

February case of the month

ALL LEUKEMIAS DON'T
READ THE BOOK

HISTORY

- 15 Year old female
- Low back pain since one month
- No fever/ rash/ bleeding/ night sweats/
steroid intake

Investigations

CBC

- Hemoglobin: 11.4 gm/dl
- WBC count: 6630/cumm
- Platelet count: 3,92,000/cumm

BIOCHEMISTRY

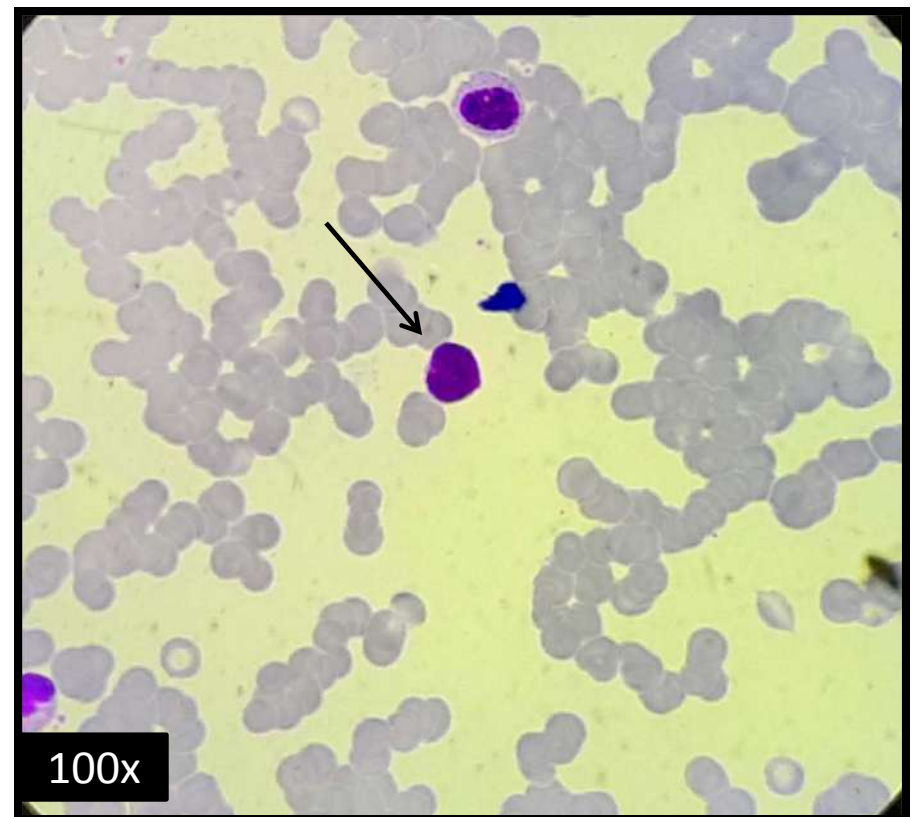
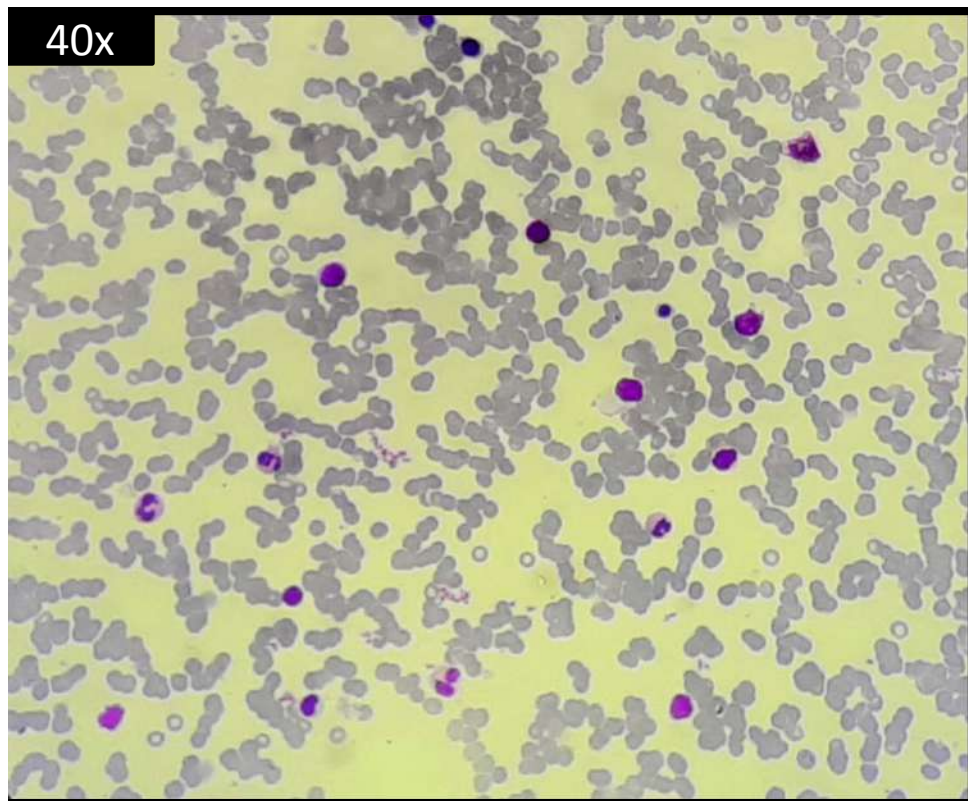
Serum LDH: 224 U/L

