

Case Report

Osteolytic Skull Lesions: Rare Finding in a Patient Presenting with Clinical Features of Progressive Multifocal Leukoencephalopathy (PML) With Unknown HIV Status

Safia Bano¹, Zomer Sardar², Muhammad Kalim³, Ahsan Numan⁴

^{1,3,4}Department of Neurology, KEMU/ Mayo Hospital, Lahore; ²Consultant Neurologist, Nankana Sahib Hospital

Abstract:

Bacillary angiomatosis (BA) is a rare but an infrequent opportunistic infection reported mostly in HIV-infected patients. The most common site of involvement is the skin manifestation followed by solid organs involvement like liver and bone. Although most cutaneous manifestations are treatable, the other organs involvement can be fatal in some cases.

We report a case of an isolated osteolytic lesion due to the Bacillary angiomatosis (BA).

We conclude that Bacillary angiomatosis (BA) should be suspected and screened when an osteolytic bone lesion is identified in immunocompromised patients like HIV with or without cutaneous manifestations as it is deadly fatal if treatment is not given.

Corresponding Authors | 1. Dr. Safia Bano, Assistant Professor, Department of Neurology, KEMU/ Mayo Hospital, Lahore **Email:** safiabano207@gmail.com, 2. Zomer Sardar, Consultant Neurologist, Nankana Sahib Hospital **Email:** zumarsardar@gmail.com

Key words: Bacillary angiomatosis, Human immunodeficiency virus, Progressive Multifocal Leukoencephalopathy, Osteolytic lesions

Introduction:

Bacillary angiomatosis (BA) is a bacterial infection characterized by epithelioid proliferation that most commonly affect the skin and less commonly internal organs (liver, gastrointestinal tract, lung and central nervous system). It is a bacterial infection caused by gram-negative bacilli *Bartonella Henselae* and *Bartonella Quintana* in immunocompromised patients¹. Cat-scratch illness is caused by *Bartonella Henselae*, whereas trench fever is caused by *Bartonella Quintana* infection, which is transmitted by a body louse². BA occur commonly in immunocompromised patients (transplant patients, chronic hepatitis, leukaemia, patients on chemotherapy) and untreated HIV patients with CD4 <100cells/microL³.

We are reporting this case because of the rarity of osteolytic lesions in bacillary angiomatosis in a patient with HIV.

Case Report:

A 20-year-old heterosexual male, presented in October 2021 to Neurology OPD with complaints of right-sided weakness, acute onset, and history of aphasia for 8 days. There was no history of vomiting, vertigo, unsteadiness, vision problems, or sphincter complaints. He had experienced two episodes of such weakness in the previous month, from which he had only partially recovered. He went to the local dispensary and Hakeem for treatment, and he improved to such an extent that he could walk with a cane. He also complained of diarrhoea for the previous seven days, of grade 2-3, and a low-grade fever of 99.8F. There was also a history of weight loss, anorexia and a mild headache for 3months.

He kept parrots and cats for 11 years, alcoholic and regular pan-user. There was no history of intravenous drug use or multiple sexual partners and extramarital affairs. He was treated for pulmonary Tuberculosis one and a

half years ago without significant family history. He took treatment for 6 months.

On examination, at the time of presentation though he was emaciated and pale. He was oriented to time, place and person. There was a tinea corporis rash on his face, abdomen and hip. His vital signs were Blood pressure, 120/80 mmHg, Heart rate, 88 bpm regular, respiratory rate was 16/min, and 100% oxygen saturation on room air. His body weight at presentation was 65 kg. Systemic examination was unremarkable. Progressive multifocal leukoencephalopathy (PML) due to HIV, Tuberculosis with multisystem involvement, secondary vasculitis was in initial differential diagnosis.

