Approaches in Hematology

Hematology Made Easy

Normocytic Normochromic Anemia

The DD of Normocytic Normochromic anemia [NCNCA] is classified according to RETICULOCYTES percentage into 2 Categories!!

1. NCNA with reticulocytosis (normal BM with reaction): retics ≥ 2.5%

Either due to

- Hemorrhage (from any site like IT, Urinary tract, vaginal, hemoptysis.

Or

- Hemolysis (acute attack of hemolysis) Either
  - Intravascular hemolysis e.g.G6PD deficiency, Cold AIHA, MAHA in TMA, PNH, incompatible blood transfusion
  - Extra-vascular hemolysis e.g. Sickle cell anemia, Hereditary Spherocytosis, Warm AIHA

2. NCNCA with low retics percentage < 2%

A. Early Anemia of chronic disease (discussed before)
B. BM disease
   1. Aplasia (aplastic anemia): It is not an isolated anemia, either pancytopenia or Bicytopenia with hypocellular BM
   2. Myelodysplasia: Either isolated NCNCA or Bi/Pancytopenia with evidence of BM dysplastic changes
   3. BM infiltrations
      - infiltration from the inside of the BM
        - Acute leukemia (with blasts)
        - Myeloma
      - Infiltration from the outside of the BM
        Lymphoma (origin of infiltration from the LN) {outside the BM}
        Solid malignancy (Breast, lung, kidney, etc.)
        TB
        Fibrosis (myelofibrosis).

Clues for Hemorrhage

- Overt bleeding from:
  - GIT (hematemesis, melena, hematochezia)
  - Genito-urinary (Hematuria, Vaginal bleeding)
  - Hemoptysis if massive
  - After epistaxis if massive
  - After Trauma & RTA

Clues for Hemolysis

- Clinically:
  - Jaundice
  - Dark urine (intravascular hemolysis) = hemoglobinuria.

- Labs
  - High retics
  - High LDH
  - High indirect bilirubin
  - Hemoglobin & hemosiderin in urine
  - Low haptoglobin

Clues for Anemia of chronic disease (ACD): discussed before

Clues for Aplastic Anemia

- Bi or pancytopenia
- Normal spleen size
- Retics % < 2%
- BM exam: hypocellular BM

Clues for MDS

- Isolated NCNCA or Bi/Pancytopenia
- BM: hypercellular in most cases (some cases have hypocellular BM: it might be difficult to differentiate between it and Aplastic anemia)
- The spleen may be enlarged in some types (CMML& MPS/MDS)

Clues for Bone marrow infiltration

- Acute leukemia
  - Blasts in peripheral blood {blood film} + BM
  - Bi/Pancytopenia in CBC or Leukocytosis (either Lymphocyte predominant in ALL & granulocytic predominant in AML)

- CML
  - leukocytosis (neutrophilic)
  - NCNCA
  - Splenomegaly
  - Philadelphia chromosome
  - BM picture in CML

- CLL
  - Lymphocytic leukocytosis with absolute Lymphocytic count > 5000
  - NCNCA
  - ± Splenomegaly
  - ± Lymphadenopathy
  - ± Fever/night fever /night sweats in old people

Clues for Myeloma

- NCNCA
- BM: plasma cells ≥ 10%
- Protein electrophoresis/immunofixation: abnormal paraprotein IgG & IgA
- CRAB features
  - Renal insufficiency
  - Calcium ≥ 10.5
  - Bone osteolytic lesions

Clues for Lymphoma

- Generalized lymphadenopathy.
- ± Splenomegaly
- ± B-symptoms (night fever, sweats, and weight loss)

DX: LN biopsy + immunophenotyping

Clues for infiltration by solid malignancy

Picture of Leuco-erythroblastic picture in blood film (immature RBC + immature WBCs)

- BM biopsy: for malignant cells
- TB: If resp symptoms → sputum test for TB + imagin