LFT, KFT: Normal limits

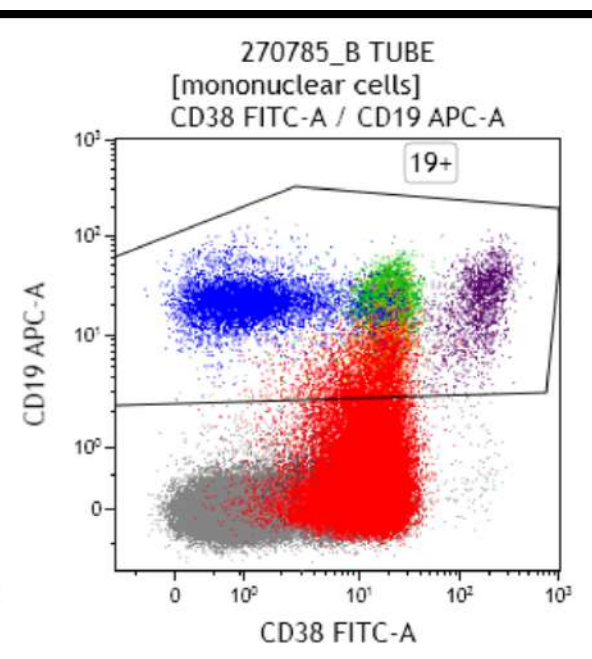
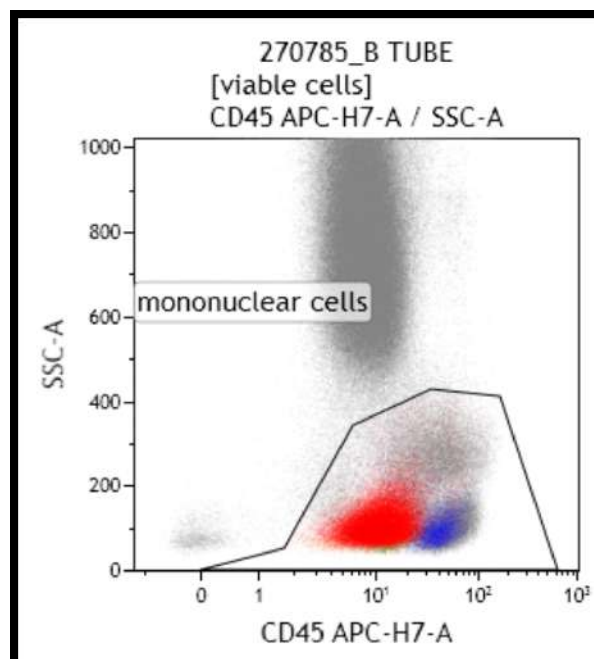
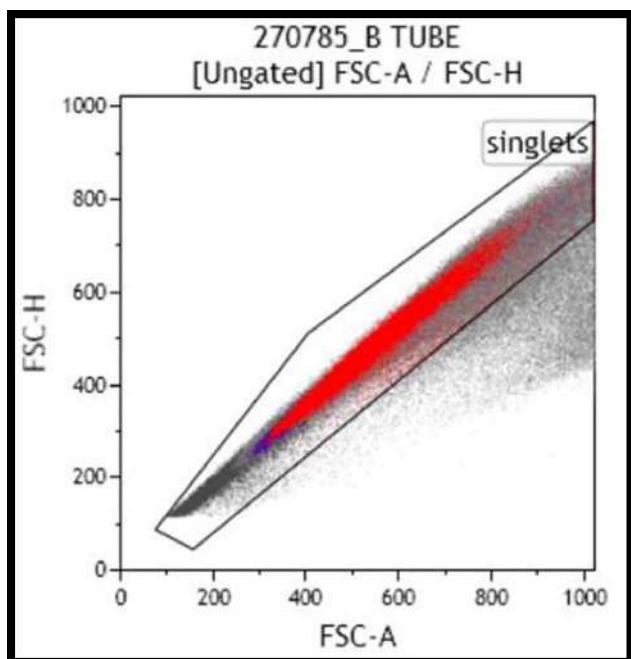
PET CT: FDG avid lesions in LIVER and CNS and multiple bony lesions

