Retroperitoneal liposarcoma

(case study)

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Summary. There are data of the literature about the prevalence, difficulties of diagnosis and methods of non-organ retroperitoneal tumors treatments, including liposarcoma represented. The dynamics of health state, the results of surveys of the patient - the liquidators of the Chernobyl nuclear power plant in 1986, held in order to avoid the cancer are described in details.

Key words: non-organ retroperitoneal tumors, liposarcoma, polyserositis, the liquidators of the Chernobyl accident.

Introduction

Non-organ retroperitoneal tumor (NRT) is a neoplasm with no organ belonging, developing from the soft tissues located in the retroperitoneal space (fat, connective, vascular, nervous), as well as embryonic cells. NRT are rare and are from 0.01 to 0.3% of all human tumors [3, 4, 5, 7, 9, 12, 13].

According to different authors, from 60 to 80% of NRT are malignant, and from 14 to 44% - benign. With high variability of the clinical picture, they are slowly progressing without marked symptoms of the disease and often recurrent. From 19 to 32% of malignant retroperitoneal tumors are capable of producing distant metastases, mainly in the liver and lungs. Most of retroperitoneal tumors (70%) are of mesodermal origin and NRT of fat nature (lipoma and liposarcoma) are on the first place among them [5,12].

Liposarcoma is 14-16% of malignant tumors of soft tissues. The source of retroperitoneal liposarcomas is usually perirenal tissue, tissue of lateral channels and mesocolon or mesentery. Generally, retroperitoneal liposarcomas look as encapsulated, rounded or lobed formations, sometimes

with multiple fat appendages extending from the main body of the tumor, and even lying apart from it [3, 4, 5, 7, 8, 12, 13].

Clinical signs of NRT are non-specific; they manifest with symptoms of lesions of various organs, major vessels, nerves, involved in the process secondary, as well as symptoms of intoxication and paraneoplastic process. A complaint is determined primarily by the location and size of the tumor.

In general, clinical symptoms of NRT, especially in the early stages of the disease are scarce and uncertain. Early diagnosis of these tumors is difficult and often requires complex and diverse study methods. The main methods of NRT diagnosis are ultrasound (U.S.), X-ray computed tomography (CT), magnetic resonance imaging (MRI), angiography, radiopaque study of stomach, colon and small intestine, fibroesophagogastroduodenoscopy (FEGDS), fibrocolonoscopy (FCC). The final diagnosis of NRT from fat tissue is set after cytology of material derived from the tumor by fine-needle aspiration, or histology of tissue obtained by a special needle puncture (when the tumor is of considerable size, when you can perform a biopsy under ultrasound) [1, 3, 5, 11, 12, 13].

The main method to implement radical or relatively radical treatment and prolong the lives of patients with NRT is a surgical treatment. The most important feature of surgical interventions for NRT is unusual situations in almost all cases. Radical removal of retroperitoneal tumors is associated with the threat of massive and supermassive bleeding (up to 70% of blood volume), damage to vital organs and is one of the most traumatic intervention with a high degree of operational risk [3, 4, 5, 7, 13].

The world is actively seeking new methods of treatment and methods to study the role of additional exposure. There are reports on the promising results of chemoradiotherapy, intraoperative radiation therapy, postoperative brachytherapy with some morphological forms of NRT, but these studies are carried out sporadically or are under investigation [1, 5, 7, 13].

Materials and methods of examination

Patient P., born in 1943, a member of the accident at the Chernobyl nuclear power plant (NPP) (to stay 28.06.-07.14.1986). A history of ischemic heart disease (IHD), urolithiasis (IBC), chronic pyelonephritis, chronic gastritis, gastric polyps, chronic colitis, from 2008 - diabetes insipidus.

Aggravation of the patient is noted from 2009. Was admitted to the hospital 03/12/2009, complaining at expressed general weakness, fatigue, poor appetite, weight loss about 2 kg for the last 6 months, leg pain when walking, aching nature recurrent pain in the upper part of abdomen, feeling heaviness after eating, constipations, occasionally thirst (drank up to 5 liters per day and night), polyuria (about 4-5 liters of urine per day and night).

An objective examination: general condition is satisfactory. Food is fair, Quetelet index is 26. Dermal is of skin color, clean. Peripheral lymph nodes were not enlarged. Pulse is 92 beats/min., regular, of satisfactory properties. The boundaries of the heart: the left to the left mid-clavicular line. Cardiac sounds are of weakened sonorities, rhythmic, systolic murmur is at the apex, the accent of the tone II is on the aorta. Blood pressure (BP) is 140/90 mmHg. Respiratory rate (RR) is 16 per 1 min. In lungs at percussion lung sound is of the boxed shade, vesicular breathing is at auscultation, there is no wheezing. Abdomen is soft, shape is unchanged, moderately painful if palpating in the epigastric region. Liver is at the costal margin, the edge is rounded, painless. There are no peripheral edemas.

