

Retroperitoneal, Para-aortocaval Lymphatic Resection as the Surgical Treatment of Choice in Seminoma Grade II

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Abstract

Background

Testicular cancer remains one of the most common malignant diseases in young men. The highest incidence was seen in the ages of 25-29 years. A significant part of them come from germ cell tumors, which are divided into seminoma and non-seminoma. Although the aggressiveness of tumors with germ cells remains high, it should be noted that there is a very high response to surgical and chemotherapeutic treatment, where a 5-year disease-free survival is evident in more than 95% of cases. The metastatic spread of these tumors follows the lymphatic drainage of the testes. The retroperitoneal and pre-aortocaval spread, which are resistant to chemotherapy, requires the intervention of an extended surgical procedure, which consists in the removal of the lymph nodes in these regions. The purpose of this procedure is the resection of pre-aortocaval lymph nodes remaining after orchidectomy, a procedure which represents one of the major components of the curative treatment.

Case presentation

There are three cases of patients, aged 37/32/39-years-old, who have undergone the surgical procedure of right orchidectomy. The biopsy obtained after the surgical intervention showed grade II seminoma. All three patients, who underwent orchidectomy in different years, were subjected to chemotherapeutic treatment with the 3 preparations bleomycin, etoposide and cisplatin. After that, for a period of 1.5-2 years, they carried out occasional checks, which they then stopped. The lack of control for a 5-year period, as well as the limitation of the surgical procedure only in the right orchidectomy, has led to the metastasis of the seminoma in the pre-aortocaval region. In this study, we consider the fact of performing the retroperitoneal lymphatic drainage procedure according to the lymphatic drainage route of the tests, in the cases of the biopsy result "Seminoma grade II" and above, as one of the major components of the curative treatment in addition to Chemotherapeutic treatment.

Discussion

The implementation of retroperitoneal, pre-aortocaval lymphadenectomy is considered mandatory, especially in the results of "Seminoma grade II" biopsy. In cases where laboratory and imaging examinations indicate residual retroperitoneal, pre-aortocaval masses, the surgical procedure of lymphadenectomy should be performed as soon as possible. The principle of the lymphadenectomy according to the way of drainage of the testes is important when we talk about oncological principles. Statistical data show the advantage of the extended surgical procedure, consisting of a disease-free survival period of 5 years at a rate of 95%. The choice of the retroperitoneal lymphadenectomy procedure has resulted in the normalization of tumor markers for at least a 2-year period after the intervention, also showing an improvement in the patient's prognosis.

Conclusion

In cases of histopathological response, where the result of Seminoma grade II and above is concluded, the surgical procedure should not be limited to simple orchidectomy or radical inguinal orchidectomy with the aim of avoiding metastatic spread along the lymphatic drainage route.

Keywords: General surgery, Testicular cancer, Seminoma, Para-aortocaval retroperitoneal lymphatic resection, RPLND.

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1. Introduction

Testicular cancer remains one of the most common malignant diseases in young men. The highest incidence is seen in the ages of 25-40. A significant part of them come from germ cell tumors, which are histologically divided into seminoma and non-seminoma. Although the aggressiveness of tumors with germ cells remains very aggressive, it should be noted that there is a very high response to treatment, where a 5-year disease free survival rate of more than 95% is evident. The staging of patients in such cases presents a challenge in itself which should

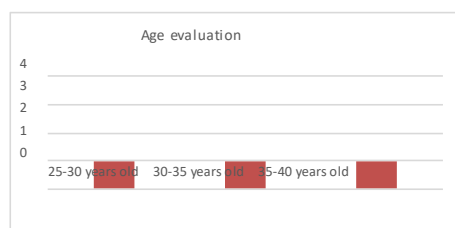
include a multitude of laboratory and imaging examinations. From the laboratory examinations, it is worth mentioning the importance of the evaluation of AFP, B-HCG and from the imaging ones the CT abdominopelvic with IV contrast. Testicular cancer advances in three stages, the first stage where no metastatic or lymphonodal spread is evident, the second stage consists of spreading in the retroperitoneal lymph nodes and depending on the size of the lymph nodes it is divided into stages 2a, 2b, 2c; in the third stage the spreading continues to distant lymph nodes. The main treatment of testicular cancer remains resection surgery with varying degrees of radicality depending on the clinical, laboratory, imaging data and depending on the histopathological result, followed by Retroperitoneal lymph node dissection (RPLND) and chemotherapy. The metastatic spread of these tumors follows the lymphatic drainage of the testes. The retroperitoneal and pre-aorto-caval spread, which are resistant to chemotherapy, requires the intervention of a surgical procedure, which consists in the removal of the lymph nodes in these regions. The purpose of this procedure is the resection of pre-aorto-caval lymph nodes remaining after orchidectomy, a procedure which represents one of the major components of the curative treatment. Para-aortocaval lymph node dissection is considered one of the most challenging surgical procedures that requires familiarity with vascular surgical techniques as well as strong anatomy proficiency.