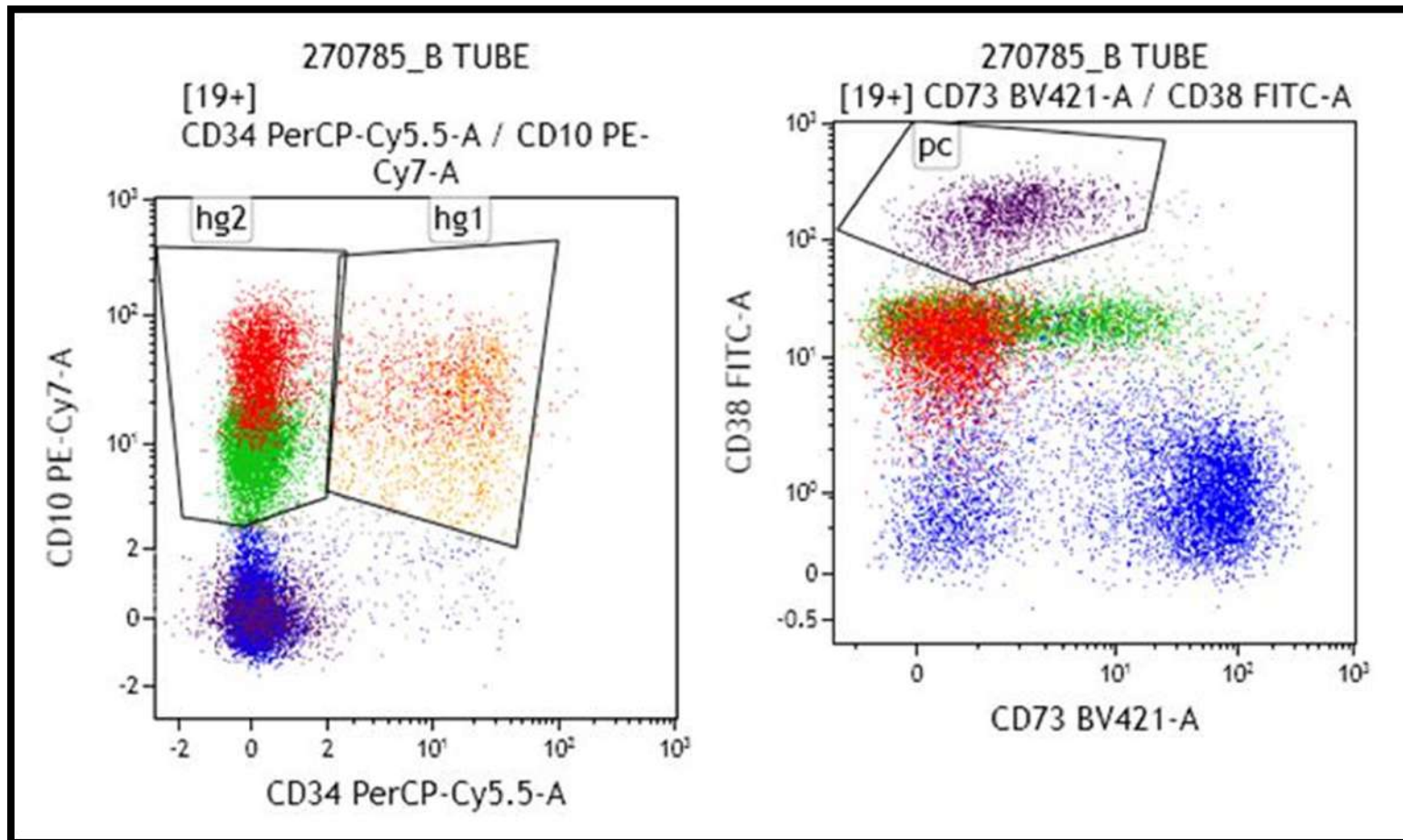
BONE MARROW ASPIRATE

- MORPHOLOGICALLY FAIRLY CELLULAR MARROW WITH 8% BLASTS

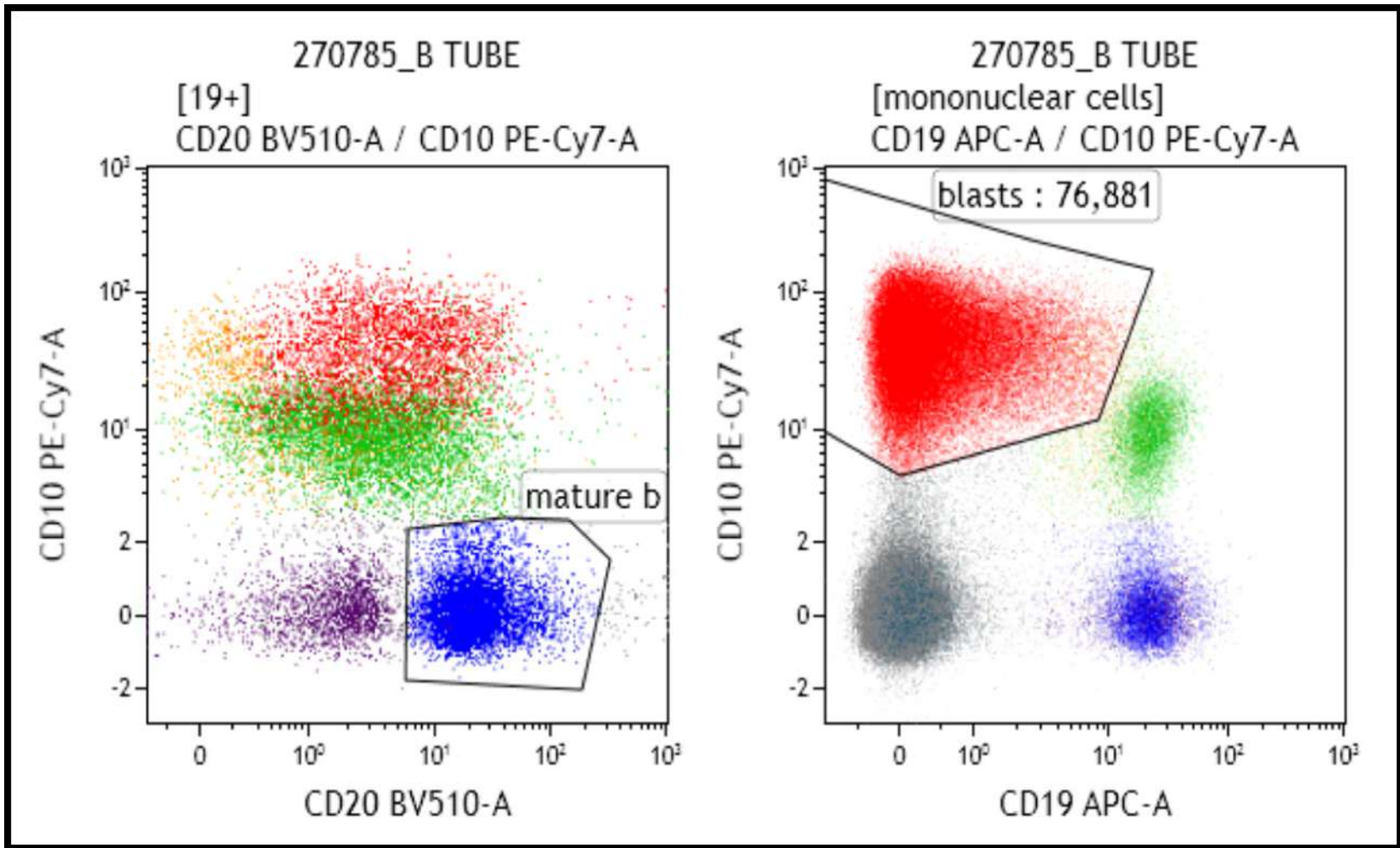


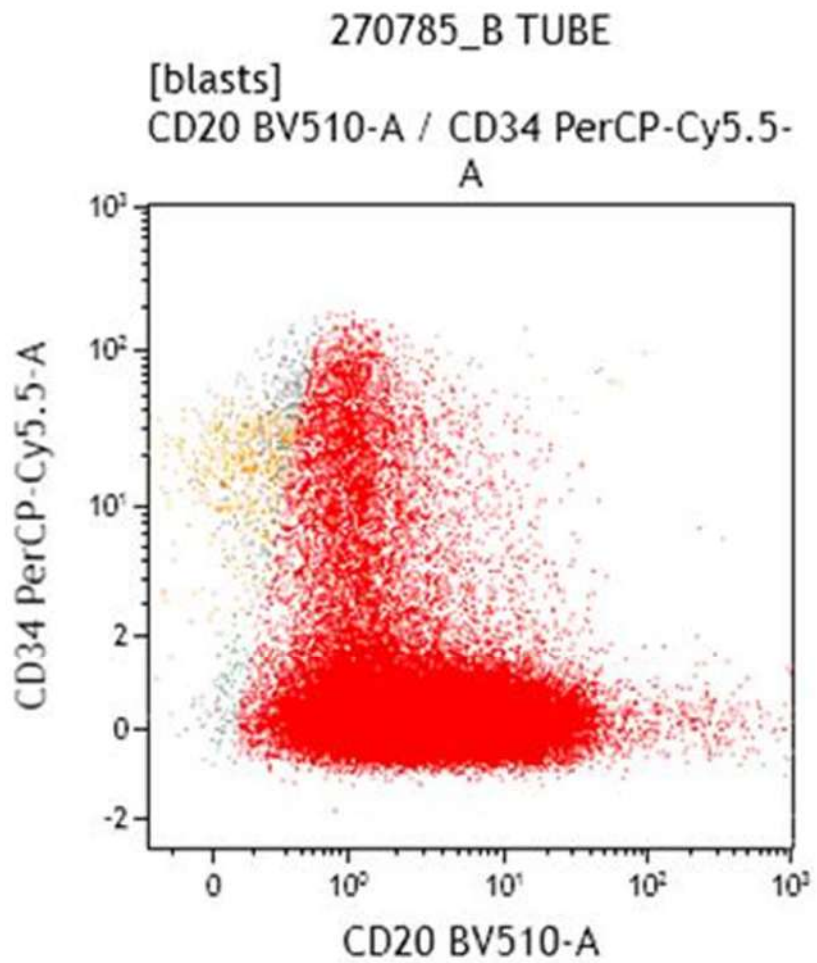