Examination data. General blood test: leukocytes - 14.0 $x10^9$ / L; stab neutrophils - 1%; segmented neutrophils - 74%; platelets – $482x10^9$ / L; RBCs - 3.44 $x10^{12}$ / L; hemoglobin in the dynamics - 135-95 g/L, hematocrit - 39.7%, erythrocyte sedimentation rate (ESR) - 52 mm/h. Biochemical analysis of blood: the level of serum iron is decreased (3.95 mmol/L), other parameters are within the normal range. General prostate-specific antigen is within the normal range. General urine analysis: specific gravity - 1014,

protein - 0.099 g/L, other indicators are within the normal range; a growth of microbial flora at bacterial inoculation has not been identified.

Fluorography of the chest: a diffuse pulmonary fibrosis, lung roots are heavier, fibrous, heart is enlarged in diameter, the aorta is enlarged, expanded, extended. Osteochondrosis, spondylosis deformans, phrenicopericardiac spikes.

Ultrasonography of the abdomen: the liver is enlarged by both lobes +1 cm, the structure with the hepatosis signs, intrahepatic ducts are not dilated, the visible part of the common bile duct - 5 mm, portal vein - 15 mm; gallbladder is deformed, uneven wall thickness – up to 6 mm, the cavity polyp - 2 mm and sediment bile, pancreas is visualized fragmented, body - 16 mm, outline is scalloped, the structure is non-uneven due to fibrosis, increased echogenicity of the tissue. Renal ultrasound: of typical location, differentiation between the parenchyma and the renal pelvis complex is saved, parenchyma is of the thickness up to 20 mm, the central complex is expanded, calculus in the left kidney is 5 mm. Ultrasound of spleen, prostate, and thyroid: normal.

FEGDS: atrophy of the gastric mucosa, polypoid hyperplasia of the antral mucosa with unit erosion. X-ray of the esophagus, stomach and duodenal ulcers (DU): chronic atrophic gastritis, polypoid mucosal thickening antrum, reflux esophagitis, duodeno-bulbar reflux. Sigmoidoscopy: no morphological changes. FCC: intestinal polyposis, histopathological conclusion: adenomatous polyp.

Irrigoskopiya: dolichocolon is without disrupting evacuation function. Intravenous urography: Hydronephrosis transformation of both kidneys more to the right, the sharp slowdown in renal excretory function.

Electrocardiography (ECG): sinus rhythm, heart rate - 71 bpm./1 min., diffuse myocardial changes. Echocardiography (echoCG): pericardial effusion, cavities of atrium and right ventricle are enlarged, left ventricular hypertrophy, myocardial contractility is satisfactory.

CT of the brain: the median structure is symmetrical, not shifted, reduced density areas are in periventricular areas, moderately dilated lateral ventricles, additional formations are not revealed.

Diagnosed as diabetes insipidus, stage of medical compensation. Gastroesophageal reflux disease. Chronic gastritis. Chronic acalculous cholecystitis. Polyp of the gallbladder. Chronic pancreatitis. Chronic colitis, polyposis of the colon. Anemia of chronic disease. IBC. Stone of the left kidney. Chronic pyelonephritis, latent nature. Chronic renal failure (CRF) of 0 stage. Hypertensive heart disease of stage II. CHD: diffuse cardio sclerosis. Cardiac failure (CH) of stage I. Atherosclerotic circulatory encephalopathy of I st.

The therapy resulted in the patient's condition improved; he was discharged in a satisfactory condition. Considering that the examination results did not allow explaining the changes in blood tests, it is recommended to continue the examination to exclude malignancy.

During January 2010 CT scan of the abdomen, kidney, bladder with intravenous contrast, it revealed signs of pericarditis, pleuritis, ascites, enlarged lymph nodes in the abdomen, hydronephrosis transformation of both kidneys, seal fat of abdomen. Consulted in the Kyiv City Oncology Hospital, concluded: Ascites, pleural effusion, retroperitoneal fibrosis, colon polyps, the polyp of the stomach. At present convincing evidence for cancer pathology were not found.

Since December 2010 there was noted deterioration of health, increased dyspnea, fatigue, weakness in the legs, dizziness, feeling of heaviness in the heart, stomach bloating. An objective examination: the general condition of moderate severity. Hypotrophy of the muscles of the shoulder girdle and upper limb, Quetelet index - 24. Hyperpigmented skin. Peripheral lymph nodes were not enlarged. Pulse - 74 beats/min., regular, of satisfactory properties. Heart borders: left is 1.5 cm to the left of the left mid-clavicular line. Heart sounds with considerably weakened sonority. Blood

pressure - 150/80 mmHg. BH - 18 per 1 min. In the lungs at percussion - shortening of percussion tone from left, starting from the angle of the scapula, vesicular breathing is at auscultation, significantly weakened on the left over a zone of shortening, fine rales. Stomach is increased due to flatulence and ascites, sensitive. The liver is enlarged up to 8 cm, thick, sensitive to palpation. Edemas of legs and feet.

