







CASE REPORT

Tuberculosis mimicking Rhabdomyosarcoma Metastasis in a pediatric patient

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Abstract

In childhood sarcomas, the lung is one of the most common organs where metastasis occurs. Immunosuppression caused by antineoplastic treatments for primary cancer may facilitate the reactivation of latent tuberculosis (TB) infection, which can mimic cancer metastasis. The thought of lung metastasis is an important entity that changes the follow-up and treatment approach. Evaluating TB in initial differential diagnosis can prevent unjustifiable chemoradiotherapy and surgery. In this case report, we submit a 2-years-old boy under follow up of alveolar type rhabdomyosarcoma in masseter muscle also received chemoradiotherapy with a pre-diagnosis of lung metastasis patient who underwent surgical resection when the treatment didn't produce any benefit and all of the 34 excised nodules from the right lung were reported as "granulomatous inflammation suggestive of TB."

Keywords: Chemotherapy, Pulmonary Metastasectomy, Tuberculosis

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INTRODUCTION

Rhabdomyosarcoma is the most widespread soft tissue sarcoma and the fourth most common solid tumor in childhood (1,2). The survival was noticed 64,5% in the Yang's report (3). Treatment is often a multimodal approach, including surgery, chemotherapy, and radiotherapy (2). Metastasis is seen in 16% of the patients, and almost one-third of them occurs in the lung (1).

In children, intrathoracic tuberculosis manifests as a primary Ghon focus, Ranke complex, lymph node disease, pleural and pericardial involvement, miliary disease, and adult-type disease forms. Multiple primary foci and diffuse parenchymal involvement are uncommon (4). Because these rare conditions may incline the clinicians to the unneeded chemotherapy and surgery with the indications mimicking malignancy metastasis, TB should be considered in the differential diagnosis (5).

In light of the literature, we present an atypical case in terms of TB and primarily considered lung metastasis in an asymptomatic patient with peripheral and widespread nodules (6).

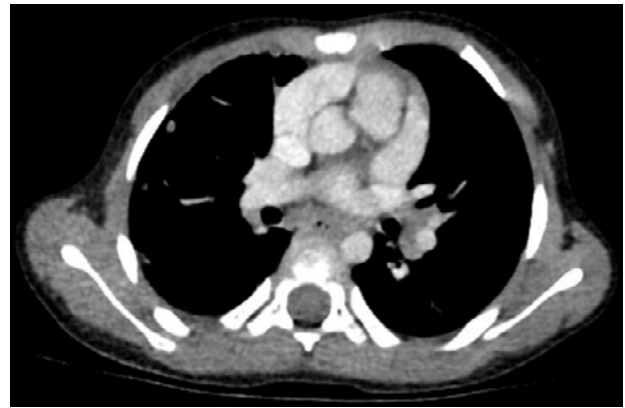
CASE REPORT

A 2-year-old boy was diagnosed with "alveolar type rhabdomyosarcoma" after an incisional biopsy of the masseter muscle was performed at the hospital. He received treatment for a sudden swelling in the cheek. After the diagnosis, the mass was totally excised, and 11 cures of chemotherapy and radiotherapy were implemented. On follow-up after completing multimodal treatment, which took about one year, thorax computed tomography (CT) showed bilateral, multiple, sub-centimetric, and subsolid nodules (Figure 1,2). When the unresponsiveness occurred to 4-week antibiotherapy for the nodules that were evaluated as pneumonia, long-term medication for fungal infection was handled. Under this treatment, nodules progressed, and the patient's condition deteriorated. The pediatric oncology council referred the patient with the pre-diagnosis of "lung metastasis of rhabdomyosarcoma" for pulmonary metastasectomy because the primary tumor was under control, and there were no other suspicious factors foci for metastasis in the body scan.

Figure 1. Lung nodules in mediastinum sections on thorax CT



Figure 2. Lung nodules in parenchyma sections on thorax CT



Following a preoperative evaluation, a muscle-sparing mini-thoracotomy in the lateral decubitus position was performed under general anesthesia. Following the surgical principles, 22 nodules from the lower lobe, eight from the middle lobe, and four from the upper lobe (34 in total) were found and excised with precision cautery excision (Perelman Technique). The intraoperative frozen examination was not implemented for nodules, for why returning for any nodule with a subsolid character as benign couldn't exclude the possibility of malignancy of the others. The operation was brought to completion when any additional nodules were detected after the palpation of the other surgeon. The patient was discharged following lung expansion without any complication on the postoperative 3rd day. During the postoperative pathology examination, all excised nodules were diagnosed with "Necrotizing granulomatous inflammation suggesting TB," and no malignant cells were found (Figure 3,4,5).

