MERIT RESEARCH JOURNALS
www.meritresearchjournals.org

Merit Research Journal of Medicine and Medical Sciences (ISSN: 2354-323X) Vol. 8(5) pp. 125-132, May, 2020
Available online http://www.meritresearchjournals.org/mms/index.htm

Original Research Article

Primary Retroperitoneal Tumors: Symptomatology, Diagnosis, Operative and Postoperative Treatment – Our Five Years Experience

Ivchev J.[1,2] and Ivchev Lj[3]

Abstract

[1]Department of Urology, General City Hospital "8th September", Skopje, North Macedonia

[2] Faculty of Medical Sciences, University "Goce Delcev"- Stip, North Macedonia

[3]Department of Surgery, General City Hospital "8th September", Skopje, North Macedonia

***Corresponding Author's E-mail: jovanivchev@yahoo.com**

Retroperitoneal tumors today are still a diagnostic and therapeutic surgical challenge due to their rarity, late symptomatic manifestation, complex anatomical topographic localization and the contact with the vital structures. Of these, according to some studies, about 40% have benign and about 60% malignant characteristics, and according to other authors malignant tumors are four times more common than benign. Benign tumors can be of different origin and malignant can be primary or secondary metastatic lesions. The primary retroperitoneal neoplasm's account for 0.1-0.2% of all malignancies in the human body. 80% of them have mesodermal origin: liposarcoma (30%), leiomyosarcoma, malignant fibrotic histiocytoma and 20% have neural origin. Liposarcomas are rare cancer of the connective tissues that resemble fat cells under microscope. Retroperitoneal sarcomas account for about 18% of all soft tissue sarcomas. Local recurrences at high stages of retroperitoneal sarcomas are the most common cause of death in post-operative patients. The aim of the study was to (1) Determining of the percentage of the primary retroperitoneal tumors in relation with the tumors of the other organs in the retroperitoneum (kidneys, adrenal glands and ureters) in patients' undergone surgical treatment at the Urology Department at the General City Hospital "8th September"-Skopje, for the last five years. Determining of the ratio between the benign and malignant retroperitoneal tumors in our study group. Analysis of the diagnosis, operative and post-operative treatment and follow-up of the patients with retroperitoneal sarcoma. Comparative analysis of the results obtained with the existing data in the world literature and relevant scientific papers. The study covers 220 patients with retroperitoneal tumors treated at the Urology Department at the General City Hospital "8th September"-Skopje, in the period between 01.03.2015 to 01.03.2020. All cases of sarcoma retroperitoneal tumors and metastatic tumors were treated with meticulous open radical surgical removal of the tumor whereas the benign tumors (lipoma, echinococcus and retroperitoneal cystic teratoma) were treated with laparoscopic procedure. Patients with malignant tumors were treated postoperatively at the Oncology Clinic at the Medical Faculty in Skopje. CT, MR, ultrasound, PET scan and frequent check of the tumor markers were used for the patients follow up for the past three years. None of the patients with primary malignant tumors received neo adjuvant therapy. Mean data, percentage representation and graphical representation of the comparative analyzes were used for statistical data processing. Of the 220 patients treated with a tumor in the retroperitoneum, 19 (8,64%) had primary retroperitoneal tumors. Of those, 11 patients or 5% had primary malignant tumor, 4 patients (1,81%) had metastatic retroperitoneal tumor and 4 patients (1,81%) had benign tumor. The histopathologic finding revealed: liposarcoma in 9 patients (4,09%), one patient with teratocarcinoma (1,81%) and one patient with neurofibrosarcoma (1,81%). The postoperative two years follow up of the patients with retroperitoneal sarcoma

