Robotic retroperitoneal lymphadenectomy for residual retroperitoneal adenopathy postchemotherapy for testicular cancer

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Abstract

Objective: In this case report we describe the safety and feasibility of robotic surgery in retroperitoneal lymphadenectomy for testicular cancer and residual masses postchemotherapy, as it represents for Romania a national premier in robotic surgery.

Introduction: DaVinci SI robotic surgical system is ideal for a retroperitoneal lymphadenectomy, because it facilitates the mobility of robotic surgical instruments due to the 7 degrees of freedom, and the optical system provides an improved image, which increases the safety and accuracy of this approach.

Patients and method: Robotic retroperitoneal lymphadenectomy with transperitoneal approach was performed in a patient aged 24 years who was diagnosed with right testicular tumor in August 2012. After the right inguinal orchectomy and the histopathologic exam which revealed pure testicular seminoma, the patient follower four cycles of chemotherapy. At 3 months after the last cycle of chemotherapy a 4 cm retroperitoneal residual mass, located above the right renal hilum and tangent to inferior vena cava has revealed. A retroperitoneal lymphadenectomy was performed by robotic transperitoneal approach. The standard area of ipsilateral lymphadenectomy was respected, including excision of residual mass.

Results: The total operative time was 240 minutes and 180 minutes during the console. There were no intraoperative or postoperative incidents. There were about 350 ml blood loss and the patient did not require blood transfusion. Histopathologic examination of the residual mass revealed a cystic formation with mature teratoma component. On the operative specimen were identified three lymph nodes which were free to the histopathologic exam. The postoperative evolution was favorable and the patient was discharged at 5 days postoperatively.

Conclusion: Robotic retroperitoneal lymphadenectomy is a feasible and safe technique in post-chemotherapy residual masses, in testicular cancer.

Keywords: robotic retroperitoneal lymphadenectomy, residual masses, testicular cancer

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Introduction

Traditional open retroperitoneal lymph node dissection for post-chemotherapy residual masses, in testicular cancer is associated with a morbidity of 20% and mortality of 8%, even in centers with experience performing this procedure [1,2].

Laparoscopic surgery has emerged as an alternative to classical surgery to reduce morbidity associated with open retroperitoneal lymph node dissection [3]. The learning curve of laparoscopic surgery is steep in retroperitoneal lymphadenectomy for post-chemotherapy residual masses and is recommended in patients with low tumor volume [2,4,5].

Da Vinci SI robotic surgical system offers all the advantages of a minimally invasive surgery. Unlike standard laparoscopic surgery [3], Da Vinci SI system provides an easier control of intraoperative complications, especially vascular, due to the easy movements that mimic the human wrist.

We evaluated the feasibility of performing robotic retroperitoneal lymphadenectomy in patients with post-chemotherapy residual retroperitoneal masses, in testicular cancer.

Patients and method

A 24 years old patient was diagnosed with right testicular tumor in August 2012. Imaging examinations performed preoperatively (CT thorax + abdomen + pelvis with intravenous contrast) showed multiple retroperitoneal adenopathy, pelvic and chest. A right inguinal orchiectomy was performed and histopathological examination revealed pure testicular seminoma. Subsequently the patient followed 4 cycles of chemotherapy with Cisplatin and Etoposide. After chemotherapy the tumor markers were normalized (AFP, BHCG,LDH) but were found imagistic residual retroperitoneal mass (a mixed lymphadenopathy block of 4 cm located antero-inferior the right renal hilum, tangent with the anterior wall of inferior vena cava and some images of retroperitoneal lymph nodes Fig. 1,2). The robotic retroperitoneal lymphadenectomy and the excision of residual mass by transperitoneal approach was performed.

The position of trocars

Transperitoneal approach is nearly identical to the standard laparoscopic approach [3]. Enforcement standard trocars technique was adapted by the transperitoneal radical nephrectomy and where arranged in the Rogers manner (Fig. 3, 4).