2. Cases presentation

Patients aged 25, 32, 39 years, presented to the general surgery service, QSUT I-st clinic, with complaints of abdominal pain in all quadrants, but more pronounced in the upper quadrants, fatigue, slight decrease in weight and fever. They further refer that they have had these complaints for about 4 months, 6 months, 3 months respectively, which have gradually been increasing, which is the reason why they presented themselves at the hospital. In the anamnesis taken, it turns out that 10 years, 5 years, 7 years ago, respectively, they were diagnosed with testicular cancer, and after that they performed the intervention where the right orchidectomy was performed, it should be noted it was not performed in the first clinic of general surgery. After the above-mentioned surgical intervention, they underwent chemotherapy sessions, three of them with bleomycin, etoposide and cisplatin. After the end of these sessions, they refer that in the first months they carried out frequent checks for one year and a half after the orchidectomy procedure and that their condition was improving until a few months ago, when they were making the complaints above. In the physical examination turned out a relatively good general condition, hemodynamically stable, body temperature up to 37.5C, palpation of the abdomen with sensitivity in the upper quadrants and the umbilical region. Inguinal, axillary or supraclavicular lymph nodes are not identified and affected. In the laboratory examinations, which include the complete blood count, biochemical analyses, PT, INR, aPTT, complete urine, and microscopic examination of the urine, all result within the norm.

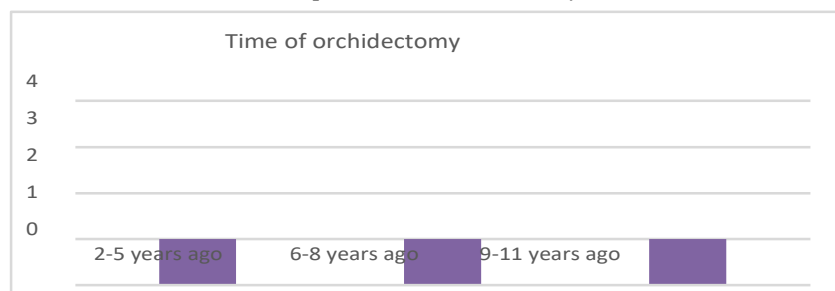
Of the three cases, one case stands out, undergoing an abdominal ultrasound, the response of which was the evidence of a subhepatic formation with dimensions of 96x80mm with cystic content inside. The rest of the abdominal ultrasound description was normal. It was deemed necessary to perform a CT abdomen where in the retroperitoneal region in the right anterior pararenal and right paraaortic space, a multi-cystic formation with clear lobular contours, measuring 13.1x10x8.3cm, is evident, which displaces the inferior vena cava anterolaterally and the head of the pancreas anteriorly. The formation is presented with thin capsules with thin septa that contrast after the injection of intravenous contrast, with cysts with pure serous content and some others with high protein and hemorrhagic content and two millimetric solid components.

Graph 1. Age evaluation



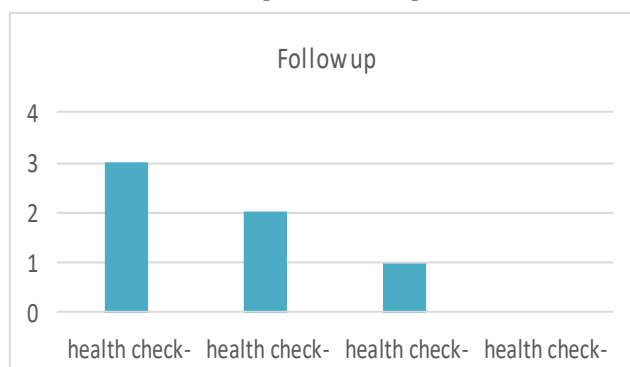
From the chart above, it can be seen that our cases have an age range of 25-40 years; more specifically in the 25-30 age group there is 1 patient, in the 30-35 age group also 1 patient, and in the 35-40 age group 1 patient.

Graph 2. Time of orchidectomy



In the second chart, it can be seen that one patient underwent orchidectomy 3-5 years ago, another patient 6-8 years ago, and the last patient 9-11 years ago.

Graph 3. Follow-up



In chart number 3, can be noted the distribution of our patients, according to the number of check-ups they performed after the orchidectomy intervention, where 3 patients performed the check-up after 3 months, 2 patients performed the check-up after 6 months, and 1 patient performed the check-up after 18 months. Furthermore, after 24 months, none of the patients has performed further check-ups.

After consulting with the multidisciplinary team, it is decided that the patient will undergo the intervention, and after obtaining the consent, the patient will enter the operating room.