(RPS) showed local recurrence and mortal outcome in 2 out of 11 patients (18%). Of the rest 9 patients with RPS, 7 patients received chemotherapy and 2 patients did not receive any chemotherapy due to the continual negative results of the CT, MRI, PET scan and tumor markers. Overall 3 years survival is 81,8%. Compared with other studies where RPS are present in one third of the primary retroperitoneal tumors, our study showed retroperitoneal sarcoma presence in 57,89%. The etiology of such high percentage is a subject for further studies. Local recurrence appeared in 2 patients with primary malignant retroperitoneal tumor and in all 4 patients with secondary metastatic tumors of the retroperitoneum, regardless the radical surgical and oncology treatment due to the presence of the high malignant stage. All of the patients with retroperitoneal tumors had general symptoms (back pain, weakness and weight loss) and gained first diagnose by ultrasound examination. Our study showed a high percentage of primary retroperitoneal tumors with 8,64% compared to the total number of operated retroperitoneal tumors. Of those 5% were primary malignant retroperitoneal tumors (liposarcoma, neurofibrosarcoma and teratocarcinoma). 60% of the treated primary and secondary malignant retroperitoneal tumors belonged to liposarcoma which is much higher percentage of the representation described in the literature to date. The high percentage of 3 years survival (81,8%) confirmed our decision for radical surgical treatment as soon as possible, without prior neoadjuvant oncology therapy. Postoperative chemotherapy is necessary for longer survival especially in patients with stage T2G2N0M0 and above. The fact that the 2 patients with RPS did not receive any oncology therapy, and are still in good health without any local recurrence, confirms that precision surgery and diagnosing the tumor at its early stage are key to successful treatment of the retroperitoneal malignant tumors. Laparoscopic surgery in our study proved to be an appropriate method in the treatment of benign tumors while open surgery is still the method of choice for radical removal of sarcomas according to our experience.

Keywords: Retroperitoneum, sarcoma, benign tumors, liposarcoma, leiomyosarcoma, echinococcus, neurofibrosarcoma.

INTRODUCTION

Retroperitoneal tumors today are still diagnostic and therapeutic surgical challenge due to their rarity, late symptomatic manifestation, complex anatomical topographic localization and the contact with the vital structures. More than 75% of those have mesenchymal origin (Maciel dos Santos Mota et al., 2018). According to their origin they are divided in two groups. The first group includes the tumors of the retroperitoneal organs: kidneys, suprarenal glands, ureters, pancreas and the bowel loops. The second group is the tumors and tumor masses which originate from the retroperitoneal tissues such as: the fat tissue, fibrotic tissue, lymphatic system, muscle tissue, the blood vessels and the nerve tissue. They belong to the so called primary retroperitoneal tumors, which according to the type of the tumor generally can be diagnosed as solid or cystic tumors while according to the histopathologic finding, can be categorized as primary malignant, secondary malignant and primary benign tumors of the retroperitoneum. Most common primary solid malignant RT (retroperitoneal tumors) are: liposarcoma, leiomyosarcoma, neurofibro-sarcoma and lymphosarcoma. Secondary lymphatic metastatic tumors mostly have origin from neoplasm of the small intestines and the colon. Most common retroperitoneal cystic lesions described in the available literature are lymphangioma, teratoma, teratocarcinoma and cystic mesothelioma. The primarily retroperitoneal fibrosis, lipoma, angiomyolipoma, schwannoma, non-Langerhans histiocytosis (Erdheim-Chester disease) and extramedullary hematopoiesis are also described as benign retroperitoneal tumors (Maciel dos Santos Mota et al., 2018).

Among the primary malignant RT, liposarcoma is the most commonly present with over 30%, of which approximately 75-85% are well differentiated tumors (GemiciK et al., 2015).

From the current surgical practice, accurate surgical removal combined with oncology therapy is an essential prerequisite for longer survival.

Aims

- Determining of the percentage of the primary retroperitoneal tumors in relation with the tumors of the other organs in the retroperitoneum (kidneys, adrenal glands and the ureters) in patients undergone surgical treatment at the Urology Department at the General City Hospital "8th September"-Skopje, for the last five years.
- Determining of the ratio between the benign and malignant retroperitoneal tumors in our study group.
-Analysis of the diagnosis, operative and post-operative treatment and follow-up of the patients with retroperitoneal sarcoma.
- Comparative analysis of the results obtained with the

existing data in the world literature and relevant scientific papers.

MATERIALS AND METHODS

The study covers 220 patients with retroperitoneal tumors treated at the Urology Department at the General City Hospital "8th September"- Skopje, in the period between 01.03.2015 to 01.03.2020. All cases of sarcoma retroperitoneal tumors and metastatic tumors were treated with meticulous open radical removal of the tumor whereas the benign tumors (lipoma, echinococcus, teratoma and retroperitoneal cysts) were treated with laparoscopic procedure. Patients with malignant tumors were treated postoperatively at the Oncology Clinic at the Medical Faculty in Skopje. CT, MR, ultrasound, PET scan and frequent check of the tumor markers were used for the patients follow up for the past three years. None of the patients with primary malignant tumors received neo adjuvant therapy. Mean data, percentage representation and graphical representation of the comparative analyzes were used for statistical data processing. The diagnostic findings, the results of the operative and postoperative treatment were compared with the current available literature.

