

THERAPY-RELATED ACUTE PROMYELOCYTIC LEUKEMIA FOLLOWING ETOPOSIDE-BASED CHEMOTHERAPY FOR TESTICULAR MIXED GERM CELL TUMOR: A CASE REPORT

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1 Background

Acute promyelocytic leukemia is a distinct, highly curable subtype of acute myeloid leukemia defined by the t(15;17) translocation and the **PML-RARA** fusion gene. Therapy-related disease follows topoisomerase II inhibitors or radiotherapy but, unlike most therapy-related myeloid neoplasms, keeps the favourable prognosis of de novo disease when treated early.

2 Case Presentation

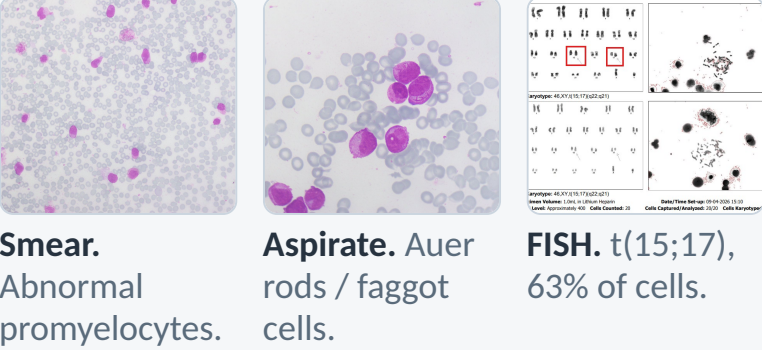
A 26-year-old man treated for a stage III mixed germ cell tumor of the testis (60% embryonal carcinoma, 40% yolk sac tumor) developed an acute haematological emergency ~3.3 years after etoposide-based chemotherapy (VIP, then GemPOX), shown above.

3 Laboratory Findings At Presentation

Parameter	Value	Reference
White blood cells	13.4 x10 ³ /μL	4.0 - 11.0
Haemoglobin	9.7 g/dL	13.5 - 17.5
Platelets	9 x10 ³ /μL	150 - 450
Neutrophils	2.6 x10 ³ /μL	1.5 - 7.5
Fibrinogen	100.3 mg/dL	200 - 400
D-dimer	>15000	<500

Clinical picture: severe thrombocytopenia, low fibrinogen and high D-dimer indicate disseminated intravascular coagulation.

4 Diagnostic Workup



Flow cytometry: 73% blasts, MPO, CD33 and CD13 positive; negative for CD34 and HLA-DR, a hallmark profile of acute promyelocytic leukemia.

FINAL DIAGNOSIS
Therapy-related acute promyelocytic leukemia

5 Why Etoposide, Not Ifosfamide

Feature	Etoposide (topo II)	Ifosfamide (alkylating)
Latency	1 to 3 yr (here ~3.3)	5 to 7 yr
Preceding MDS	Absent, sudden	Common
Cytogenetics	Balanced t(15;17)	Unbalanced -5, -7
Prognosis	As de novo	Generally poor

Short latency, no myelodysplastic phase and balanced t(15;17) point to etoposide as the cause.

6 Treatment And Outcome

Empirical ATRA
Started on morphologic suspicion, before molecular confirmation

ATRA + idarubicin
Risk-adapted induction (high risk, WBC >10)

Complete Remission
18 May 2026: morphology CR, FISH negative

Consolidation
ATRA + arsenic trioxide (ongoing)

7 Conclusion

This case shows the classic short-latency, topoisomerase II inhibitor pathway to therapy-related acute promyelocytic leukemia. The balanced t(15;17), absent myelodysplastic phase and 3.3-year latency after etoposide mark it as a secondary leukemia that keeps the favourable prognosis of de novo disease.

8 Clinical Pearls

- ✓ Stay vigilant: new cytopenias in a treated survivor warrant urgent marrow evaluation.
- ✓ Know the window: topoisomerase II inhibitors cause leukemia within 1 to 3 years, no myelodysplastic phase.
- ✓ The exception: therapy-related disease here keeps a de novo prognosis.
- ✓ Treat on suspicion: start ATRA on morphology, before genetic confirmation.
- ✓ Control coagulopathy: aggressive fibrinogen and platelet replacement prevents fatal haemorrhage.
- ✓ Anticipate: watch for differentiation syndrome; give steroids when WBC is high.

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