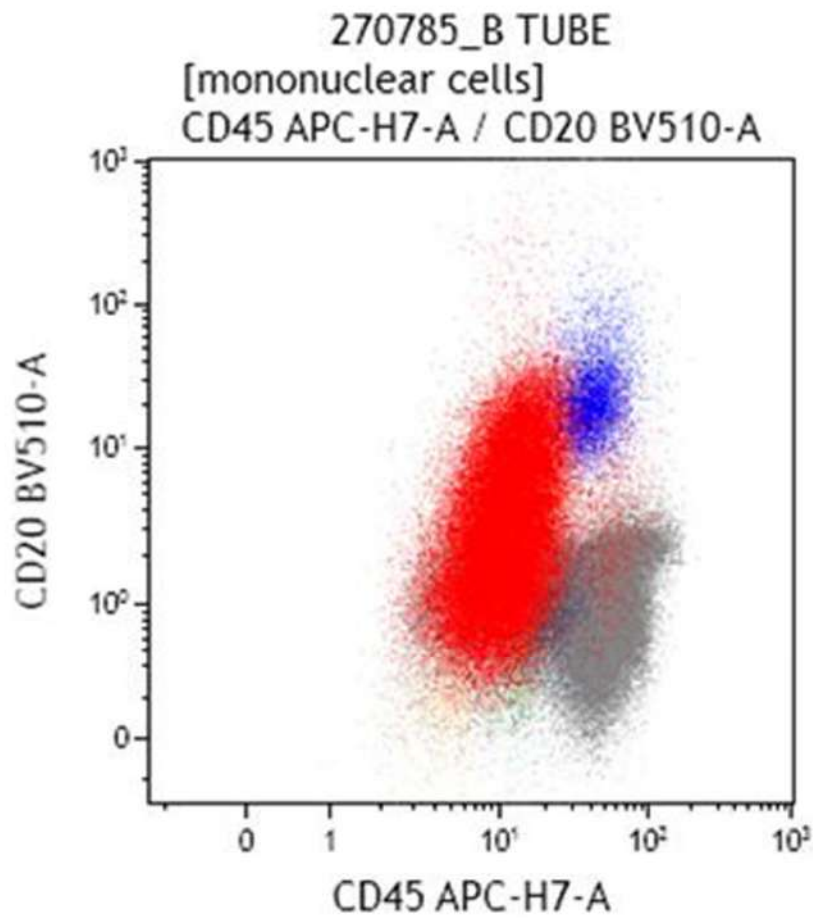
Immunophenotype

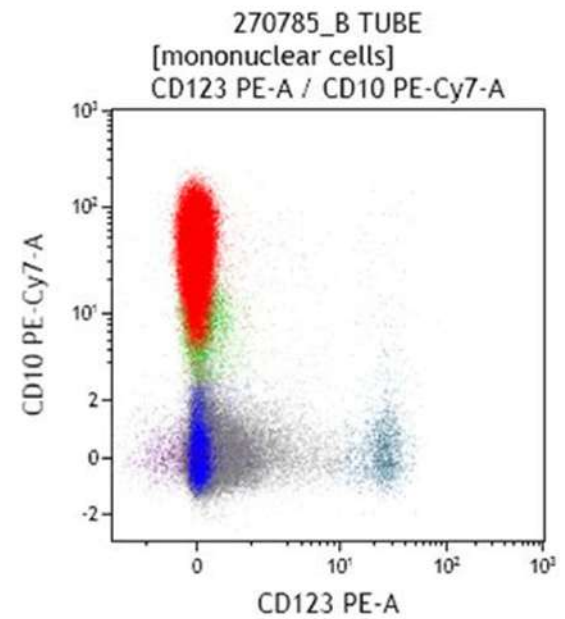
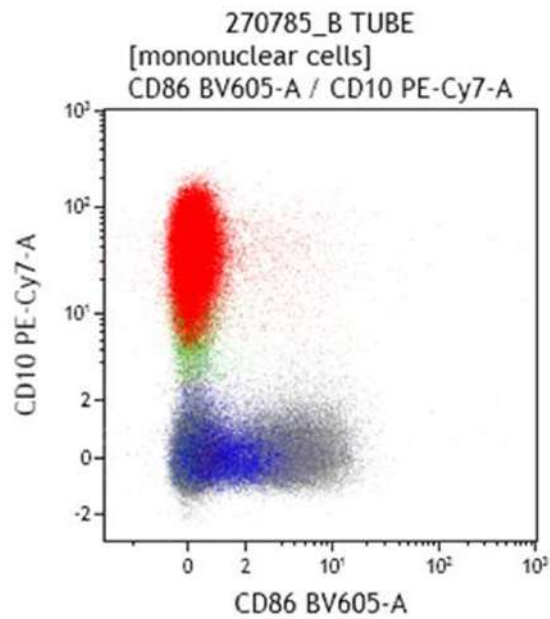
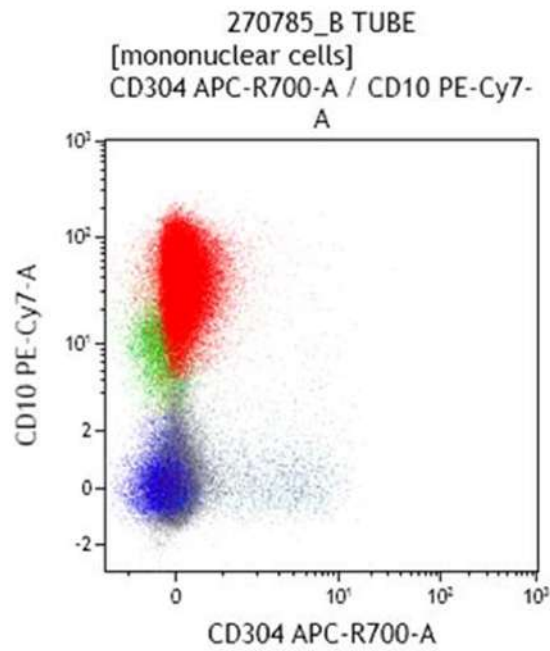
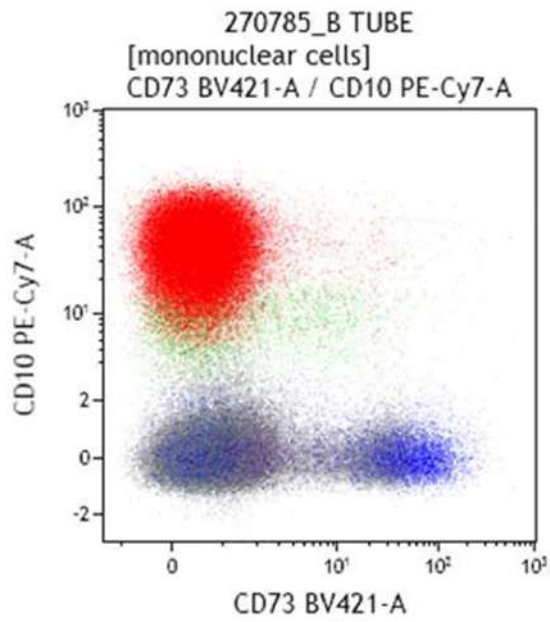




