Laboratory case reports

Interpretation of blood counts, anemias, bone marrow examination

Case report I - Female, 75 years,

- Admitted for pancytopenia – leu 3.98, neutrofily abs. 3.28, Hb 29, MCV 128, trombo 90
- Další laboratorní vyšetření:
  - Aktivní vitamin B12 8 (norma, 19-119), folát 1.1 (norma, 3.9-26.8)
  - Bilirubin 66, LD 33.6

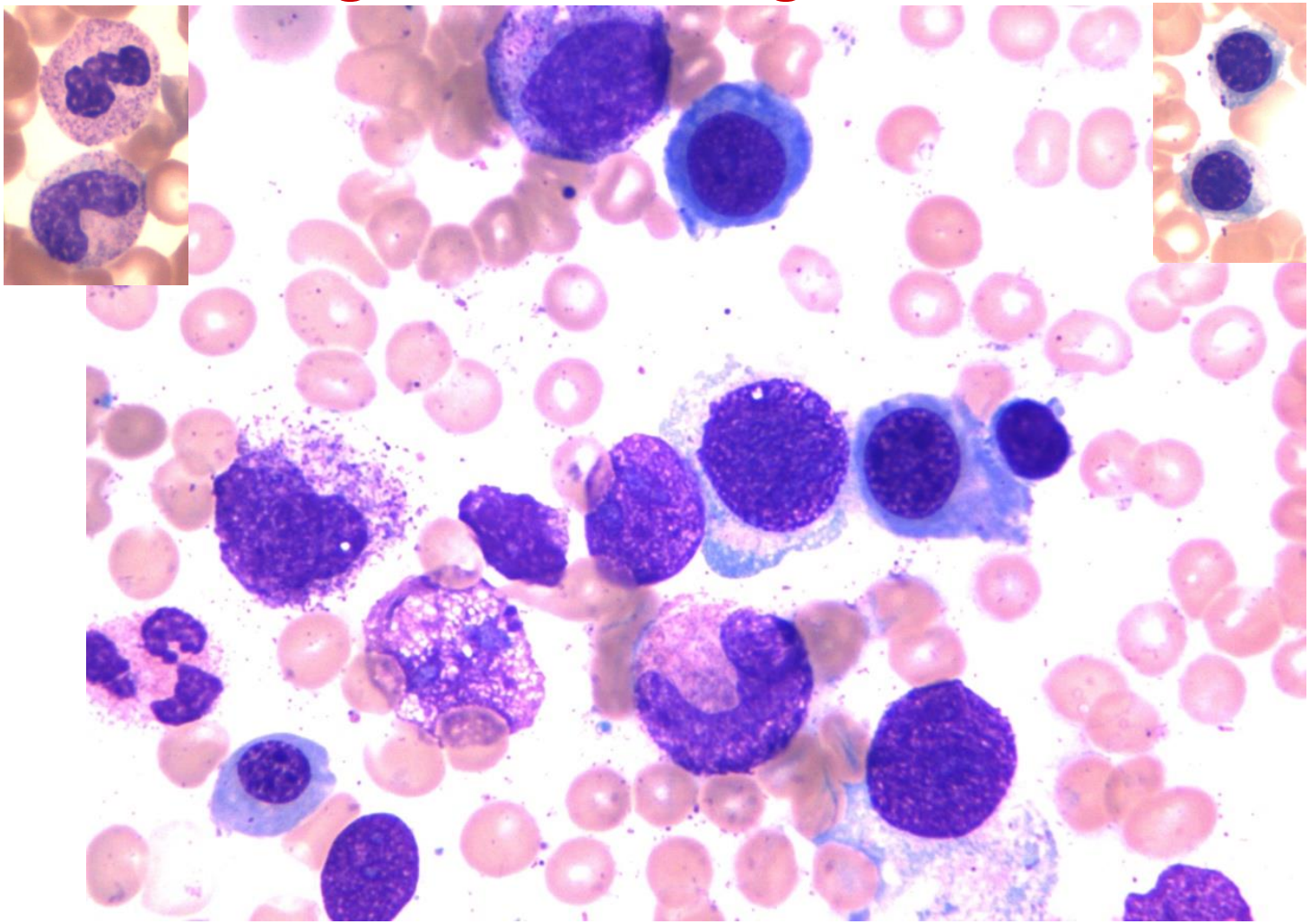
What‘s the diagnosis?

1. Iron deficiency anemia
   - 0
2. Megaloblastic anemia
   - 0
3. Hemolytic anemia
   - 0
4. Not sure, we need to perform bone marrow aspiration
   - 0
5. Not sure, we need to perform direct antiglobulin test (DAT)
   - 0
6. Not sure, wee need to perform bone marrow aspiration and DAT
   - 0

