ETP/Myeloid Mixed Phenotype Acute Leukemia: A Provisional Entity

Abhimanyu Sharma¹ · Namrata Kaul¹ · Neha Singh¹ · Anurag Mehta¹

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ETP-ALL is a newer entity incorporated in the 2017 WHO revised classification of hematolymphoid neoplasms characterized by expression of one or more stem cell/myeloid antigens such as CD34, CD33, CD13, HLA-DR, CD117, CD65, CD11b etc. in addition to the T cell antigens and lack CD1a, CD8 and CD5 (may be dim to negative). By definition, MPO is negative. If MPO is positive in the presence of ETP-ALL immunophenotype, it must be characterized as T/myeloid MPAL [1]. A new provisional entity, ETP-myeloid MPAL has been proposed recently in

addition to the already existing ETP ALL by Patel et al. on the basis of significant overlap between the immunophenotype (CD117, CD13 and CD33 positive) and molecular profiling (higher frequency of DNMT3 and FLT3 mutations) of these patients [2], hence supporting the notion of lymphocyte-primed multipotent progenitors due to promiscuity between immature precursor T cells and myeloid lineages. We report 2 such cases which fall in the domain of ETP-myeloid MPAL (Table 1; Figs. 1, 2, 3).

✉ Neha Singh
drnehasingh123@gmail.com

¹ Department of Pathology, Rajiv Gandhi Cancer Institute and Research Centre, Sector 5, Rohini, Delhi 110085, India

Table 1 Clinico-hematologic characteristics of two ETP-myeloid MPAL patients

Variables	Case 1	Case 2
Age/sex	59 years/male	44 years/male
Hemogram	Hb-9.1 gm/dl/TLC-2130 cells/mm ³ /platelet count-53,000/mm ³	Hb-10.2 gm/dl/TLC-5060 cells/mm ³ /platelet count-10,000/mm ³
Bone marrow blasts % at diagnosis	55 (occasional Auer rods seen)	96 (occasional Auer rods seen)
Immunophenotyping		
(A) Positive markers	CD34, CD99, HLA-DR, MPO, CD117, CD33, CD123, CD11c, cyto CD3, CD5(DIM), CD7, CD38, CD16, CD56	CD34, CD99, HLA-DR, MPO, CD33, CD64, CD123, CD11c, CD10, cyto CD3, CD7, CD38, CD56
(B) Negative markers	CD1a, CD13, CD8, CD14, CD36, CD64, CD19, CD10, CD79a, CD22, CD20, Surface CD3	CD1a, CD13, CD8, CD14, CD36, CD19, CD10, CD117, CD79a, CD22, CD20, Surface CD3, CD5
Cytogenetics	Normal	del11q23
FLT3 mutation	Negative	Negative
CNS and testis involvement	Not seen	Not seen
Treatment	UKALL protocol	UKALL protocol
Follow-up duration in months	7 months	Lost to follow-up at 1 month
Last follow-up status	Complete remission post-induction	Blasts 58% at last follow-up

Fig. 1 Immunophenotyping in case 1

Fig. 2 Immunophenotyping in case 2

Fig. 3 Bone marrow morphology

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