sciendo Romanian Journal of Orthopaedic Surgery and Traumatology, Volume 5, Issue 1, January-June 2022. pp:7-11
doi:10.2478/rojost-2022-0003

Accepted: November 22nd 2022

CASE REPORT

Radical hysterectomy for locally advanced cervical cancer with Para-Aortic lymphadenectomy: case presentation

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Abstract

Pelvic lymphadenectomy with radical hysterectomy is the basic treatment in locally advanced cervical cancer, but, for carefully selected cases, this intervention can be extended and high Para-Aortic lymphadenectomy can be performed to the site of emergence of the renal arteries. The mortality of the procedure has decreased significantly since the 1900s when it was introduced by Wertheim, while the 5-year DFS reached rates of over 90%.
Keywords: cervical cancer, lymphadenectomy, radical hysterectomy

Introduction

Despite the advancements in early detection, cervical cancer remains a formidable public health issue. It is considered a public health issue because, on average, from the detection stage, when it is easily treatable to an inoperable tumor with an invasion of the Mackerodt ligaments, it takes around 20 years or so for a woman to develop this stage; in addition, she must go to the physician during this period [1].

As time has passed and vaccination has been introduced for the HPV virus, we have observed that the incidence has decreased dramatically to the point that it is rarely diagnosed especially in high-income countries in Europe such as Finland and Sweden, while in eastern European countries such as Romania, unfortunately we still find this disease that ravages the women's lives [2].

An important tool in the diagnosis is the Papanicolau test, which allows early diagnosis and early radical surgery [3].

Ernst Wertheim described the first radical hysterectomy with subsequent lymphadenectomy in 1898 and also published the first study on this procedure with intraoperative mortality of 31% [4].

Wertheim did not have the means for early diagnosis so, in his view, which was correct, the wide excision of the organ far from the tumor would ensure free invasion margins. From that moment, Wertheim procedure, as it is called, has been the stepping stone in the treatment of early invasive cervical cancer [5].

However, new advancements in radiotherapy bring these aspects into discussion [6].

The paratissues parametrium and paracolpium contain the channels that drain the cervix.

According to literature, extensive studies have demonstrated this fact. Lymphatic drainage of the cervix and automatically that of cervical tumors is achieved through three different pathways or directions. Posterior pathway in which the lymphatic structures are arranged along the uterosacral ligaments, a lateral pathway in which the lymphatic structures are arranged in the parametrium to its lateral extremity near the pelvic wall, and an anterior pathway in which the lymphatic structures are arranged along the vesicocervical ligament. It is considered that physiological drainage in the absence of obstruction by direct invasion of the tumor is initially in the stations closest to the cervix before reaching the nodules in the iliac vessels [7,8].

If a curative lymphadenectomy is to be done, the entire parametrium must be removed, this being the point where most of the complications arise, because the blood vessels and nerves are exposed to damage when the ligaments are sutured and cut [9].

The present paper aims to discuss the case of a patient with early-stage invasive cervical cancer operated by radical hysterectomy, with high para-aortic lymphadenectomy, and to thoroughly review literature regarding this pathology. Radical hysterectomy with local lymphadenectomy is currently the bedrock of the surgical treatment in cervical cancer for stages IA2 to IB1. This procedure can also be used for selected cases, such as recurrence, or tumors of the uterus, like endometrial cancer.

Case report

Our patient was diagnosed with IA2 cervical cancer. Its presence was confirmed after routine yearly examination. The lesion was asymptomatic.

Before surgery, it was necessary to evaluate the medical history. The anesthetic team had to be informed that there could be a possibility of significant blood loss. Other surgical conditions that were considered were the common ones for abdominal interventions: prophylactic antibiotic therapy 30 minutes before the start of the operation, prophylactic anticoagulation to prevent embolism, and antithrombotic elastic stockings.

The patient was positioned in supine position, a median incision was made, that started from a higher level of the umbilicus and extended lower to the pubis.

