

A Case Report of HIV-Related Bilateral Inflammatory Myofibroblastic Tumors of Adrenal Gland

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Short Report

Keywords: HIV, IMT, HAART, adrenal gland.

Posted Date: October 5th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-942058/v1>

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Abstract

Inflammatory myofibroblastic tumor (IMT) is a rare disease which mostly occurs at younger age and locates in lung in general population. We report a rare case of 44-year-old man diagnosed adrenal IMT with HIV infection, who refused regular highly active antiretroviral therapy (HAART) 13 years ago until in hospital because of findings of adrenal masses. The patient underwent CT-guided needle biopsy successfully, and the pathological analysis documented the diagnosis of IMT by the feature of proliferation of fibroblastic-myofibroblastic with inflammatory infiltration. We failed to perform tumor complete resection due to diffuse invasion of tumor under laparoscope. The patient was complicated with severely multiple pulmonary infection post to surgery because of immunodeficiency, that eventually caused the death of patient 2 months later. This case reminds us that IMTs may be too aggressive and progressed in HIV-positive patients with irregular HAART to perform surgical resections, and severe immunodeficiency can be more fatal. To our knowledge, this case is the second IMT patient with HIV infection worldwide, but the first case occurs at adrenal gland rather than lung in adult.

Introduction

Inflammatory myofibroblastic tumor (IMT) which originates from mesenchymal tissue is a very rare disease worldwide. IMT mostly occurs at younger age and locates in lung in general population, while other rare sites are gradually reported in recent years such as liver, pancreas, pharynx, spinal canal, retroperitoneal space and so on [1, 2, 3, 4]. Nowadays we are used to thinking of IMT as a low-grade malignant tumor with pathological feature of proliferation of fibroblastic-myofibroblastic cells with inflammatory infiltration and a potential of local recurrence but a lower risk of distant metastases [5].

Human immunodeficiency virus (HIV) attacks body's dendritic cells and macrophages, causing deficits in T-cell function, and leading to the occurrence of acquired immune deficiency syndrome (AIDS)-defining cancers such as Kaposi's sarcoma, non-Hodgkin lymphoma [NHL], and invasive cervical carcinoma [6]. While an increased incidence of non-AIDS-defining cancers is gradually noted along with improved life expectancy because of the advent of highly active antiretroviral therapy (HAART) worldwide [7]. IMT is one kind of non-AIDS-defining cancers reported only one case in Romania which located in lung and occurred at younger age [8]. We present a rare case of HIV-related IMT which is the second case in the world, but the first case occurs at adrenal gland rather than lung at middle age.

Case Report

A 44-year-old man presented with a 3-week history of a persistently dull back pain. The patient refused to accept highly active antiretroviral therapy (HAART) post to the diagnosis of HIV infection 13 years ago. On physical examination, the tapping pain at costal-spinal angle was present. The extremely decreased CD4⁺ T-lymphocyte cell count (6 cells/ μ L) and really increased HIV load (10001391 copies/mL) represented collapsed immunal system, however laboratory examination showed no evidence of opportunistic infection such as Cytomegalovirus, Epstein-Barr virus, fungus, and tubercle bacilli.

Functional adrenal analysis was found to be within normal range. Abdominal unenhanced computed tomographic (CT) scan showed two hypodense and heterogeneous solid lesions adjacent to bilateral adrenal gland subsequently, and the lesion adjacent to left adrenal gland measured approximately 67mm by 38mm in size versus 56mm by 58mm of the lesion adjacent to right adrenal gland (Fig. 1A). Meanwhile enhanced CT showed moderate and heterogeneous enhancement (Fig. 1B), following enlargement of lymph nodes in retroperitoneal space, and accompanied by an inability to recognize normally anatomical structures of adrenal gland because of tumor oppression (Fig. 2A-B). We firstly considered the diagnosis of lymphoma in light of image features and severe immunodeficiency caused by HIV, subsequently a CT-guided biopsy of the lesion adjacent to right adrenal gland was proceed.

The pathological analysis of biopsy specimen documented the diagnosis of IMT. The specimen measured 4/8/12 mm in size, 1mm in diameter, with a gray-white surface grossly. Histological findings revealed a proliferation of spindle cells without obvious atypia and small vessels in myxoid and collagenous background with an infiltration of plasma cells, lymphocytes and neutrophils. Collagenous sclerosis and myxoid degeneration were seen in partial area. The spindle cells didn't exhibit nuclear pleomorphism (Fig. 4A-B). Immunohistochemical staining confirmed that these spindle cells were diffusely and strongly positive for Vimentin (Fig. 4C), while focally and weakly positive for smooth muscle actin (SMA) (Fig. 4D). Anaplastic lymphoma kinase 1 (ALK1) and S-100 protein were negative (Fig. 4E-F). IgG4, CD34 and CD38 immunostain demonstrated focally positive as well.