CBC revealed that he had anemia with hemoglobin of 9.9 g/dl, with TLC and platelet counts within normal limits. He had slightly raised liver enzymes (SGOT 83 U/L, SGPT 84 U/L), normal serum electrolytes (serum Na 135 mEq/L, serum K 4.5 mEq/L, serum Ca 2.0 mg/dl), serum albumin 3.5 mg/dl, and serum LDH 428 U/L. COVID-PCR came back negative. His other tests anti-HCV, HbsAg and Syphilis were negative. Chest X-ray was normal.

On admission, a CT scan of the brain plain revealed asymmetrical, hypodense lesions involving the frontoparietal lobes on the left side (Fig. 1 A & B). In addition, unusual and abnormal bone lesions were observed on the CT scan of the brain. A plain skull X-ray was ordered to elucidate the findings. Multiple well-circumscribed osteolytic lesions were noticed on a skull X-ray (Fig. 2 A & B). A plain and contrast MRI of the brain was also done, in the context of his unilateral recurrent limb weakness with suspicions of Progressive multifocal leukoencephalopathy (PML). The MRI showed asymmetrical hypointense lesions on T1 hyperintense on T2 with involvement of U-fibres in the frontoparietal lobes and there was no contrast enhancement (Fig. 3 A, B & C). These features were consistent with the diagnosis of progressive multifocal leukoencephalopathy (PML).

In the interim, after obtaining the patient's permission, an HIV test was performed, which turned to be positive result. Later, PCR HIV was done that also came back positive.

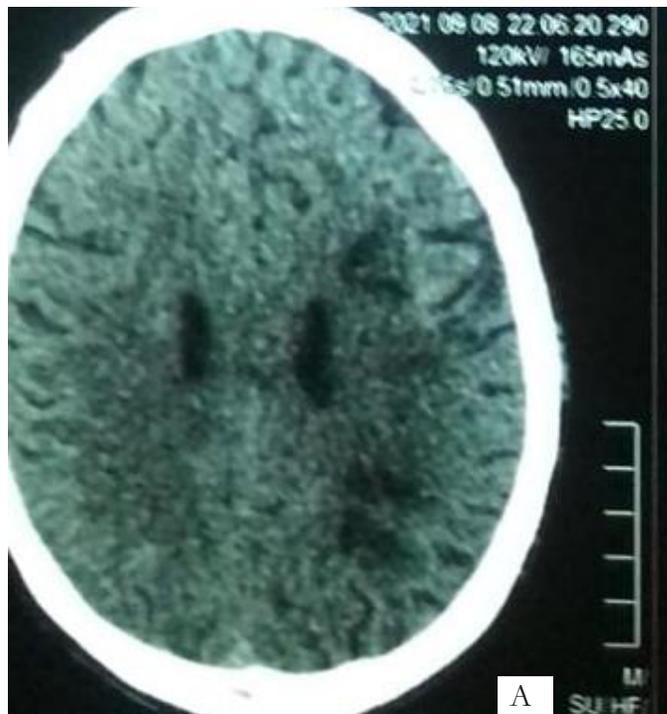
Generalized increased soft tissue uptake of radionuclide involving nasopharyngeal region, both sides of

chest, both kidney and in both thighs was observed on bone scan.

Lumbar puncture revealed opening pressure in the CSF was 7 cmH₂O, the LDH was 58, the CSF glucose was 50 mg/dl, the CSF protein was 137 mg/dl, and the WBC count was 20 with 70% lymphocytes. At the time of the lumbar puncture, the blood glucose level was 106 mg/dl. Bacillus species observed in CSF culture led to the diagnosis of Bacillary angiomatosis with bony involvement.

The patient was initiated on HAART therapy (Dolutegravir 50 mg, Lamivudine 330 mg, Tenofovir 300 mg) by the HIV clinic. He was prescribed erythromycin (500 mg daily four times daily) for Bacillary angiomatosis. His fever and diarrhoea resolved a few days later.

After almost a week of discharge, the patient was re-admitted with complaints of shortness of breath and altered consciousness, CBC showed slightly raised TLC (17×10) Urea was 210, creatinine was 5.0 mg/dl, the cause of acute renal failure was attributed to HAART therapy. HAART therapy was discontinued on the recommendation of the Nephrology department. Unfortunately, the patient died the next day. The cause of death was rapid development drug induced renal failure. Patient died before scheduled hemodialysis session.