RESULTS

Total of 220 patients were treated of retroperitoneal tumors for the past five years at our Urology Department. Of those 188 patients (85,45%) were operated from renal malignant tumors: 150 (68,18%) with renal cell carcinoma, 33 (15%) with transitional cell carcinoma, 3 (1,36%) with planocellular carcinoma of the renal calyx and 2 (0,9%) with papillary cell renal carcinoma. 7 patients (3,18%) were treated from transitional cell carcinoma of the ureter. 19 patients (8,64%) were operated from primary retroperitoneal tumors (table 1).

Table 1. Patients undergone retroperitoneal surgery for the past five years categorized according to the histopathologic findings

Patient undergone retroperitoneal surgery for the past five years categorized according to the histopathologic findings	**Number (percentage) of all**
Renal cell carcinoma – clear cell type	96 (43,63%)
Renal cell carcinoma	36 (16,36%)
Renal cell carcinoma infiltrative	3 (1,36%)
Renal cell carcinoma papillary type	15 (6,81%)
Renal transitional cell carcinoma	33 (15%)
Retroperitoneal sarcoma (liposarcoma)	9 (4,09%)
Retroperitoneal soft tissue sarcoma (verrossimilis neurollema malignum)	1 (0,45%)
Retroperitoneal cystic malignant teratoma (teratocarcinoma)	1 (0,45%)
Renal angiomiolipoma	6 (2,72%)
Metastasis adenocarcinomatis in texto adiposo	4 (1,81%)
Carcinoma planocellulare calyces renalis	3 (1,36%)
Papillary renal cell oncocytic carcinoma	2 (0,90%)
Transitional cell carcinoma ureteris	7 (3,18%)
Retroperitoneal echinococcus	1 (0,45%)
Benign idiopathic retroperitoneal cyst	2 (0,90%)
Retroperitoneal lipoma	1 (0,45%)
total	220 (100%)

Of total 19 patients (8,64%) with primary retroperitoneal tumors: 11 patients (5%) had primary malignant tumors. Of those: 9 (4,09%) liposarcoma, 1 (0,45%) neurofibrosarcoma and 1 patient (0,45%) teratocarcinoma. Secondary malignant metastatic tumors had 4 patients (1,81%). Primary benign retroperitoneal tumors were diagnosed in 4 patients (1,81%): 2 (0,9%) lipoma, 1 (0,45%) teratoma and 1 (0,45%) with cystis echinococci retroperitonei (table 2).

Table 2. Primary malign and benign retroperitoneal tumors treated for the past five years at our Urology Department

Primary tumors of retroperitoneum	19 (8,64%)
Liposarcoma retroperitonei	9 (4,09%)
Soft tissue sarcom verrossimilis neurollema malignum retroperitonei	1(0,45%)
Teratoma cysticum malignum retroperitonei (teratocarcinoma)	1(0,45%)
Benign tumors of the retroperitoneum (lipoma, echinococcus, teratoma)	4(1,81%)
Metastatic malignant tumors of the retroperitoneum	4(1,81%)

Of the 19 operated patients with retroperitoneal tumors, only 4 were male and the remaining 15 were female. Malignant primary retroperitoneal tumors were found in 4 men (26,6%) out of 15 patients. 11 patients (73,3%) with malignant RT were female. Liposarcoma was present in 8 female (88,9%) out of total 9 patients. Overall from 19 patients treated of retroperitoneal tumors 15 (78,9%) were malignant and 4 (21,05%) were benign tumors. Of those 15 with malignant tumors, 11 (73,3%) had primary malignant tumors and 4 (26,6%) had secondary metastatic malignant retroperitoneal tumors (Diagram 1).