We used emtricitabine, tenofovir, and dolutegravir to control HIV infection. After the HAART duration of 1 month, CD4⁺ T-lymphocyte cell count increased to 33 cells/ μ L, however patient's symptom of back pain became progressively worse. Acknowledging the uncertain efficacy and adverse effects of chemotherapy, steroid therapy and radiotherapy when referred to HIV infection, we selected tumor resection of bilateral lesions under laparoscope by step. Unexpectedly we failed to make it due to undefined margins and extensive invasion of the tumor found in operation. During postoperative course the patient was complicated with multiple pulmonary infections (Fig. 4), leading to the impossibility of adjuvant therapy. The patient died of multiple organ dysfunction syndrome caused by pulmonary infection two months later ultimately.

Discussion

The most common site of IMT is lung according to former studies, while adrenal gland is unusual anatomical location [9]. The patient merely presented with back pain accompanied by no other manifestations such as fever, palpable mass, and emaciation. In addition, CT showed bilateral masses with no specifically enhanced images. Above all, the patient had a 13-year history of HIV-infection with no treatments, leading to collapsed immune system. In light of the above aspects, AIDS-defining cancers were given priority in differential diagnosis such as lymphoma and Kaposi's sarcoma. CT-guided biopsy of the lesion was necessary to make a diagnosis.

Pathological analysis documented a proliferation of spindle cells and an infiltration of plasma cells, lymphocytes and neutrophils in accordance with features reported in former studies [10, 11]. Immunohistochemical study showed that ALK1 was negative, representing less aggressive pathology and less likely to recur [12]. A study involved 84 cases suggested a 25% increasement of recurrence rate for ALK1-positive IMT specimens versus those of ALK1 negative [13]. However intraoperative findings showed more aggressive pathological features in our case, which was in inconsistent with the predictive effect of ALK. This contradiction might be caused by HIV infection.

Completely surgical resection is the main treatment for most IMTs, and mass biopsy should be recommended to avoid organ resection for certain patients, when it is difficult to differentiate from primary organ malignancy. A retrospective study including 22 IMTs of urinary system documented good outcomes with no recurrence or metastases in a median follow-up duration of 6.1 years, who were treated with completely mass resection or radical organ resection[14]. If incomplete resection occurs, adjuvant therapy including steroid therapy, antibiotics, radiotherapy, chemotherapy or carbon dioxide laser should be attempted. Recent study showed that ALK inhibitors appeared to be beneficial to IMT as adjuvant therapy, which had been approved efficacy for ALK-positive non-small cell lung cancer [15]. In a multicenter prospective study, 12 patients of IMTs achieved an objective response of 50%, who accepted adjuvant therapy of ALK inhibitor (crizotinib), and ALK inhibitor regarded as a kind of targeted therapy seemed to be quite effective in treating IMTs with incomplete resection [16]. We did not succeed in mass resection because of undefined margine and extensive invasion of the tumor in this case, that might be caused by immunodeficiency. We did not recommend any adjuvant therapies as well, because the patient was complicated with uncontrolled pulmonary infection that might be caused by endotracheal intubation in operation.

IMT was used to considering as benign tumor since it was firstly reported in lung in 1939 [17]. Most of IMTs had good outcomes according to the former studies, that relied on many factors such as demographics, comorbidities, oncologic features, expression of ALK, and degree of surgical completion[4, 14]. Nowadays, pathologists demonstrate IMT's aggressive features of pathology in certain cases, suggesting its malignant potential [18, 19]. Nevertheless, the outcome of IMT is uncertain when it comes to HIV infection due to rare case reports of HIV-related IMTs. As far as we know, only 1 case had previously been reported in Romania, who didn't undergo surgical resection but received broad-spectrum antibiotics, antiviral and antifungal treatment, and the case had good evolution without any recurrence during 3-year follow-up. In our case, the patient finally died of AIDS complications post to unsuccessful surgery withthin 2 months, that made it impossible to try adjuvant therapies and track the natural course of tumor.

Our case and Romania case were featured by collapsed immunity caused by HIV. It is reasonable to speculate that there may be a possible correlation between HIV and IMT. More studies of HIV-related IMTs are necessary to confirm that it is accidental or not.

