Minimally invasive surgical treatment for early-stage ovarian cancer: a case report

Tratamento cirúrgico com técnica minimamente invasiva de tumor ovariano localizado na pélve: Relato de caso

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ABSTRACT
Case report of a 54-year-old patient, with no complaints and no alterations detected during the physical examination, who underwent a routine pelvic ultrasound that showed a complex cyst on the right ovary which was confirmed with a CT scan. The serum CA125 level was elevated while other tumor markers – carcinoembryonic antigen, alphafetoprotein antigen and the beta human chorionic gonadotrophin were normal. Videolaparoscopy was used for the diagnosis and therapeutic management, revealing vegetating lesions on both ovaries but no other alterations. Biopsies were performed on the tumor masses and analyzed using the frozen section technique during the surgical procedure which revealed a serous neoplasm of low malignant potential - borderline. Next, ovarian carcinoma staging was performed in accordance with the standards recommended by the International Federation of Gynecology and Obstetrics: bilateral salpingo-oophorectomy, total abdominal hysterectomy, bilateral pelvic and para-aortic lymphadenectomy. To complete the staging, an omentectomy was performed by means of a 4 cm transverse incision in the epigastric region which was enlarged using a special Dexterity Protractor™ retractor. The incision also enabled the removal of surgical specimens. The patient was discharged from the hospital on the following day and recovered without any complications. Histological analysis confirmed the borderline tumor and no malignant cells were found on the other surgical specimens. Videolaparoscopy, minilaparotomy and the special retractor enabled adequate diagnosis, staging and removal of the localized ovarian tumor.

Keywords: Laparoscopy/methods; Laparoscopy/instruments; Ovarian neoplasms; Minimally invasive surgical procedures; Neoplasms

RESUMO
Relato de caso de uma paciente de 54 anos, sem queixas e sem alterações ao exame físico, realizou ultra-sonografia pélvica rotineira que mostrou cisto complexo em ovário direito, confirmado à tomografia. A dosagem sérica de CA125 estava elevada, enquanto os outros marcadores tumorais - antígeno carcinoembridroigênico, alfa-fetoproteína, e a fração beta da gonadotropina coriônica estavam normais. A abordagem diagnóstica e terapêutica foi feita por meio de videolaparoscopia, com observação de lesões vegetantes em ambos os ovários, sem outras alterações. As massas tumorais foram biopsiadas e analisadas por técnica de congelação intra-operatória, sendo constatada neoplasia serosa de baixo potencial de malignidade - "borderline". A seguir, foi realizado estadiamento para carcinoma ovariano, segundo norma preconizada pela Federação Internacional de Ginecologistas e Obstetras: salpingo-ooforectomia bilateral, histerectomia total, linfadenectomia pélvica bilateral e paraaórtica. Para completar o estadiamento, foi realizada a omentectomia por meio de corte transversal de 4 cm no epigástrico, dilatado com um afastador especial - Protractor®, a incisão também possibilitou a remoção das peças cirúrgicas. A paciente teve alta hospitalar no dia seguinte à cirurgia, evoluindo sem complicações. A análise histológica confirmou o tumor tipo “borderline” e não encontrou células malignas nas outras peças cirúrgicas removidas. A videolaparoscopia, uma minilaparotomia, e a utilização de um afastador especial permitiram o adequado diagnóstico, estadiamento e remoção de tumor ovariano localizado.

Descritores: Laparoscopia/métodos; Laparoscopia/instrumentação; Neoplasias ovarianas; Procedimentos cirúrgicos minimamente invasivos; Neoplasias

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There was no sponsorship of the manufacturer of the retractor; the authors have no commercial links.
INTRODUCTION

Videolaparoscopy (VLP) is the preferred method to assess adnexal masses located in the pelvic region that are presumed to be ovarian cancer - the so-called epithelial ovarian cancer (EOC)\(^{(1,2)}\). This is due to the limited sensitivity and specificity of imaging methods and serum tumor markers. VLP offers a detailed vision of the ovaries and other abdominal organs, and frozen-section biopsies can be performed during the procedure for histological testing\(^{(1,3)}\). However, in the treatment of EOC, it is still difficult to perform complete tumor staging and remove surgical specimens without compression using VLP. Therefore, once the ovarian cancer has been confirmed or presumed through frozen-section biopsies, the VLP procedure is usually converted into open surgery by means of a median laparotomy\(^{(1,4)}\) that enables removing the surgical specimens without compression or contact with the abdominal wall, as well as performing infracolic omentectomy for tumor staging\(^{(5)}\).