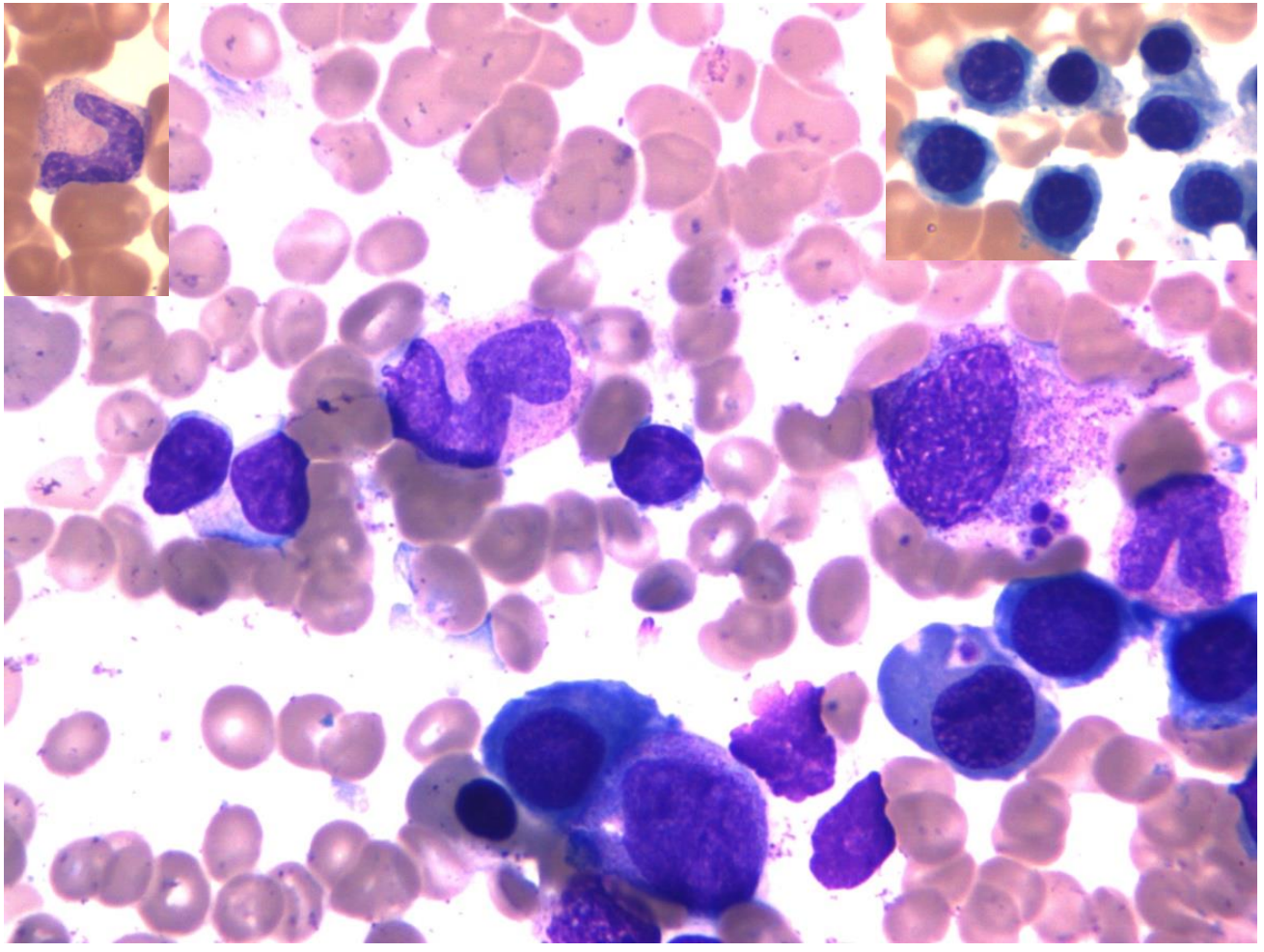
- **Working diagnosis:**
  Megaloblastic anemia,
  bone marrow aspiration requested

Cytology result: Rather than megaloblastic anemia, this is myelodysplastic syndrome

