Laparoscopic Bilateral Retroperitoneal Lymph Node Dissection in Stage II Testis Cancer

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Purpose: We report our experience with laparoscopic bilateral retroperitoneal lymph node dissection (RPLND) in 4 patients with stage II testis cancer.
Materials and Methods: Between January 2002 and January 2009, 4 patients with stage II testis cancer underwent laparoscopic bilateral RPLND. In 2 patients, laparoscopic bilateral RPLND was performed for residual mass post-chemotherapy. We performed classic bilateral RPLND without patient repositioning.
Results: The procedure was done uneventfully without any major peri-operative complication. The demanding part was contralateral, depending side dissection, which was accomplished with the help of a bowel retractor. Patient repositioning was not necessary.
Conclusion: Laparoscopic bilateral RPLND can be performed efficiently and safely in stage II testis cancer, without need to repositioning and placement of trocar in contralateral side.

Keywords: testis neoplasm, lymph node dissection, laparoscopy

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INTRODUCTION

Carcinoma of the testis remains the most common malignancy in males 15 to 35 years old [(1)] and its primary landing sites for metastases are retroperitoneal lymph nodes.[(2)] Laparoscopic retroperitoneal lymph node dissection (L-RPLND) was developed for diagnostic and therapeutic benefits of open retroperitoneal lymph node dissection, without its inherent morbidity in patients with clinical stage I nonseminomatous germ cell tumors (NSGCT).[(3-5)]

Because of various advantages of L-RPLND, it has also been introduced in the management of stage II testis cancer.[(6,7)] Most urologists prefer the strategy of primary chemotherapy followed by L-RPLND for residual mass in advanced stage II testis cancer. In such circumstances, L-RPLND has both diagnostic and curative intent. Laparoscopic RPLND could also be performed as the first step (before chemotherapy) in patients with advanced stage II testis cancer, but it has to be done bilaterally to remove not only the primary landing site, but also other possible sites of tumor spread.[(6)]

Bilateral L-RPLND has only been reported as a staged procedure. Typically, laparoscopy is performed for unilateral dissection and for complete RPLND, repositioning of the patients is assumed to be necessary.[(7)] To the best of our knowledge, laparoscopic bilateral RPLND without patient repositioning has not been reported previously.

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MATERIALS AND METHODS

Between January 2002 and January 2009, transperitoneal bilateral laparoscopic RPLND was performed on 4 patients with stage II NSGCTs. In 2 patients, laparoscopic bilateral RPLND was performed for residual mass after chemotherapy while the other 2 were before chemotherapy. Pre and postoperative patients' data are presented in Table 1.

Under general anesthesia, patients were placed in semi-flank position. Four trocars were used, including 3 midline ports and one in anterior axillary line at the level of the umbilicus. One additional port was placed for bowel retraction. The white line was incised and the colon was completely mobilized from one side to another until visualizing the ureter and the renal vein on the opposite side, to make sure that it is possible to have acceptable exposure to difficult dependent part.

The target area for lymphatic dissection was between the two ureters laterally, renal veins superiorly, and iliac vessels inferiorly (Figure 1). After contralateral side lymphatic dissection, between dependent ureter and the aorta or the inferior vena cava (Figure 2), we continued to complete classic dissection in ipsilateral side. During contralateral side dissection, successful bowel retraction provided great help, especially in obese patients. In the presence of huge mass, lumbar vessels were transected for removal of reteroaortic and reterocaval lymphatic tissues. We

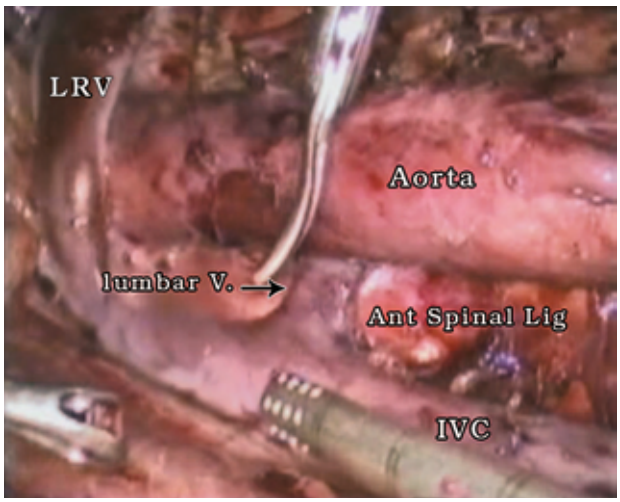

Figure 1. Laparoscopic RPLND in a patient with primary left testis tumor. LRV, indicates left renal vein; and IVC, inferior vena cava.

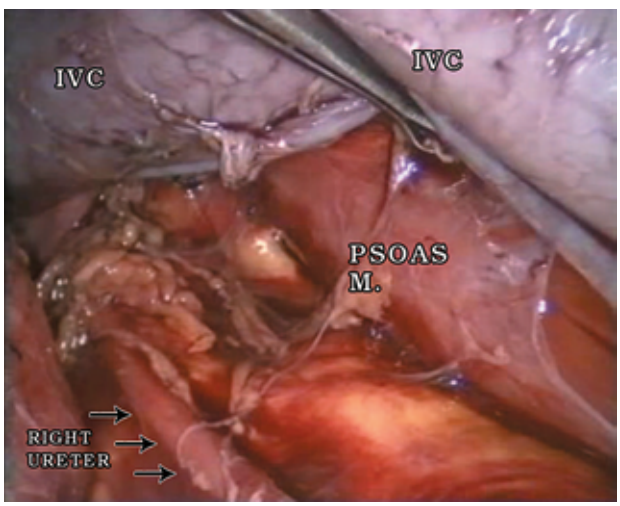

Figure 2. Contralateral (Right sided) dissection in a patient with primary left testis tumor. IVC, indicates inferior vena cava.