The general blood test contained leukocytosis, thrombocytosis, mild anemia, increased erythrocyte sedimentation rate, and in the biochemical analysis of blood was an increase of urea level (9.4 mmol/L). LE-cells were not identified. Rheumatoid factor, C-reactive protein, Antistreptolysin-O were negative. Traces of protein were preserved in urinalysis.

During CT of the chest there were revealed signs of stagnation in the pulmonary circulation, pericarditis, left-sided hydrothorax (up to 1.8 liters), calcified retrocaval and para-aortic lymph nodes. Microscopy and cytological study of pleural fluid did not reveal the signs of atypia.

Ultrasound revealed a meager amount of free fluid in the abdomen; in the upper pole of the right kidney was hypo echoic formation of the size – 53x43 mm with rough fuzzy outline and hydrophilic area in the center; fibrosis of the prostate; signs of nodular goiter. FEGDS and FCC data are the former. Echocardiography: the phenomena of exudative pericarditis are stored, identified insufficiency of aortic valve with minimal regurgitation, mitral insufficiency with moderate regurgitation; hollow formation is detected behind the right atrium (possibly encysted pericarditis).

There was conducted CT of the abdomen with intravenous contrast in dynamics: CT signs of polyserositis are persisted (left-side pleurisy, pericarditis), enlarged lymph nodes of the abdomen, retroperitoneal fibrosis, IBC and hydronephrosis of both kidneys, cystic formation is in the right kidney.

The diagnosis defined: Coronary Artery Disease: Diffuse cardio sclerosis. Mitral insufficiency of I st. Labile supraventricular extra systole.

CH of II B st. Pericardial effusion, pleural effusion. Ascites. IBC. Hydronephrosis of both kidneys. Cyst of the right kidney. CRF of I st. Atherosclerotic circulatory encephalopathy of II st. Nodular goiter of I st., Euthyroidism. Retroperitoneal fibrosis. The patient was discharged in a satisfactory condition.

During hospital examination in 2011 the general blood test revealed leukocytosis up to 23.9 $x10^9$ /L; thrombocytosis –up to $516x10^9$ /L; increase in ESR – up to 63 mm/h. Examination of blood: alpha-fetoprotein is negative; total prostate-specific antigen is within the normal range. The biochemical blood analysis showed increased the creatinine levels (119.2 mkmol/L), urea (9.54 mmol/L), reduced levels of albumin (29.8 g/L); normal serum iron levels. Traces of protein are preserved in urinalysis. Sputum microscopy: leukocytes densely cover all fields of view with a reduction up to 20-30 in view of the treatment, Mycobacterium tuberculosis have not been identified, at bacterial inoculation there is the growth of Str.pneumoniae 10^5 of colony forming units (CFU), Str. haemolytisus - 10^6 CFU.

During 2011 there was continued examination of the patient to exclude cancer. During the ultrasound of the abdomen there is revealed a cyst in the gate of the liver with the size of 20 mm; in the abdomen there is remained scant amount of free fluid, in both pleural cavities free liquid was not visualized. Renal ultrasound: stones in both kidneys, cysts of both kidneys, hydronephrosis of right kidney. Echocardiography in dynamics: the phenomenon of exudative pericarditis remained.

By CT data of the chest: the phenomenon of bilateral hydrothorax, pericarditis and stagnation in the pulmonary circulation, increased intrathoratic lymph nodes up to 12 mm and axillary) (Fig. 1); CT of the abdomen, kidney, bladder, retroperitoneal area with capture of pleural cavities (with intravenous contrast): persisted conditions of polyserositis (pericarditis, left-sided hydrothorax with a tendency to encapsulation), IBC, hydronephrosis of right kidney, left kidney cyst, ascites, abdominal and

retroperitoneal mass lesions without clear uniform circuits (due to edema), mesentery is infiltrated, great vessels are involved (Fig. 2, 3); CT mediastinum: mediastinal lymph nodes are increased to 1.5 mm, left-sided hydrothorax; adrenal CT: failed clear differentiation of adrenal due to increased density of mesenteric, retroperitoneal fat with interwoven severe fibrosis, left in the front pararenal space there is defined a small amount of liquid, cyst formations of kidneys. Data of FEGDS and FCC are former.

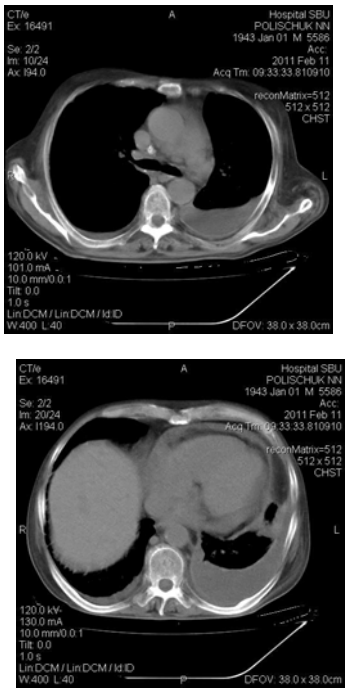

Fig. 1. CT chest of the patient P. Mediastinal limph nodes, bilateral hydrothorax, pericarditis