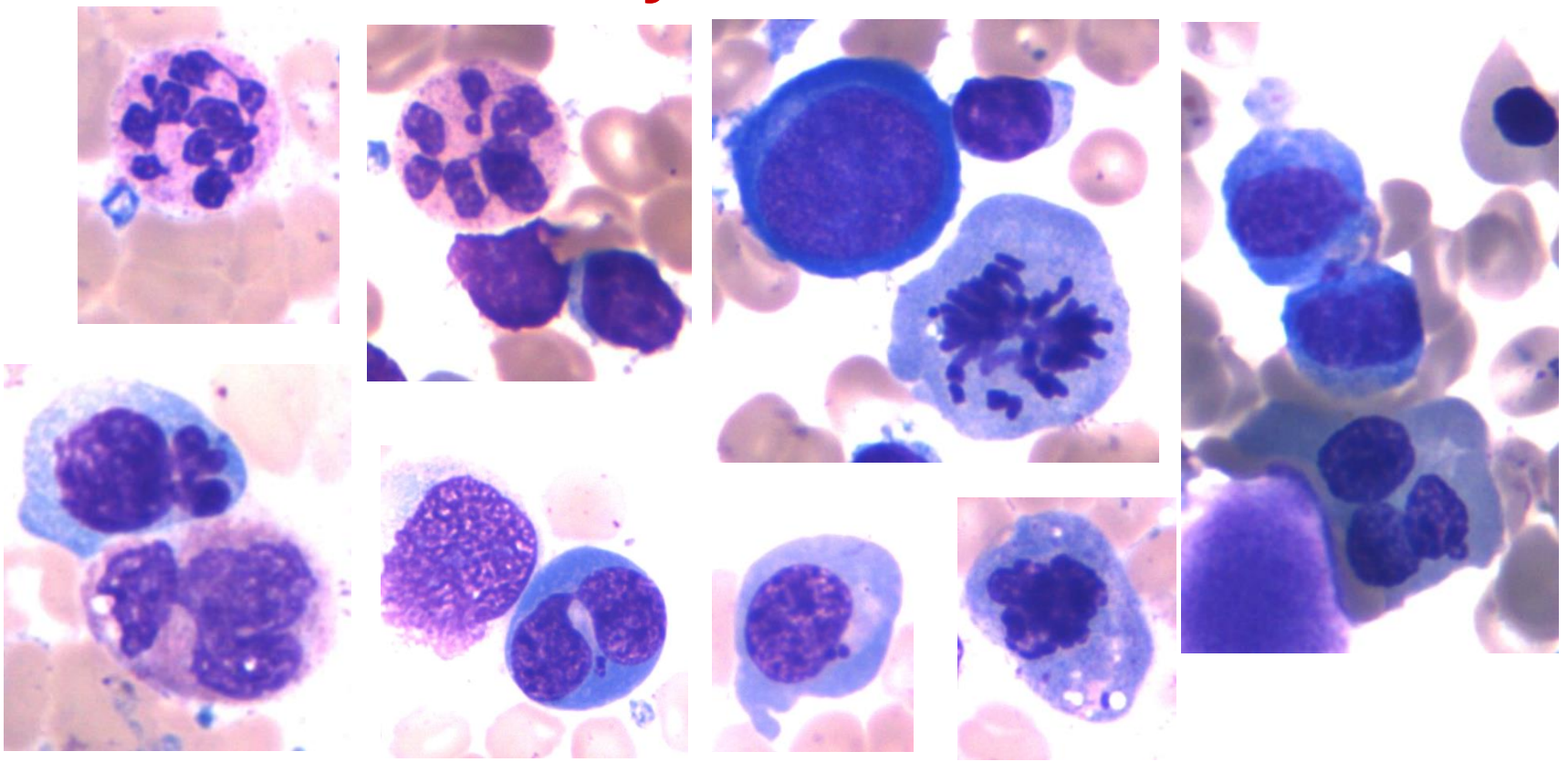
Bone marrow aspirate 1: Megaloblasts, giant rods



Bone marrow aspirate 2: Megaloblasts, giant rods



Bone marrow aspirate 3: hypersegmented neutrophils, bizzare erytroblasts



Final diagnosis:

Megaloblastic anemia

Key examination:

biochemical

Simplified differential diagnosis of anemias

Anemia	Reticulocytes low	Reticulocytes high
Microcytic	**Sideropenic anemia**	**Microangiopathic hemolytic anemia**
Normocytic	**Anemia of chronic diseases**	**Bleeding**
Macrocytic	**Megaloblastic anemia or myelodysplastic syndrome**	**Hemolytic autoimmune anemia**

What is (are) greates problém(s) in differential diagnosis of anemia?

1. Megaloblastic anemia x myelodysplastic syndrome

0

2. Autoimmune hemolytic anemia x anemia of chronic diseases

0

3. Sideropenic anemia x anemia of chronic diseases

0

4. 1+2

0

5. 1+3

0

6. 2+3

0

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When will we ask for bone marrow aspiration?

1. Megaloblastic anemia x myelodysplastic syndrome

0

2. Autoimmune hemolytic anemia x anemia of chronic diseases

0

3. Sideropenic anemia x anemia of chronic diseases

0

4. 1+2

0

5. 1+3

0

6. 2+3

0

What is (are) greates problém(s) in differential diagnosis of anemia?