The majority of patients with primary retroperitoneal tumors referred for examination due to nonspecific symptoms such as: pain in the flank, pain in the lumbar spine, weakness and weight loss. Blood tests showed mainly hi values of SE (over 50/ first hour), secondary anemia and some elevation of the tumor markers CEA,

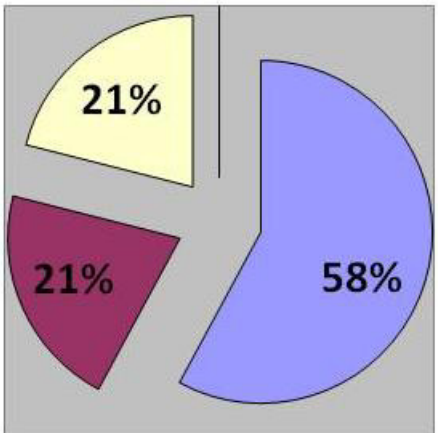

Diagram 1. Primary malignant RT 58%, secondary malignant RT 21%, benign RT 21%

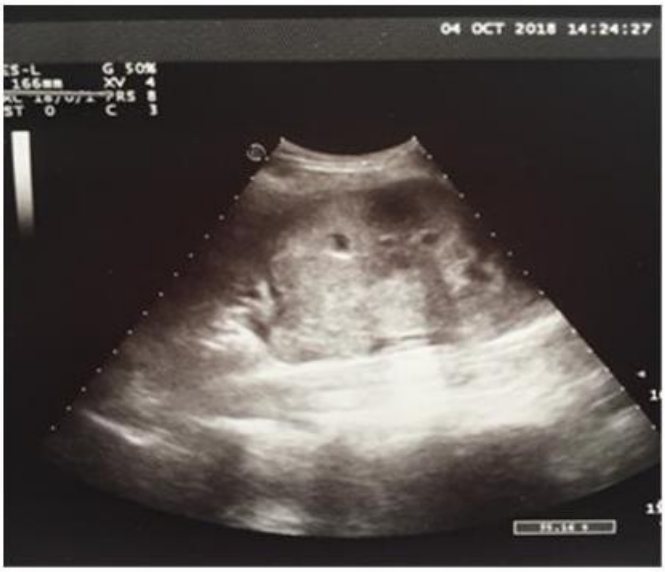

Figure 1. Ultrasound of a 69 years old male with necrotic neurofibrosarcoma in the right retroperitoneum

C19,9 and C15,3. The first diagnose was based on an abdominal ultrasound examination and then forwarded to an urologist for further evaluation (figure 1).

CT, MR of the abdomen and percutaneous needle biopsy were used for definitive diagnosis as a preparation for surgery (figure 2,3).

All of the patients with malignant RT were treated with accurate open surgical removal without prior neo-adjuvant therapy. 7 of 9 patients with liposarcoma received postoperative chemotherapy. The patient with neurofibrosarcoma (figure 4) and teratocarcinoma (figure 5) also received postoperative oncology therapy. The patients with secondary metastatic retroperitoneal tumors were treated also with open surgical removal of the tumor with prior neo adjuvant therapy at the Oncology Clinic. All of them had adenocarcinomatous origin from the colon and small intestines.

The postoperative 3 years follow up revealed two deaths (18,2%) within the patients with primary malignant RT and survival in 9 (81,8%) patients. Three years survival within the patients with secondary malignant RT was 50% (2 out of 4 patients are still under oncology therapy) (table 3).

The four patients with benign RT (2 lipoma, 1 cystic teratoma and 1 echinococcal cyst) were treated with laparoscopic surgery. The three years follow up of

