



EP12.48 Osimertinib-Induced Bone Marrow Aplasia in Metastatic EGFR-Mutated Non-Small Cell Lung Cancer: A Case Report

Ibrahim Thabet, RN, BSN, MSN, FNP-C, AOCNP
Adult Hematology/Oncology Cancer Center, Department of Medicine,
SUNY Upstate Medical University, Syracuse, NY



IASLC 2026
World Conference
on Lung Cancer
SEPTEMBER 12 - 15, 2026
SEOUL, REPUBLIC OF KOREA

INTRODUCTION

Osimertinib is a third-generation, irreversible epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor (TKI) approved for multiple indications in EGFR-mutated non-small cell lung cancer (NSCLC). Common adverse effects include diarrhea, rash, and fatigue. Hematologic toxicities are uncommon, and aplastic anemia is exceedingly rare.

We report a case of severe, persistent bone marrow aplasia in a patient receiving osimertinib for metastatic EGFR-mutated NSCLC.

CASE PREVENTION

- 64-year-old female
- Past medical history: Hypertension
- Smoking history: Former smoker, 30 pack-years, quit 10 years prior
- ECOG Performance Status: 1 at diagnosis
- Initial Presentation: Persistent cough and right-sided chest pain
- Imaging: Right lung mass with mediastinal lymphadenopathy and bilateral pulmonary nodules; metastases to pleura and bone
- Diagnosis: Stage IVB (cT3N3M1c) adenocarcinoma of the right lung
- Molecular testing: EGFR exon 19 deletion
- Baseline CBC priot to osimertinib:

Parameter	Value
WBC	6,100 / μ L
Hemoglobin	12.2 g/dL
Platelets	214,000 / μ L
ANC	4,200 / μ L

CONCLUSION

This case highlights a rare but potentially fatal complication of osimertinib. Clinicians should maintain a high index of suspicion for bone marrow aplasia in patients who develop progressive cytopenias. Prompt recognition, discontinuation of therapy, and appropriate supportive care are critical. Further hematologic recovery may not occur despite cessation of the drug, underlining the need for vigilance and individualized care.

CLINICAL COURSE

- Month 0** Diagnosed with Stage IVB EGFR-mutated adenocarcinoma. Started on carboplatin + pemetrexed while awaiting NGS.
- Month 1** NGS revealed EGFR exon 19 deletion. Switched to osimertinib 80 mg PO daily.
- Month 3** Experienced fatigue, diarrhea, anorexia, and skin rash. Developed increasing cough and shortness of breath. CT chest: Decrease in tumor burden; new airspace disease (pneumonia vs. osimertinib-induced pneumonitis). Treated with cefuroxime for presumed infection.
- Month 4** Four weeks after antibiotics, developed maculopapular rash on legs. Osimertinib held. Dermatology evaluation consistent with delayed allergic reaction to cefuroxime. Treated with prednisone taper with resolution of rash.
- Month 5** Osimertinib restarted.
- Month 5.5** Five weeks after resuming osimertinib: Epistaxis and increased bruising. CBC showed severe pancytopenia (see table). Osimertinib held. Hospitalized and hematology consulted.
- Month 5.5 (Workup)** Bone marrow biopsy #1: Hypocellular marrow with relative erythroid hyperplasia. No evidence of leukemia, lymphoma, carcinoma, or overt dysplasia. Cytogenetics: Normal female karyotype. Flow cytometry: No abnormal population. Differential: Aplastic anemia (drug-induced vs. viral).
- Month 6.5** No improvement in counts after 5 weeks off osimertinib. Switched to erlotinib 150 mg PO daily. Started eltrombopag and darbepoetin.
- Month 8** Minimal platelet response; persistent leukopenia and anemia. Sought second opinion.
- Month 9** Bone marrow biopsy #2: Hypocellular marrow with almost absent megakaryocytes; precursors consistent with bone marrow aplasia/aplastic anemia.
- Month 9-12** Not a candidate for intensive immunosuppression or allogeneic stem cell transplant due to advanced malignancy. Progressive disease on image and clinically. Best supportive care provided. Patient succumbed to progressive cancer.

REFERENCES

1. AstraZeneca Pharmaceuticals LP. (2015). *Tagrisso (osimertinib) prescribing information*. Wilmington, DE: AstraZeneca Pharmaceuticals LP.
2. Kim, S. R., Han, J., Yoon, J. H., et al. (2018). Severe aplastic anemia during osimertinib treatment in a non-small cell lung cancer patient harboring EGFR T790M mutation. *Hematology & Medical Oncology*, 3(3), 1-3. <https://doi.org/10.15761/HMO.1000165>
3. Di Marino, P., Chiapperino, C., Primavera, F. C., et al. (2022). Pancytopenia during osimertinib treatment in a patient with EGFR-mutated non-smal cell lung cancer. *OncoTargets and Therapy*, 15, 407-410. <https://doi.org/10.2147/OTT.S315385>
4. Abdalhadi, A., Omar, N., Kohla, S., et al. (2024). Aplastic anemia secondary to adjuvant osimertinib therapy: A case report and review of the literature. *Frontiers in Oncology*, 14. <https://doi.org/10.3389/fonc.2024.1275275>
5. Kawamura, T., Minagi, K., Kawabata, S., & Suzuki, H. (2025). Osimertinib-induced aplastic anemia after curative surgery for EGFR-mutant lung adenocarcinoma. *Respiratory Medicine Case Reports*, 58, 102314. <https://doi.org/10.1016/j.rmcr.2025.102314>

LABORATORY TREND

Time Point	WBC (/ μ L)	Hemoglobin (/ μ L)	Platelets (/ μ L)	ANC (/ μ L)
Baseline (pre osimertinib)	6,100	12.2	214,000	4,200
3 months on osimertinib	4,300	11.0	105,000	2,800
At pancytopenia (5 wks after restarting osimertinib)	1,100	8.6	8,000	600
After 5 weeks off osimertinib	1,200	8.4	10,000	700
After 8 weeks (on erlotinib, eltrombopag, darbepoetin)	1,000	8.2	12,000	500

ANC = absolute neutrophil count

DISCUSSION

- Osimertinib is generally well tolerated, with hematologic toxicities occurring in <2% of patients. Aplastic anemia is extremely rare, with only a few cases reported.
- Proposed mechanism is immune-mediated marrow suppression, a class effect seen with other TKIs, though the exact pathophysiology is unclear.
- In previously published reports, hematologic recover occurred after drug discontinuation, dose reduction, or immunosuppressive therapy.
- In our case, pancytopenia persisted despite osimertinib discontinuation, supportive care, switching to erlotinib, and use of eltrombopag and darbepoetin.
- This suggests that irreversible marrow injury may occur in rare patients.
- Advanced practitioners play a key role in early recognition of cytopenias, timely evaluation, multidisciplinary care, and patient education regarding potential toxicities.

CLINICAL IMPLICATIONS FOR ADVANCED PRACTITIONERS



Monitor CBC regularly in patients on EGFR TKIs, even though hemotologic toxicity is uncommon.



Evaluate new or worsening cytopenias promptly and consider drug-induced etiologies.



Early hematology referral and bone marrow evaluation are essential when cytopenias persist.



Educate patients to report symptoms such as bleeding, bruising, or recurrent infections.

**IASLC maintains oversight of all educational content and conducts a thorough review process to ensure that materials are evidence-based, fair-balanced, and free from commercial bias, consistent with ACCME Standards for Integrity and Independence. No Artificial Intelligence (AI) was used in the creation of this work.*