2.1 Intraoperative

In the performed laparotomy, the diagnosis of a group of para-aortocaval lymph nodes is noted. Through the midline incision, the peritoneal cavity is opened and a retroperitoneal, subhepatic, retro-duodenal formation is found which continues on the right flank, retro-colic space with dimensions of 18-12 cm in diameter. Another incision is made perpendicular to the median incision, starting from the umbilicus to the right lumbar direction. The Told fascia and the hepatic flexure of the right colon are prepared and the entire right colon is mobilized. It is evident that the formation is located between the Cave and the abdominal Aorta. The vena cava is carefully prepared above and below the formation and laces are placed without tightening them. The extirpation of the formation is done carefully step by step, keeping the Cava, Aorta and other structures undamaged.

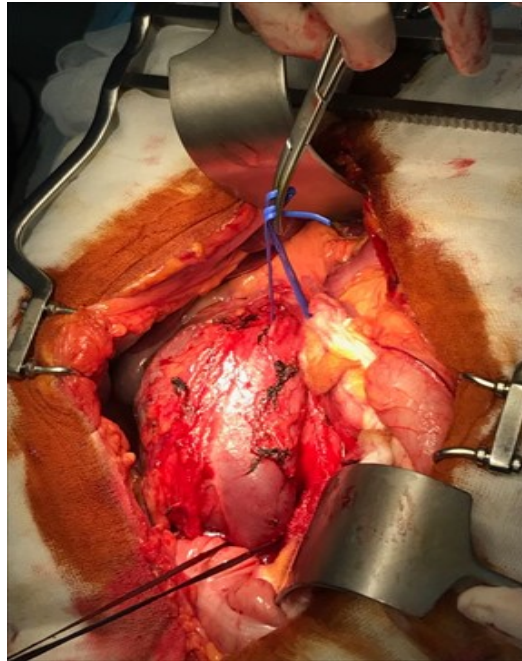


Figure 1. Intraoperative image 1



Figure 2. Intraoperative image 2

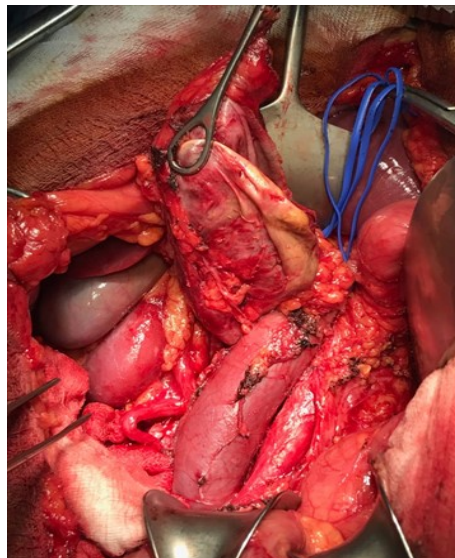


Figure 3. Intraoperative image 3

3. Discussion

In cases where laboratory and imaging examinations indicate residual retroperitoneal, pre-aorto-caval masses, the surgical procedure of lymphatic drainage should be performed as soon as possible. Performing a 100% metastatic lymph node dissection is also associated with a very good prognosis for the patient. There has been a long discussion over the years whether an extended surgical procedure (RPLND) should be performed, or whether it should be performed only locally. However, the data from the conducted studies have shown that the extended surgical procedure has brought the normalization of tumour markers for at least a 2-year period after the intervention, showing an improvement in the patient's prognosis. In some cases, where the lymphatic drainage procedure has not been carried out with a 100% success rate, cases of recurrence have been observed, where it is again emphasized that even after chemotherapy, the patient must undergo a second procedure to remove metastatic lymph nodes. Statistical data show for a period of 5 years disease free a survival rate of 55% of the cases when the lymphatic dissection was not completely performed, and 86% when it was performed with 100% success. From the results of our study, it is worth noting that the affected age ranged from 25-40 years old, the check-ups that the patients should perform seem to have not been completed. We can clearly see that the check-ups after 3 months after the operation have been carried out by all 3 patients, while after the passage of months the patients abandoned them, drawing the conclusion that none of them has carried out visits with the doctor after 2 years from the operation. The time distribution of simple orchidectomy surgery ranged from 3-11 years ago. The European Society of Oncology emphasizes, among other things, the complete pre-aortocaval dissection in cases of second-grade seminoma and above, where the anatomical limits for the above-mentioned procedure are the renal vessels, the pre-aortocaval region, the ureters and the common iliac arteries. In cases of simple orchidectomy, it should be taken into account that the imaging evaluation should not be performed before 4-6 weeks after the last cycle of chemotherapy, in order to avoid false-positive results, only when the imaging evaluation concludes the presence of distant masses, at that time the patient must undergo extended surgery. One of the disadvantages of chemotherapeutic treatment after surgery is the installation of infertility, for this reason, before these sessions, patients are encouraged to donate sperm to the respective banks. During extended surgery, the primary care should be taken in visualizing and preserving the innervation in order to avoid infertility and ejaculatory dysfunction. Performing of the limited orchidectomy, without extension towards the lymphatic drainage stations, constitutes the basic problem in the progress of the patient. Apart from others, and in cases of limited orchidectomy, in cases of first-degree seminoma, during the procedure the surgeon should not hold the testicle in his hand for much longer, and the ligation of the spermatic duct should be performed as elevated as possible, at the level of superficial inguinal ring if sub-inguinal orchidectomy is performed, and at the level of the deep inguinal ring if radical inguinal orchidectomy is performed. In cases where the biopsy shows that we are facing a grade II seminoma and above, limited orchidectomy should not be performed. It must be completed with lymphatic, retro-duodenal para-aortocaval dissection in order to have the best possible result and to avoid further recurrences. Complete resection of all residual masses, by means of pre-aortocaval dissection, results in a disease-free life expectancy of up to 95%.