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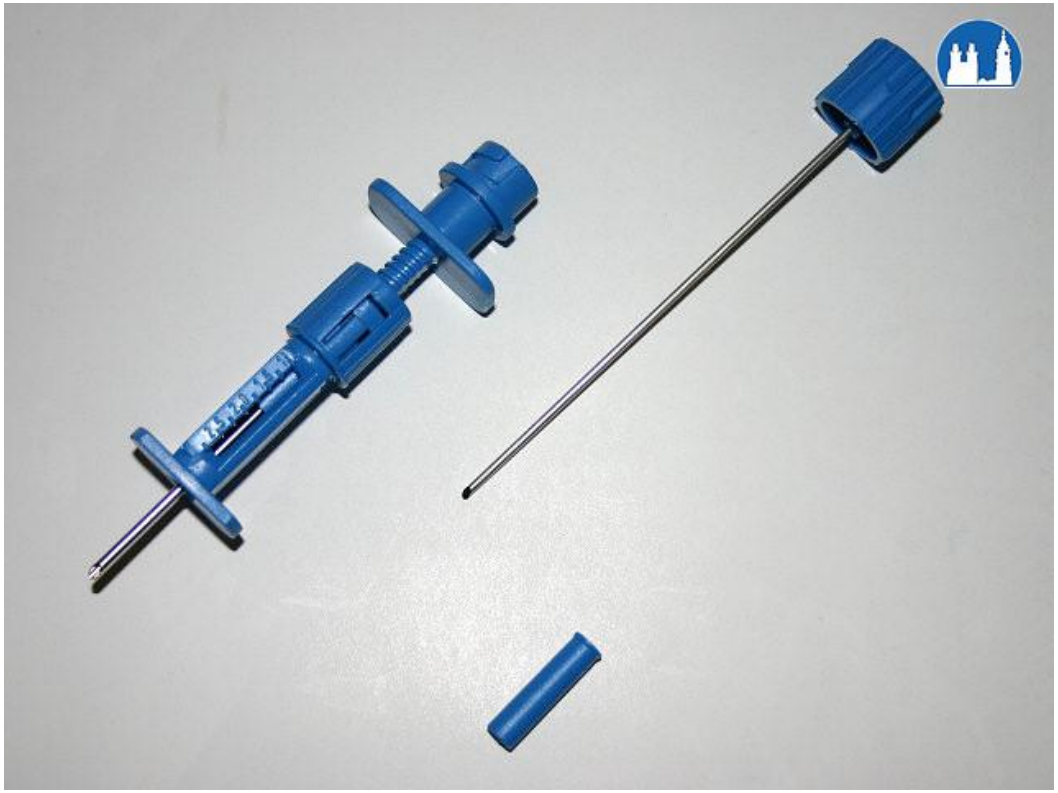
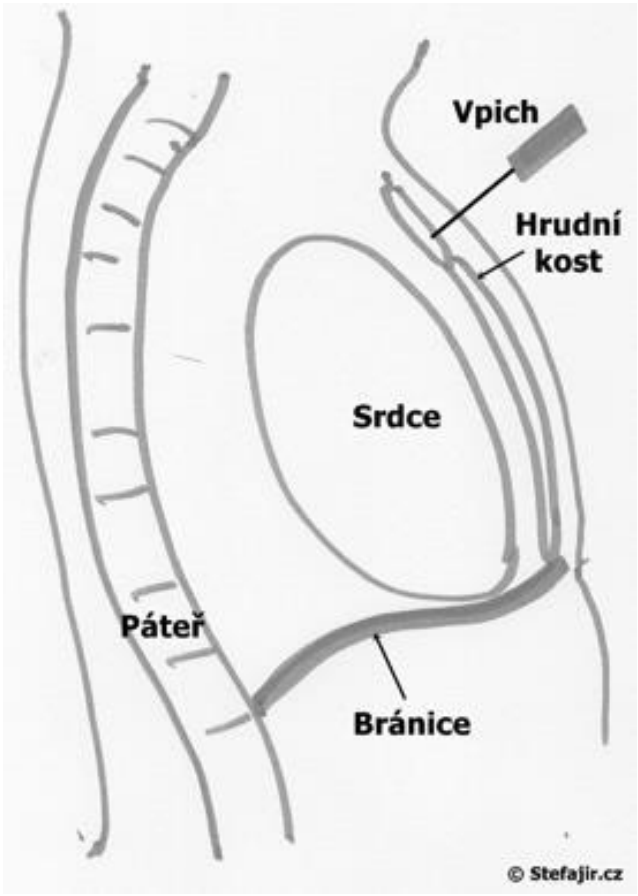
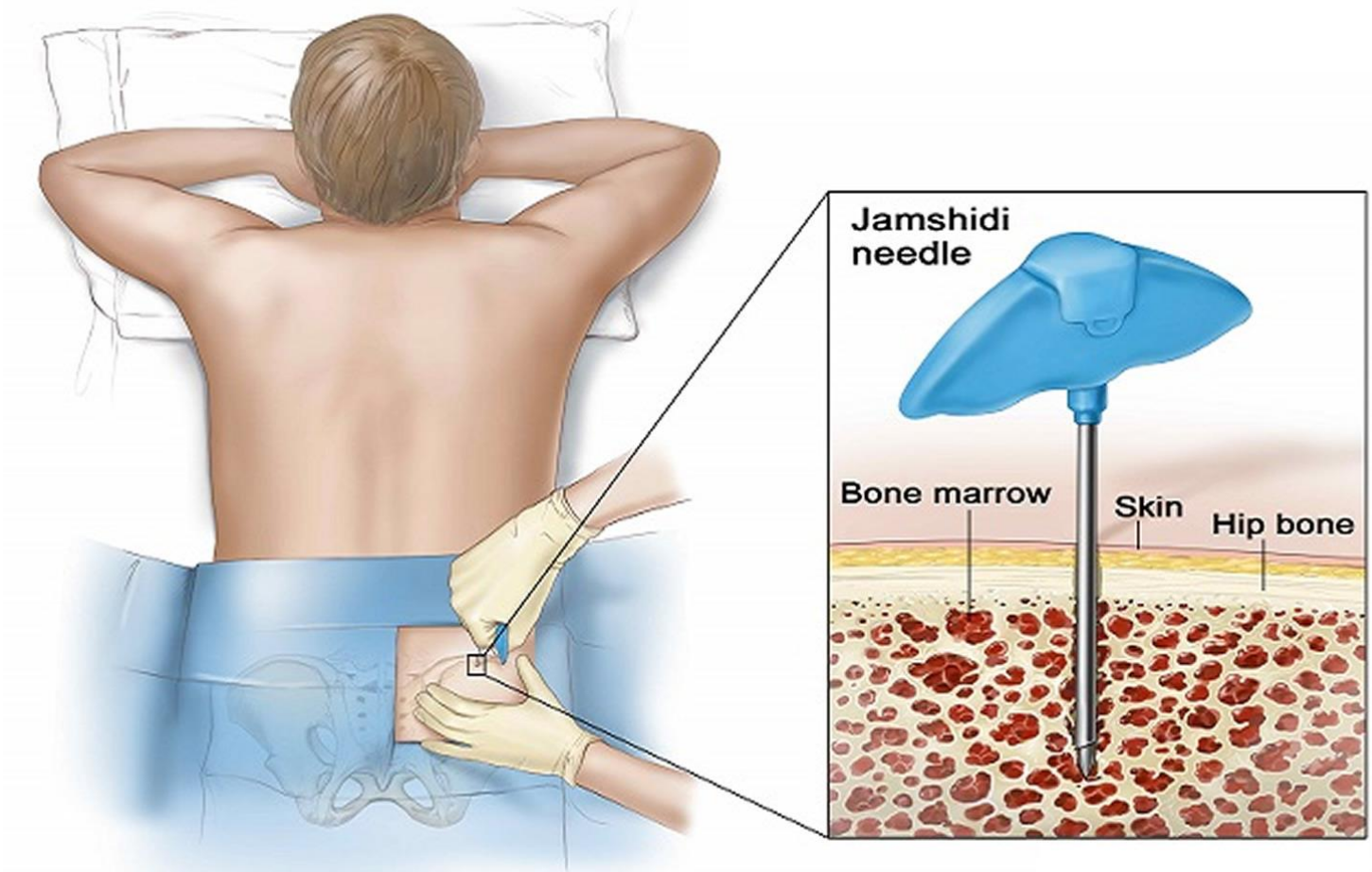
Bone marrow aspiration