After the peritoneum was sectioned and the surgeon entered the peritoneal cavity, it was essential to evaluate the entire abdominal cavity, broad ligaments, and the degree of local invasion of the tumor. In the case of our patient, in whom a high lymphatic para aortic dissection was performed, the median incision was extended superiorly close to the epigastric region (Fig. 1).

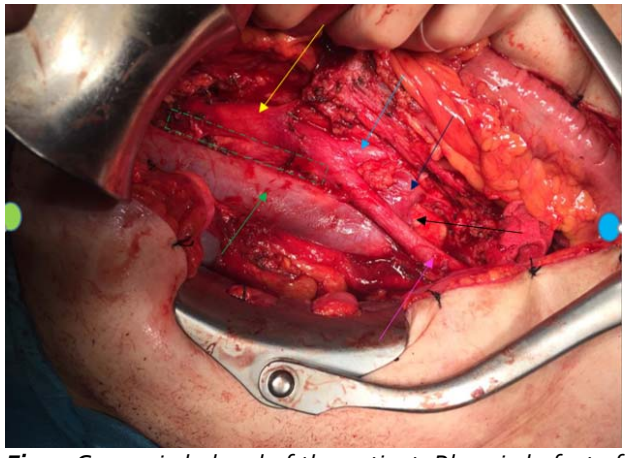

Fig. 1 *Green circle-head of the patient. Blue circle-feet of the patient. Green arrow-inferior vena cava. Yellow arrow - abdominal aorta. Light blue arrow - left common iliac artery. Dark blue arrow - left common iliac vein. Purple arrow - right common iliac artery. Black arrow - promontory. Green square: space between the abdominal aorta and inferior vena cava that can be clearly visualized as it was dissected and lymphatic tissue was removed. Also, the promontory and bifurcation of the abdominal aorta can be observed, which were cleared of lymphatic tissue*

Once the evaluation of the abdominal cavity was completed and the operability of the case was confirmed, the pelvis and pelvic peritoneum were exposed by positioning the patient in Trendelenburg position, introducing two soft fields to keep the small bowel loops away from the working field. The round ligaments were then exposed, they were fixed between 2 Pean forceps, and they were ligated and sectioned close to the pelvic wall. The uterus was mobilized with Kocher or Kelly forceps, which were applied to the fundus.

The bilateral broad ligaments were identified, and the anterior peritoneal sheet was incised parallel to the pelvic wall from top to bottom for a distance of a few centimeters. The space between the 2 sheets, where there was loose tissue, which did not bleed, was penetrated with the finger, and the posterior sheet, which was also incised to the level of the ovarian ligament, was identified.

The infundibulopelvic ligaments were identified and sectioned after the previous dissection at a higher level towards the aorta.

The next step was to expose the iliac vascular bundle where the lymphatic tissue to be excised was located. What was important to mention at that moment of surgery was that the ureters had to be identified, under which a lasso formed by a Foley catheter could be passed. The extent of lymphatic tissue dissection to the side was given by the position of the genitofemoral nerve. The lymph nodes depending on the region from which they were removed, the common, internal or external iliac artery, were sent separately for histopathological examination.

After the identification of the internal iliac artery, it was dissected and the surrounding adipose/ lymphatic tissue was removed, its branch was observed - namely the uterine artery, which detached in a common trunk or separately with the superior vesical artery. The uterine artery was sectioned and ligated, the superior vesical artery was preserved. The dissection was extended upwards to the common iliac artery and the abdominal aorta. The space between the inferior vena cava and the artery was dissected and the lymph nodes were extracted (**Fig. 1** - green square).

After this dissection, the surgeon went further with great attention into the obturator fossa, this space filled with lymphatic/ adipose tissue being dissected and the lymph nodes being removed. Vascular and nervous structures located on the floor of the obturator fossa were retained.

The surgeon then descended with the dissection to the pararectal space and to the lateral extremity of the cardinal ligament, which was sectioned and ligated close to the pelvic wall. The next aim was to create a tunnel by dissection around the ureter by mobilizing it to the side and placing light traction on the Foley catheter that was wrapped under it.