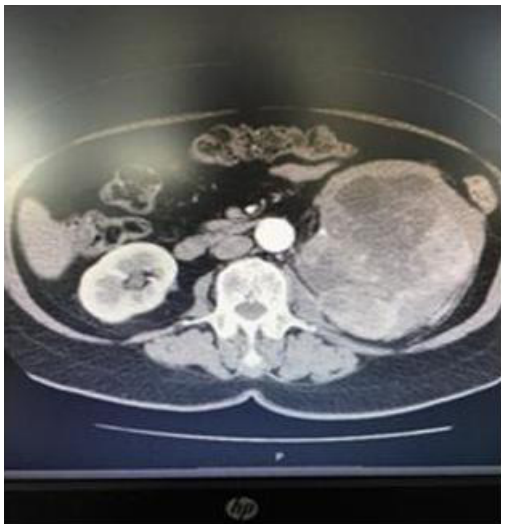

Figure 2. CT of a female (58) with liposarcoma in the left RP

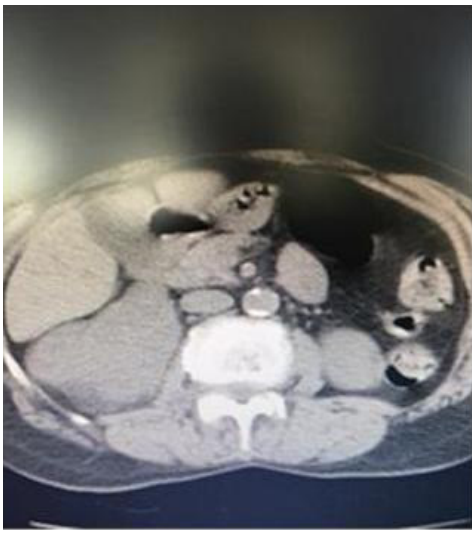

Figure 3. CT of a male (68) with liposarcoma in the right RP

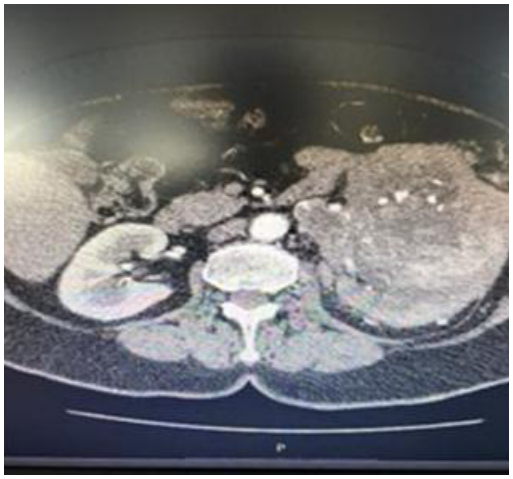

Figure 4. CT of a male (69) with left RP

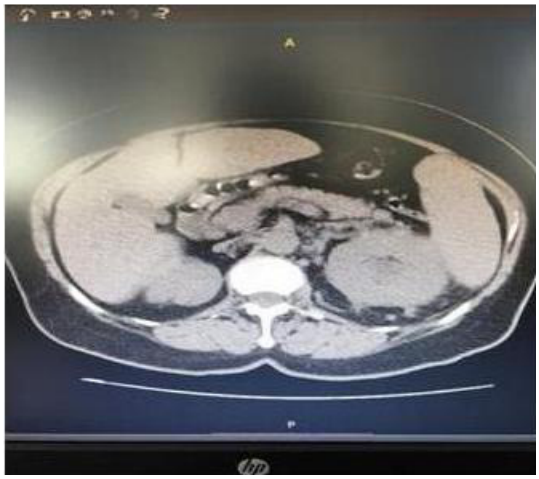

Figure 5. CT of a male (70) with neurofibrosarcoma in the teratocarcinoma in the left RP

Table 3. Postoperative mortality of the primary malignant RT

Type of malignant retroperitoneal tumor	3 years postoperative survival	lethal outcome
Primary malignant RT	9 patients out of 11 **(81,8%)**	2 **(18,%)**
Secondary malignant RT	2 patients out of 4 **(50%)**	2 **(50%)**
Total	11 patients out of 15 **(73,3%)**	4 (**26,7%)**

these patients did not show any recurrence.

DISCUSSION

According to some published studies the most common primary retroperitoneal malignant tumor is lymphoma with 33 % of the retroperitoneal neoplasm (Cherciu et al., 2019). For the last 5 years of our experience we have encountered sarcomas as the most common malignant retroperitoneal tumor with approximately 5% in relation to all types of operated tumors in the retroperitoneum.

