Case Report

Ewing's Sarcoma in a 58-Year-Old Man: Oncological Diagnosis in the Time of COVID-19

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Abstract

Ewing's sarcoma is a rare and extremely aggressive neoplasm with a tendency to recur even after radical surgery and a tendency to early metastasis. This cancer is characteristic of the pediatric population because the peak incidence of this type of cancer occurs in patients between 10 and 20 years of age, but about 30% of cases occur in older patients. We present a case of Ewing's sarcoma in a 58-year-old man with a foot tumor manifestation with a history of back and left leg pain. Due to a lung tumor in the chest X-ray, the patient was referred to the Pulmonology Department, however, the diagnosis was postponed for many months, which in the case of an aggressive tumor, such as Ewing's sarcoma, significantly worsened the initially unfavorable prognosis. The COVID-19 pandemic is having a strong impact on the healthcare systems of countries around the world. Reorganizing medical care and focusing on the pandemic has an impact on the diagnosis and treatment of other diseases. In the current situation, we observe an increase in the number of patients presenting at an advanced stage of the disease, which excludes the possibility of radical treatment. Fear of infection causes both patients to avoid diagnosing disease by focusing on acute symptomatic treatment. The discussed case shows the possible impact of the epidemiological situation of the COVID19 pandemic on the diagnosis and treatment of oncology.

Keywords: *Ewing sarcoma, COVID19, Delayed diagnosis, Metastasis, Lung neoplasms*

Introduction

Ewing's sarcoma (ES, Ewing's sarcoma) is a rare and highly malignant tumor composed of small round cells. This tumor belongs to the Ewing's sarcoma family of tumors (ESFT) which, apart from the aforementioned sarcoma, also includes other malignant peripheral neuroectodermal tumors. [1] The incidence of Ewing sarcoma in the United States was 2.93 per million during the period between 1973 and 2004.[2] ES is characterized by a tendency to recur even after radical surgery and a tendency to early metastasis. This cancer is characteristic of the pediatric population because the peak incidence of this type of cancer occurs in patients between 10 and 20 years of age, but about 30% of cases occur in older patients.[3] Treatment of ES is combined and comprehensive. It includes neoadjuvant (pre-operative) chemotherapy, surgery, adjuvant (post-operative) chemotherapy, and sometimes additional radiotherapy. Chemotherapy regimens are based on anthracyclines but other drugs pazopanib, eribulin, and trabectedin are recently under consideration.[4]

Materials and Methods

Due to a lung tumor in the chest X-ray, the patient was referred to the Pulmonology Department. After admission chest CT scan, AP radiograph of the left foot and oblique projections, PET scan, bronchoscopy, transthoracic fine-needle biopsy, and histopathological examination. The patient is offered treatment and the seriousness of the disease is explained.

Case report

A 58-year-old man, heavy smoker (about 140 pack-years history), road worker, without concomitant diseases, was admitted to the Department due to a tumor found on his chest X-ray. About 5 months before admission, in April 2020, weakness, deterioration of exercise tolerance, and back pain occurred. The symptoms were accompanied by pain and swelling of the left foot, which made it impossible to fit the patient's shoes, and pain in the right upper limb. The ambulatory chest X-ray showed a circular opacity in the lower field of the right lung, about 88x70mm with small opacities of the diaphragmatic-costal angle

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on the right **(Figure 1)**.

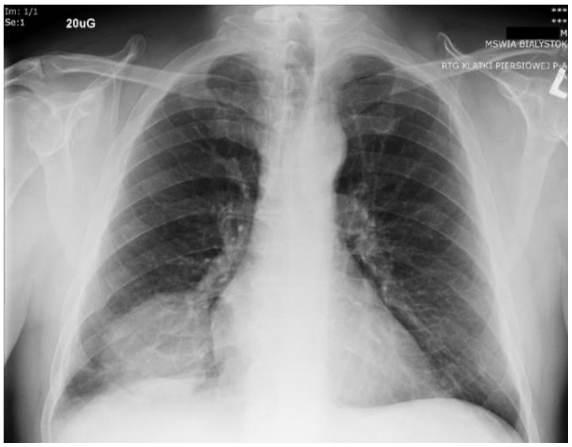
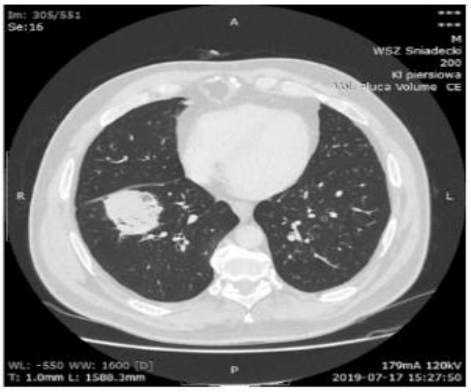


Figure 1. Chest X-ray PA - a circular opacity in the lower field of the right lung, about 88x70mm with small opacities of the diaphragmatic-costal angle on the right.