Conclusions

The case reminds us that IMTs may be too aggressive and progressed in HIV-positive patients with irregular HAART to perform surgical resections, and severe immunodeficiency can be more fatal. Whether surgical resection is appropriate for HIV-related IMT is unclear, and more studies are necessary to draw meaningful conclusions. The correlation between HIV and IMT needs to be investigated in more cases.

Declarations

Acknowledgments

We would like to thank our collaborators in pathology and radiology department for their great efforts to the study.

Authors' contributions

Mengmeng Zhang contributed research design, data collection, and manuscript writing/ editing. Yanyan zhang contributed image analysis. Yu Zhang and Xiaopeng Hu revised the manuscript. Hui Liu was responsible for pathological analysis.

Funding

No funding was received for this study

Ethics approval and consent to participate

The research was reviewed and approved by the Ethics Committee of Beijing Youan Hospital Capital Medical University. The Ethics Committee archive number is LL-2019-176-K, and the approval number is [2020]035.

All the participants provided informed consent.

Consent for publication

Written informed consent for publication was obtained from all participants.

Availability of data and material

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests

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Figures

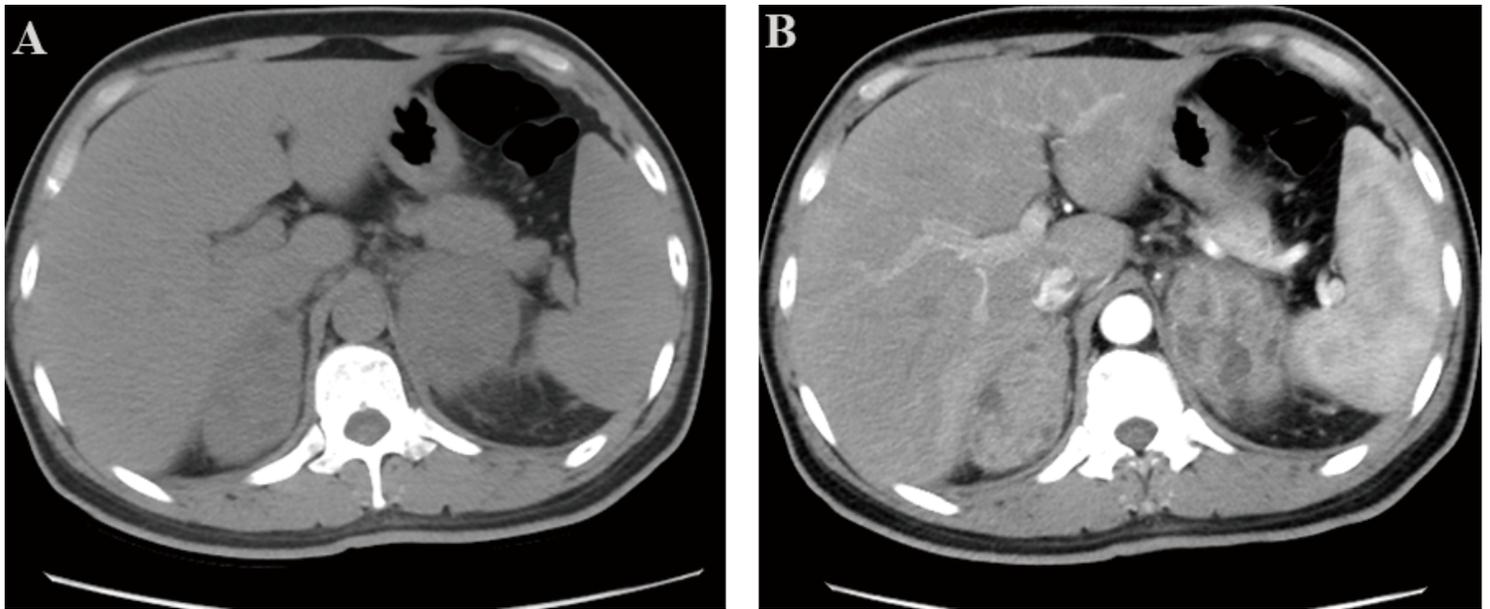


Figure 1

(A) Unenhanced CT showed hypodense and heterogeneous solid lesions adjacent to bilateral adrenal gland. (B) Enhanced CT showed moderate and heterogeneous enhancement of masses.