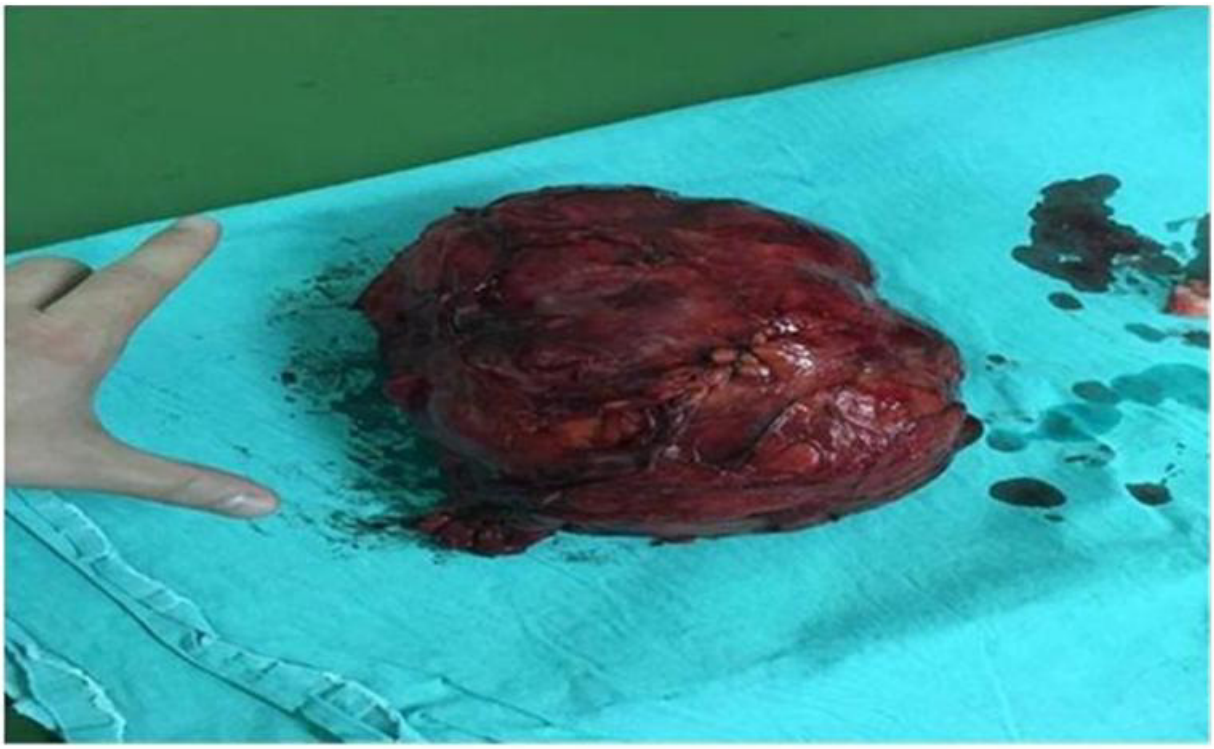

Figure 6. Sarcoma infiltrated into the left kidney fatty and fibrous capsule in 58 years old female

Unlike the data in most of the studies, where sarcoma tumors are present in approximately 30% of all other primary RT, in our study they dominate with about 58% of all primary malignant RP tumors. The etiology of such high percentage could be a subject for further studies.

The small number of patients treated of secondary metastatic RT (1,81%), shown in our study is most likely because such patients were usually diagnosed and treated at the Abdominal Surgery Department during the postoperative follow up, after the surgery of the intestinal or colon adenocarcinoma.

Local recurrence appeared in 2 patients with primary malignant retroperitoneal tumor and in all 4 patients with secondary metastatic tumors of the retroperitoneum regardless the radical surgical and oncology treatment due to the presence of the high malignant stage.

All of the patients with retroperitoneal tumors had general symptoms (back pain, weakness and weight loss) and gained first diagnose by ultrasound examination. For further diagnosis CT, MR of abdomen and needle biopsy was used.

Accurate open surgical removal of the primary RT with perihilar lymphadenectomy was performed in 6 out of 11 patients. In 5 patients we performed nephrectomy due to intraoperative finding of malignant infiltration into the fatty and fibrous kidney capsule (figure 6).

Splenectomy was performed in one patient due to malignant infiltration in the hilum of the spleen. The surgical treatment of the secondary malignant tumors was consisted of the surgical removal of the metastatic lymph node packages in the retroperitoneum. In one female patients right hemicolectomy with partial resection of the ileum was performed together with the retroperitoneal lymphadenectomy due to intraoperative finding of malignant infiltration in the colon and terminal ileum.

In one 38 years female patient with liposarcoma we performed left nephrectomy due to the preoperative CT finding of infiltration in the renal pelvis and hilum (figure 7,8,). The postoperative histopathology finding revealed well differentiated liposarcoma. Hence she did not receive postoperatively chemotherapy. The last controlled PET scan 2,5 years after the surgical treatment did not reveal any signs of tumor recurrence.

The majority of patients with primary malignant retroperitoneal tumor (sarcoma) were diagnosed at the stage of large tumor mass, due to the long period of asymptomatic manifestation, which significantly hampered the surgical operation (Figure 9).