Table 1. Pre and postoperative patients' data that underwent classic laparoscopic RPLND

	Case 1	Case 2	Case 3	Case 4
Tumor side	Right	Right	Left	Right
Age (years)	25	27	35	28
BMI	20	23	22	28
Tumor Pathology	Embryonal cell carcinoma	Embryonal/Immature teratoma	Yolk sac tumor	Embryonal cell carcinoma
Size of lymph nodes on CT scan	2 cm	4 cm	4 cm	3.5 cm
Pre-operative chemotherapy	No	No	Yes	Yes
Operative time (minutes)	440	340	420	240
Hospital stay (days)	8	3	8	4
Pre-operative Hb (mg/dL)	14.7	16.6	14	15
Postoperative Hb (mg/dL)	14.3	15.6	13.7	14.6
Complication	Lymphatic leakage	Nothing	Lymphatic leakage	Nothing
Follow-up (months)	66	9	3	3
Recurrence	No	No	No	No
Open conversion	No	No	No	No

tried to preserve postganglionic fibers when we could clearly discriminate them.

RESULTS

Bilateral laparoscopic RPLND was completed in all of the patients. Conversion to open surgery was not necessary. Operative time ranged from 240 to 440 minutes. No blood transfusion was required. No major intra or postoperative complications occurred. Prolonged lymphatic leakage (7 days) was noted in 2 subjects that were managed conservatively. Hospital stay was between 3 and 8 days.

Laparoscopic RPLND was successful to remove 20 to 37 lymph nodes. The related pathology is delineated in Table 2. Patients were followed up between 3 to 66 months, through which no relapses occurred.

DISCUSSION

Open RPLND has been assumed as the gold standard for the surgical management of low stage NSGCTs. Laparoscopic RPLND has been proposed to be a minimally invasive and valuable alternative approach to open surgery.[8] It provides less morbidity and increases patient's satisfaction with similar oncologic outcomes compared to open counterpart.[8,9]

Laparoscopic RPLND is traditionally indicated for low stage tumors which are candidate for unilateral modified dissection. Whenever widespread retroperitoneal tumor is present, a complete bilateral RPLND is indicated.[7] Laparoscopic bilateral RPLND was first proposed by Palese and colleagues. They declared that although L-RPLND is a feasible operation in patients after chemotherapy, but it is challenging and should be reserved for the patients with limited retroperitoneal residual disease as well as institutions with considerable laparoscopic expertise.[10]

Benway and associates showed that in porcine model, laparoscopic bilateral RPLND is capable of providing lymph node yields similar to open RPLND, further supporting the potential for oncologic equivalency via a laparoscopic approach.[8]

To the best of our knowledge, this is the first report on performing bilateral L-RPLND in human beings without the need for patient repositioning. We overcame the problem of difficult exposure to contralateral side using a bowel retractor from an additional port. In this study, the results in terms of disease-free and disease-specific survival were favorable. All of the 4 patients survived with no evidence of biochemical or disease recurrence in on average 20-month follow-up. In our series, dissection in contralateral side was feasible and efficient, but further studies with larger sample size are needed to better clarify this issue.

Laparoscopic RPLND has its own potential complications, mainly vascular. In some studies, high morbidity has been reported with this technique.[8] Palese and colleagues reported that of 7 patients, 3 subjects (42%) who underwent post-chemotherapy L-RPLND had major complications, including iatrogenic cavotomy, renal and external iliac arteries injury, and duodenal perforation. Interestingly, the only patient who underwent bilateral L-RPLND had no complication.[10]

No major complication was seen in our patients. Only 2 of them had lymphatic leakage which was managed with conservative treatment. Our complication rate was much lower than the reported rate in the literature. This might be due to mainly small sample size, but improved

Table 2. Pathology of lymph nodes

	Case 1	Case 2	Case 3	Case 4
Cord Stump	Negative	Negative	Negative	Negative
Para-aortic lymph nodes	Negative	Positive (3/3)	Positive (3/15) mature teratoma	Negative
Inter-aortocaval lymph nodes	Positive (2/5)	Negative	Positive(9/16) mature teratoma	Positive(6-cm mass) teratocarcinoma
Para-caval lymph nodes	Negative	Negative	Positive (1/6) mature teratoma	Negative

experience and less desmoplastic reactions are also contributory factors.

It has been assumed that repositioning of the patient from one side to the other side is the only way to obtain a total, although consecutive exposure of the retroperitoneum for L-RPLND.[7] According to our experience, we recommend using a bowel retractor with an extra port to overcome this issue. Another issue is bilateral L-RPLND in obese patients. We recommend starting this procedure from contralateral (dependent) side, because edematous distended bowel will not hamper later ipsilateral dissection.

CONCLUSION

Bilateral L-RPLND is a feasible procedure in stage II NSGCTs. Using a bowel retractor, we could omit the necessity of the patient repositioning for bilateral L-RPLND. Experienced surgeons at dedicated centers are essential for such a complex surgical approach.

CONFLICT OF INTEREST

None declared.

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