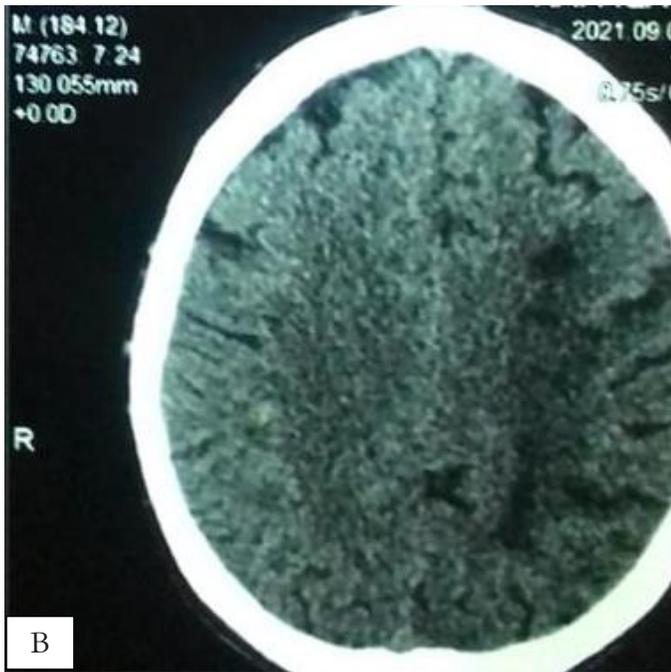


Figure 1: Non-Contrast computed tomography brain showed multiple hypodense lesions

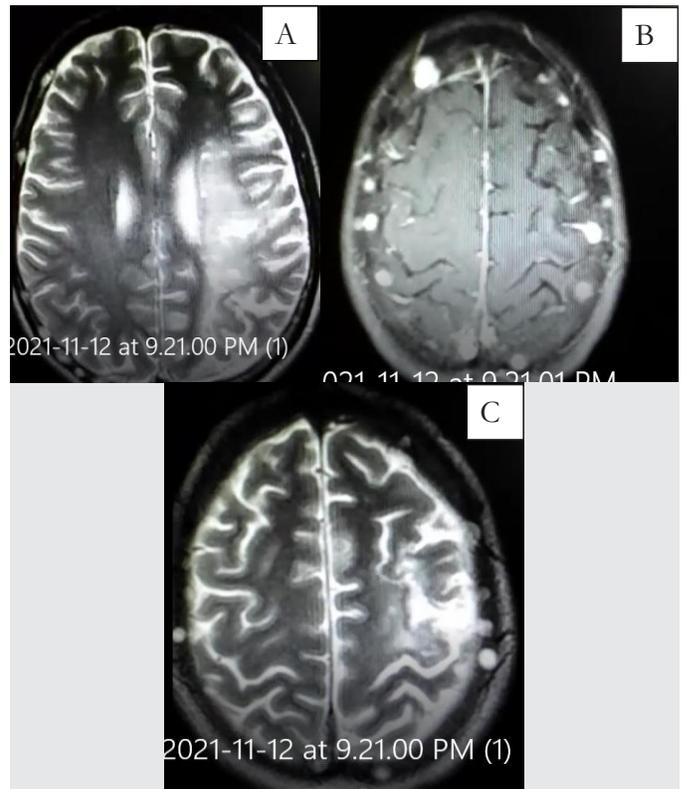


Figure 3: Brain plain & contrast images show multiple bony and soft tissue lesions along with finding of PML