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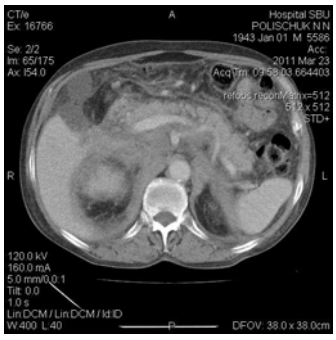

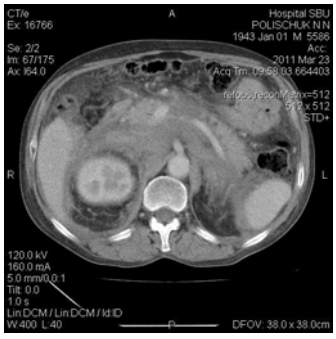

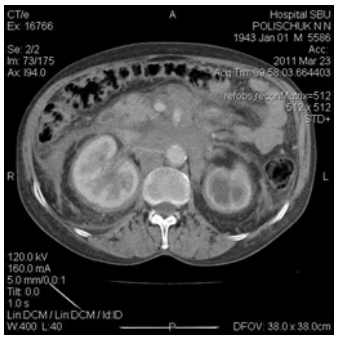
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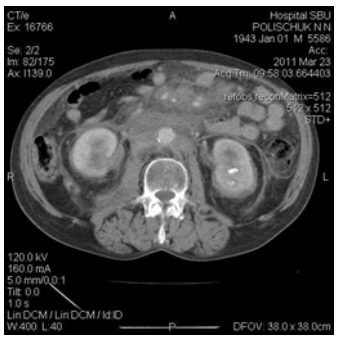
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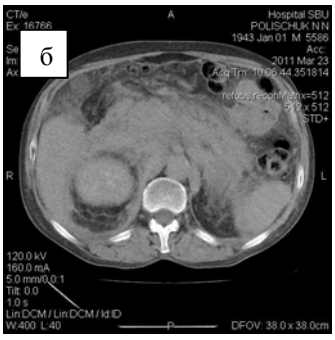
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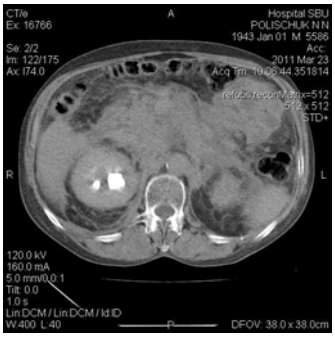
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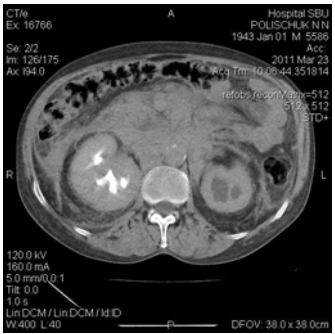
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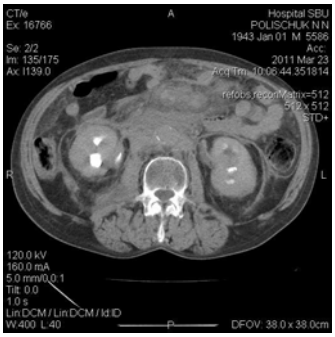


Fig. 2. CT of the abdomen with intravenous contrast patient P. Infiltration of cellulose of front pararenal and perirenal spases with involving great vessels. "Turbid" mesentery. Hydronephrosis of both kidneys. Urolithiasis of the left kidney. Thickened Gerota's fascsia (a – parenhimatosis phase, b – ekskretoris phase)

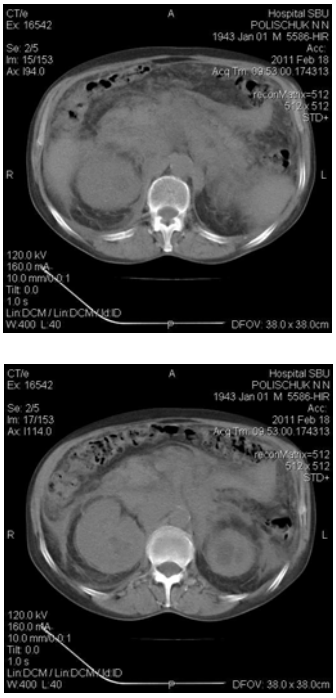


Fig. 3. CT bladder patient P. Expressed infiltration of the paravezikalis cellulose

Patient was consulted at the National Cancer Institute, data from all surveys were presented, conclusion: canceromatosis? of abdominal and

retroperitoneal space, left-sided hydrothorax, hydropericardium, susp. mts liver. There were performed diagnostic pleural puncture, cytological conclusion: red blood cells, lymphocytes, white blood cells, the cells of the mesothelium with pronounced signs of proliferation; ultrasound: pericardial effusion, violation of the structure and function of the right kidney (tumor? Pyelonephritis?). In order to confirm the diagnosis it was recommended to perform blood test for tumor markers (tests have been passed, within the normal range), to repeat CT scan of the chest, abdomen, kidney, pelvic organs with intravenous contrast in 6 months with a re-consultation.