4. Conclusion

As mentioned above, performing pre-aortocaval lymphadenectomy is a challenge for the surgeon, who must have a familiarity with vascular surgical techniques and a very good knowledge of anatomy.

Patients must perform follow-up sessions after the intervention related to the disease according to the protocols for a predetermined period. This includes periodic checks with the evaluation of laboratory examinations (AFP, B-hCG) and imaging examinations.

Depending on these controls, and depending on the response of the examinations, the extended surgical procedure (RPLND) may be indicated as an efficient treatment of the current health condition, with a success rate of 95% disease-free survival for a 5-year period

In special cases, even after performing RPLND 1, we may have relapse phenomena, where it is again emphasized that even after RPLND 1 and after chemotherapy sessions, RPLND 2 is indicated.

In cases of histopathological response, where the result of Seminomatous Tumor grade II and above is concluded, the surgical procedure should not be limited to simple orchidectomy or radical inguinal orchidectomy with the aim of avoiding metastatic spread along the lymphatic drainage route.

The extended surgical procedure directly affects the normalization of tumor markers for at least a 2-year period after the intervention, showing an improvement in the patient's prognosis.

During the process of diagnosis, evaluation of the patient and decision-making for the chosen surgical procedure, it is worth mentioning the forming of a multidisciplinary medical team including general surgeons, urologists, oncologists, and imaging specialists.

References

1. Beck S.D.W, Foster R.S (2006) *Long-term outcome of retroperitoneal lymph node dissection in the management of testis cancer.* PMID: 16523338
DOI: 10.1007/s00345-006-0060-8
2. Beck S.D, Foster R.S, Bihrl R, Einhorn L.H, Donohue J.P (2005) *Outcome analysis for patients with elevated serum tumor markers at post-chemotherapy retroperitoneal lymph node dissection.* PMID: 16135481
DOI: 10.1200/JCO.2005.11.684
3. Barentsz J, Takahashi S, Oyen W, Mus R, De Mulder P, Reznik R. (2006) *Commonly used imaging techniques for diagnosis and staging.* PMID: 16829647
DOI: 10.1200/JCO.2006.06.5946
4. Oldenburg J, Fosså SD, Nuver J, et al. (2013) *ESMO Guidelines Working Group. Testicular seminoma and non-seminoma: ESMO clinical practice guidelines for diagnosis, treatment and follow-up.* PMID: 24078656
DOI: 10.1093/annonc/mdt304
5. Wheeler JS, Babayan RK, Jr, Hong WK, Krane RJ. (1983) *Inguinal node metastases from testicular tumors in patients with prior orchiopexy.* PMID: 6133968
DOI: 10.1016/s0022-5347(17)52664-6
6. Cespedes R.D., Peretsman S.J. (1999) *Retroperitoneal recurrences after retroperitoneal lymph node dissection for low-stage non-seminomatous germ cell tumors.* PMID: 10475370
DOI: 10.1016/s0090-4295(99)00180-6
7. Donohue J.P, Foster R.S, Rowland R.G, Bihrl R, Jones J, Geier G. (1990) *Nerve-sparing retroperitoneal lymphadenectomy with preservation of ejaculation.* PMID: 2165181
DOI: 10.1016/s0022-5347(17)39434-x
8. Nicolai N, Miceli R, Necchi A, Biasoni D, Catanzaro M, Milani A, et al. (2010) *Retroperitoneal lymph node dissection with no adjuvant chemotherapy in clinical stage I non-seminomatous germ cell tumors: long-term outcome and analysis of risk factors of recurrence.* PMID: 20817343
DOI: 10.1016/j.eururo.2010.08.032