Bone Marrow Karyotype

45,XX,-13[4]/ 46,XX,-13,+20[4]/ 46,XX[9]

Two abnormal cell lines: one with monosomy for chromosome 13 and the second with trisomy for chromosome 20 in addition to the monosomy 13

Karyotypically normal cells are also present

Not inconsistent with myeloid disease, but not specific
Further Ix & F/U

- No PB involvement
- CT/MRI: disseminated disease in skin, lungs, liver and dura/CNS
- HODS meeting - Chemotherapy as per AML protocol
- Some good radiological response to Tx
Working diagnosis of Blastic Plasmacytoid Dendritic Cell Neoplasm (BPDCN) & DD
BPDCN – diagnostic challenge

- Rare
- Overlapping features with other entities
- Heterogeneous clinical presentation
- Lack of recurrent and specific chromosomal abnormalities
- Biologically diverse (differ in maturational stage of blast cells, eg variable immunophenotype!)
BPDCN – nomenclature evolution

Mid 1990s
- Agranular CD4+NK-cell leukemia due to its unique agranular morphology and phenotype
- Blastic NK-cell lymphoma due to its expression of NK-cell marker CD56
- CD4+CD56+ haematodermic neoplasm based on morphology, immunophenotype and tropism for the skin

2008 WHO classification: BPDCN is under AML & related precursor neoplasms

2016 revision of WHO classification: BPDCN is under myeloid neoplasm and acute leukemia

Arber et al. Blood 19 May 2016 Vol127 No20

British Lymphoma Pathology Group Spring/Summer meeting 2016
Schematic diagram of the origin. Both macrophages and dendritic cells (antigen presenting cells) are derived from common bone marrow precursor. In contrast, follicular dendritic cells are thought to be of non-haematopoietic origin, most if not all cells positive; -, all cells negative; -/+ , a minority of cells positive; v, variable intensity.

WHO 2008 Classification of tumour of Haematopoietic and lymphoid tissues
BPDCN – cell of origin

Precursor plasmacytoid dendritic cell (pDC)

\[ \text{pDC} \] immunophenotype Lin-HLA-DR+ CD56-CD123+CD11c- is distinct from BPDCN

**Plasmacytoid dendritic-like cells (pDLC)** *Osaki et al. PLoS One 2013:*

Lin-HLA-DR+ CD56+

\[ \text{pDLC} \] express blood dendritic cell antigens (BDCA)2, BDCA4, myeloid antigens, Toll-like rc

\[ \text{pDLC/pDC} \] higher in BM than in PB
BPDCN – Epidemiology & Aetiology

Limited literature: hundreds cases

Rare: 0.44% of all hematological malignancies, <1% of acute leukemias, 0.7% of cutaneous lymphoma cases

Associations with prior chemotherapy and myeloid neoplasms - a putative initiating mutation might reside in HSCs or a common myeloid/lymphoid progenitor
BPDCN - presentation

- Nonpruritic cutaneous lesions (tumors, nodules, bruise-like infiltrates, plaques), BM and lymph node involvement
- Splenomegaly, hepatomegaly, cytopenias
- Soft tissues, lungs, CNS involvement
- Less frequently presentation in the leukemic phase without skin involvement
BPDCN – cutaneous involvement


Riaz et al. Cancer Control 279 October 2014, Vol. 21, No. 4
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<th>Reference</th>
<th>No. of Patients</th>
<th>Methods</th>
<th>Chromosome Abnormality</th>
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<td>Leroux et al(^24)</td>
<td>21</td>
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<td>5q, 12p, 13q, 6q, 15q, monosomy 9</td>
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<td>Wiesner et al(^26)</td>
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<td>Tokuda et al(^27)</td>
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<td>IRF4, NFκB, BCL2</td>
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aCGH = array-based comparative genomic hybridization, GEP = gene expression profiling, NA = not applicable, NGS = next-generation sequencing, TS = target sequencing, WES = whole-exome sequencing.