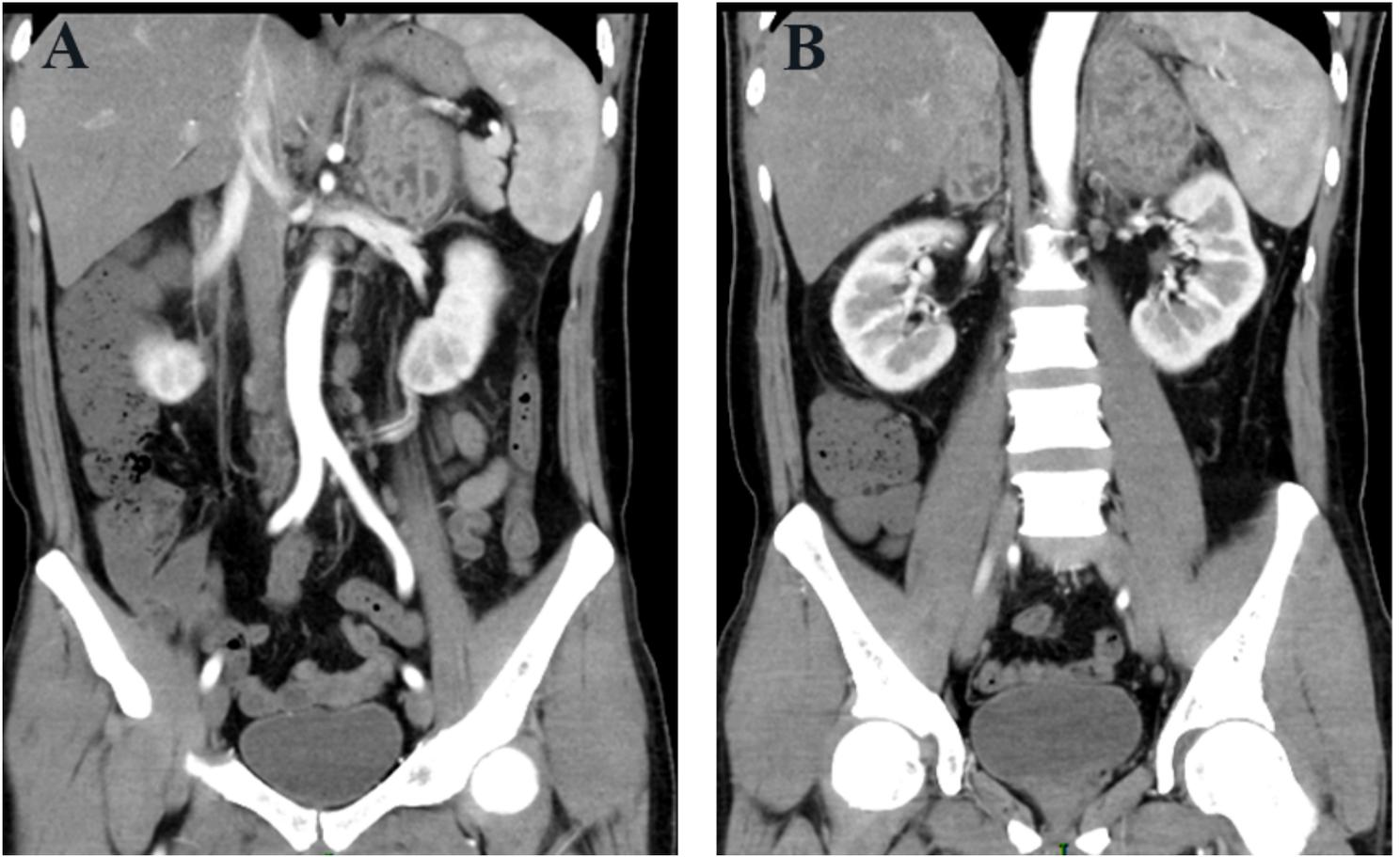


Figure 2

Coronal view of enhanced CT findings (A) Enlargement of lymph nodes around the aorta. (B) An inability to recognize normally anatomical structures of adrenal because of tumor oppression.

