

“From Pruritus to Parenchyma: A Rare Dermatoneurological Presentation of HIV”

Authors

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Abstract

Cerebral toxoplasmosis remains the most frequent cause of cerebral lesions in patients with AIDS, especially in the absence of antibiotic prophylaxis [1]. However, its emergence as the *initial clue* to underlying immunosuppression is rare. When skin speaks before the brain, the clinical narrative often risks being dismissed as superficial—literally. Yet in neurology, patterns often hide in plain sight. We present a unique case of a 55-year-old male whose journey progressed from unexplained pruritic skin rashes to transient ischemic attack (TIA) like presentation with transient dysarthria and right hemiparesis unraveled a dual diagnosis of cerebral toxoplasmosis and HIV infection. This case highlights the need for high clinical suspicion and integrated thinking when atypical skin findings and stroke-like symptoms coexist, reaffirming the neurologist’s role in detecting silent immunosuppression before it manifests as a neurological emergency—and serves as a reminder: sometimes, the skin speaks louder than the brain.

Abbreviations

HIV- Human Immunodeficiency Virus TIA

- Transient Ischemic attack

CT - Computed tomography

MRI- Magnetic resonance imaging PL

HIV- Patient living with HIV

ND -Not disclosed

Introduction

Toxoplasma gondii is an obligate intracellular protozoan parasite with three morphological forms - oocyst (the infective form), tachyzoites, and tissue cysts containing bradyzoites. Infection occurs by ingestion of food or water contaminated by oocytes excreted in cat feces, or via improperly cooked meat. Global seroprevalence of *Toxoplasma gondii* is 25.7%, highest noted in African countries (61.4%), South America 31.2% and Asia has 16.4%[2].

In people living with HIV (PLHIV), the depletion of CD4⁺ T cells compromises cell-mediated immunity, leading to reactivation of latent infection. Toxoplasmosis can present as encephalitis, chorioretinitis, pneumonitis, or as disseminated disease. Neurological symptoms develop subacutely and may include fever, lethargy, altered sensorium, focal deficits, seizures, or neuropsychiatric disturbances[3]. HIV getting diagnosed after cerebral toxoplasmosis presenting like a Transient Ischemic Attack (TIA) is rare. We report a case of cerebral toxoplasmosis in a newly diagnosed HIV patient, presenting with pruritic skin rash and Transient Ischemic Attack (TIA).

Case Presentation

55 years old gentleman with no significant past medical history, presented to the hospital with transient slurring of speech and right hemiparesis lasting 15 mins 2 weeks before presenting to hospital, later developed right hemiparesis 2 days after hospital admission. Upon enquiring patient also gave history of pruritic skin

lesions over extremities for 3 months before admission.

Throughout the illness he never reported any headache or seizures.

On examination patient was noted papular rashes over extremities which was intensely pruritic. A detailed neurological examination was also done which revealed bilaterally reactive pupils, normal in size. There were no obvious visual field defects and Cranial nerves II to XII were grossly intact. Motor system examination showed mild limb weakness of the right side, right upperlimb and lowerlimb power of 4+/5. Deep tendon reflexes were brisk and symmetric, plantars bilateral flexors. Gait testing showed mild ataxia. Patient also had few cerebellar symptoms with dysdiachokinesia on right side. With a suspicion of TIA progressing to Middle cerebral artery territory infarct patient was admitted and urgent Non Contrast Computed Tomography (CT) scan of the head was ordered. The CT scan demonstrated Areas of hypodensity in the periventricular white matters of bilateral parietal lobes, bilateral posterior limbs of internal capsule, bilateral thalami and right cerebellar hemisphere.

It was followed by MRI with Gadolinium contrast study, scan revealed well defined ring like lesion in T1 hypointense, T2 and FLAIR hyperintense lesion with mild central restricted diffusion and peripheral ring enhancement in bilateral capsuloganglionic region, left frontal lobe, right cerebellar hemisphere and right occipital lobe, no perilesional edema or mass effect. The differential diagnosis for the patient included tuberculosis of the brain, metastasis, lymphoma, an infection or multiple infarcts. There arose a strong suspicion for toxoplasmosis versus septic emboli from an unclear source of infection, and appropriate titers and cultures were sent. The decision to perform a lumbar puncture (LP) was made to evaluate for infectious etiologies. The LP revealed cell count of 6cells/cumm, 80% lymphocytes, protein was high with normal glucose and chloride, ADA and ZN stain for AFB was negative.

The patients blood work revealed haemoglobin (Hb) level of 12.1 mg/dl, White Blood Cells (WBC's) of 7.29 cells per mm of blood. Renal and Liver function tests were found to be normal. Serological testing revealed the patient to be having a retroviral infection, confirmed by the fourth generation HIV-1/2 Antigen/Antibody combination immunoassay (fourth-generation HIV test). His CD4+ count was found to be 130 cells/uL. Toxoplasma IgG antibody testing was positive 16.7 IU/ ml (Negative <2.0 IU/ml). Testing for tuberculosis by CBNAAT was negative. Fundoscopy was normal.