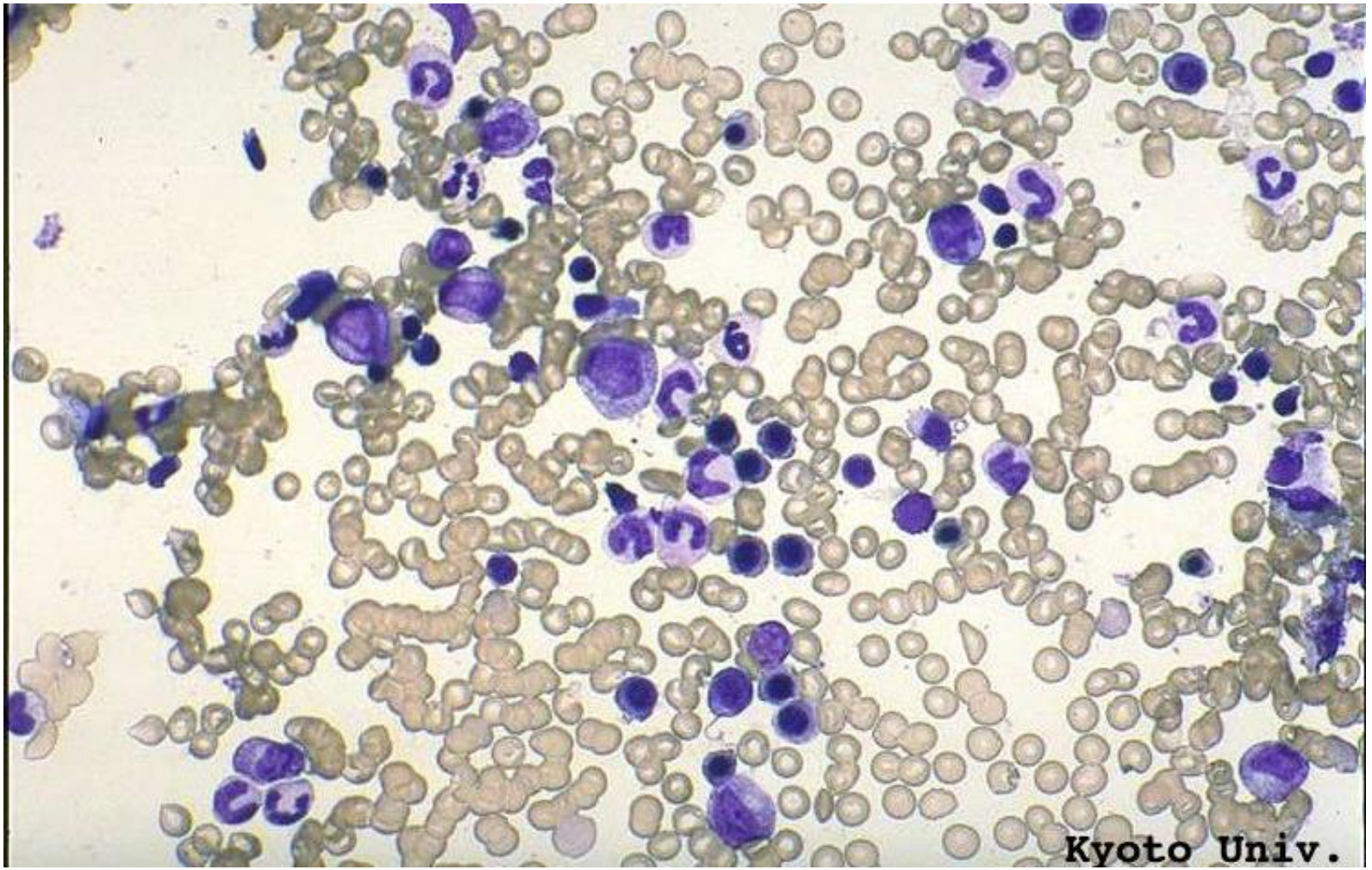




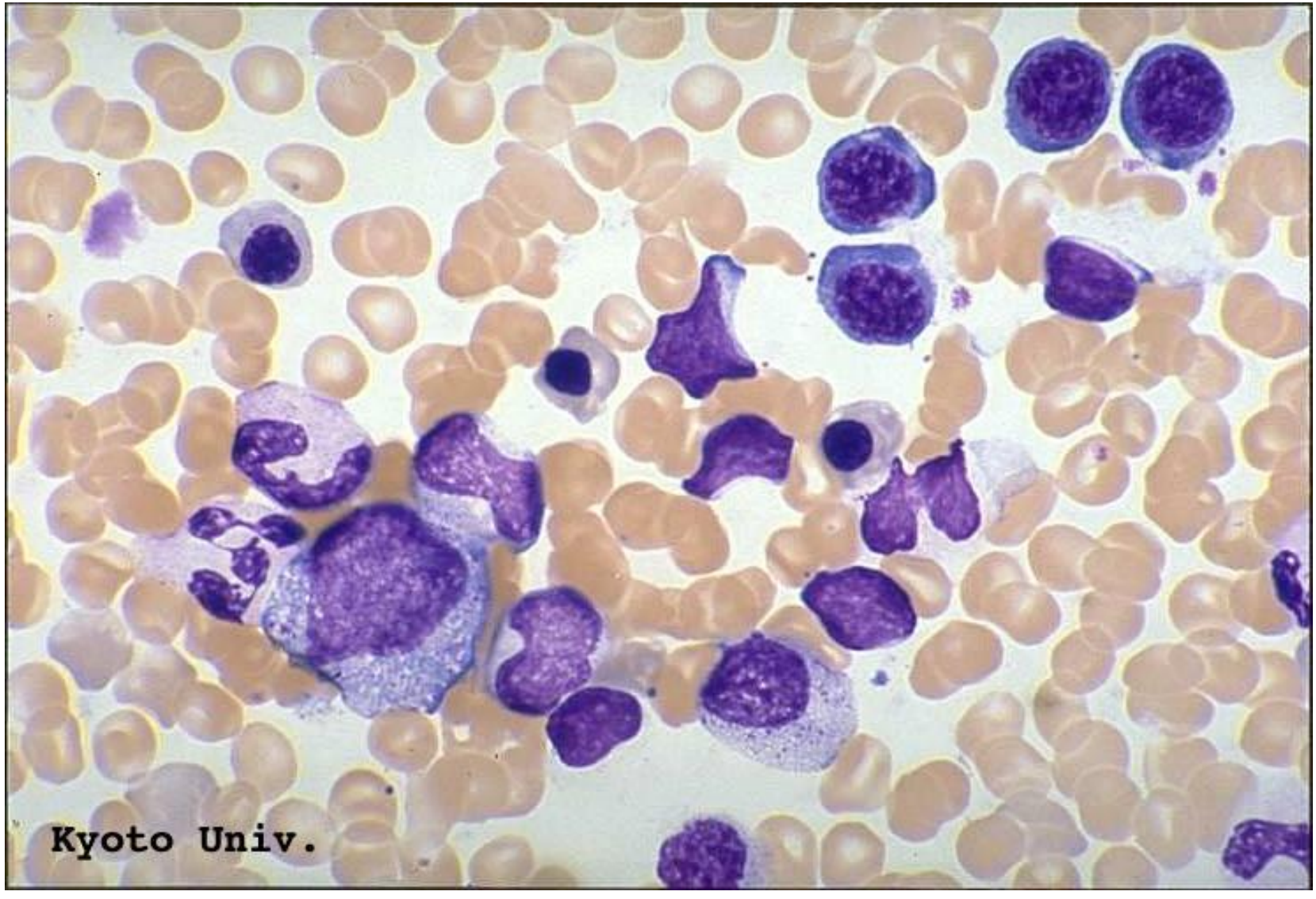
