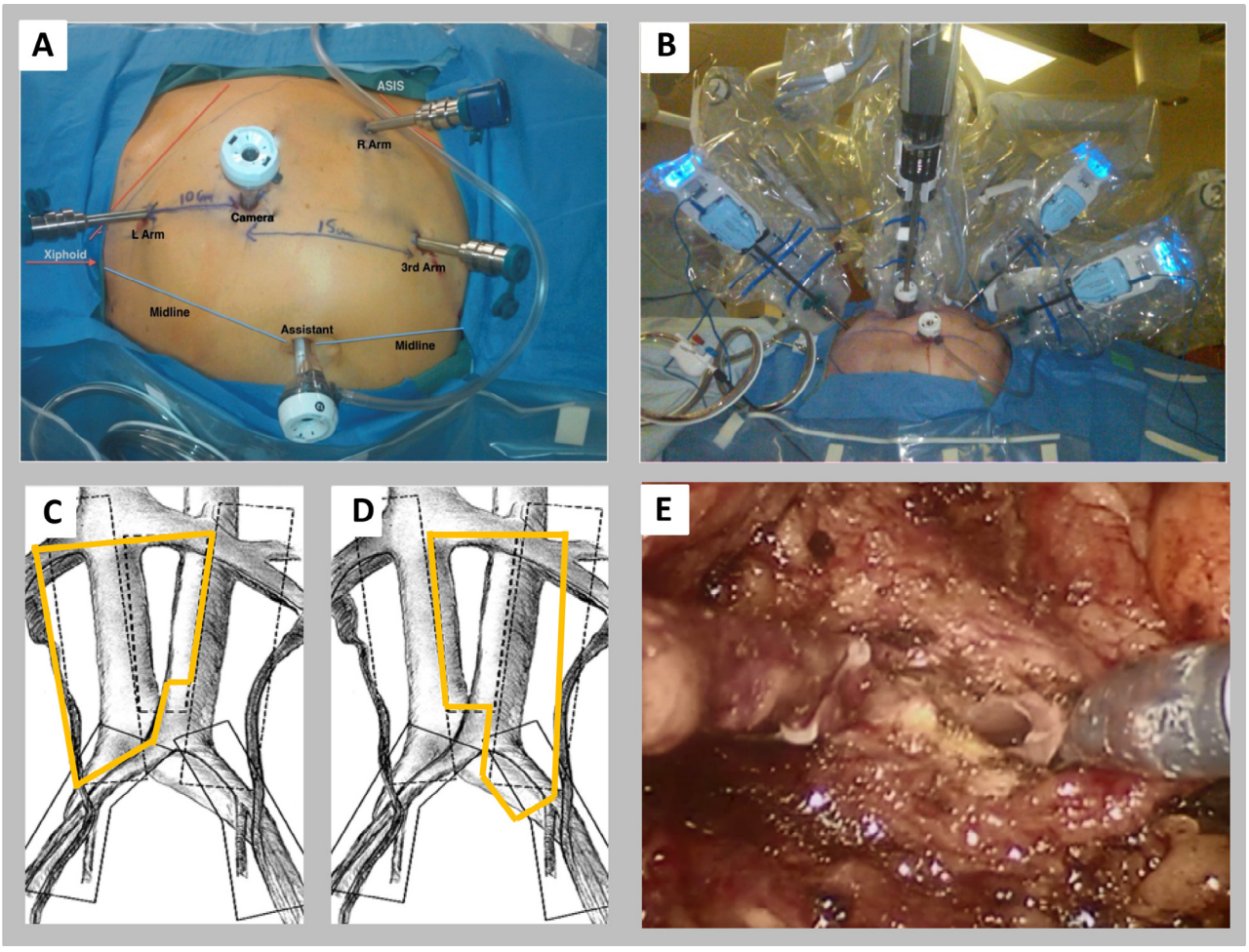

Figure 1. We demonstrate placement of the robotic ports for performing single-docking RNU technique. **(A)** The port placement for a left RNU with RPLND. The robot is docked approximately 45° from perpendicular and facing the contralateral shoulder **(B)**. Once abdominal access is secured, the retroperitoneum is exposed and the nephroureterectomy is performed. **(C and D)** The template utilized in right- and left-sided malignancies, respectively. The bladder cuff is excised circumferentially **(E)**.