中文題目：白血病相關肺浸潤相似於新冠肺炎臨床表現

英文題目：Leukemic pneumonitis mimicking COVID-19 pneumonia

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Introduction:

Acute myeloid leukemia (AML), a malignantly hematologic disorder characterized by blockage of transformation of myeloid lineage hematopoietic cells, has aroused huge concerns by exploiting the property of diverse manifestations. Of note, pulmonary complication of leukemia, developed upward to 80% of patient with leukemia, often perplexes the clinicians with its various differential diagnosis and lacking specificity of radiologic image, in turn, make the interpretation challenging. Herein, we presented a 77-year-old patient whose initial presentation was indistinguishable to COVID-19 pneumonia without evidence of leukemia, but leukemic pneumonitis due to acute myelogenous leukemia (AML) was finally diagnosed as clinical course progression.

Case presentation:

A 77-year-old woman without underlying disease presented to our emergency department with a 1-week history of low-grade fever, chillness, dry cough, arthralgia, general soreness, and diarrhea in June 2021. She had contact history with her neighbor who had been back from American for 2 weeks, and travel history to Changhua three weeks ago, when COVID-19 cluster infection outbroke. Physical examination revealed body temperature of 38.5℃otherwise unremarkable. Peripheral blood examination reported absolute nuclear cells of 1172/uL, total white blood differential count consisted of 55% lymphocytes and 3% atypical lymphocyte, hemoglobulin 9.8 g/dL, platelet count 106000/uL, which was compatible with pancytopenia. No immature blast cell was detected. CRP level was 329 mg/L and procalcitonin level was 0.55 ng/mL. The initial chest x-ray disclosed mild infiltration over right lower lung and bilateral minimal pleural effusion. Viral or atypical infection was favored, so she received multiple times of COVID-19 PCR testing, and atypical pathogens testing included legionella, mycoplasma and *chlamydia pneumoniae*, the results were all negative. Levofloxacin was initiated empirically. After 3 days of treatment, spiking fever persisted, and gradually increased oxygen demand was noted. We tailored her oxygen supplement from nasal cannula to venturi mask in one week. Nonetheless, no obviously enhanced respiratory effort was complained even though her oxygen demand increased significantly, similar presentation as happy hypoxia. Antibiotics was escalated to cover nosocomial bacterial infection and viral infection. Further infection work up was arranged. Chest computed tomography showed few scattered nodular lesions at bilateral lung with maximum size of 1 centimeter and mild bilateral pleural effusion. Viral infection profile was rechecked including film-array and additional COVID-19 PCR testing but still yielded negative results, so was the autoimmune work up.

After 11 days of treatment, respiratory failure followed with shock status was noted and chest x-ray showed rapidly pneumonia progression, correlated with acute respiratory distress syndrome. Endotracheal tube was therefore inserted. Bronchoscope revealed extensive pulmonary hemorrhage and sputum impaction. Aspergillosis serum test was positive. Multiple lines antibiotics include anti-fungal agent, anti-bacterial agent were given, but her recurrent shock and respiratory failure

condition progressed. Not until 3 weeks later after admission did peripheral blood smear showed 2% blast cell and further bone marrow aspiration confirmed acute myeloid leukemia without maturation with 99% blast in bone marrow. The patient expired 2 weeks later after the diagnosis due to uncontrollable septic shock.

Discussion:

Pulmonary complication of leukemia, developed upward to 80% of patient with leukemia, may render interpretation challenging [1]. Differential diagnosis of leukemia related pulmonary infiltrates includes broad spectrum of pulmonary infections, alveolar hemorrhage, pulmonary edema, drug induced toxicity, pulmonary leukostasis and leukemic pulmonary infiltration [2]. Of note, pulmonary leukostasis and leukemic pulmonary infiltration worth additional attention. Pulmonary leukostasis, occurs mostly when peripheral blast cell count is > 100,000/ml, increases blood viscosity and the capability of leukemic cell to invaded through the endothelium, causing pulmonary hemorrhage [3]. On the other hand, Leukemic pulmonary infiltration, usually occurs while blast cells were over 40% in peripheral blood, is defined as extravascular collection of leukemic cell in lung parenchyma without apparent cause [4]. Both conditions can be indistinguishable from bacterial infection and do not response to antimicrobial agent but often resolve after chemotherapy [3] [4]. Radiology image feature of leukemia related pulmonary infiltrates can be categorized into nodular, interstitial and consolidating pattern. Nodular and consolidating infiltrate are commonly related to bacterial infection and fungal infection but thromboembolic event and pulmonary hemorrhage should also be considered. On the other hand, interstitial pulmonary infiltrate had various differential diagnosis included viral infection, pulmonary edema, leukemic infiltrate, radiation and drug related pneumonitis. In our case, rapidly progression of consolidating and interstitial pulmonary infiltration favored the diagnosis of infection but leukemic infiltrate or leukostasis may lurked beneath the diagnosis since no obvious infective pathogen was identified during whole intensive care units stay [5].

Conclusion:

In our case, her clinical presentation mimics COVID-19 pneumonia which misled us to viral infection, delaying preparation for AML complication, such as leukostasis, leukemic pulmonary infiltration, tumor lysis, pulmonary hemorrhage or opportunistic infection. Differential diagnosis of fever, pancytopenia and multiple organs involved complaint should include infection, autoimmune disease and hematological disease while contemplating further examination and treatment.