The patient was then referred to the Pulmonology Department, where a chest CT scan was performed. The chest CT performed in July 2020 confirmed the presence of a 52x64mm tumor within segment 8 **(Figures 2a and 2b)**.

a)



b)

Figure 2. Chest CT with contrast 52x64mm – a tumor within segment 8.

Despite being referred to the Department of Pulmonology, the patient did not come to the hospital due to fear of contact with other patients and the possibility of SARS-CoV-2 infection. The nearest hospital approximately the patient's place of residence was transformed into a COVID19 hospital, and a journey by public transport to a hospital in the main city of the area aroused fear of the risk of COVID19 infection, as referred by the patient. For the reasons mentioned above, the patient delayed his visit to the hospital, but in August, he was concerned about the tumor growing on his foot. Only then, did the patient decide to take advantage of the previously issued referral to the hospital and come to the Department. On admission, the general condition was good; the main symptoms were a pain in the upper right limb. In addition, the patient reported weakness and difficulty fitting shoes due to a growing tumor. He did not report dyspnea or cough. The physical examination revealed diminished vesicular sound in the right subscapular region. Moreover, there was a tumor on the left foot **(Figure 3)**.

Figure 3. Tumor on the left foot

AP radiograph of the left foot and oblique projections revealed lysis of the 2nd and 3rd metatarsal bones and phalanx of the 2nd proximal toe with accompanying soft-tissue edema - an image suggesting a metastatic lesion **(Figures 4a and 4b)**. In the further course of diagnostics, specimens from the tumor were collected. Histopathological examination revealed small round neoplastic cells with features of the formation of rosette structures and a myxoid stroma were visible in the examined material. Cells expressed CD99, panCK, and synaptophysin. The morphological picture and the immunohistochemical profile suggested a sarcoma.

a)

b)

Figure 4. The AP and oblique projections radiograph of the left foot - lysis of the 2nd and 3rd metatarsal bones and phalanx of the 2nd proximal toe with accompanying soft-tissue edema - an image suggesting a metastatic lesion.

The PET scan examination revealed a hypermetabolic tumor 67x77mm with a wide base adjacent to the diaphragm with numerous metastases to the lungs, right hilum, mediastinal lymph nodes, external iliac, and inguinal on the left side. Moreover, numerous bone metastases were found - the largest in the left foot.

Apart from the tumor of the foot, the diagnosis of the lung tumor was also undertaken. Bronchoscopy revealed bronchial constriction of 8, 9, and 10 on the right side due to compression. A transthoracic fine-needle biopsy of the tumor was also performed under CT control **(Figure 5)**. The obtained aspirate revealed small round neoplastic cells, confirming the metastatic origin of the lung tumor. This examination was complicated by an extensive pneumothorax covering all lobes of the lung **(Figure 6)** - after a surgical consultation, the patient was transferred to the Department of Thoracic Surgery, however, after the transfer, the patient refused further treatment and discharged himself at his request, justifying the decision with fear of the possibility of SARS-CoV-2 infection during hospitalization. Unfortunately, the contact with the patient was lost and no further diagnostics or treatment was undertaken.

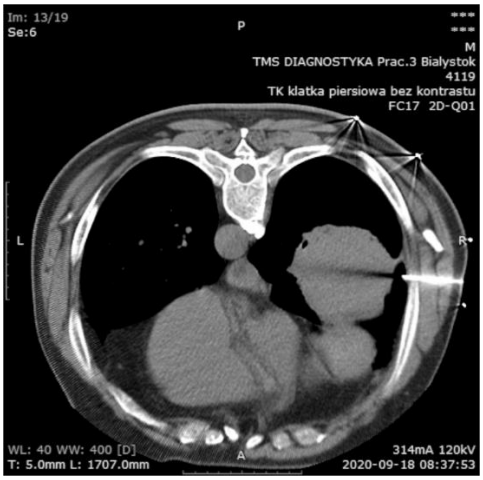


Figure 5. A transthoracic fine-needle biopsy of the tumor under CT control.

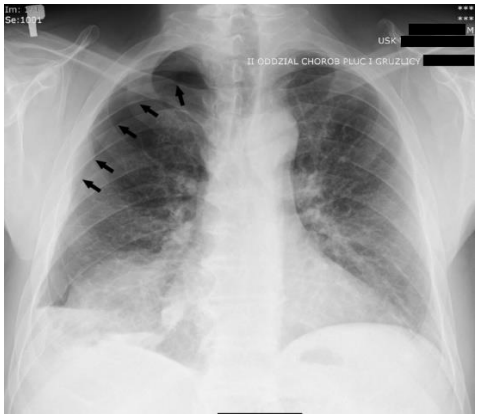


Figure 6. Chest X-ray PA - pneumothorax covering all lobes of the right lung.