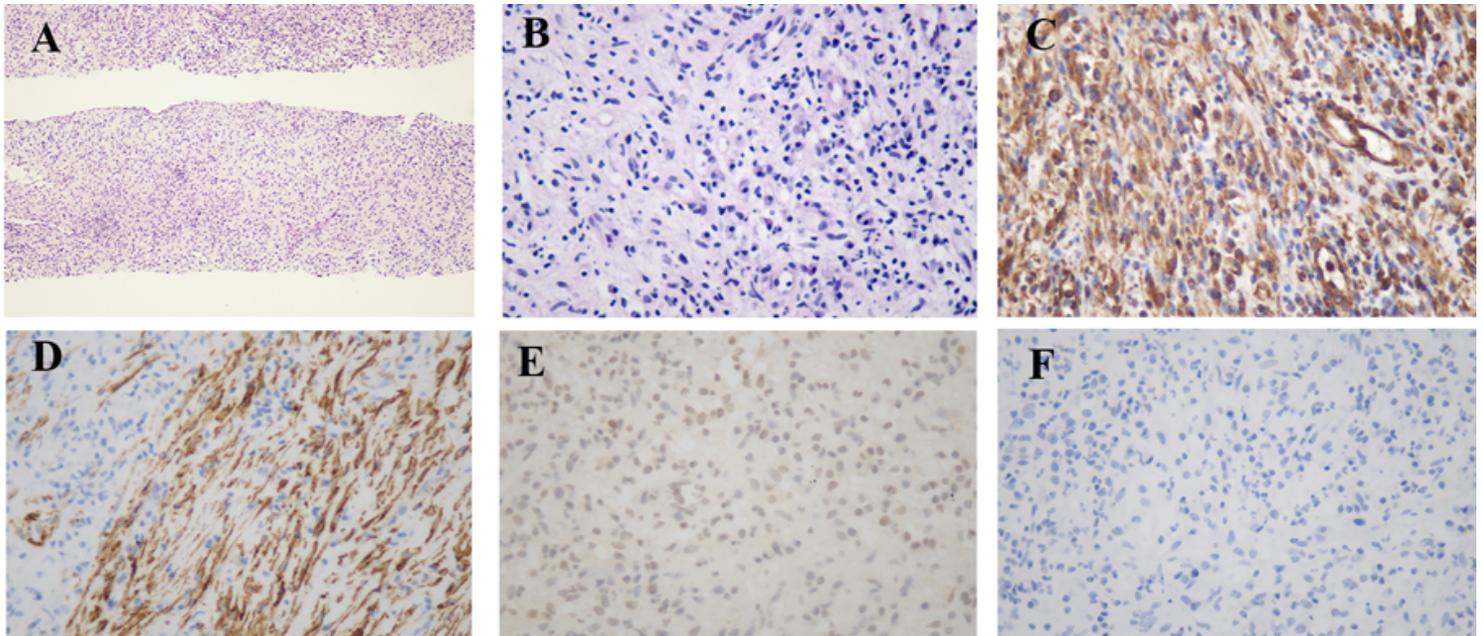


Figure 3

Histological and immunohistochemical findings. (A) HE×100. (B) HE×400. (C) Diffusely and strongly positive for Vimentin. (D) Focally and weakly positive for SMA. (E) Negative for ALK1. (F) Negative for S100.

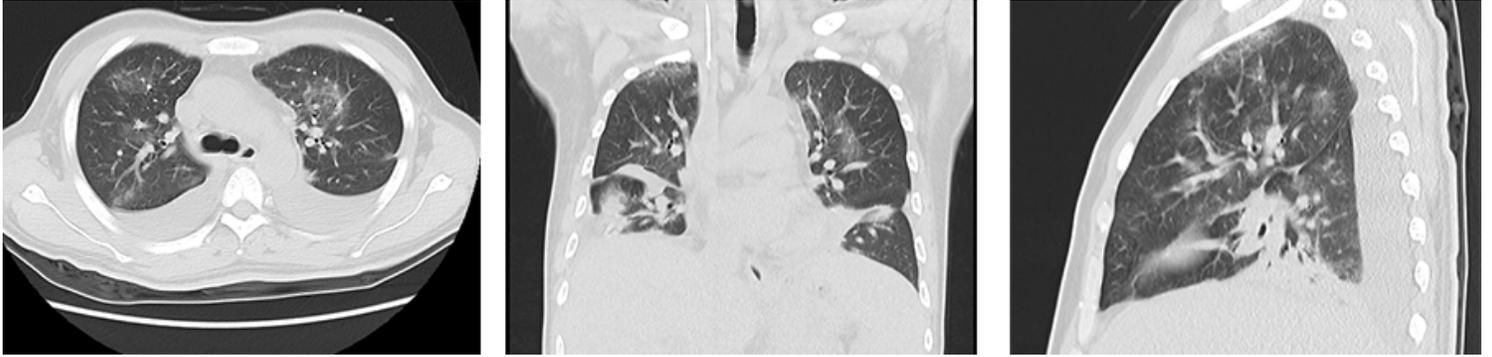


Figure 4

Pulmonary CT showed extensive inflammatory lesions of bilateral lungs