SKILL AND TALENT

Laparoendoscopic single-site retroperitoneal lymph node dissection in non-seminomatous germ cell malignancy

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Abstract
Introduction: Umbilical laparoendoscopic single-site (LESS) surgery represents an excellent alternative to laparoscopic or robotic multiport surgery. LESS surgery offers faster recovery, less postoperative pain and optimal cosmetic results. LESS is possible in virtually any urologic surgery.

Patient and method: We present a 38-year-old male with BMI 31.2 and with history of stage I nonseminomatous mixed germ cell tumor showing interaortocaval lymph node recurrence without elevation of tumor markers. Patient had to undergo a right laparoendoscopic single-site retroperitoneal lymph node dissection (LDRP-LESS) by umbilical approach using a single-site multichannel KeyPort (Richard Wolf GmbH, Knittlingen, Germany).

Results: After the placement of the device and triangulation of the clips, we proceeded to operate on posterior parietal peritoneum. The descending colon was mobilized to access the retroperitoneum. Complete retroperitoneal lymph node dissection on the right side from iliac vessels to renal vessels, including the paracaval and interaortocaval space, was performed. The specimen was inserted into a laparoscopic bag and was removed together with multichannel system. Abdominal drainage was not employed. Surgical time was 85 min and estimated bleeding 50 cc. The patient was very satisfied with the cosmetic results and was discharged the following day without needing analgesia. The pathology report revealed metastatic seminoma in 5 of 11 lymph nodes receiving systemic chemotherapy (VP16-CDDPs) for 4 cycles with good tolerance. A year later, the patient was disease-free and had no complications.

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Introduction

The dissection of the retroperitoneal lymph nodes is a part of multimodal treatment of non-seminomatous germ cell tumors and may be curative in low-stage disease. It is usually carried out primarily in clinical stage I with high probability of metastasis to the retroperitoneal lymph nodes or as salvage when there is residual retroperitoneal disease after stage II chemotherapy.\(^1\) Most non-seminomatous germ cell testicular tumors present as stage I, but it is classically admitted that in around 30–50% of these patients, there is occult metastatic disease in the retroperitoneum\(^2\) and retroperitoneal lymphadenectomy (RLP) is the only reliable tool to identify these micrometastases and provide histopathologic staging.

Currently, thanks to improved diagnostic methods and the good therapeutic results achieved, an increasing number of patients with stage I disease initially choose active surveillance after negativization of markers in the absence of visible disease by imaging methods.\(^3\) When these patients have recurrence at the level of the retroperitoneum, laparoscopic or robotic RLP provides minimally invasive robotic opportunity for histological filiation of recurrence and it is an excellent initial therapeutic option to cope with disease relapse.\(^4\)\(^–\)\(^6\)

Clinical stage II patients may have surgery, with or without adjuvant chemotherapy, although they usually receive systemic chemotherapy first and RLP is reserved to treat residual masses.\(^7\) For some authors, there is considerable controversy over whether it is appropriate to apply minimally invasive techniques (laparoscopy, robotics) after chemotherapy.\(^8\)\(^–\)\(^9\) In fact, RLP is a technically advanced procedure that is associated with significant morbidity, even in centers of excellence.\(^10\) However, centers with extensive experience in laparoscopic surgery practice laparoscopic RLP in selected cases as an option of excellence, both in patients with and without prior systemic chemotherapy.\(^2\)\(^,\)\(^11\)\(^,\)\(^12\)

The laparoscopic single site approach (LESS) has been used in virtually all surgical techniques in urology.\(^13\)\(^–\)\(^15\)
However, the opportunity and the convenience of performing RLP through a laparoendoscopic access have not been defined yet.

Casuistry

38-year-old male patient, who consults for high-volume mass in the right testicle, which produces a marked elevation of β-hCG tumor markers (1224 mU/ml) and LDH (672 U/l), with extension study negative for metastasis. After radical orchiectomy through right inguinal pathway, the specimen revealed testicular mixed germ cell neoplasm, composed of choriocarcinoma (30–40%) and seminoma (60–70%). The disease was apparently limited to the testis by imaging methods and no lymphovascular invasion (pT1N0M0) was detected. Serum markers were normalized after surgery and, therefore, active surveillance was decided, the first extension study conducted 2 months after surgery being negative. On the second postoperative CT scan, conducted at 4 months, enlarged lymph nodes were observed in the interaortocavac space, which were metabolically active confirmed by PET–CT with 18F-fluorodeoxyglucose (Fig. 1). The markers at that moment continued negative. The body mass index was 31.2. We decided to perform an RLP primarily to dismiss the teratoma-growing syndrome.

Surgical technique

The surgery was performed using only laparoendoscopic approach through the reusable multichannel KeyPort platform (Richard Wolf, Knittingen, Germany) of umbilical placement. No accessory port was used. The patient was placed in left lateral decubitus, inserting the single port through a 2.5-cm umbilical incision (Fig. 2). The triangulation was performed with precurved DuoRotate instruments (Fig. 3), which make it possible to retrieve the effective triangulation without crossing the surgeon’s hands and get a sense of depth, avoiding the collision of tools and improving the capacity of organ retraction. Through this platform, tissue sealing systems can be used without conflict of space. Moreover, its perfect umbilical adaptation provides tightness and double rotation of the tools gets great precision of movement.

Right decollation and Kocher maneuver were performed, which allowed for the complete exposure of the great vessels. The dissection of the lymph nodes was initiated at the level of the right common iliac artery (Fig. 3), from the junction of the iliac vessels and the ureter, and reached the paracaval and interaortocaval space. The whole nodal tissue was resected reaching as limit the renal veins (Fig. 4). By means of the vacuum and the grip forceps, the well-known split and roll technique was performed (Fig. 4). The excised lymph nodes were bagged and removed through the same umbilical incision. The fascia was closed with vicryl 1 and the skin with vicryl rapide 3/0. No drain was left. In additional material (Appendix B 2), a video showing the technique used is presented.
Figure 3  (A) DuoRotate precurved instruments at the start of surgery. (B) Start of nodal dissection in the right common iliac artery.

Figure 4  (A) Dissection of lymph node tissue. (B) 'Separate and roll' technique practiced with vacuum and grip forceps.

Figure 5  (A) Topographic reconstruction of the resected tissue. (B) Postoperative CT shows no residual disease.
The total operative time was 85 min, and the estimated bleeding 50 cc. The patient was discharged 24 h later, without any need for analgesics. He developed no early or late complication. The pathology report revealed metastatic seminoma in 5 out of 11 removed lymph nodes. Topographic reconstruction of resected lymph node and fatty tissue, and the absence of residual disease in the postoperative check-up are shown (Fig. 5). The patient was very satisfied, with an absolutely invisible wound (Fig. 6), and he carried out a great physical and mental recovery.

The patient received 4 cycles of systemic chemotherapy (VP16-CDDP) early with very good tolerance. The patient is currently followed, and 18 months later he is free from disease, presenting as the only sequel mild postchemotherapy hearing loss. Ejaculation is not altered.

Conflict of interest

The authors declare that they have no conflict of interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.acuroe.2015.03.012.

References