Laparoscopic Retroperitoneal Lymph Node Dissection for Stage I Nonseminomatous Germ Cell Testis Tumors

The First Case Series in Iran

Seyed Amir Mohsen Ziaee, Ali Tabibi, Farzaneh Sharifiaghdas, Seyyed Mohammad Ghahestani, Samad Zare, Mohammad Samzadeh

Purpose: To report laparoscopic retroperitoneal lymph node dissection (RPLND) as an approach for management of low-stage nonseminomatous germ cell testis tumors (NSGCT).

Materials and Methods: Between August 2002 and December 2008, 19 patients with stage I NSGCT underwent RPLND in our center.

Results: Mean operation time was 340 minutes (range, 250 to 360 minutes). Procedure in 2 (10.5%) patients was converted to open. Four (21%) patients had tumors with pure histopathology while other 15 (79%) had mixed histopathology. The mean number of removed lymph nodes was 11 (range, 6 to 14). Pathology revealed lymph node involvement in 8 (42%) patients, including 6 (75%) viable tumors and 2 (25%) teratoma. After on average 47-month follow-up (range, 3 to 70 months), recurrence occurred in 2 (10.5%) patients, who underwent open retroperitoneal lymph node dissection after chemotherapy, and surgical pathology revealed teratoma in one and fibrotic tissue in another. No patient developed systematic metastasis during follow-up period.

Conclusion: Our results show that compared with open surgery, RPLND has same oncologic outcome, but lower, and can be recommended for management of patients with low stage NSGCT.

Keywords: laparoscopy, nonseminomatous germ cell tumor, testis

Urol J. 2011;8:27-30.
www.uj.unrc.ir

INTRODUCTION

Integration of medical and surgical approaches to cancer over the last three decades has made the management of the testis cancer effective.[1] Effective chemotherapeutic regimens, refined minimally invasive surgery, and radiation therapy have increased the overall survival to more than 90% in patients with seminoma.[2] Since the application of laparoscopic approach to retroperitoneal lymph node dissection (RPLND) in 1992, it has become more accessible and is currently suggested as a "gold standard" method for staging of nonseminomatous germ cell testis tumors (NSGCT).[3] However, laparoscopic RPLND (L- RPLND) as a surgical modality has met significant challenges and thus has not been widely accepted.[4] Longer operation time and greater cost are among its drawbacks. It is also stated that oncologic results have not yet been proven by L-RPLND and dissection is not as complete

Urology and Nephrology Research Center, Shahid Labbafinejad Medical Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Corresponding Author: Seyed Amir Mohsen Ziaee, MD Urology and Nephrology Research Center, No.103, 9th Boustan St., Pasdaran Ave., Tehran, Iran Tel: +98 21 2256 7222 Fax: +98 21 2256 7282 E-mail:samziaee@hotmail.com.com

Received October 2009
Accepted March 2010

as the open approach.[5] On the other hand, L-RPLND not only decreases morbidity, hospital stay, and time to return to normal activity, but also has comparable outcome.[6] Although many cases of L-RPLND have been reported in literature, but to the best of our knowledge, this is the first report from Iran.

MATERIALS AND METHODS

Between August 2002 and December 2008, 19 L-RPLNDs were performed in our urology department. Patients who selected surveillance or primary chemotherapy and those with general contraindications for laparoscopic surgery had been excluded.

Pre-operative clinical staging included tumor markers measurements, computed tomography scan of the chest and the abdomen, and chest x-ray. None of the patients had metastatic diseases. Therefore, patients with clinical stage TI were candidate for L-RPLND. A modified approach was used, but in 4 (21%) subjects, surgery was converted to classic RPLND because of clearly visible intra-operative mass. Patients were followed up for 47 months (range, 3 to 70 months).

Data regarding testis tumor characteristics, pre and postoperative serum levels of hemoglobin and creatinine, numbers and location of resected lymph nodes, operation time, hospital stay, conversion to open surgery, complications, and relapses were gathered.

RESULTS

Mean operation time was 340 minutes (range, 250 to 360 minutes). Procedure in 2 (10.5%) patients was converted to open; the first one was due to bleeding and the second one was due to severe adhesion of mass to the inferior vena cava.

The primary tumor was on the right testis in 12 (63%) patients and on the left side in 7 (37%). Considering primary tumor characteristics, 4 (21%) patients had tumors with pure histopathology while other 15 (79%) had mixed histopathology. Primary testicular pathology after radical orchiectomy is depicted in Table.