Technical aspects

After the docking the posterior parietal laterocolic right peritoneum is incised and retrocolic Told fascia is dissected, this allowing the medial mobilisation of the ascending colon. Hepaticolic ligament incision and right hepatic triangular ligament allows further mobilization of the ascending colon. The ureter is identified, isolated and the superior traction is made with a lasso by an assistant surgeon. The lymphatic tissue between the ureter and inferior vena cava is dissected. The sympathetic ganglionic chain located right next to the inferior vena cava is preserved (Fig. 5). The upper limit of the lymph node dissection is the right renal vein and the lower limit is the crossing of the right ureter with the iliac vessels. Kocher maneuver was performed by blunt and sharp dissection to facilitate exposure post-chemotherapy residual mass located anteroinferior the...
right renal hilum and tangent to the inferior vena cava. After identifying the inferior pole of the residual mass, the dissection plane between the tumor and the inferior vena cava is identified (Fig. 6). The tumor was isolated of the right renal hilum. We continue with the dissection and isolation residual mass of the anterior wall of inferior vena cava with consecutive clipping emerging tumor vessels. The residual mass was completely detached (Fig. 7). The lumbar vessels in the interaortocaval space found throughout the lymph node dissection, which was difficult, were isolated and clipped (Fig 8). At the end of the intervention, hemostatic agents were placed in the dissection area. The tumor and the lymph nodes are placed in an endocatch bag.

**Results**

There were no intraoperative or postoperative incidents. Total operative time was 240 minutes and 180 minutes during the console. The blood loss was 350 ml and the patient did not require blood transfusion. The tumor was completely removed and from the lymphatic tissue the pathologist revealed three nodes. Histopathological examination revealed a 4 cm cystic formation with mature teratoma component, free resection margins and the 3 lymph nodes were free of tumor cells. Postoperative evolution was favorable and the patient was discharged postoperatively after 5 days. At 12 months of postoperative surveillance there was no recurrence exception from a 2 cm interaortocaval lymphocele.

**Discussions**

Intraoperative complication rate, in this case, was minimal and can be compared with the literature where intraoperative complications of robotic surgery, especially vascular, are minimal[2]. Gerber et al. shows that the rate of laparoscopic retroperitoneal lymphadenectomy vascular complications is 30% [5]. Both the operative time and the blood loss, which were observed in our case of robotic lymphadenectomy, are comparable with data from the literature[2].

Taking into account that it is our first case of robotic retroperitoneal lymphadenectomy, we watched closely the postoperative evolution of the patient. Consequently, the patient was discharged at 5 days postoperatively, although the intestinal transit and active mobilization were resumed after 24 hours.

Robotic retroperitoneal lymphadenectomy offers a very good chance of cure in patients with post-chemotherapy residual mass and normal tumor markers even when they occur outside of the standard dissection [2,6].

Laparoscopic retroperitoneal lymphadenectomy is an attractive alternative, but difficult, as far as the technical standpoint and control of intraoperative complications are concerned, especially vascular [2,3]. As a result laparoscopic retroperitoneal lymphadenectomy is not perform very often, excepting some centers of excellence in laparoscopy [2].

The data on the use of robotic surgery in retroperitoneal lymphadenectomy are limited [2,7].

The surgical boundaries of retroperitoneal lymphadenectomy for post-chemotherapy residual retroperitoneal masses have been widely discussed and have been modified in the current professional literature. The standard dissection area in retroperitoneal lymphadenectomy is limited superior of renal vessels, ureter laterally and common iliac vessels inferior [6]. Recent studies have confirmed that the standard dissection area can be modified without compromising oncologic outcomes and has a lower morbidity.

Heidenreich et al. conducted a large study on two groups of patients. In the first group he included 98 patients who had standard ipsilateral lymphadenectomy and excision of the residual mass and in the second group included 54 patients and he performed bilateral retroperitoneal lymphadenectomy. After analyzing the two groups he found only one relapse in the standard area of dissection compared with seven relapses in the area of bilateral dissection. Heidenreich et al. concluded that when the lymph node mass is < 5 cm and is
resected and is in the area of the primary tumor, retroperitoneal lymphadenectomy and excision of residual mass is justified [8].

Conclusion

Robotic retroperitoneal lymphadenectomy is a feasible and safe procedure in patients with post-chemotherapy residual masses. Due to technical difficulty and higher intraoperative complications, especially bleeding, retroperitoneal lymphadenectomy should be performed in experienced robotic surgery centers.

References