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Case Report

Idiopathic Hypereosinophilic Syndrome with Pulmonary Nodules Mimicking Lung Secondaries: A Case Report

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Abstract:
Idiopathic Hypereosinophilic Syndrome (IHES) is a condition that presents with eosinophilia of more than 1.5 × 10⁹/L associated with organ damage. IHES is a rare disease, with an incidence of 0.36-6.3 per 100,000 people. It can affect multiple organ systems, including the lungs, and mimic various pulmonary pathologies. Its imaging characteristics, especially those of multiple lung nodules, often resemble those of secondary malignancies, leading to misdiagnosis. We present a case of hypereosinophilic syndrome that looked like lung secondaries, which initially resolved with steroid therapy but later relapsed with the development of steroid dependence.

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Introduction

Hypereosinophilic syndrome (HES) is defined by elevated absolute eosinophil counts (AEC >1.5 × 10⁹/L) with eosinophil-mediated end-organ damage lasting over six months [1]. Its estimated incidence is 0.36–6.3 per 100,000 people [2]. Idiopathic hypereosinophilic syndrome (IHES) is a diagnosis of exclusion, after ruling out secondary causes [1]. The most commonly involved organs are the skin, lungs, and gastrointestinal tract [3]. Pulmonary involvement occurs in roughly 25% of HES patients [4]. Corticosteroids are the first-line treatment, often leading to rapid improvement [5]. Clinically significant organ damage may necessitate therapy even when the six-month criterion has not been fulfilled [3].

Here we present a 50-year-old Ethiopian male with IHES presenting with multiple pulmonary nodules initially mistaken for metastases. His case demonstrates the diagnostic challenges and therapeutic outcomes in a resource-limited setting.

CasePresentation

A 50-year-old man presented with progressive weight loss, malaise, exertional dyspnea, and a dry cough for two months. He denied fever, chest pain, hemoptysis, gastrointestinal complaints, or skin rashes. There was no family or personal history of allergic or autoimmune disease.

On examination, he was stable and not in acute distress. Vital signs were within normal limits with an oxygen saturation of 93% on room air. Cardiopulmonary findings were unremarkable. No lymphadenopathy, hepatosplenomegaly, or skin lesions were noted. He had received empiric antibiotics and anti-malarial drugs at local facilities with no improvement though.

Laboratory evaluation showed eosinophilia: Eos% 43.2 and AEC 7,940/µL (reference: 0–500/µL). WBC was 18,380/µL, and hemoglobin was 17.6 g/dL. LDH was elevated to 443 units/L. Repeat counts confirmed persistent eosinophilia (Table 1). Peripheral morphology and bone marrow biopsy were unremarkable other than eosinophilia (Eos% of 28 and 38 respectively).

Table 1: Hematological trends during phases of treatment in a patient with Idiopathic Hypereosinophilic Syndrome (IHES)

Treatment Phase (Prednisolone Dose)	WBC (/µL)	Eosino-phils (Eos%)	Absolute Eosinophil Count (/µL)	Platelets (/ µL)
Baseline	18,380	43.2	7,940	231,000
Initiated on 30 mg/day	16,000	37.8	6,346	219,000
2 weeks on 30 mg/day	12,000	34.0	4,080	212,000
1 month on 30 mg/day	11,450	13.4	1,533	186,000
2 months on 30 mg/day	15,450	3.3	520	202,000
Tapered to 20 mg/day	16,490	3.1	510	224,000
Tapered to 15 mg/day	16,000	5.8	970	155,000
Tapered to 10 mg/day	25,890	32.0	8,390	154,000
Re-escalated to 20 mg/day	17,780	4.9	870	169,000

Chest CT demonstrated multiple bilateral pulmonary nodules of varying size, predominantly peripheral, the largest measuring 1.8 cm in diameter (Figure 1). The largest nodule was not accessible for imaging-guided biopsy, while the peripheral nodules were too small for sampling. Two nodules were cavitating, leading to the suspicion of metastasis. HIV and tumor markers tests were negative. Stool microscopy, abdominal ultrasound, and abdomino-pelvic CT were unremarkable.

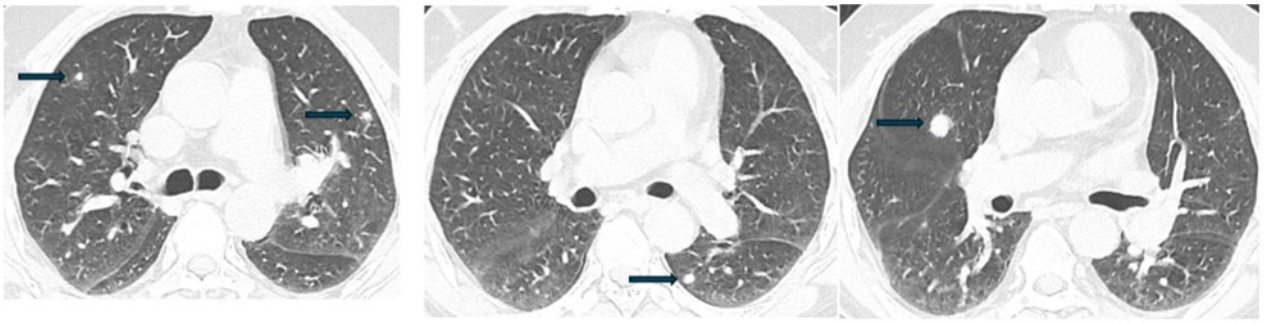

Figure 1: Chest CT scan (lung window) image showing multiple bilateral lung field nodules, the largest measuring 1.8cm in diameter

Molecular testing for FIP1L1/PDGFRA or BCR-ABL rearrangements was not available. A diagnosis of IHES was made after exclusion of common secondary causes and based on clinical-radiologic steroid responsiveness despite the absence of advanced tests.