The patient was initiated on a therapeutic dose of trimethoprim/sulfamethoxazole (TMP-SMX). During his stay, he was also diagnosed with oral Candida mucositis for which he was given a course of fluconazole. He was later started on Tab Pyrimethamine and Sulfadiazine along with Leucovorin. Dermatology consultation was sought for pruritic lesions over extremities which was diagnosed as Pruritic papular eruption. Patient was followed up 2 weeks later he showed improvement in speech but power remained 4+/5. Repeat MRI Brain done showed resolution of symptoms.

Lab investigations

Tests	Report
Hb	12.1
WBC count	7.29
Platelet count	199
Urea/ creatinine	13/1.1
Sodium / potassium / chloride	132/4.2/100
Total Bilirubin/ Direct bilirubin	1.09/0.18
AST/ ALT	51/39

ALP/GGT	122
Albumin	3.7
T3 /T4 /TSH	0.96/0.82/ 4.54
HIV (ELISA)	Positive
HBsAg	Negative
HCV	Negative
VDRL	Non Reactive
T.chol /LDL /HDL / Triglycerides	158/113/31/161
RBS /FBS /HbA1c	91/81/5.9
PT /INR /aPTT	10.8/0.83/35.7
CBNAAT	Negative
CSF Cell count / cell type	2 cell/mm3, predominantly Lymphocytes
CSF Protein	118mg/dl
CSF Glucose	45mg/dl
CSF AFB (ZN stain)	Negative
Csf Gram stain	Negative
CSF cultures	No growth
Serum Toxoplasma IgG	16.7 IU/ml (positive) (Normal = <2.0 IU/ml)
CD4 count	130

C a s e N o.	Auth or/ sour ce	Year of publi shing	A ge	Se x	Presenting symptom	Other symptom s	Neuroi maging	CD4 @ diag nosi s	Tox opl as ma IgG (IU/ ml)	Treatm ent	ART initiati on	Outcom e
1	Turkist ani et al [5]	2024	53	F	Headache, vomiting, Ataxia	Loss of appetite, weight loss	MRI: Solitary Left cerebella r lesion	448	111	Sulfadia zine+ pyrimeth amine + leucovor in	ND	Recover ed
2	Abbas i Fard et al [6]	2020	9	M	Fever, AMS, GTCS	ND	MRI: Multiple diffuse ring lesions and edema	<100	+ ND	TMP- SMX	ND	Died on Day 6
3	Alzou bi et al [7]	2017	39	M	Behavioral disturbances, Headache	CMV induced GI ulcer	MRI: Rt caudate lesion	14	ND	TMP- SMX	ND	Radiologi cal improve ment 6 weeks

4	Ortiz et al [8]	2024	38	F	Headache, Rt hemiparesis	Loss of appetite	MRI: Multiple enhancing lesions	54	320	TMP-SMX	After 2 weeks	Clinical and radiological improvement by 3 weeks
5	Y Kang et al [9]	2024	65	F	Rt sided weakness, headache	ND	MRI: multiple lesions on left side	67	205	TMP-SMX + Clindamycin	After 2 weeks	Residual weakness
6	B. Barman et al [10]	2018	62	M	GTCS, Lt hemiplegia	Pruritic erythematous rash, Pyrexia of unknown origin	MRI: Multiple ring-enhancing lesions	<100	>200	Sulfadiazine + pyrimethamine + clindamycin	ND	Resolution of lesions/symptoms after 2 weeks
Case No.	Author/source	Year of publishing	Age	Sex	Presenting symptom	Other symptoms	Neuroimaging	CD4 @ diagnosis	Toxoplasma IgG (IU/ml)	Treatment	ART initiation	Outcome
7	A Khosla et al [11]	2022	41	F	Confusion, fever, neck pain	Oral candidiasis	MRI: Multiple ring-enhancing lesions + obstructive hydrocephalus	50	>400	TMP-SMX + EVD	After 2 weeks	Improvement in lesions/symptoms after 6 weeks
		Case2	47	F	Behavioral abnormality, hallucinations	Candida esophagitis	MRI: Multiple ring-enhancing lesions	20	>400	TMP-SMX	ND	Hallucinations resolved in 1 week
		Case3	52	M	Left leg weakness, speech disturbance	ND	MRI: Multiple ring-enhancing lesions	59	>400	TMP-SMX	ND	ND

Discussion

Opportunistic infections remain a major complication in HIV-infected individuals, particularly as immune function declines. Common pathogens include *Toxoplasma gondii*, *Mycobacterium tuberculosis*, cytomegalovirus (CMV), and primary central nervous system (CNS) lymphoma.[4] Among these, *T. gondii* poses a significant risk for CNS involvement in immunocompromised patients.

Following initial infection, *T. gondii* invades the CNS through hematogenous dissemination, establishing a latent infection via transformation into bradyzoites. In immunocompetent individuals, this phase remains asymptomatic. However, in HIV-positive individuals with declining CD4+ counts, latent bradyzoites can reactivate into tachyzoites, leading to cytotoxic inflammation and necrotic lesions in the brain. The risk is especially high in those with CD4+ counts <100 cells/mm³ and positive anti-toxoplasma IgG, with a 30% likelihood of reactivation [3].

