When Infection and Malignancy intersect in Rwanda: A diagnostic challenge in the tropics—A Case Report

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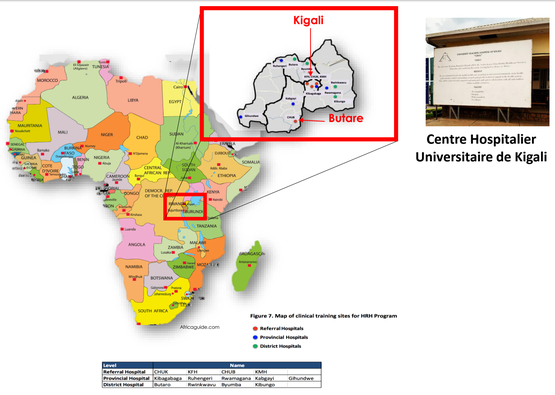

Centre Hospitalier Universitaire de Kigali

Figure 1. Centre Hospitalier Universitaire de Kigali is located in the capital of Rwanda.

Imaging

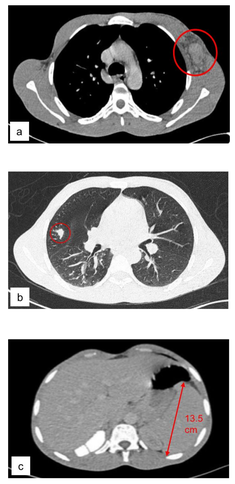

Figure 5. a) CT chest with multiple enlarged left axillary & subpectoral lymph nodes, some necrotic, up to 3.6 cm. b) CT chest with a 1.6 cm R upper lobe pulmonary nodule. c) CT abdomen with mild splenomegaly, span ~13.5 cm.

Abstract

- We describe a 38-year-old Rwandan male patient who presented to the hospital with a **2-week history of left axillary lymphadenopathy, fever, weight loss, & 1-year history of dysphagia.**
- Lymph node fine needle aspirate was consistent with tuberculous lymphadenitis.
- Peripheral blood smear suggested a concomitant diagnosis of Acute Myeloid Leukemia (AML), which was confirmed by bone marrow biopsy.
- Although several cases of concurrent pulmonary tuberculosis & AML exist, fewer cases of concomitant tuberculous lymphadenitis & AML have been reported.

Clinical Case

- A 38-year-old M presented with a 2-week history of L axillary **lymphadenopathy, fever, weight loss,** & 1-year history of **dysphagia**.
- Exam: **Cachectic. Mobile L axillary mass** (4 cm diameter), tender to palpation.
- Labs: **WBC 48,800 cells/µL (68% eosinophils, 23% monocytes**, 6% lymphocytes, 3% neutrophils); **Hb 9.1 g/dL**; **PLT 88k** cells/µL.
- Lymph node FNA & (+) Auramine stain confirming acid-fast bacilli were consistent with **TB lymphadenitis**. Peripheral blood smear & bone marrow biopsy confirmed concomitant **Acute Myeloid Leukemia**.

Diagnostics

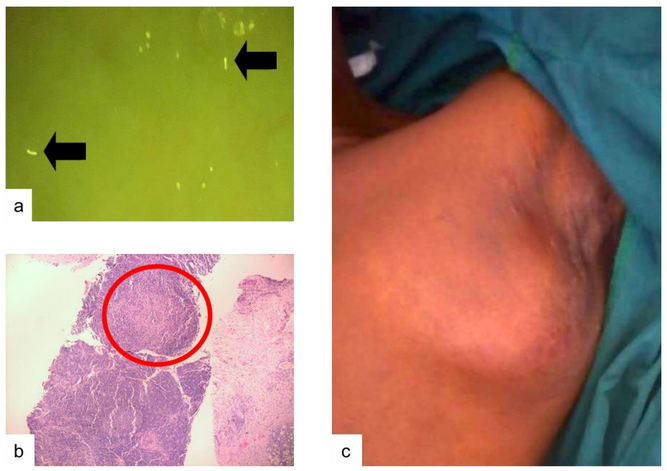

Figure 5. a) Auramine stain of L axillary mass FNA cytology confirms acid-fast bacilli. b) Core lymph node biopsy reveals granulomas with central necrosis c) On day 26, L axillary lymph node grew 3x the initial size.