PC is plasma cells, HG1 and HG2 are hematogones stage 1 and stage 2

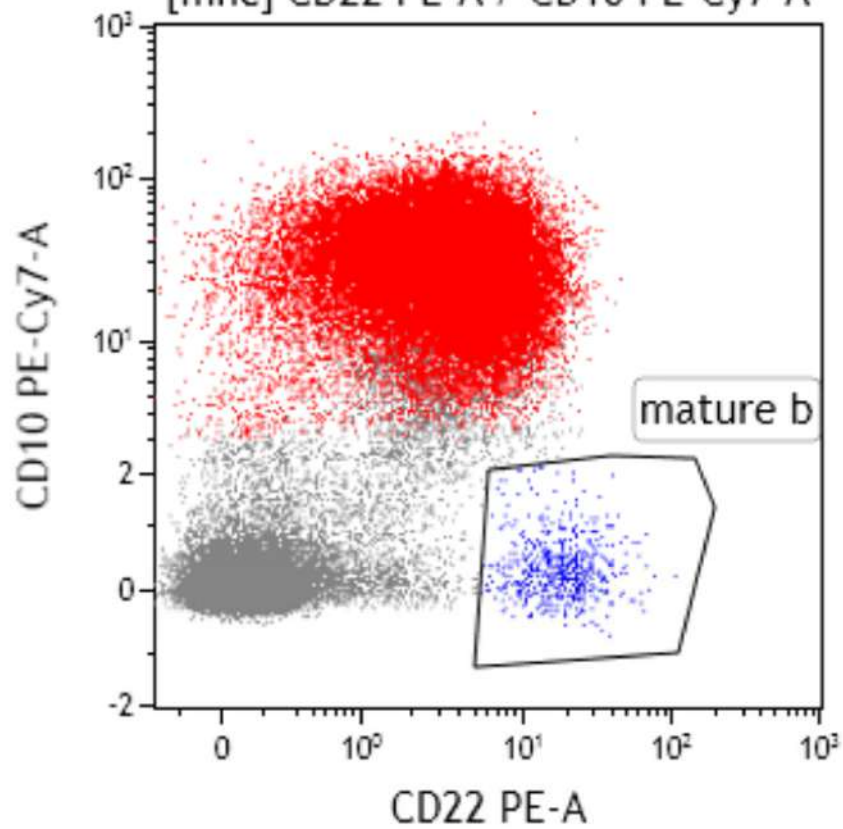






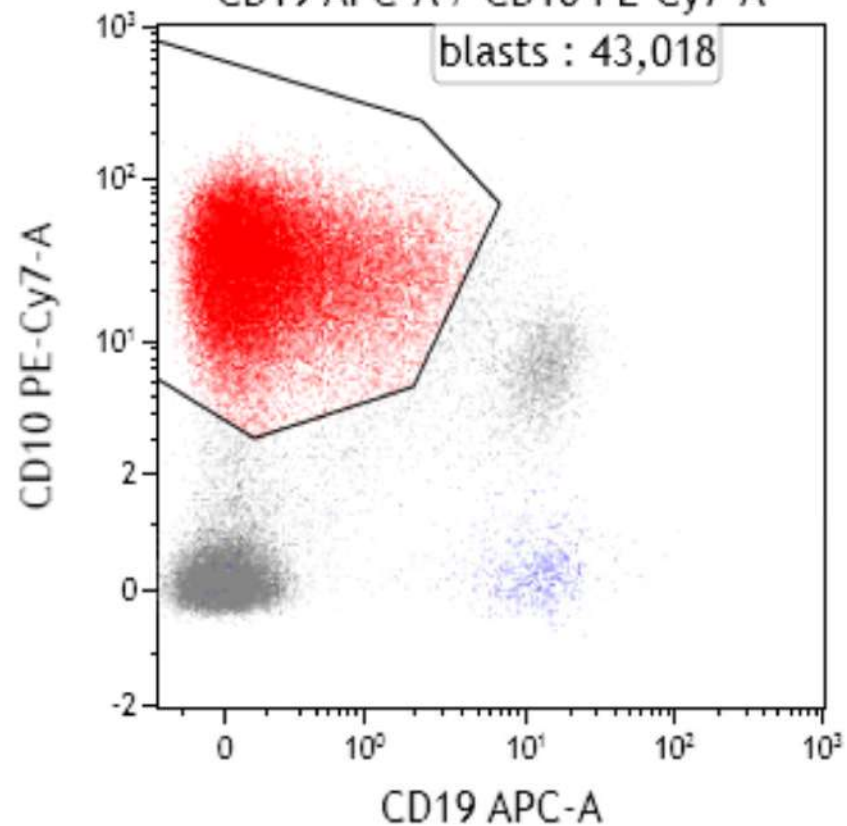
270785_Tube_001

[mnc] CD22 PE-A / CD10 PE-Cy7-A