Bone marrow biopsy



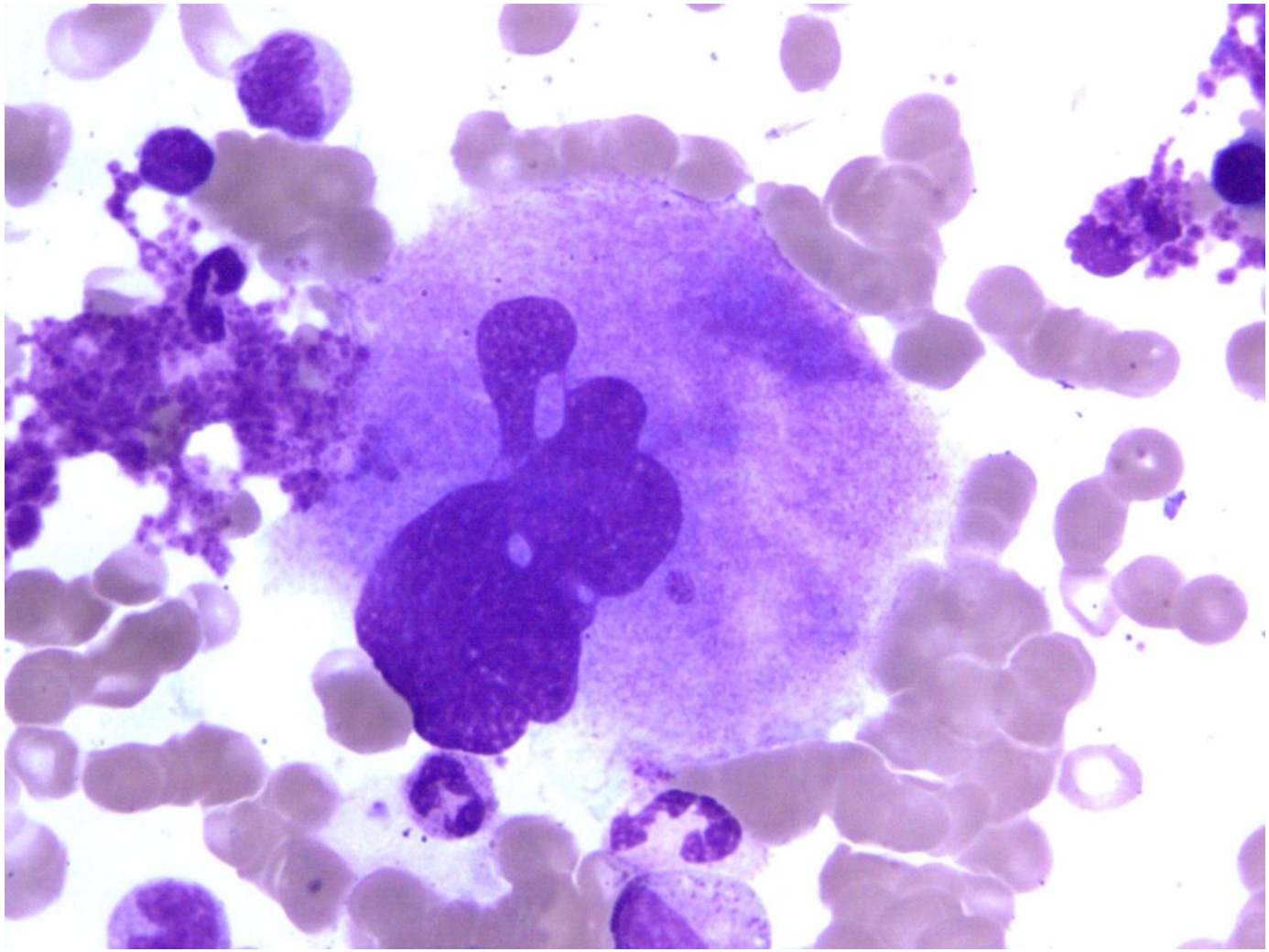
Three cell populations in bone