Results and Discussion

The case report presents a case of a 58-year-old man with a disseminated Ewing's sarcoma. This neoplasm is characteristic of the childhood population and is rare in adults (3). The most common anatomical sites of Ewing's sarcoma tumors are the pelvis, axial skeleton, and the femur, but it can affect almost any bone or soft tissue. Despite overt metastases being present in only about 25% of patients at diagnosis, it is suspected that subclinical dissemination may affect almost all patients, as 80-90% of patients will relapse after radical local treatment alone.[5] The tumor destroys healthy bone, causing osteolytic defects or infiltration. The weakening of the bone structure may result in a pathological fracture. The presence of distant metastases indicates the spread of the disease and significantly worsens the prognosis.[6] At diagnosis due to massive dissemination, the disease involved the spine, left scapula, upper right humerus, anterior segment of the right 5th rib, both hips, left femur, left tibia, left calcaneus, and right lung (tumor size 67x77mm), also numerous smaller nodules in both lungs and lymph nodes of the right hilum and right inferior paratracheal. The course of the disease and the clinical manifestation of this patient were non-typical. Pain in the upper right limb and back pain of moderate-intensity dominated in clinical presentation, but the reason for referral to the hospital was a lung tumor.

Apart from the unusual manifestation of Ewing's sarcoma in an adult patient, the case presented highlights the potential impact of the current epidemiological situation related to the COVID-19 pandemic on delaying the diagnosis and treatment of oncological diseases. On the one hand, the COVID-19 pandemic may make it difficult to contact a general practitioner or outpatient specialist care, which means that some patients are hospitalized only after severe symptoms, such as hemoptysis or with a visible tumor appear.[7] Furthermore rare cancers needs specialized care and early access to expertise, the research have shown that referral networks such as in France can improve the management and survival of patients.[8] Delay in diagnosis may arise at the expense of immediate causative treatment. On the other hand, an aspect that is often forgotten is the patients' fear of having to contact the health service, which may be even greater in the

current situation. The presented case may indicate the impact of the pandemic lasting several months on delaying the diagnosis of cancer, and thus worse treatment outcomes and increased mortality. Due to the relatively new situation, there are no studies objectively assessing the scale of the problem. Currently, many public health authorities recommend postponement of most cancer screening procedures (e.g. screening mammography and colonoscopy) be recommended to conserve healthcare system resources and reduce patient exposure to healthcare facilities unless clinically significant cancer is suspected. Such action, in the long run, may, however, translate into an increase in the diagnosis of advanced cancers, which reduces the therapeutic options that can be applied.[9] The number of performed endoscopies during the pandemic done in April 2020, was 90% fewer than the number done in each of the first three months of 2020.[10] After the lockdown, in June 2020 the diagnostic services had restarted, however, the capacity was reduced.[11] It is also worth noting that overwork, insomnia and anxiety of healthcare workers in the time of pandemic can also affect the quality of healthcare.[12]

Maringe *et al*. in their work estimated the impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis. The study analyzed data regarding breast cancer, colorectal cancer, and lung cancer and compared it with pre-pandemic figures. The study predicts possible substantial increases in the number of avoidable cancer deaths in England expected because of diagnostic delays due to the COVID-19 pandemic in the UK. According to the authors, across the four major tumor types (breast, colorectal, lung, and esophageal) 3291 to 3621 avoidable deaths and an additional 59 204 to 63 229 years of life lost (YYLs) will occur as a result of a delay in cancer diagnosis alone as a result of COVID-19 lockdown in the UK.[13]

These conclusions can also be extrapolated to other fields of medicine, however, due to the relatively new situation; there is a lack of thorough research and scientific studies allowing to accurately assessing the scale of the problem.

Conclusion

Treatment outcomes for lung cancer, as well as for other cancers, are strongly related to the efficiency of the healthcare organization. For this purpose, solutions are introduced that minimize the time between the start of diagnosis and confirmation of cancer and the implementation of appropriate treatment. Unfortunately, in the current situation, postponing diagnostics due to the COVID-19 pandemic may delay diagnosis, causing, and patients to lose the possibility of radical treatment or worse treatment outcomes due to disease progression. In this kind of situation, both physicians and patients should remain vigilant in the event of symptoms that may indicate the presence of cancer. Fear of SARS-CoV-2 infection cannot justify in any way the doctor delaying the performance of diagnostic tests, as well as avoiding the patient’s contact with the health service, as the consequences of delayed diagnosis may deprive the patient of the possibility of applying the most favorable treatment.

Acknowledgments

None.

Conflict of interest

None.

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None.

Ethics statement

Written informed consent has been obtained.

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