Although cerebral toxoplasmosis is a well-recognized complication of advanced HIV infection, its presentation as the initial manifestation of HIV remains exceedingly rare. Our patient presented with transient dysarthria and stroke-like symptoms—an atypical clinical picture for cerebral toxoplasmosis. While a few case reports describe similar presentations in newly diagnosed HIV patients, these often include additional neurological features such as headache, hemiparesis, or seizures [8-10].

An additional noteworthy finding in our case was the presence of pruritic papular skin eruptions over the extremities, predating the neurological symptoms by three months. Such dermatological signs have been reported as early indicators of HIV infection but are often overlooked [10]. Later during the course of therapy patient was noted to have oral candidiasis—a classic feature of advanced HIV—further supported

immunosuppression. Similar presentation has been reported at the time of diagnosis of cerebral toxoplasmosis in newly detected HIV patients. [11]

Neuroimaging, particularly MRI with contrast, plays a pivotal role in diagnosing cerebral toxoplasmosis. Characteristic features include multiple ring-enhancing lesions with surrounding edema, typically located in the basal ganglia, frontal lobes, corticomedullary junction, or deep white matter. A distinctive “eccentric target sign”—an enhancing lesion with an eccentric mural nodule——— may be present and is considered pathognomonic. [13] Our patient had multiple similar lesions however no surrounding edema or mass effect which explains the absence of headache or raised intracranial pressure symptoms. The differential diagnosis for such lesions is broad and includes CNS lymphoma, progressive multifocal leukoencephalopathy (PML), CNS tuberculosis, cryptococcal granulomas, CMV encephalitis, and bacterial abscesses. Most cases of cerebral toxoplasmosis occur in patients with CD4+ counts <100 cells/mm³. However, rare cases have been reported at higher counts, with one instance at 448 cells/mm³ [4]. Our patient’s CD4+ count was 134, aligning with the threshold for increased susceptibility.

Anti-*Toxoplasma* IgG testing is a useful initial diagnostic tool, with a high sensitivity (91–100%), though it lacks specificity [14]. A positive IgG result indicates prior exposure but does not confirm active disease. Definitive diagnosis requires brain biopsy, typically reserved for cases with diagnostic uncertainty or lesions causing mass effect.

Given the urgency of the condition, empirical therapy is often initiated based on clinical and radiological findings without waiting for confirmatory tests. Standard treatment includes pyrimethamine and sulfadiazine, supplemented with folinic acid to prevent hematologic toxicity. Trimethoprim-sulfamethoxazole serves as an effective alternative. Therapy is typically administered for six weeks, followed by lifelong maintenance in severely immunocompromised patients [15]. In cases with significant cerebral edema or ocular involvement, corticosteroids may be added to reduce inflammation. The optimal timing for antiretroviral therapy (ART) initiation in patients with cerebral toxoplasmosis remains debated. Most case reports support starting ART approximately 2 weeks after initiating antitoxoplasma therapy, balancing the need for immune restoration against the risk of immune reconstitution inflammatory syndrome (IRIS). However, delaying ART beyond two weeks has not shown clear mortality benefits [16].

The prognosis and outcomes of toxoplasmosis in patients vary and depend on factors such as their immune competence and the location of the reactivation. Acute toxoplasmosis is typically self-limited in immunocompetent individuals. The prognosis is excellent without any long-term effects of infection. Early diagnosis of toxoplasmosis and initiation of empiric treatment, as well as antiretroviral therapy in patients with HIV/AIDS, improves outcomes in immunosuppressed individuals. Prophylactic treatment is indicated in all patients with HIV/AIDS with CD4 lymphocyte counts less than 100 cells/ μ L with trimethoprim-sulfamethoxazole.

Management of CNS toxoplasmosis with anti-toxoplasma therapy, demonstrates an 80% to 90% clinical and radiological improvement [17]. It is worth mentioning that the radiologic response to antitoxoplasma therapy lags behind the clinical response [18].

Prognosis largely depends on the patient's immune status and the timing of diagnosis and treatment. In immunocompetent hosts, toxoplasmosis is typically self-limiting. In contrast, outcomes in immunosuppressed patients improve significantly with early diagnosis, timely initiation of antitoxoplasma therapy, and ART. Prophylactic treatment with trimethoprim-sulfamethoxazole is indicated for all HIV-infected individuals with CD4⁺ counts <100 cells/ μ L. Therapeutic response is favorable in most cases, with 80–90% demonstrating clinical and radiological improvement[17].

Importantly, radiologic resolution tends to lag behind clinical recovery, necessitating continued follow-up imaging to assess treatment response [18].

Conclusion

This case highlights the critical importance of maintaining a high index of suspicion for HIV in patients presenting with atypical features such as pruritic skin papules and stroke-like episodes. Opportunistic infections, including cerebral toxoplasmosis, can manifest as initial presentations and may be easily overlooked in the absence of classic HIV-related symptoms. High suspicion and timely workup of all neurological symptoms and skin lesion is necessary in all high-risk individuals which leads to early initiation of treatment and good clinical outcomes.

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