Tunneling of the ureter began proximal to the uterosacral ligaments and continued distally to the site of its penetration into the urinary bladder. Once the surgeon reached the bladder, it was dissected by sharp dissection from the anterior wall of the vagina, and the uterus was mobilized. Sharp dissection of the recto-vaginal space was accomplished. The uterus was pulled upwards. That tensioned the

uterosacral ligaments that were sectioned and ligated between clamps. The paravaginal tissue was dissected below the level of the pubic symphysis and the complete resection of the vagina was performed, which was sectioned at 3-4 cm below the cervix. Vaginal suturing was performed.

Discussion

Regarding the survival after this procedure, for cases staged as 1A1-1B2 (early-stage cervical cancer), the 5-year disease-free survival (DFS) can be encountered in as high 95% of the patients, and can increase to 100% for patients with low risk [**10-12**].

The complications after this procedure have been thoroughly analyzed and discussed. Bladder dysfunction remains one of the constant repercussions [**13**].

The dysfunction may be on short-term or long-term, but some patients may require catheter drainage for up to 2 weeks for bladder atony [**14**].

Other complications worth mentioning are vesicovaginal fistulas and ureterovaginal fistulas that occur in 4% of the cases [**15**].

They are encountered more frequently in patients with radiotherapy or brachytherapy. Rectal dysfunction has a lower incidence than vesical dysfunction and appears primarily due to local dissection and trauma to the autonomic nerves [**16**].

These dysfunctions are easily treatable by fiber ingestion. Other described complications are pneumonia, wound infection, retroperitoneal cellulitis, and small bowel obstruction.

Thelissen et al. have demonstrated that in the case of nonsuspicious lymphatic nodules on PET-CT or MRI, routine dissection and biopsy of the Para-Aortic lymphatic tissues will confirm the presence of tumors cells in up to 12% of the cases for patients with locally advanced disease and close to a quarter of the patients with metastasis in the pelvic lymphatic nodules (around the common iliac artery) [**17**].

All these translate into an upstaging of the disease, and by doing so, it affects the type of postoperative treatment (increases the radiotherapy field), monitoring, and reevaluations. Regarding the moment and method this dissection is to be done, it is still in discussion, as the potential comorbidities of the biopsy must outweigh the risks. A good indicator is the presence of tumor cells in the pelvic lymphatic nodules.

The introduction of PET-CT was thought to increase the ability to observe and therefore diagnose invasion in the para-aortic nodes, but the results are comparable to the ones of Annelou, demonstrated by surgical dissection and biopsy (12%) [**17**].

This is mainly because the size of the metastasis is strongly correlated with the ability of the CT to observe them only if they are above 5 mm [**18**].

The upper limit of the dissection is still up for debate - many authors in literature place it at the level of the renal arteries just like us. In our opinion, skipping metastasis is rare and the risks for a high Para-Aortic dissection outweigh the benefits.

Conclusion

To summarize, Wertheim's radical operation is focused mainly of the parametrium that needs to be excised as far from the tumor as possible to obtain margins free of disease. The dissection is guided by the pelvic fascia, the order of the steps being also important from our point of view. Also, Para-Aortic dissection demonstrates a relatively high percentage of lymphatic metastasis for cervical cancer. Most of these patients also have positive pelvic nodes and can be used as selection criteria, as PET-CT can give false-negative results.

Conflicts of interest

The authors state no conflict of interest.

Informed Consent and Human and Animal Rights statements

An informed consent has been obtained from the individual included in this study.

Authorization for the use of human subjects

Ethical approval: The research related to human use complies with all the relevant national regulations, institutional policies, is in accordance with the tenets of the Helsinki Declaration, and has been approved by the review board of "Prof. Dr. Agrippa Ionescu" Emergency Hospital, Bucharest, Romania.

Acknowledgements

None.

Sources of Funding

None.

Disclosures

None.

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