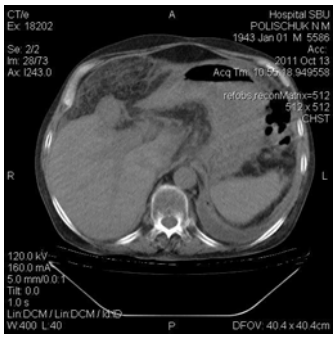
Examined by a hematologist of the Institute of Hematology and Transfusion of NAMS of Ukraine: blood disease was excluded based on results of hematological examinations (myelogramma, examination of bone marrow bioptate derived from iliac by trepanation). Changes in blood are leukemoid reaction on the main pathology.

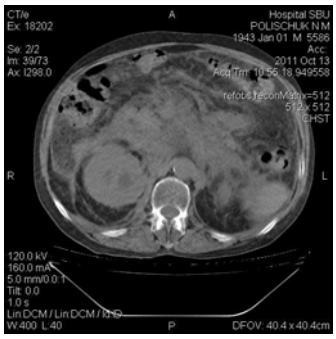
MRI of brain was performed on 29.06.2011: distal part of superior sagittal sinus was extended to 15 mm on the 50 mm distance, moderately extended lateral and straight sinuses, their contours were blurred (changes may be due to dural arteriovenous fistulas); astrogliosis; subtentorial cyst in the projection of cranial parts of the right cerebellar hemisphere (diameter - about 11 mm), a syndrome of "empty" sella turcica.

28/09/2011 patient P. was enrolled in the hospital with complaints of severe pain in the lumbar spine, a condition deteriorated after a fall. There was conducted radiography of the lumbar spine: a compression fracture of L2 vertebral body, the signs of diffuse osteoporosis, spinal spondylosis deformans, osteochondrosis; radiographs of the pelvis: Moderate diffuse osteoporosis of the pelvis and upper third of the femur, the signs of hip osteoarthritis deformans of II st. The diagnosis: Systemic osteoporosis, compression fracture of the L2 vertebral body. The patient was recommended bed rest on the shield, medical treatment held.

During the examination there were preserved leukocytosis, thrombocytosis, increased erythrocyte sedimentation rate, elevated levels of creatinine, urea, protein in urinalysis, Bence-Jones protein in the urine sample was negative three times, the phenomenon of left-sided hydrothorax. Ultrasonography of the abdomen and pelvis: a free liquid was not determined. Irrigoscopy: Irritable colon symptoms, ileocecal valve weakness. Fluoroscopy of the esophagus, stomach and duodenum: signs of subcompensated stenosis of the gastric outlet.

CT of the chest: the left pleural space there is defined a significant amount of liquid content (up to 1.2 L), in the right pleural cavity free liquid is not defined; pulmonary drawing is amplified, distorted; patency of the trachea, bronchi is not affected; paracavially there are determined calcified lymph nodes to 12 mm in diameter, front mediastinal ones - to 6 mm in diameter; in the mediastinum groups of lymph nodes are marked up to 13 mm in diameter in the "aortic window", para-aortic, tracheobronchial; strip of fluid in the pericardial cavity is up to 1 cm. CT of the abdomen: ascites, hepatosis, kidney cysts, IBC, CT density of mesenteric fat throughout is raised to 46-56 Hu units, of severe-looped type, thickened Gerota's fascia on both sides, groups of enlarged lymph nodes are determined in retroperitoneal (Fig. 4).





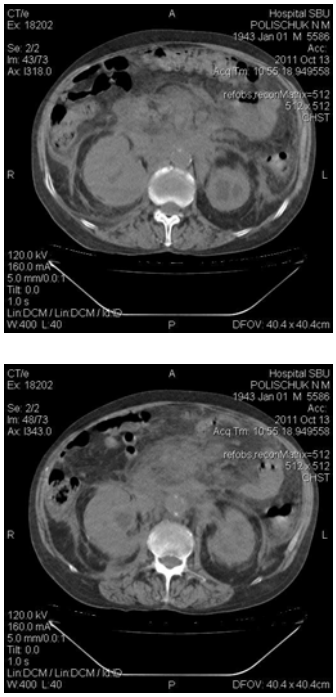


Fig. 4. CT of the abdomen patient P. Infiltration of cellulose of front pararenal and perirenal spaces. "Turbid" mesentery. Ascites. Thickened Gerota's facsia

Thus, based on the performed examinations, the presence of increased intrathoratic and retroperitoneal lymph nodes it was allowed assuming the patient's lymphoma. Considering the technical difficulties of laparoscopic retroperitoneal revision (conglomerate of small sized lymph nodes), the severity of the patient condition due to cardio-respiratory failure, the laparoscopic revision with the overlay of pneumoperitoneum with endotracheal anesthesia possessed a significant risk and minimal technical possibilities of getting retroperitoneal lymph node biopsy. The patient refused of further examination, consultation in the National Cancer Institute. He was discharged with a relative improvement, continued treatment under the supervision of local therapist.