Treatment with 30 mg/day prednisolone was initiated due to significant symptomatic organ involvement despite short timeline (progressive dyspnea, weight loss, and radiographic lung damage). Within

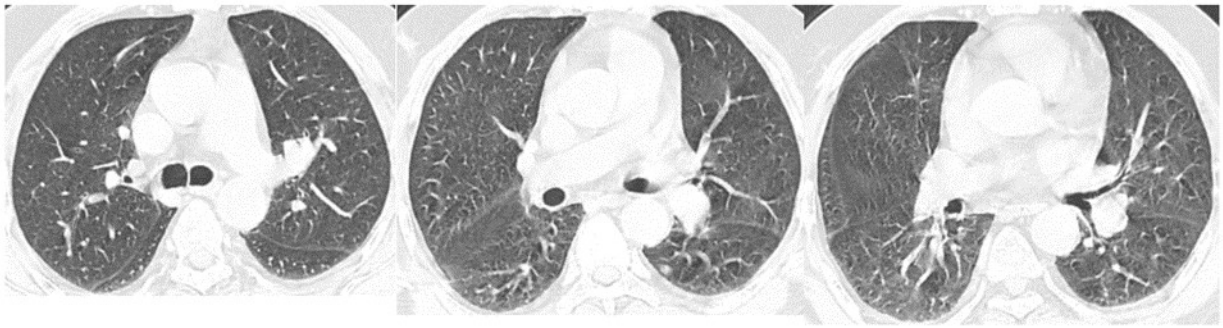

Figure 2: Post-treatment Chest CT scan showing marked resolution of the nodules

Steroids were gradually tapered to 15 mg/day. Attempts to reduce further led to recurrent eosinophilia, requiring re-escalation (Table 1). He is currently stable on low-dose prednisolone with ongoing follow-up and discussion of steroid-sparing options.

Discussion

This case report illustrates IHES presenting with pulmonary nodules mimicking malignancy that was managed with corticosteroids. IHES is a rare condition characterized by persistent eosinophilia (AEC > 1.5 × 10^9/L) [1, 2]. It has several manifestations affecting the skin, lungs, heart, and gastrointestinal tract [6, 7]. Pulmonary presentations range from infiltrates and effusions to fibrosis or nodular disease. Pulmonary manifestations are well recognized, but nodules resembling metastases are less frequently reported [4, 8].

Diagnostic approach for patients with IHES includes ruling out secondary causes of parasitic infections, HIV, malignancies, lymphomas, and primary allergic disorders. Molecular and immunologic markers of FIP1L1/PDGFRA mutation on PCR or FISH have been described to sub-classify IHES[9]. Despite the need for additional testing, most investigations were unavailable in this case highlighting the diagnostic challenge faced in a resource-limited setting

Corticosteroids are the first-line therapy except for patients with positive FIP1L1/PDGFRA, for whom tyrosine kinase inhibitors, such as Imatinib mesylate, are the first line [5, 9]. However, relapses during tapering are common, leading to steroid dependence, as seen in this case. Other second-line agents include hydroxurea and IFN-a. Biologic agents, such as anti-IL-5 monoclonal antibodies and other cytotoxic agents (cyclophosphamide, 6-thioguanine, methotrexate, and cytarabine) have shown efficacy in refractory IHES [9]. The availability of modern interventions remains limited in low-resource settings. In such contexts, disease control is maintained with the lowest effective steroid dose, though long-term monitoring is essential for steroid use complications [10].

Conclusion

HES poses significant diagnostic and therapeutic challenges in a resource-limited environment. IHES with multiple pulmonary nodules is rare and requires a high index of suspicion and the exhaustive use of clinical reasoning and available resources. Advanced tests and steroid-sparing treatment options remain a challenge in resource-restricted settings.

Ethical clearance

Ethical clearance for this case report was obtained from **MeQrez Health Services S.C. / MeQrez Hospital, Addis Ababa, Ethiopia** (Reference No.: **MHS/1645/18/26**). The institution reviewed the manuscript and confirmed that patient confidentiality was adequately protected. Written informed consent for publication was obtained from the patient.

Conflict of interest

The authors declare no competing interests**.**

Author's Contribution

Rediet Getu Kebede: Conceptualization, Data curation, Writing - original draft, Writing - review and editing

Lijalem Abera Tema: Data curation, Writing- Review and editing

Helen Hilawe Gebremariyam: Data curation, Writing- Review and editing

Azmera Gissila Aboye: Writing- Review and editing

Dawit Kebede Huluka: Conceptualization, Data curation, Writing- review and editing, Supervision

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Tables and figures

Table 1: Hematological trends during phases of treatment in a patient with Idiopathic Hypereosinophilic Syndrome (IHES)

Figure 1: Chest CT scan (lung window) image showing multiple bilateral lung field nodules, the largest measuring 1.8cm in diameter

Figure 2: Post-treatment Chest CT scan showing marked resolution of the nodules

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