SKILL AND TALENT

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

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KEYWORDS
Germ cell malignancy; Retroperitoneal lymph node dissection; Laparoendoscopic single site surgery

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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Conclusions: Umbilical primary LDRP-LESS, with excellent oncologic and cosmetic results, is feasible in selected cases. This approach could be considered the least invasive surgical option economically advantageous due to the reusable nature of the instruments used.

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PALABRAS CLAVE
Tumor de células germinales; Linfadenectomía retroperitoneal; Cirugía laparoendoscópica por puerto único

Linfadenectomía retroperitoneal laparoendoscópica por puerto único en tumor germinal no seminomatoso

Resumen
Introducción: La cirugía laparoendoscópica a través de puerto único (LESS) umbilical constituye una excelente alternativa a la cirugía laparoscópica o robótica multipuerto. Implica menos dolor postoperatorio, rápida recuperación y óptimo resultado cosmético. Prácticamente, resulta posible practicar cualquier cirugía urológica a través de este abordaje.

Paciente y método: Presentamos a un varón de 38 años con BMI 31,2 y antecedentes de tumor germinal mixto no seminomatoso estadio I en vigilancia que presenta recidiva ganglionar interaortocava sin elevación de marcadores. Se practicó una linfadenectomía retroperitoneal LESS (LDRP-LESS) derecha mediante abordaje umbilical por puerto único multicanal KeyPort (Richard Wolf GmbH, Knittingen, Alemania).

Resultados: Tras la colocación del dispositivo y la triangulación de las pinzas, se incidió el peritoneo parietal posterior y se movilizó el colon ascendente para acceder al retroperitoneo. Se llevó a cabo una disección ganglionar retroperitoneal completa del lado derecho desde los vasos ilíacos hasta los vasos renales, incluyendo el espacio paracava e interaortocava. El espécimen se introdujo en una bolsa laparoscópica, que se extrajo junto con el sistema multicanal. No se colocó drenaje abdominal. El tiempo operatorio fue 85 min y el sangrado estimado 50 cc. El paciente se mostró muy satisfecho, con una herida absolutamente invisible, y fue dado de alta tras un día de ingreso hospitalario sin necesidad alguna de analgesia. El informe anatomopatólogo reveló seminoma metastásico en 5 de 11 ganglios linfáticos, por lo que recibió 4 ciclos de quimioterapia sistémica (VP16-CDDP), con buena tolerancia. Un año después se encuentra libre de enfermedad y sin complicaciones.

Conclusiones: Es posible llevar a cabo LDRP-LESS primaria mediante abordaje umbilical con excelente resultado oncológico y cosmético en casos seleccionados. Este abordaje podría ser la opción quirúrgica menos invasiva económicamente ventajosa, gracias a la naturaleza reutilizable de los instrumentos empleados.

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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. 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 and retroperitoneal lymphadenectomy (RPL) 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. 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.1,11,12

The laparoendoscopic 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 ß-hCG tumor markers (1224 mU/ml) and LDH (672 U/l), with extension study negative for metastasis. After radical orchectomy 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 interaortocava 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 precurred 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.
Laparoendoscopic single-site retroperitoneal LESS

Results

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.

Commentary

Laparoscopic or robotic dissection of retroperitoneal lymph nodes is feasible in expert hands and offers good oncological results and minimum morbidity. There is no randomized study comparing these approaches to open surgery, but there have been numerous prospective comparative studies published that make it possible to obtain some conclusions comparing open and laparoscopic approaches. Oncological safety seems equivalent, but the operative time is higher for laparoscopic surgery, while hospital stay and complication rate of this approach are lower. Currently, different authors accumulate wide laparoscopic casuistry, both before and after chemotherapy. Generally, in residual masses after chemotherapy, bilateral lymph node dissection is preferred to reduce the risk of recurrence.

The placement of the trocars is available in the abdominal midline usually with 4 10–12 mm ports, or 3 in the midline and another in the anterior axillary line to assist retraction of the intestinal mass. Frankly, there is no proper definition of what the role of carrying out RLP by laparoendoscopic approach (RLP-LESS) can be because there is virtually no experience with it. There is only a previous description to which we now present, made in Zhubjiang Hospital (Guangzhou, China) with this approach for the treatment of 3 patients with non-seminomatous germ cell testicular tumor using a single port performed with glove and placed at pararectal level. However, in the field of gynecologic oncology, the laparoscopic or robotic LESS approach has been used to perform pelvic and para-aortic lymphadenectomy in the extension study and as part of the treatment of cervical and ovarian cancers. In fact, single-site retroperitoneal lumbo-aortic lymphadenectomy is an approach which is increasingly used in gynecologic surgery and its interest lies in reducing the risk that these patients have intestinal adhesions after radiotherapy.

This surgery ought to be performed using retroperitoneal approach and through different disposable platforms (SILS, Gelport). In summary, no prior RLP experience has been described with multichannel reusable platform of umbilical placement.

There is no doubt that it is necessary to accumulate more experience to better define the role of LESS surgery in these indications and evaluate its benefit over conventional minimally invasive approaches, such as laparoscopy or multitport robotics. We believe that LESS access could be an even less invasive option and the best esthetic alternative to perform this surgery. If reusable tools are used, this option is also economically advantageous.

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