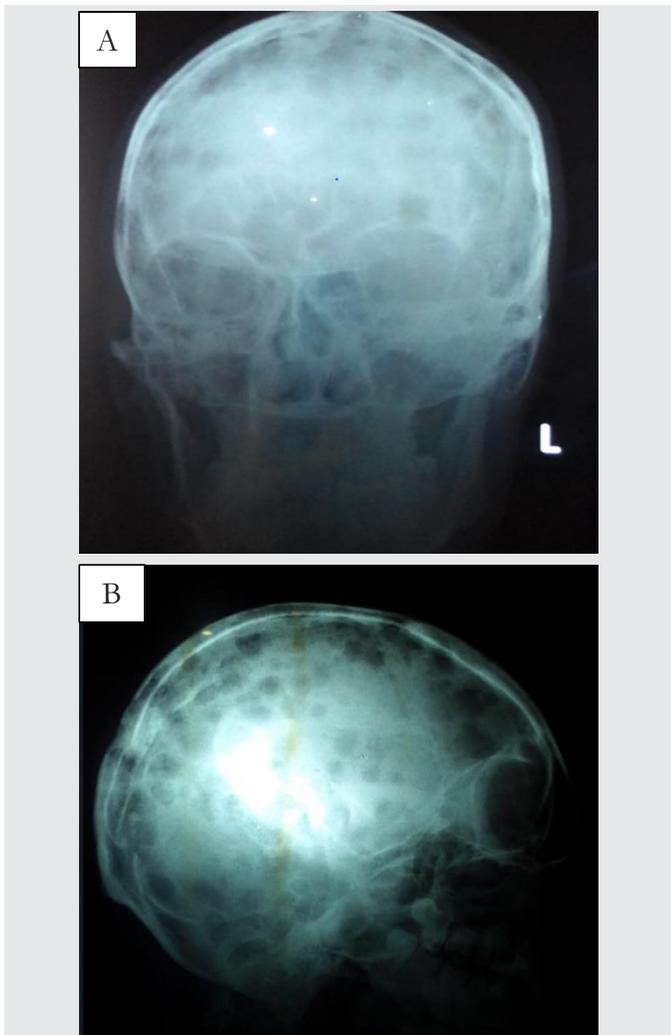


Figure 2: X-rays skull showing multiple lesion

Discussion:

Bacillary angiomatosis occurs in advanced untreated HIV with CD4 count <200micro/L. In our patient CD4 count was 186 micro/L. PCR for JCV on CSF was not done due to the non-availability of a test at our institution and unaffordability However, Gazineo JL et.al in brazil observed median CD4 lymphocyte counts of 96 cells per mm³.⁴ A case-control study by JC Mohle-Boetani et. al observed a median Cd4 lymphocyte count of 21/mm³.⁵

BA causes cutaneous proliferative vascular lesions, sub-cutaneous lesions or nodules and bony lesions¹. It also causes systemic dissemination (liver, brain, heart, lymph nodes and gastrointestinal and respiratory system)⁶. Respiratory involvement manifests as nodules, mediastinal adenopathy, peripheral adenopathy, and pleural effusion⁷. Gastrointestinal manifestations include ascites, diarrhoea, abdominal adenopathy, soft tissue masses, hypodense lesions in the liver and spleen (bacillary peliosis)⁷. Our patient presented with diarrhoea and fever. No hypodense lesions were observed on ultrasound in the liver and spleen in our patient.

The mean age reported in literature ranged from 35-39

years. Diniz LM et al reported a case of 29 years old man with skin and bony involvement from Brazil². Our patient is the youngest reported case in the available literature.

Skin lesions in BA mimic lesions of Kaposi sarcoma (violaceous coloured papules or nodules) clinically and histopathologically⁸. Our patient did not have any skin manifestation of disease. Multiple osteolytic lesions involving all bony structures including skull and vertebrae were reported⁹. Our patient had more peculiar features of osseous involvement of skull as described in the literature.

Bacillus species were not identified in CSF cultures. Because the patient has had contact with cats for the previous 11 years, he may have been infected with *B. Quintana*.

BA is a curable condition in most of cases, The drug of choice for bacillary angiomatosis is either macrolide (erythromycin) or doxycycline. Duration of treatment is variable depending upon site of involvement and CD count¹² but it is lethal if not treated. Therefore, early recognition of the disease is required. Macrolide (erythromycin) was given in our patient.