No specific microorganisms and bacilli were observed in the tissues stained with EZN and PAS. Thus, the patient was referred to the tuberculosis clinic with the reversal of left lung exploration for multiple nodules. In retrograde interrogation, the sputum ATB was negative, and the patient didn't have any history of contiguity with anyone diagnosed with tuberculosis. With the diagnosis of bacillus negative TB, he was given 150 mg isoniazid, 200 mg rifampin, and 500 mg pyrazinamide for two months under the supervision of healthcare professionals, followed by four months of isoniazid and rifampin maintenance therapy. At the end of the TB chemotherapy, the TB specialists requested a repetition of surgical intervention because of the progression of the nodules in actual CT. Still, we proffered follow-up for a while with the thought of the late radiological response. Six months after the end of the therapy, radiological response occurred as supposed, and the nodules dissolved completely. In the one-year follow-up, the patient is in complete remission and gained 12% of the weight.

Figure 3. H&E, X40. Assemblages of granulomas organized as nodular structures in the lung parenchyma

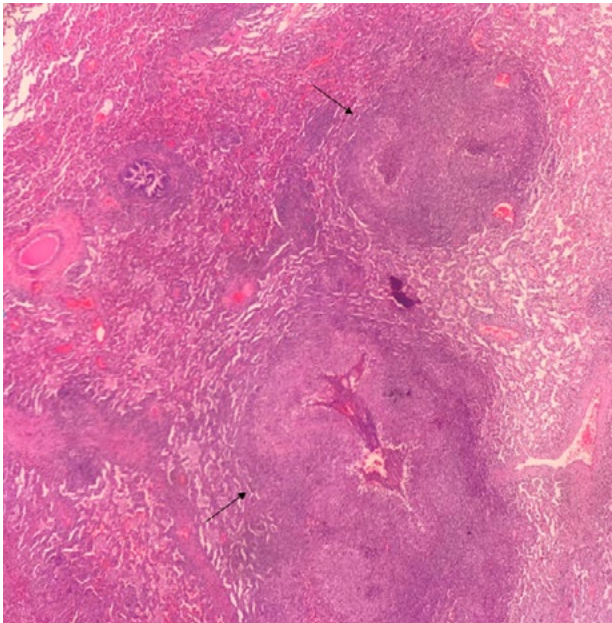


Figure 4.H&E, X200. Granuloma structure consisting of epithelioid histiocytes and lymphocytes

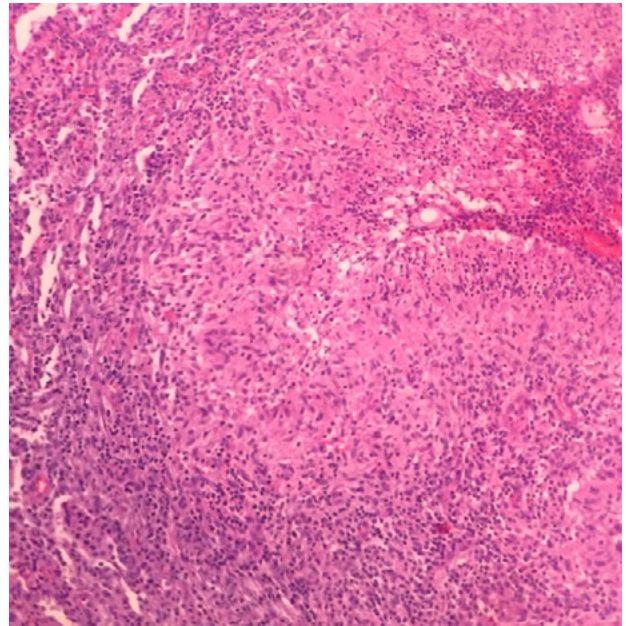
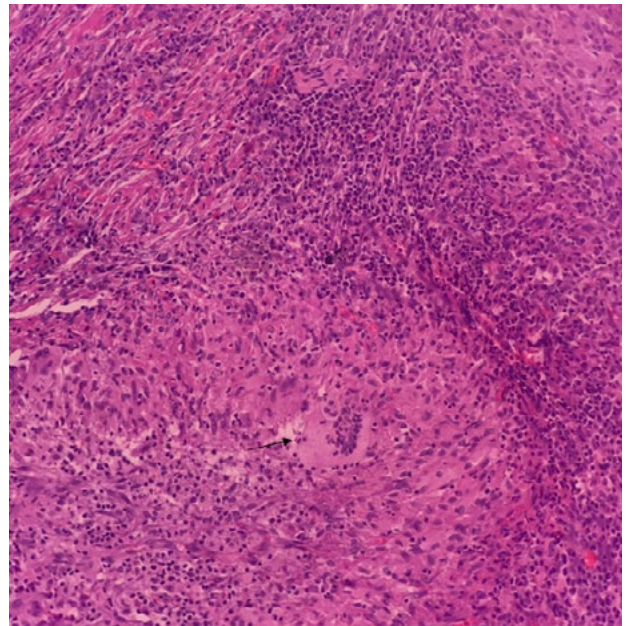