Histopathology of primary testis tumors

Histopathology	Number (Percent)	Group
Pure	2 (10.5%)	Teratoma
	2 (10.5%)	Embryonal cell carcinoma
Mixed	15 (79%)	Embryonal cell carcinoma (64%) Teratoma (32%) Yolk sac (32%) Seminoma (26.3%) Choriocarcinoma (5.2%) Endodermal sinus tumor (5.2%)

Accidental ureteral damage (transection) happened in 1 (5%) subject, which was repaired by end-to-end anastomosis laparoscopically without long-term complication. Postoperatively, the mean hemoglobin drop and the mean creatinine raise were 0.47 mg/dL and 0.08 mg/dL, respectively. Significant creatinine raise occurred in 1 patient (from 0.9 mg/dL pre-operatively to 1.7 mg/dL postoperatively). Only 1 patient had a fever greater than 38°C, which improved after 4-day antimicrobial therapy. Average hospital stay was 4.3 days (range, 3 to 6 days).

The mean number of resected lymph nodes was 11 (range, 6 to 14). Pathology revealed lymph node involvement in 8 (42%) patients; of which 6 (75%) were viable tumors and 2 (25%) eratoma. Positive nodes were located in the left para-aortic, interaortocaval, and right paracaval region in 3 (37.5%), 2 (25%), and 3 (37.5%) patients, respectively. Postoperative surgical staging revealed false negative computed tomography scan results in 2 (10.5%) patients.

After on average 47-month follow-up (range, 3 to 70 months), there were 10.5% recurrences (2 patients). Median relapse-free time was 26 months. They underwent open RPLND (O-RPLND) after chemotherapy, and surgical pathology revealed teratoma in one and fibrotic tissue in another. No patient developed systematic metastasis during follow-up period.

DISCUSSION

Low stage NSGCT is a highly curable neoplasm. The evolution of cancer control for this disease has found an effective integration of medical and surgical modalities over the last 3 decades.[7] Management options for clinical stage I NSGCT

include surveillance, modified RPLND, or two cycles of chemotherapy with bleomycin, etoposide, and cisplatin; the related recurrence rate is 25%, 10%, and 5%, respectively.[8] Recent treatment of NSGCT focuses on minimizing morbidity while maintaining consistently high cure rates as previously seen.[9] Patients without evidence of lymphovascular invasion, embryonal carcinoma component predominance, or advanced pathologic stage (pT2 or greater) are at low risk for occult metastases and are good candidates for surveillance.[10]

Retroperitoneal lymph node dissection in experienced hands provides excellent results in patients who are not candidates for surveillance.[11] When performed perfectly, RPLND has 99.5% tumor survival for patients with clinical stage I or early stage II and eliminates the relapse, which in turn provides psychological and emotional relief to the patient and simplifies the follow-up protocol.[12] Although open RPLND remains the gold standard for pathologic staging of the retroperitoneum as well as an effective therapy for patients with minimal nodal involvement, but recently L-RPLND is also presented as an acceptable approach.[13]

Some studies have compared the safety and efficacy of laparoscopic versus open RPLND in patients with NSGCT. Castillo and colleagues performed L-RPLND on 111 patients with stage I NSGCTs. Mean operation time was 140 minutes (range, 60 to 300 minutes). Conversion to open surgery occurred in 3 (2.7%) patients. Mean hospital stay was 2 days (range, 1 to 5 days). Intra-operative complications occurred in 10 (9%) subjects. Five (4.5%) patients had tumor relapse, with a mean follow-up of 30 months (range, 24 to 94 months). Recurrence occurred between 4 and 64 months postoperatively, and was in the retroperitoneum, the lungs, and the mediastinum.[10] Based on their study, as the technique improves, it is likely that L-RPLND becomes equal if not more cost-effective than conventional RPLND. However, the oncologic outcomes, while are on a par with O-RPLNDs, are difficult to attribute to successful L-RPLND alone when nearly all patients with positive lymph nodes received chemotherapy postoperatively. Although uncertainties exist, L-RPLND holds much future promise.

