HLS - fined

① ITp: IgG against GpIIb/IIIa } Acquired → Acute: children
→ chronic: Adults F > M

② Heparin-Induced thrombocytopenia: IgG against PF-4 } Acquired

③ TTp: ADAMST 13 (vWF) } Genetic
④ HUS: Shiga-toxin "E. coli" } Acquired (children)
→ schistocytes

⑤ Glanzmann: Def. of GpIIb/IIIa receptors (CD41/CD61 complex) } Autosomal recessive ⊕ AI "acquired"
⑥ Bernard Soulier: Def. of Gb1B (CD42b) } Autosomal recessive
→ flow cytometry

⑦ vWD: ↓↓ vWF ⊕ ↓↓ Factor VIII } Autosomal Dominant → prolonged PTT only

⑧ Hemophilia A: ↓↓ Factor VIII or Non-functional } X-Linked → *No skin peteehia, *prolonged PTT, * specific assay test
⑨ Hemophilia B: ↓↓ Factor IX } X-Linked → prolonged PTT, Factor assay test
→ Mixing study

⑩ DIC: consumption of clotting factors } Acquired → prolonged PT & PTT ⊕ schistocytes

⑪ HLH:
- Type 1: Homozygous in PRF1 / Infants & children
- Type 2: X-Lined SLAM protein / Adults / EBV
- Type 3: Heterogenous in CD8 + T-cells
- Type 4: T-cell lymphoma

WBC's Disorders

① ALL:
mutations in Transcription factors involved in maturation ⊕ RAS & Tyrosine kinases / Flow cytometry

- → B-ALL: PAX5 / Hyperdiploidy
  - → Children: t(12;21) ETV6 ⊕ RUNX1
  - → Adults: t(9;22) ABL & BCR
  -] CD 34, +DT ⊕ CD19, 20, 22 ⊕ CD10
- → T-ALL: NOTCH1 / PTEN ⊕ CDKN2A] CD34, tDt ⊕ CD2-8 ⊕ CD10

② AML:
RAS & Tyrosine kinase & P53 & mutated IDH / Auer Rods] → CD34, MPO ⊕ CD13, 33

"Anemia ⊕ Neutropenia ⊕ Thrombocytopenia"

- → Ⓐ APL: t(15;17) PML → RARA / Auer Rods "8" nuclei] → ⊖ for CD34
- → Ⓑ MDS: chromosomal aberration
  - Monosomy 5
  - Monosomy 7
  - Deletion of 5q, 7q, 20q
  - Trisomy 8
  - ⊕ Mutation in DNA methylation & Histone modif. ⊕ P53 ⊕ RNA splicing factor → RNA Sideroblasts "تكررت علي الالاسيميا"
  -] old age

③ CLL:
↑BCL2 ⊕ Rare translocation of chromosomes ⊕ Active BCR ↓ Active Bruton Tyrosine Kinase (BTK)] → Bcl2 ⊕ CD19, 20 ⊕ CD5

- * Smudge cells "old age"
- * Richter transformation to DLBCL (prolymphocytes)

④ Hairy Cell Leukemia:
Serine/threonine kinase (BRAF gene)] → old age ⊕ prominent cytoplasmic projections ⊕ BM fibrosis

⑤ Adult T-cell leukemia/lymphoma: Tax protein ⊕ PI3 kinase & cyclin D ⊖↓ CDK inhibitor ⊕→ NF-kB → Hypercalcemia & CD 25⊕

⑥ Mycosis fungoides: cerebriform nucleus ⊕ Sezary syndrome

⑦ peripheral T-cell lymphoma: CD 2, 3, 5, 7

⑧ MPN: Tyrosine kinase / Extramedullary hem.

- Ⓐ CML: Harbor t(9;22) Bcr/Abl → New Tyr. kin. → Basophilia
- Ⓑ polycythemia vera: Tyrosine kinase JAK2 → panmyelosis⊕ ↓Epo ⊕ Basophilia
- Ⓒ primary myelofibrosis: JAK-STAT pathway ⊕ Mpl gene ⊕ JAK2 → Teear Drop ⊕ Leucoerythroblastic Anemia
- Ⓓ Essential thrombocythemia: JAK2 mutation

④ Non-Hodgkin lymphomas:

- Ⓐ Follicular lymphoma: t(14;18) ($CBcl_2 \rightarrow IgH$) ⊕ Epigenetic in histone → CD 20, 10 / Bcl2, 6 / centrocyte & centroblast
- Ⓑ Mantle cell lymphoma: t(11;14) (cyclin $D_1 \rightarrow IgH$) → CD 20, ⊖ for CD10 & Bcl6 / Waldeyer ring ⊕ / lymphomatoid polyposis ⊕ / centrocytes
- Ⓒ Extranodal Marginal Zone lymphoma: Hashimoto & Sjogren syndrome / H. pylori gastritis
- Ⓓ Burkitt lymphoma: t(8;14) (Myc → IgH) warburg metabolism → CD20 → germinal center → CD10, Bcl6 / Tangible body macrophages ⊕ / Starry sky ⊕ / Lipid vacuoles
- Ⓔ DLBCL: t(14;18) Ⓐ ⇒ ($CBcl_2 \rightarrow IgH$) ⊕ mutation in MCY & Bcl6 promoter gene → CD20

⑩ Hodgkin lymphoma: RS cells → CD 15, 30 (+) / CD 3, 20, 45 (-) / PD / IL-5

- Ⓐ Nodular sclerosis: Lacunar cells / children
- Ⓑ Mixed cellularity: EBV / old ages
- Ⓒ Non-classic lymphocyte predominant: lymphohistiocyte · (L&H) ⊕ Variant RS cells → (LP-cells) / popcorn cells

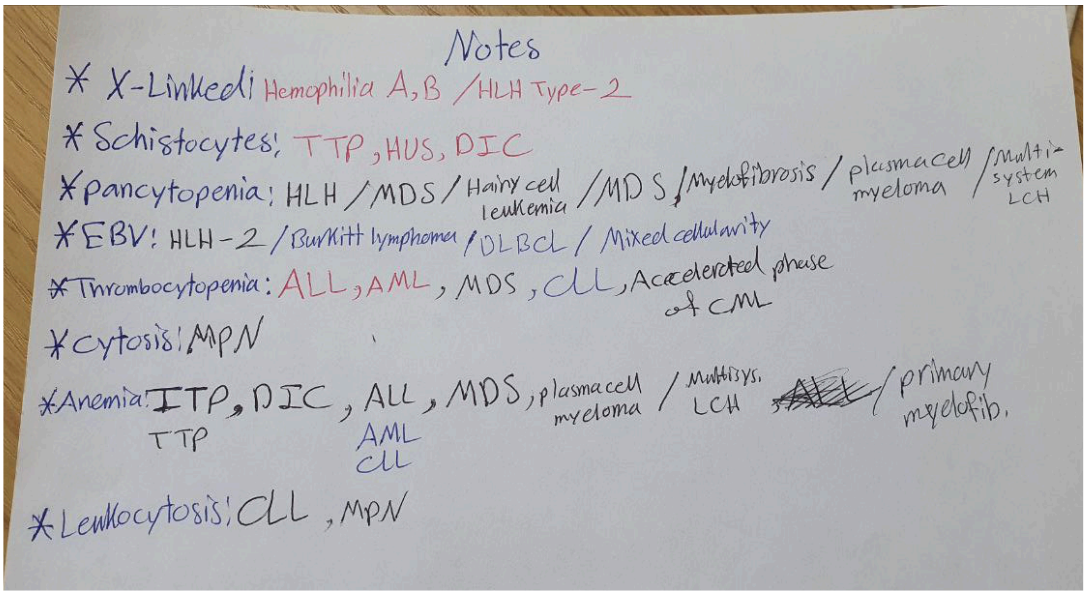
CD 15, 30 (-) / CD 20, 45 (+) ← خلايا الـ Hodgkin فإنها تكون

(11) plasma cell myeloma (Multiple Myeloma) • t(11;14) or Myc • cyclin D_1 or D_3 → IgH

/ *↑↑ESR, *CRAB, *Amyloidosis, *RANKL, *IL-6 → Bence Jones protein ⊕ Roulex formation ⊕ cartwheel chromatin

(12) LCH: CD1a & Langerin → Birbeck granules "Tennis Racket shape" → mutation in serine/threonine kinase (BRAF)

- (A) Multisystems LCH: osteolytic ⊕ pulmonary lesions / children
- (B) Unisystem LCH: Eosinophilic granuloma / Diabetes ⊕ Exophthalmos ⊕ osteolytic lesion → Hamel-schuller-christian Triad



- Good Luck -