During the past few years, the need to perform a median laparotomy has been reduced with the use of the endobag to protect the surgical specimens before removal, lowering the incidence of metastasis at the incision location (port-side metastasis)\(^{(6)}\). The limitations of VLP to complete tumor staging still exist due to the technical problems involved in performing the infracolic omentectomy. In order to overcome these VLP difficulties in the treatment of EOC, the authors of this case report used a specially coated retractor designed for pediatric and uterine myoma surgeries\(^{(7)}\). This retractor was placed in a small incision (minilaparotomy), which permitted complete EOC staging, and excision of the surgical specimens during a minimally invasive procedure.

CASE REPORT

A 54-year-old woman, who had three pregnancies and three live births, in menopause and with no complaints, was submitted to a routine transvaginal ultrasound examination that showed a single complex 13.5 cm\(^3\) ovarian cyst on the right side which was confirmed by a CT scan\(^{(5)}\). The serum CA125 level was elevated – 422 UI/mL, but other tumor markers were within normal limits – carcinoembryonic antigen, alphafetoprotein antigen and beta human chorionic gonadotrophin. The physical examination was normal and colpocytology showed inflammatory abnormalities (Papanicolaou class II). Videolaparoscopy was used to evaluate the adnexal mass presumed to be a localized pelvic ovarian carcinoma (EOC), but vegetating lesions were observed on both ovaries with no other cavity alterations. The scarce peritoneal fluid was collected for cytological examination. A bilateral oophorectomy was performed and the ovaries were placed in an endobag. The surgical specimens were removed through a small incision in the wall and examined using the frozen section method that showed a serous ovarian tumor (borderline tumor)\(^{(8)}\). Based on the tumor malignancy potential, complete staging of the patient's abdomen was performed in accordance with established standards\(^{(5)}\), as shown in chart 1.

Initially a bilateral pelvic lymph node dissection was performed using VLP through an incision in the retroperitoneal space followed by resection of the round ligaments. Next, a total abdominal hysterectomy and bilateral salpingectomy were performed. The next step included a four-cm median incision in the epigastric region and placement of the Dexterity Protractor® retractor (figure 1) to enlarge the incision and protect the walls.

**Chart 1. Staging of tumor mass presumed to be ovarian carcinoma**

<table>
<thead>
<tr>
<th>A</th>
<th>Biopsy and resection of suspected lesion</th>
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<tr>
<td>B</td>
<td>Randomized biopsies of peritoneum, right diaphragmatic surface, vesical reflection, cul-de-sac, right and left paracolic recesses, pelvic walls</td>
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<td>C</td>
<td>Total hysterectomy</td>
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<td>D</td>
<td>Perform four lavages of the peritoneal cavity: diaphragm, left abdomen (flank), right abdomen (flank), pelvis</td>
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<td>E</td>
<td>Selective pelvic and para-aortic (infra-renal) lymphadenectomy</td>
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<td>F</td>
<td>Infra-colic omentectomy</td>
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<td>G</td>
<td>Appendicectomy (only mucous tumors)</td>
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The Dexterity Protractor® retractor is a circular instrument composed of two plastic rings joined by a thin elastic sheath\(^{(6)}\). After placing one ring in the epigastric incision, the elastic sheath is wound onto the other external ring that compresses the fat on the abdominal wall between the two rings, enlarging the incision. This allows complete access to the abdominal cavity and also protects the abdominal wall from contact...
with possible malignant cells. After placement of the retractor, the uterus was removed through the incision as seen in figure 2 and a complete infracolic omentectomy was performed (figure 3). A peritoneal closing was performed to avoid metastases along the parietal incision, using low pressure intra-abdominal CO₂ and the ovarian tumors were handled carefully to eliminate the possibility of compression or contact with the abdominal cavity. Lastly the incision was sutured and the entire abdominal cavity was explored using VLP. The patient was discharged from the hospital on the following day and to date, nine months after the procedure, has not presented any clinical complications. The specimens were fixed in paraffin and submitted to histological testing which confirmed the frozen section biopsy results conducted during the operation of a low malignant, borderline tumor. No invasion areas were found beyond the tumor, in the 32 lymph nodes removed or in the omentum.