When hospitalized in the Ukrainian State Medical and Social Center of Veterans in March 2012 there was held FEGDS: found out esophageal varicose from the upper third to an outlet, submucosal hemorrhage, micro bleeding, erythematous gastrobulbopathy, was treated, discharged with improvement.

01/10/2012 patient P. was enrolled in the hospital due to worsening health. Complaints, physical examination data and survey data corresponded to a diagnosis: non-hospital right-sided polysegmental pneumonia of the III clinical group. Respiratory insufficiency of the I st. Nonspecific recurrent polyserositis (pleurisy, pericarditis, ascites). CHD: diffuse cardiosclerosis, insufficiency of aortic valve, tricuspid valve of the I st. CH - II AB st. Hypertensionof the II stage. The risk is very high. Diabetes insipidus. Chronic kidney disease of the II st. CRF - IIst.

Despite on the treatment held the condition had been progressively worsened and 05/10/2012 the patient died.

Autopsy revealed a firm formation of light yellow color protruding into the abdominal cavity, without clear boundaries, with sprouting to the root of the mesentery of the small intestine, in both kidneys from the capsule side and the renal pelvis segment (macro medicines are shown in Fig. 5 and 6).

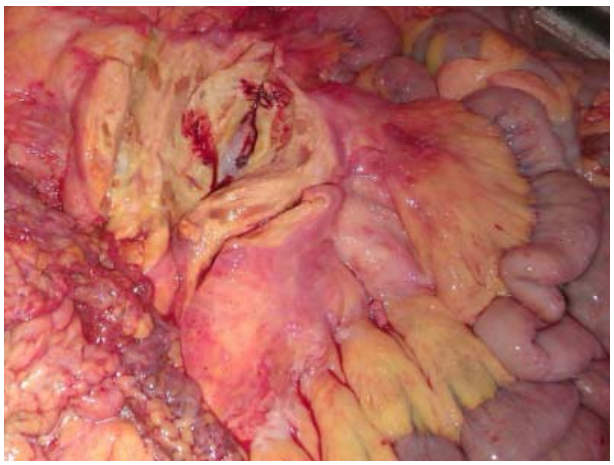


Fig. 5. The root of the mesentery (sectional view) with liposarcoma, enlarged lymph nodes: 1 - liposarcoma, 2 - intestine, 3 – lymph nodes

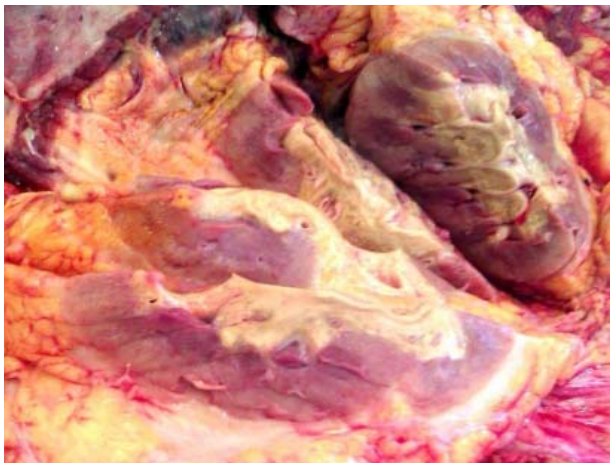


Fig. 6. Sprouting of liposarcoma in the kidney (section view): 1 - an increase of liposarcoma from capsules, 2 - liposarcoma in pyelocaliceal system, 3 - renal parenchyma

With histological examination of retroperitoneal formation there was revealed cells of different size and shape that contained fat with signs of cellular atypia (Fig. 7).