To date, 17 cases have been reported of BA with osseous involvement in Brazilian medical literature. Four of these 17 case reports are of skin and bone involvement². Murugan S reported a case of BA with extensive bony involvement⁹. Fagan et. al. reported a patient of BA with bone marrow involvement¹⁰. Braekeveld. P et. Al. reported a case of BA presenting with venous insufficiency of lower legs due to involvement of bone and bone marrow¹¹. This is the first and only case report of BA with osseous involvement without skin lesions from Pakistan.

Limitations:

Type of Bacillus species, our patient was suffering, couldn't be found due to patient refusal for re LP/CSF

Conclusion:

Bacillary angiomatosis is a life-threatening illness in immunocompromised patients. Physicians should be aware that Bacillary angiomatosis in HIV-infected patients may present with osteolytic lesion without cutaneous manifestations. Since this treatable infectious disorder may rapidly progress. Outcome is usually better if

timely diagnosis and appropriate antimicrobial therapy is initiated.

References:

1. Plettenberg A, Lorenzen T, Burtsche BT, Rasokat H, Kaliebe T, Albrecht H, et al Bacillary Angiomatosis in HIV-Infected Patients – An Epidemiological and Clinical Study. *Dermatology* 2000;201(9): 326-331.
2. Diniz LM, Medeiros KB, Landeiro LG, Lucas EA. Bacillary angiomatosis with bone invasion. *An Bras Dermatol.* 2016;91(6):811-814.
3. Akram SM, Anwar MY, Thandra KC. Bacillary Angiomatosis. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021.
4. Gazineo JL, Trope BM, Maceira JP, May SB, Coelho JM, Lambert JS, et al. Bacillary angiomatosis: description of 13 cases reported in five reference centres for AIDS treatment in Rio de Janeiro, Brazil. *Rev Inst Med Trop Sao Paulo.* 2001;43(1):1-6.
5. Mohle-Boetani JC, Koehler JE, Berger TG, LeBoit PE, Kemper CA, Reingold AL, et al. Bacillary angiomatosis and bacillary peliosis in patients infected with human immunodeficiency virus: clinical characteristics in a case-control study. *Clin Infect Dis.* 1996;22(5):794-800.
6. Romero-Cabello R, Romero-Feregrino R, Romero-Feregrino R. Bacillary angiomatosis: a case report. *Rev Mex Patol Clin Med Lab.* 2016;63(3):119-123.
7. Chetty R, Sabaratnam RM. Upper gastrointestinal bacillary angiomatosis causing hematemesis: a case report. *Int J Surg Pathol.* 2003;11(3):241-4
8. Ramírez Ramírez CR, Saavedra S, Ramírez Ronda C. Bacillary angiomatosis: microbiology, histopathology, clinical presentation, diagnosis and management. *Bol Asoc Med PR.* 1995;87(7-9):140-6.
9. Murugan S. Multiple osteolytic lesions in a 14-year-old boy with HIV disease. *Indian Journal of Sexually Transmitted Diseases and AIDS.* 2015;36(1):92-94.
10. Fagan WA, Skinner SM, Ondo A, Williams JT, Anthony K, DeVillez RL, et al. Bacillary angiomatosis of the skin and bone marrow in a patient

- with HIV infection. *Journal of the American Academy of Dermatology*. 1995;32(3):510-2.
11. P Braekeveld, K Verstraete, K Deprest, E Van Hecke, M Kunnen. Bacillary Angiomatosis in a Patient with AIDS : JBR–BTR. 2002;85(4): 124-125.
 12. Rodriguez O, Campbell LR, Bacha JM, Kovarik CL. Successful treatment of bacillary angiomatosis with oral doxycycline in an HIV-infected child with skin lesions mimicking Kaposi sarcoma. *JAAD Case Rep*. 2016;2(1):77-9.