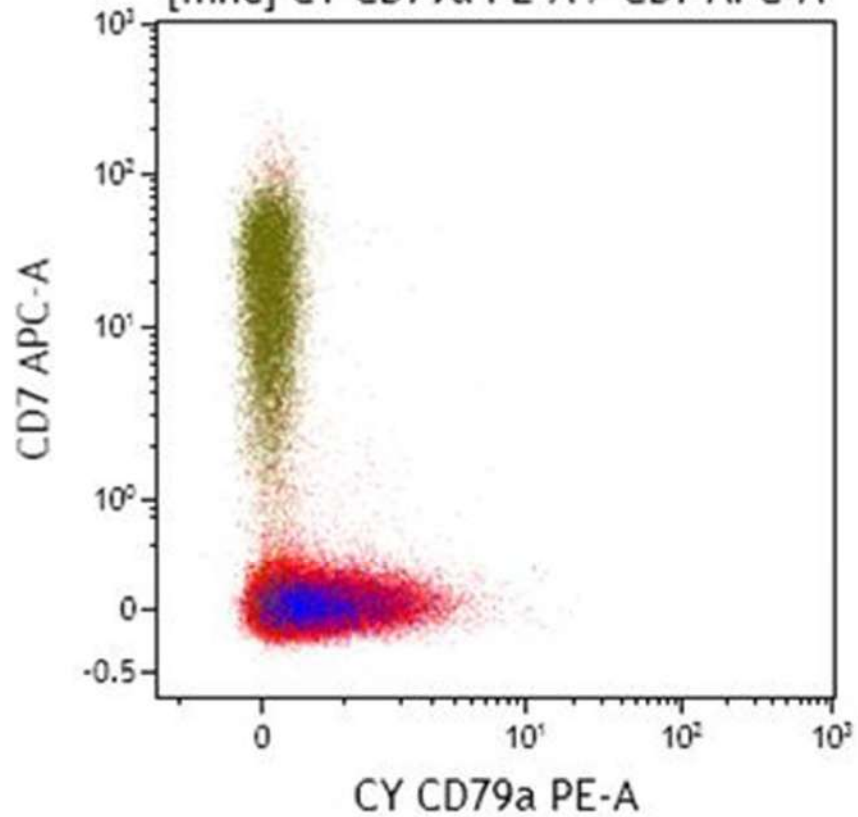


270785_Tube_001

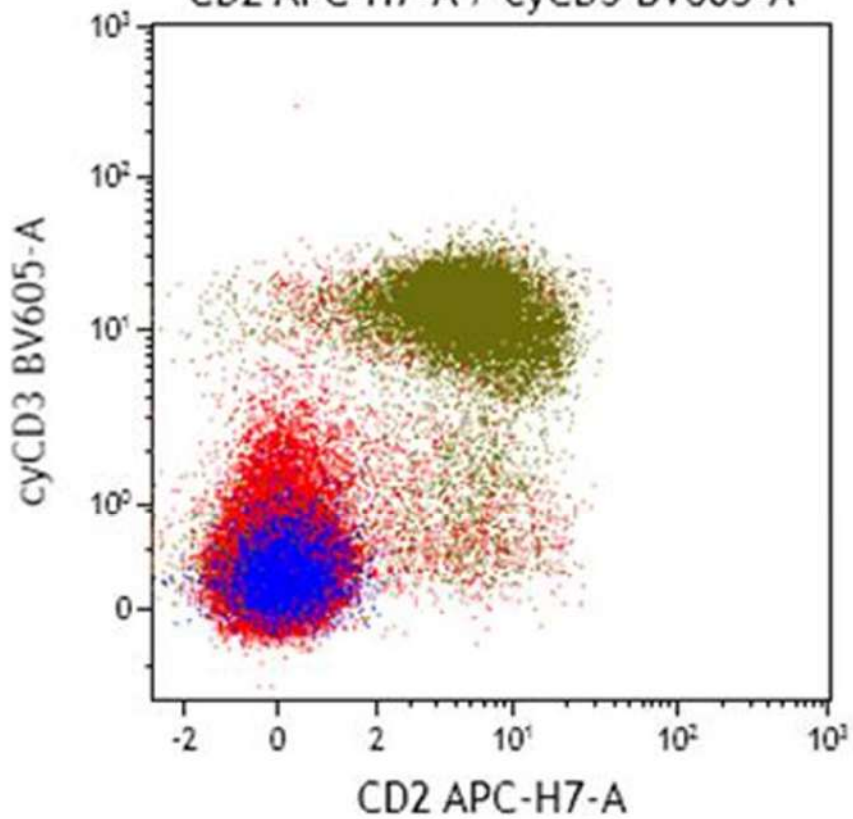
[mnc]
CD19 APC-A / CD10 PE-Cy7-A

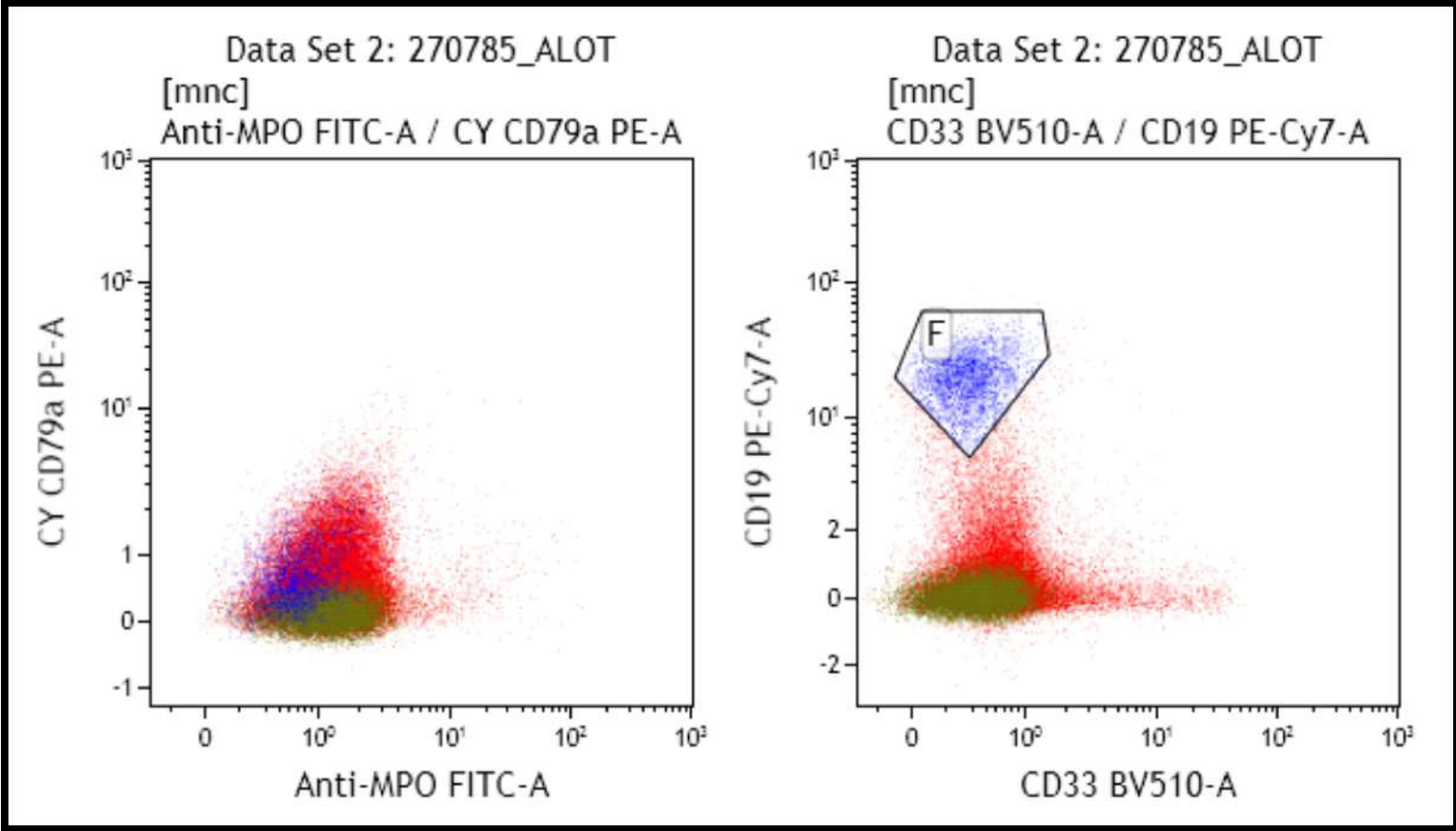