The postoperative treatment continued with chemotherapy in 14 out of 15 patients with malignant RT. According to current practice regarding the justification of post-operative radiation therapy, especially in

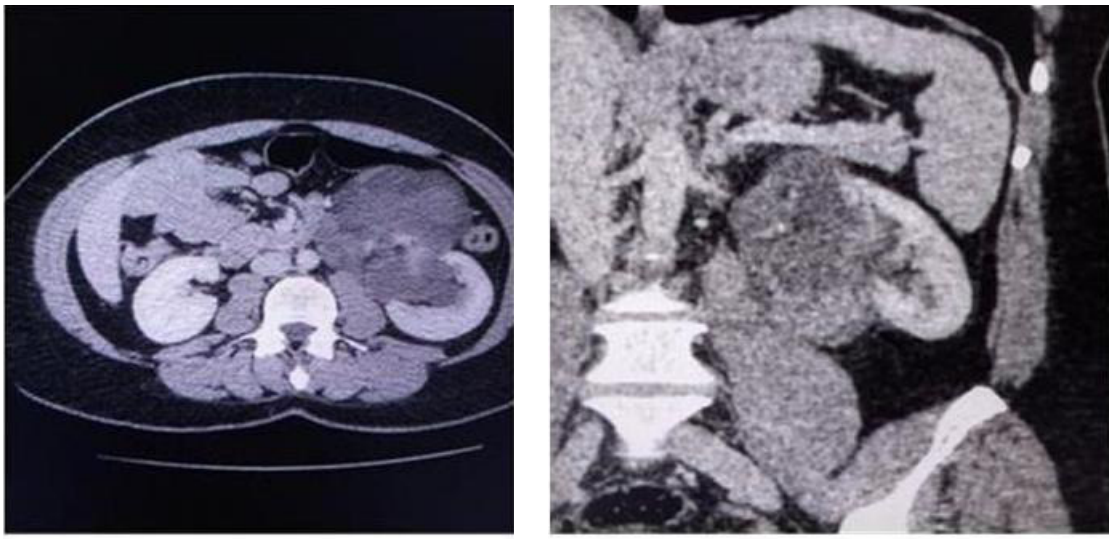

Figure 7.8. CT of 38 years female with liposarcoma infiltrated into the renal pelvis and hilum

Figure 9. Large tumor mass in the right retro peritoneum (liposarcoma)

retroperitoneal sarcomas, there is still no clear position in the available literature. The radio therapy is usually used in patients with high-grade tumors. It is not recommended for long treatment because of their damaging effect on the intestinal tract (Pawlik et al., 2006; Van De Voorde et al., 2011). In our patients only two received postoperative radiotherapy at Oncology Clinic without any significant effect probably because of the very high stage of the malignant tumor.

The chemotherapy have significant role in the treatment of the primary RT especially for the liposarcoma and leiomyosarcoma as neo adjuvant or

Table 4. Radiotherapy & chemotherapy with 3 years postoperative survival and mortality within the patient treated at our urology department

Number and Type of malignant retroperitoneal tumor	Radiotherapy	Chemotherapy	3 years survival	Egzitus lethalis
Liposarcoma (9)		8	7	2
Neurofibrosarcoma (1)	1	1		1
Teratocarcinoma (1)		1	1	
Secondary MS tumors (4)		4	2	2

postoperative treatment. But it is important to emphasize that the efficiency depends on the cell differentiation and the level of the malignant stage (Pisters et al., 2003; Strauss et al., 2010; Krikelis and Judson, 2010). According to our cases, chemotherapy received 13 out of 15 patients. The effect was very positive especially for the patient with primary RT, because during our three years follow up egzitus lethal is had 2 out of 9 patients (rephrase). The chemotherapy had also significant effect in the postoperative treatment of the secondary RT (table 4).

CONCLUSION

Our study showed a high percentage of primary retroperitoneal tumors with 8,64% compared to the total number of operated retroperitoneal tumors. Of those 5% were primary malignant retroperitoneal tumors (liposarcoma, neurofibrosarcoma and teratocarcinoma). 60% of the treated primary and secondary malignant retroperitoneal tumors belonged to liposarcoma which is much higher percentage of the representation described in the literature to date (30%). The high percentage of 3 years survival (81,8%) confirmed our decision for radical surgical treatment as soon as possible, without prior neo adjuvant oncology therapy. Postoperative chemotherapy is necessary for longer survival especially in patients with stage T2G2N0M0 and above. The fact that the 2 patients with RPS did not receive any oncology therapy, and are still in good health without any local recurrence, confirms that precision surgery and diagnosing the tumor at its early stage are key to successful treatment of the retroperitoneal malignant tumors. Laparoscopic surgery in our study proved to be an appropriate method in the treatment of benign tumors while open surgery is still the method of choice for radical removal of sarcomas according to our experience.