marrow (400x)



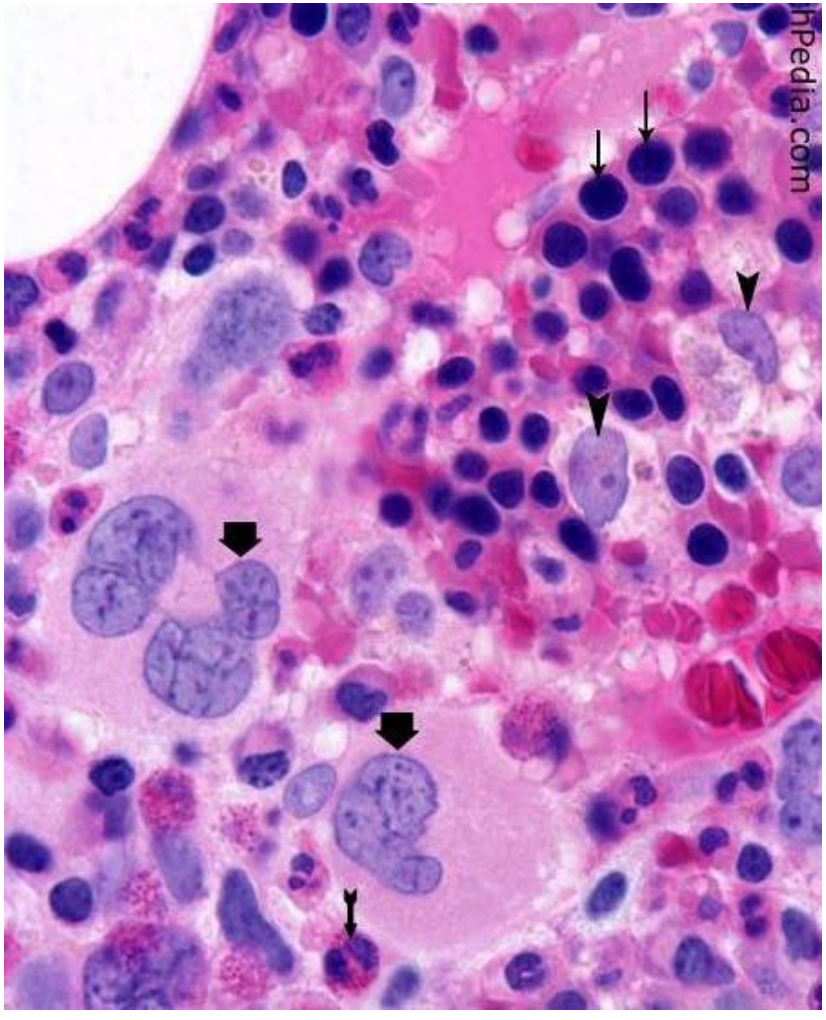
Bone marrow aspirate (1000x)