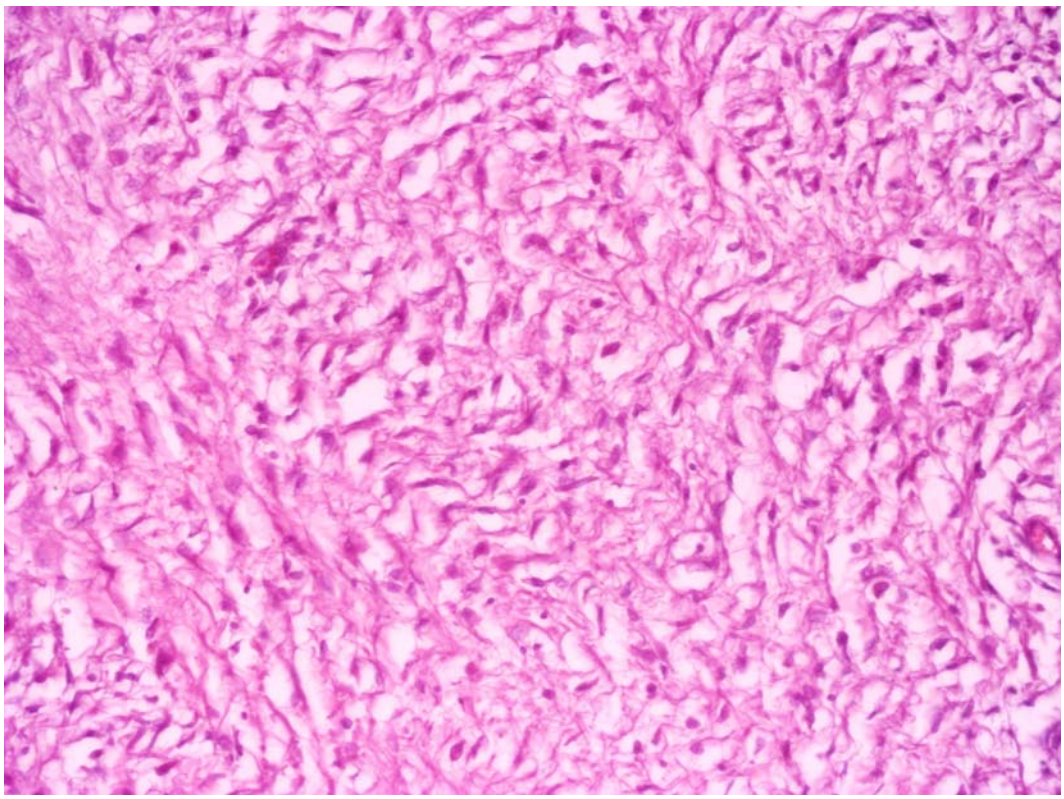


Fig. 7. Retroperitoneal liposarcoma (coloration with hematoxylin-eosin, x200)

With histological examination of tumor tissues in kidneys there were defined nidi of necrosis and inflammatory infiltration in the similar formations.

Mesenteric and paraaortic lymph nodes of the intestine are with hyperplasia, metastatic liposarcoma symptoms were not found.

Hematogenous way is typical way for metastasizing of retroperitoneal tumors: neoplastic cells sprouting to vessels running into the inferior cava vein are sent to the right half of the heart, lungs, and bypassing the pulmonary microvasculature, fall into the bone and brain [14]. There were found metastases in these organs.

There were revealed dense white-yellow tissues in the form of strands without clear boundaries of the growth to 2.8 cm in height, 5.5 cm in length located in the wall of the right atrium (Fig. 8). Histological examination confirmed liposarcoma.

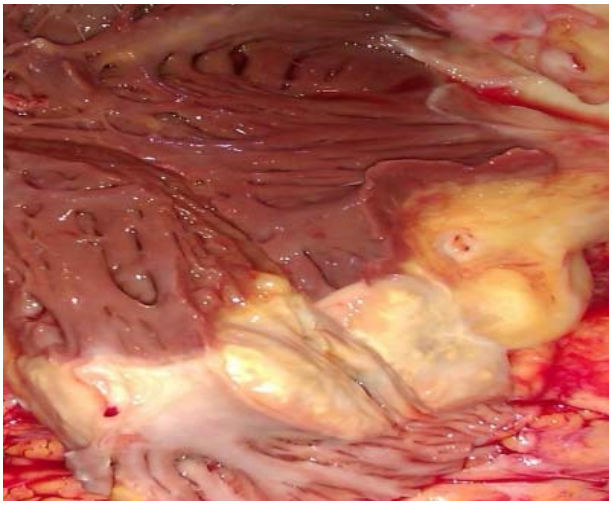


Fig. 8. Metastatic liposarcoma in the wall of the right atrium (a view in cross-section): 1 - liposarcoma, 2 - right ventricle, 3 - right atrium

Under the epicardium of the right atrium there were revealed yellow convoluted formations with the diameter up to 1 mm and 3.5 cm long. Liposarcoma was confirmed by histology (Fig. 9).

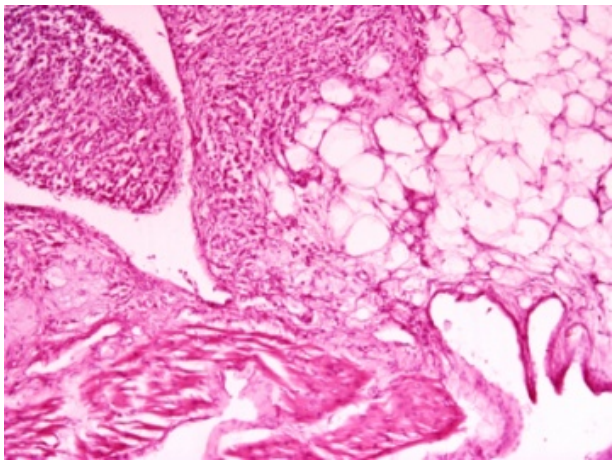


Fig. 9. Metastatic liposarcoma under the epicardium of the right atrium (coloration with hematoxylin-eosin, x100): 1 - liposarcoma, 2 - right atrial myocardium, 3 - cavity of the right atrium

Metastases were not macroscopically detected during examination of lungs, multiple small seals mainly in the lower lobes were defined by

palpation. Histological examination of lungs revealed the presence of liposarcoma metastases around the vessels (Fig. 10).