Poulakis and colleagues assessed the quality of life after laparoscopic and open RPLND in clinical stage I NSGCT. They concluded that L-RPLND is a reasonable procedure with better postoperative quality of life and faster return to normal activity than O-RPLND for patients with clinical stage I NSGCT .[11] In the literature, L-RPLND was converted to open surgery in 2% to 5% of subjects,[12] while it was 10.5% in our series. In our study, the mean operation time was 340 minutes (range, 250 to 360 minutes) that is relatively greater than other studies,[10,14] reflecting that we passed our learning curve. Average hospital stay in our patients was 4.3 days (range, 3 to 6 days) that is compatible with other series.[10-12] It seems that our recurrence rate (10.5%) is relatively more than other studies,[10] which perhaps can be explained by our inexperience. The L-RPLND is associated with less blood loss and a shorter hospital stay than O-RPLND, whereas the lymph-node yield of O-RPLND is greater.[15]

CONCLUSION

Among 3 modalities for management of stage I NSGCT, RPLND has an acceptable rate of recurrence in the retroperitoneum. Our results show that L-RPLND has same oncologic outcome, but lower morbidity. Therefore, it merits being an acceptable alternative to O-RPLND in experienced hands, and encourages young patients to choose it instead of primary chemotherapy or surveillance.

CONFLICT OF INTEREST

None declared

REFERENCES

1. Abdel-Aziz KF, Anderson JK, Svatek R, Margulis V, Sagalowsky AI, Cadeddu JA. Laparoscopic and open retroperitoneal lymph-node dissection for clinical stage I nonseminomatous germ-cell testis tumors. J Endourol. 2006;20:627-31.
2. Albqami N, Janetschek G. Laparoscopic retroperitoneal lymph-node dissection in the management of clinical stage I and II testicular cancer. J Endourol. 2005;19:683-92; discussion 92.

3. Corvin S, Kuczyk M, Anastasiadis A, Stenzl A. Laparoscopic retroperitoneal lymph node dissection for nonseminomatous testicular carcinoma. World J Urol. 2004;22:33-6.
4. Steiner H, Peschel R, Janetschek G, et al. Long-term results of laparoscopic retroperitoneal lymph node dissection: a single-center 10-year experience. Urology. 2004;63:550-5.
5. Correa JJ, Politis C, Rodriguez AR, Pow-Sang JM. Laparoscopic retroperitoneal lymph node dissection in the management of testis cancer. Cancer Control. 2007;14:258-64.
6. Hamilton RJ, Finelli A. Laparoscopic retroperitoneal lymph node dissection for nonseminomatous germ-cell tumors: current status. Urol Clin North Am. 2007;34:159-69; abstract viii.
7. Yoon GH, Stein JP, Skinner DG. Retroperitoneal lymph node dissection in the treatment of low-stage nonseminomatous germ cell tumors of the testicle: an update. Urol Oncol. 2005;23:168-77.
8. Stephenson AJ, Sheinfeld J. Management of patients with low-stage nonseminomatous germ cell testicular cancer. Curr Treat Options Oncol. 2005;6:367-77.
9. Richie JP. Open retroperitoneal lymph node dissection. Can J Urol. 2005;12 Suppl 1:37-9.
10. Castillo OA, Alvarez JM, Vitagliano G, Ramirez D, Diaz M, Sanchez-Salas R. [Retroperitoneal laparoscopic lymphadenectomy for stage I non seminomatous testicular cancer]. Arch Esp Urol. 2007;60:59-66.
11. Poulakis V, Skriapas K, de Vries R, et al. Quality of life after laparoscopic and open retroperitoneal lymph node dissection in clinical Stage I nonseminomatous germ cell tumor: a comparison study. Urology. 2006;68:154-60.
12. Beltrami P, Giusti G, Tallarigo C, Mofferdin A, Mobilio G. [Laparoscopic unilateral retroperitoneal lymphadenectomy in non-seminomatous neoplasms of the testis in clinical stage I]. Arch Ital Urol Androl. 1998;70:27-35.
13. Nielsen ME, Lima G, Schaeffer EM, et al. Oncologic efficacy of laparoscopic RPLND in treatment of clinical stage I nonseminomatous germ cell testicular cancer. Urology. 2007;70:1168-72.
14. Escalera Almendros C, Chiva Robles V, Pascual Mateo C, Rodriguez Garcia N, Garcia Tello A, Berenguer Sanchez A. [Post chemotherapy laparoscopic retroperitoneal lymph node dissection]. Arch Esp Urol. 2006;59:517-23.
15. Custureri F, Urciuoli P, Iavarone C, et al. Laparoscopic retroperitoneal lymphadenectomy for stage I non-seminomatous testicular tumors. Hepatogastroenterology. 2005;52:1677-80.