Figure 5.H&E, X200. Multinuclear giant cell in granuloma structure



DISCUSSION

In pediatric solid tumors, surgery has a substantial role in both diagnosis and multimodal treatment of lung metastasis. Pulmonary metastasectomy contributes to survival if the primary tumor is under control and there is no organ metastasis (7). There isn't any contraindication even if there are umpteen metastases and the patient is in childhood. Primary tumor type, complete resection of metastatic nodules, and disease-free survival rate are good prognostic indicators (8). In our case, surgery was performed for both diagnosis and cure for parenchymal nodules detected in the follow up after chemotherapy and primarily assessed as metastasis

TB can occur either attending to the malignancy or due to the immunosuppression resulting from antineoplastic therapy (5, 9). Patients initially taken chemotherapy and then diagnosed with TB with the lymph node biopsy following the regression of their condition are noticed in the literature. Because there is no TB-specific imaging modality, microbiological and histopathological examinations can be used to diagnose TB (5). In our case, preoperative research on TB wasn't performed because there was no typical imaging evidence as lymph nodes with a pathological increase in size, primary Ghon focus, or cavitation.

The incidence of TB in children with malignancy is 22 times higher than in the normal population. In Stefan's study, 47% of active TB infection in malignancy patients occurred in the first five months of chemotherapy and was more common in boys aged 0-4 years. Fifty-seven children were included in the study, and while there wasn't any case that evolved after rhabdomyosarcoma, mainly TB infection was detected in the children with hematological malignancies (10). Even if our case parallels this study in terms of age group, dissimilarities were the primary malignancy (rhabdomyosarcoma) and time to arise (1 year) in our case.

Dobler's meta-analysis, including Stefan's study, also noticed that the most often diagnosis of TB was defined in hematological or solid malignancies in children. According to this meta-analysis, the most increased risk of TB was at the time of diagnosis, and with time, it reduced with the strict follow-up. Nevertheless, whether tuberculosis causes cancer or cancer tuberculosis dilemma

has not been resolved (9). Besides, TB mortality occurring after antineoplastic therapy was defined as higher in an old study, and additionally, they submitted that mortality directly due to TB was 17% (11).

TB screening, anamnesis, and physical examination, tuberculin skin test in the initial evaluation and on the 6th month of the malignancy treatment, a repeated tuberculin skin test with clinical and radiological assessment are suggested to decrease the risk of TB in the children with malignancy (7,9). In the meta-analysis of Dobler mentioned earlier, latent TB infection screening is also proffered for hematologic and solid malignancies with the ultimate risk of TB. Protective isoniazid therapy is being carried out for the patient, tuberculin skin test and interferon-gamma releasing assay positive depending to the TB Diagnosis and Treatment Guidelines in our country (12).

Children in Stefan's sample received an average of 5,6 months of tuberculosis treatment (10). In Cruz's study, five of 6 children infected with TB after bone marrow transplantation due to malignancy received a nine-month anti-TB therapy containing isoniazid, rifampin, ethambutol, and pyrazinamide Cruz's study (13). However, there is a lack of consensus about the anti-TB treatment in the literature, and the patient-based approach takes attention. We provide treatment to our patient for six months depending on the TB Guide in our country, and the patient has taken to follow up.

In conclusion, the surgical approach to the pulmonary metastasis of sarcomas in childhood significantly benefits survival. Yet, infectious diseases have to be kept in mind while assessing new findings on follow-up for these patients. Misdiagnosis based on delayed radiological response and sole oncological perspective may result in unnecessary medical treatment, chemotherapy, and surgical intervention. With patience, these patients should be considered in a multidisciplinary approach and follow-up response to the treatment.

Declarations

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Ethical Committee approval was not required. Informed consent was obtained from all participants.

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