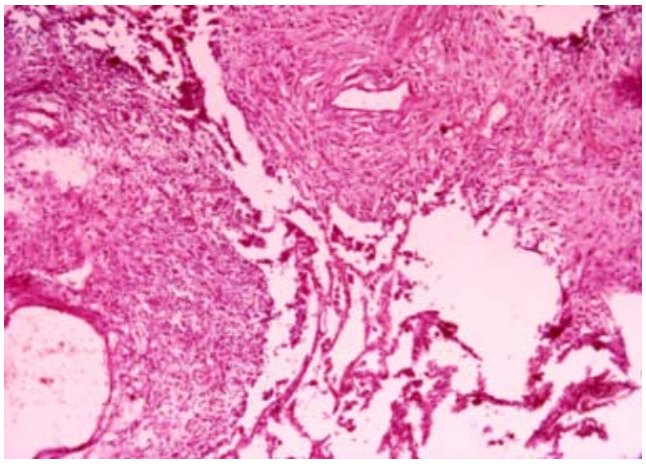


Fig. 10. Liposarcoma metastases in the lungs (coloration with hematoxylin-eosin, x100): 1 - liposarcoma, 2 - alveoli, 3 - vascular lumen

In the center of the posterior fossa there were revealed a light yellow lumpy structure of both hemispheres of the cerebellum (Fig. 11). With histological examination it was revealed a metastatic liposarcoma with areas of necrosis and myxomatosis.

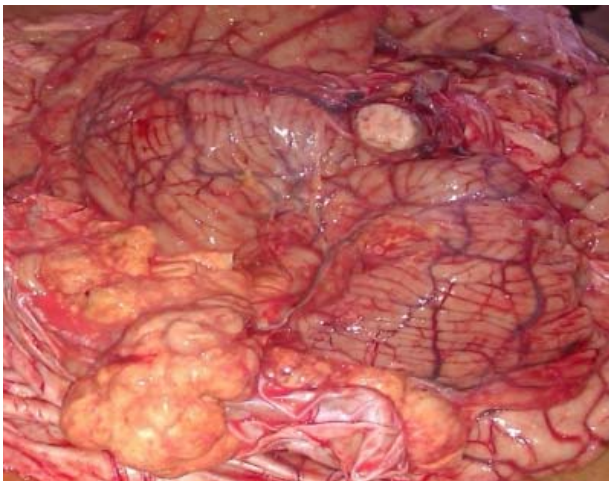


Fig. 11. Liposarcoma metastasis to the brain (external view): 1 - liposarcoma, 2 - depression of liposarcoma in the cerebellar hemispheres, 3 - medulla, 4 - the meninges

It was revealed the signs of cachexia with significant atrophy of the fat tissue of the greater omentum (Fig. 12).

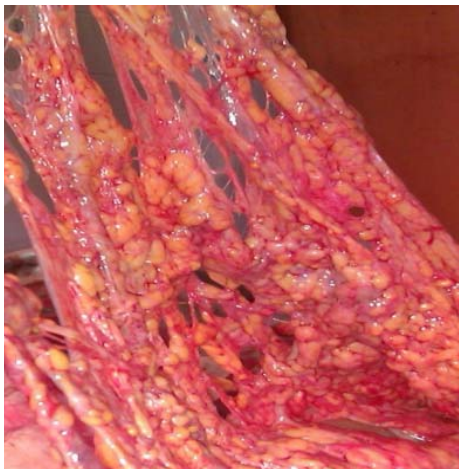


Fig. 12. Greater omentum (macro preparation)

Anatomopathological diagnosis is set:

Main disease. Retroperitoneal liposarcoma with spread to the kidneys, mesentery, with metastases into the right atrium, lungs, bones, brain, with areas of necrosis.

Complications. Cachexia. Anemia. Swelling of the brain. Pulmonary edema. Parenchymatous degeneration of internal organs. Additional deseases. Generalized form of vascular atherosclerosis. Diffuse cardio sclerosis.

Conclusion

Thus, the presented case is interesting in that the patient survey conducted in order to clarify the localization of cancer, did not allow a precise diagnosis. The features of this case are seldom reveal by NRT, the rapid

progression of the disease in this patient, the absence of a specific organ lesion, the technical difficulties of the histological examination, the absence of liver metastases and lymph nodes, multiple distant metastases.

It should be noted that the diagnosis of liposarcoma in retroperitoneal space is a difficult task. At the time of detection of a disease the tumor becomes large, engages not one anatomical area of the retroperitoneal space and is characterized by multicentric growth. The main cause of death in patients with liposarcoma is distant metastasis.

It should also be noted that the patient was a participant in the accident at the Chernobyl nuclear power plant. Analysis of the health effects after the Chernobyl disaster shows that the main causes of death among liquidators of the Chernobyl accident are cancer and death from cardiovascular complications. The coming years are projected to maintain high rates of thyroid cancer, urinary system cancer, increasing incidence of breast cancer and lung cancer; reduction of radiation-induced leukemia with increasing incidence of multiple myeloma and myelodysplastic syndrome [2, 10].

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