Data Set 2: 270785_ALOT
[mnc] CY CD79a PE-A / CD7 APC-A



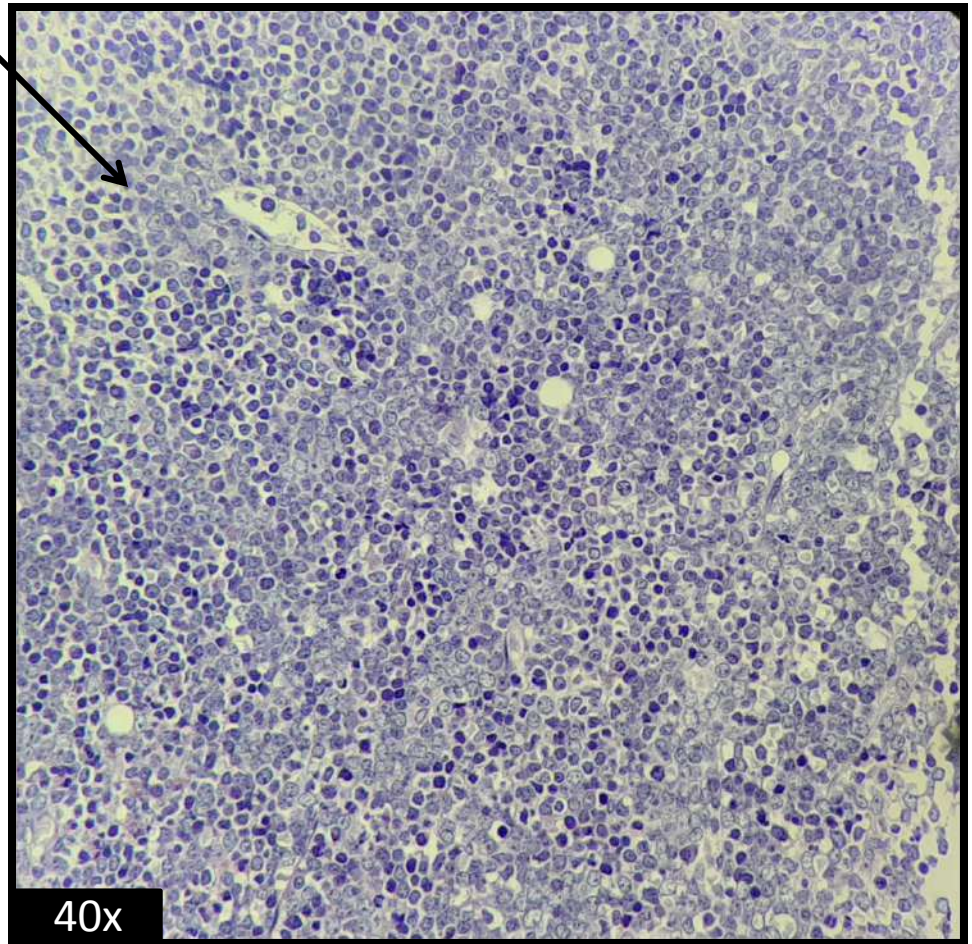
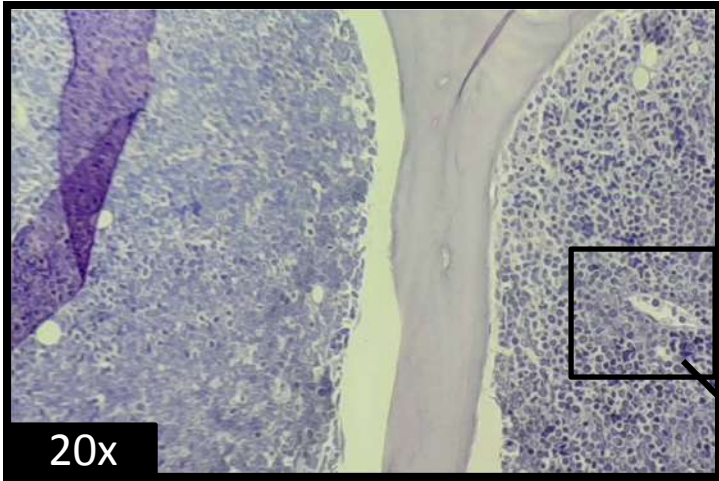
Data Set 2: 270785_ALOT
[mnc]
CD2 APC-H7-A / cyCD3 BV605-A