DISCUSSION

The diagnosis, resection and, especially, the complete staging of this bilateral borderline ovarian tumor could be performed using VLP and a minilaparotomy. This trend to perform minimally invasive surgeries for EOC is a recent suggestion (8-10). Roughly 15% of all ovarian cancers detected are located in the pelvic region. VLP can be used in these cases and to detect benign tumors (1-4).

The use of VLP to evaluate pelvic adnexal masses began approximately ten years ago but it was only considered as an appropriate diagnostic approach for EOC recently (9). For some time, it was presumed that VLP could facilitate tumor spreading in the cavity and cause metastases at the laparotomy location (3,6). In addition, difficulties to perform the omentectomy led to incomplete staging. The risk of tumor dissemination during VLP was reduced by adopting safety measures: a) the use of the endobag – a sheath placed around presumed adnexal mass to eliminate tumor dissemination; b) careful surgical handling; and c) low intra-abdominal gas pressure (5-8). With these precautions, VLP was considered a better option compared to open surgery to diagnose adnexal masses presumed to be ovarian carcinomas in the pelvic region (6). VLP offers improved postoperative recovery and a better view of the cavity, which, in this case, revealed the presence of a bilateral ovarian tumor which was not detected during the ultrasound. In the long run, term VLP results in less abdominal adherences when compared to open surgery (1).

Ovarian tumor staging detects the histological tumor type, the abdominal organs affected and determines the chemotherapy treatment and prognosis (1-2). The infracolic omentectomy with extensive lymph node resection, which is part of the staging procedure, was performed using a small laparotomy (4 cm), that was enlarged significantly using a special retractor. The retracted incision was covered with an elastic sheath allowing the surgical specimens to be removed carefully and offered additional protection to the endobag to reduce metastasis in the surgical incision (6). The usual procedure in such cases is to interrupt the VLP and perform the omentectomy and surgical specimen removal in open surgery by means of a median laparotomy. The retractor used was the Dexterity Protractor™, which was created ten years ago to perform myomectomies. The objective of this initial report is to propose the use of the VLP (9) to treat adnexal masses presumed to be ovarian carcinomas in conjunction with a minilaparotomy, as recently suggested (60). It should be emphasized that the routine use of VLP and minilaparotomies as a diagnostic and therapeutic approach for pelvic adnexal masses is contingent on
the results of prospective and comparative protocols with open surgery.

In the present case, abdominal tumor dissemination was not confirmed on the cellular lavage or intra-abdominal biopsies performed. The tumor detected was of low malignant potential - borderline: characterized by malignant histological aspects - cellular atypia, papillary projections, pseudostratification, cellular hyperplasia and hypertrophy. However, like benign neoplasms, they do not normally present stromal invasion or metastasis\(^8\). Serous tumors are the most common histological type and have demonstrated survival rates of 99% for stage I and 92% for more advanced stages.

**CONCLUSION**

An ovarian carcinoma of low malignant potential (borderline) was diagnosed, staged and treated using videolaparoscopy, minilaparotomy and a special retractor. This allows surgeons to investigate an adnexal mass presumed to be a localized ovarian carcinoma in accordance with the recommendations of the International Federation of Gynecology and Obstetrics\(^8\).

**REFERENCES**