REFERENCES

Bauer HC, Trovik CS, Alvegård TA, Berlin O, Erlanson M, Gustafson P, et al. (2001). Monitoring referral and treatment in soft tissue sarcoma: study based on 1,851 patients from the Scandinavian Sarcoma Group Register. Acta Orthop Scand. ;72:150–9.

Cherciu A, Radu A, Iorga L, Marcu D (2019). Primary retroperitoneal tumors-A brief classification and differential diagnosis. J of Milit Med 122(1):9-15 · April

GemiciK, Buldu I, Acar T, Alptekin H, Kaynar M, Tekinarslan E, Karatağ T, Efe D, Çolak H, Küçükkartalla T, İstanbulluoğlu OM (2015). Management of patients with retroperitoneal tumors and a review of the literature. World J Surg Oncol. 13: 143.

Hassan I, Park SZ, Donohue JH, Nagorney DM, Kay PA, Nasciemento AG, et al (2004). Operative management of primary retroperitoneal sarcomas: a reappraisal of an institutional experience. Ann Surg. ;239:244–50.

Hueman MT, Herman JM, Ahuja N (2008). Management of retroperitoneal sarcomas. Surg Clin North Am. 88:583–97.

Jagues DP, Coit DG, Hajdu SI, Brennan MF (1990). Management of primary and recurrent soft-tissue sarcoma of the retroperitoneum. Ann Surg. 212:51–9.

Krikelis D, Judson I (2010). Role of chemotherapy in the management of soft tissue sarcomas. Expert Rev Anticancer Ther. 10:249–60.

Maciel dos Santos Mota M, Otaviano França Bezerra R, Ricardo Taveira Garcia M (2018). Practical approach to primary retroperitoneal masses in adults. Radiol Bras. Nov-Dec; 51(6): 391–400.

Messiou C, Moskovic E, Vanel D, et al. (2017). Primary retroperitoneal soft tissue sarcoma: imaging appearances, pitfalls and diagnostic algorithm. Eur J Surg Oncol. 43:1191–1198.

Neuhaus SJ, Barry P, Clark MA, Hayes AJ, Fisher C, Thomas JM (2005). Surgical management of primary and recurrent retroperitoneal liposarcoma. Br J Surg. 92:246–52.

Osman S, Lehnert B E, Elojeimy S, et al. (2013). A comprehensive review of the retroperitoneal anatomy, neoplasms, and pattern of disease spread. Curr Probl Diagn Radiol. 42:191–208.

Pawlik TM, Pisters PW, Mikula L, Feig BW, Hunt KK, Cormier JN, et al. (2006). Long-term results of two prospective trials of preoperative external beam radiotherapy for localized intermediate or high grade retroperitoneal soft tissue sarcoma. Ann Surg Oncol. 13:508–17.

Pisters PW, Ballo MT, Fenstermacher MJ, Feig BW, Hunt KK, Raymond KA, et al. (2003). Phase I trial of preoperative concurrent doxorubicin and radiation therapy, surgical resection, and intraoperative electron-beam radiation therapy for patients with localized retroperitoneal sarcoma. J Clin Oncol. 21:3092–7.

Singer S, Antonescu CR, Riedel E, Brennan MF (2003). Histologic subtype and margin of resection predict pattern of recurrence and survival for retroperitoneal liposarcoma. Ann Surg. 238:358–71.

Strauss DC, Hayes AJ, Thomas JM (2011). Retroperitoneal tumours: review of management. Ann R Coll Surg Engl. 93:275–80.

Strauss DC, Hayes AJ, Thway K, Moskovic EC, Fisher C, Thomas JM (2010). Surgical management of primary retroperitoneal sarcoma. Br J Surg. ;97:698–706.

Van De Voorde L, Delrue L, van Eijkeren M, De Meerleer G (2011). Radiotherapy and surgery an indispensable duo in the treatment of retroperitoneal sarcoma. Cancer. ;117:4355–64.

Zhou Z, McDade TP, Simons JP, Ng SC, Lambert LA, Whalen GF, et al. (2010). Surgery and radiotherapy for retroperitoneal and abdominal sarcoma: both necessary and sufficient. Arch Surg. 145:426–31.