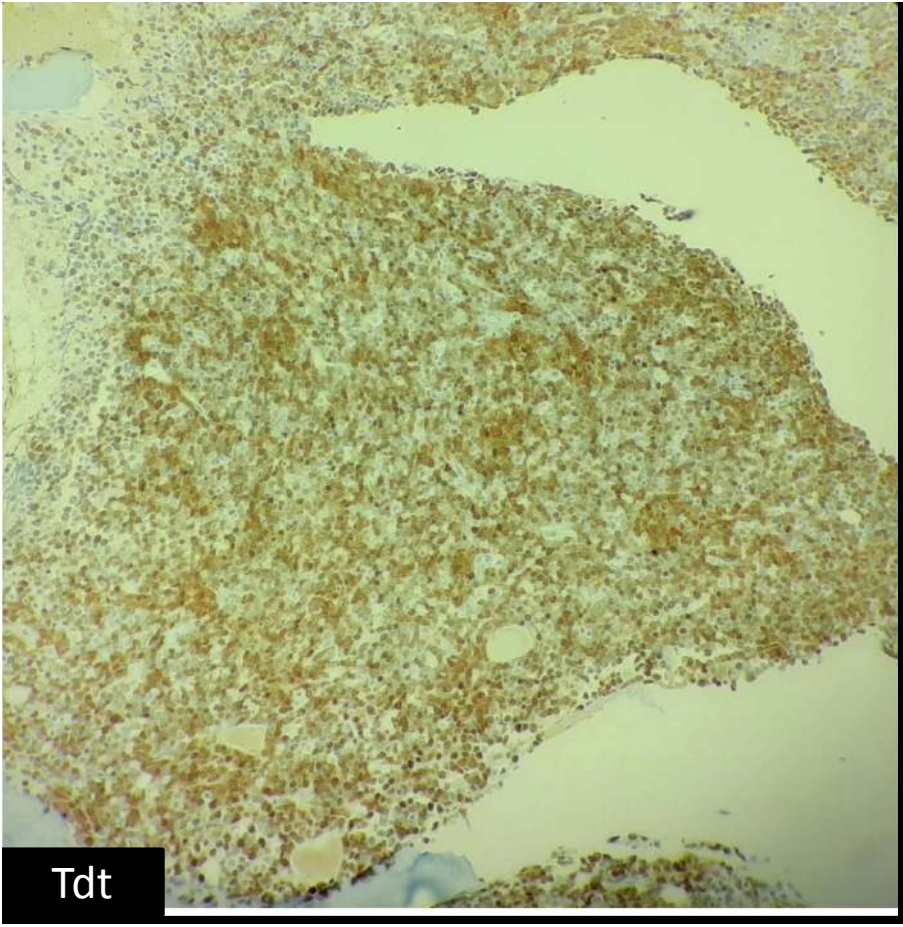




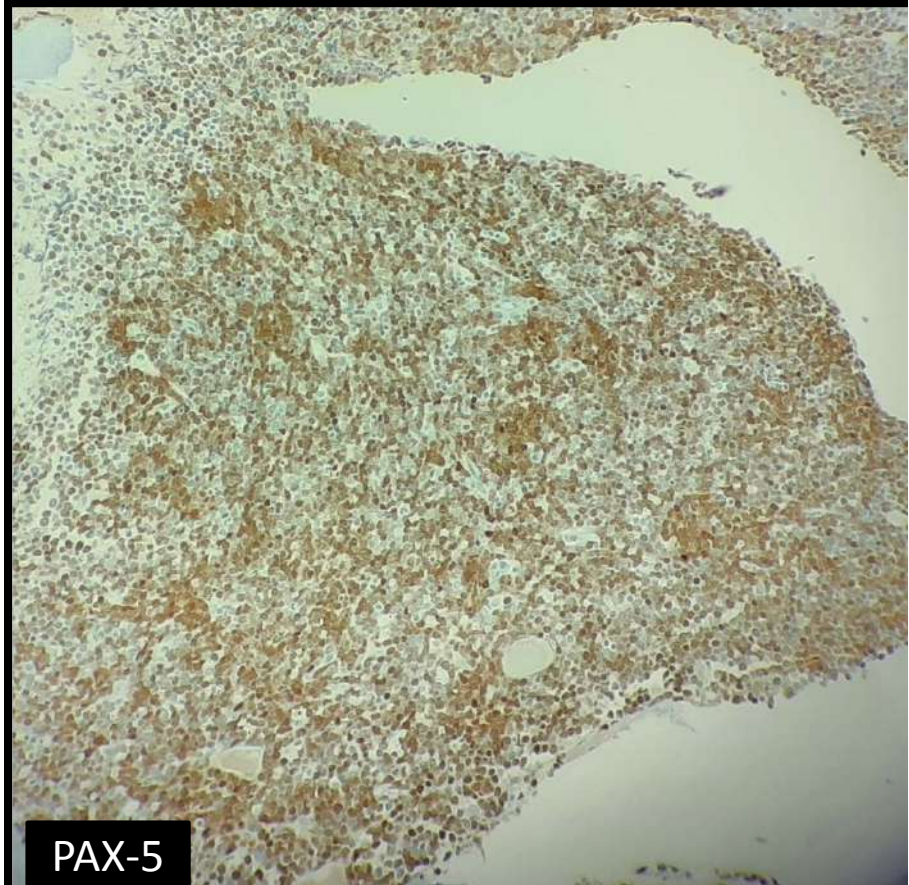
IMMUNOPHENOTYPIC DIAGNOSIS

- **IMMUNOPHENOTYPIC ANALYSIS REVEALED 9.8% ABNORMAL 'B' BLASTS SUGGESTIVE OF B-CELL ACUTE LYMPHOBLASTIC LEUKEMIA/LYMPHOMA (? PATIALLY TREATED).**
- CD45 moderate, CD19 dim to negative, CD10 bright, CD79a dim to negative, CD22 dim to moderate, CD20 dim to neg, CD79a dim to neg and CD34 negative. T cells markers and myeloid markers are negative





Tdt



PAX-5

- **BONEMARROW BIOPSY SHOWED SHEETS OF BLASTS IN 10/13 TRABECULAR SPACES**
- **IN CORRELATION WITH SHEETS OF BLASTS ON BONE MARROW BIOPSY, A DIAGNOSIS OF B-CELL ACUTE LYMPHOBLASTIC LEUKEMIA TO BE CONSIDERED.**

CLICHES IN THIS CASE

- Patient did not present with usual leukemia symptoms
- CBC is normal, No thrombocytopenia or anemia in patient
- Immunophenotype show dim to negative expression of lineage specific marker CD19

POINTS SUPPORTING DIAGNOSIS

- Though CD19 negative, strong CD10 positivity and homogenous expression of CD22 direct towards b-lineage
- Tdt expression by flowcytometry points towards BCPALL
- Tdt expression and PAX-5 on bone marrow biopsy confirm BCPALL

Take home message...

- **CD 19 negative BCPALL is very rare.**
- **In absence of CD19, other markers specifying lineage to be looked for..**
- **Packed marrows sometimes give rise to less blasts on aspirate smears**
- **CD19 negative BCPALL present with aleukemic presentation(see references)**
- **On follow up of such cases for MRD analysis, markers which are strongly positive(Example CD10 in this case) should be used as gating strategy instead of usual CD19 gating strategy for MRD analysis.**

References

- Ghodke K, Bibi A, Rabade N, Patkar N, Subramanian PG, Kadam PA, Badrinath Y, Ghogale S, Gujral S, Tembhare P. CD19 Negative Precursor B Acute Lymphoblastic Leukemia (B-ALL)—Immunophenotypic Challenges in Diagnosis and Monitoring: A Study of Three Cases. *Cytometry Part B* 2017; 92B: 315–318.
- Hussein S, Pinkney K, Jobanputra V, Bhagat G, Alobeid B. CD19-negative B-lymphoblastic leukemia associated with hypercalcemia, lytic bone lesions and aleukemic presentation. *Leuk Lymphoma* 2015;56: 1533–1537.