- **Day 1:** Started broad-spectrum antibiotics for neutropenic fever. Fine needle aspiration (FNA) cytology of axilla mass revealed lymphocytes, granulomatous formations, & giant cells in a protein-necrotic background
- **Day 3:** Auramine stain of the axilla mass FNA cytology revealed AFB, diagnosing Mycobacterium tuberculosis lymphadenitis. He started rifampicin, isoniazid, pyrazinamide, ethambutol & B6.
- **Day 4:** Peripheral blood smear showed 95% myeloblast cells, consistent with M4 acute myeloid leukemia (AML).
- **Day 8:** Spiral CT chest showed enlarged left axilla & subpectoral lymph nodes, some necrotic & B/L pulmonary emboli. Enoxaparin was started. CT abdomen showed mild splenomegaly. Endoscopy revealed ulcerative esophagitis.
- **Day 10:** Transferred to Butaro Cancer Center in Rwanda, for bone marrow biopsy & AML management, although he ultimately pursued palliative measures as AML treatment in Rwanda is costly.

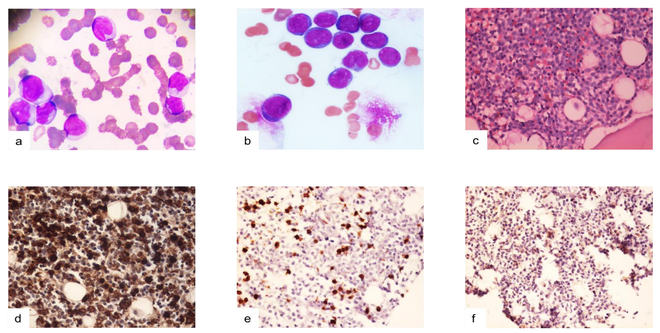

Figure 5. a) Peripheral blood smear with 95% immature blasts with high N:C ratio, consistent with Acute Myeloid Leukemia. b) Bone marrow aspirate hypercellular and spicular with diffuse infiltrate of blasts. c) Bone marrow core tissue hypercellular, with <5% fat, with diffuse infiltrate of blasts. d) Lysozyme stain (+) in all blasts. e) CD3 and f) CD19 staining (-).

Discussion

Clinical Experience

- Several case series exist demonstrating pulmonary tuberculosis (TB) & concomitant Acute Myeloid Leukemia. However, fewer case reports exist regarding patients with TB lymphadenitis and concurrent Acute Myeloid Leukemia.
- In 2017, the estimated incidence of TB was 57 cases per 100,000 people in Rwanda. The estimated incidence of leukemia in Rwanda was 370 new cases in 2018.
- Hematologic malignancies have been reported to increase the relative risk for TB infection by 2-40x that of the population.
- The immune system responds to TB infection by initially releasing macrophages, which phagocytose aerosolized *Mycobacterium tuberculosis*, and subsequently produce cytokines—including neutrophils, macrophages, natural killer cells, & T cells—resulting in an inflammatory cascade & tissue remodeling, leading to granuloma formation.
- Patients with hematologic malignancies have an underlying alteration in immunity leading to immunodeficiency, which may result in progression from latent to active TB & other infections.
- Tuberculous lymphadenitis, a form of extrapulmonary TB, typically occurs due to reactivation of TB at a hematogenously seeded site during primary TB infection.
- Young adults generally present with chronic lymphadenopathy which is non-tender. On physical exam, a firm, discrete mass or collection of nodes may be present.
- A diagnosis is made via AFB smear via FNA or excisional lymph node biopsy. Culture of mycobacteria is the gold standard.
- TB lymphadenitis treatment is rifampicin, isoniazid, ethambutol, & pyrazinamide x 2 mo., followed by rifampicin & isoniazid x 4 mo.
- TB-Immune Reconstitution Inflammatory Syndrome (IRIS) occurs as an exaggerated response to *Mycobacterium tuberculosis* antigen, and may present as a paradoxical worsening of prior tuberculous lesions or development of new tubercular lesions after TB therapy.

Conclusions

- Arriving at a concomitant diagnosis of malignancy and tuberculous lymphadenitis in a tropical setting can be challenging.
- Clinical suspicion for malignancy should be high in a patient with marked leukocytosis, constitutional symptoms, and persistent high-grade fevers.
- However, in this case, the suspicion for TB lymphadenitis also remained high due to the presence of necrotic lymphadenopathy in the context of the patient's symptoms and location in a tuberculosis-endemic region.
- When initial evidence supported the diagnosis of tuberculous lymphadenitis for this patient, further workup for an alternative, concomitant diagnosis based on his clinical presentation continued.
- **An important lesson to highlight from this case is to not overlook concurrent opportunistic infections, such as tuberculosis—particularly in endemic regions in Africa—in the tropical clinical setting in Rwanda.**

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