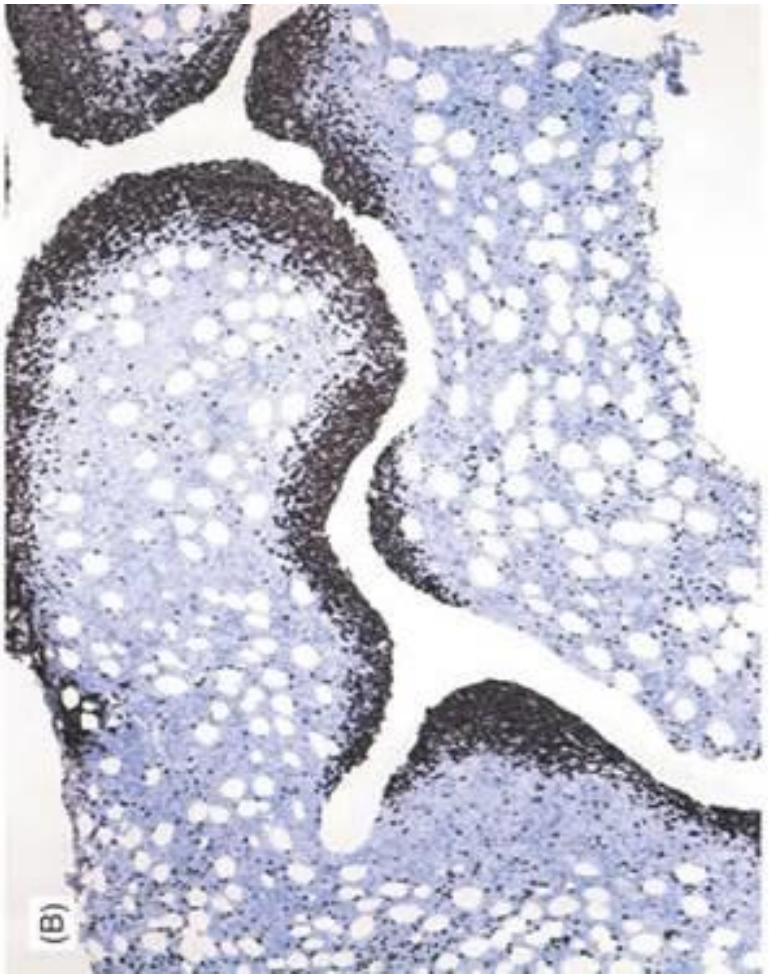
… and megakaryocytes



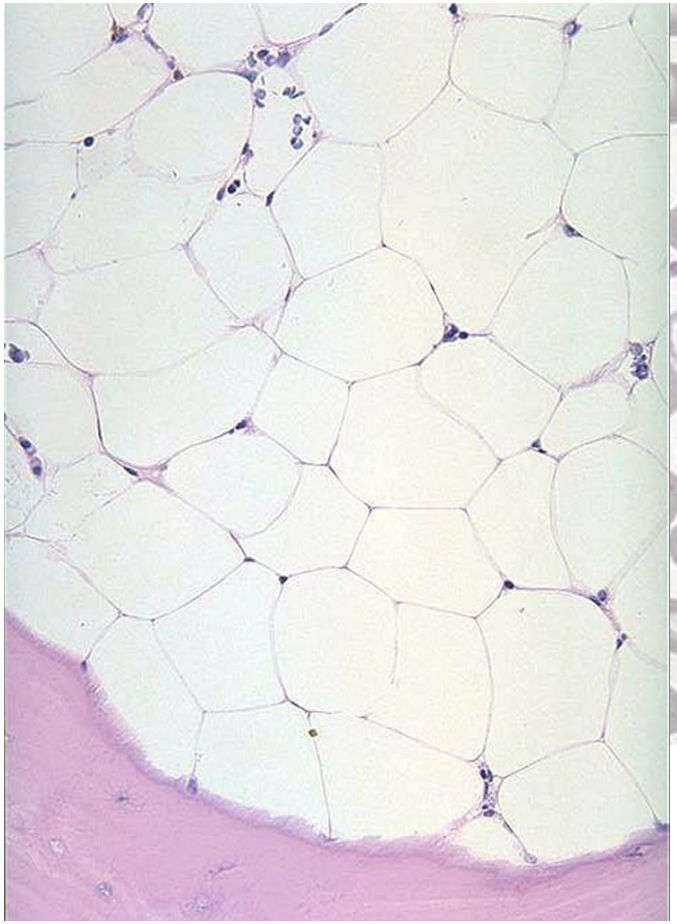
Why trephine biopsy (1)?
! Bone marrow architecture!

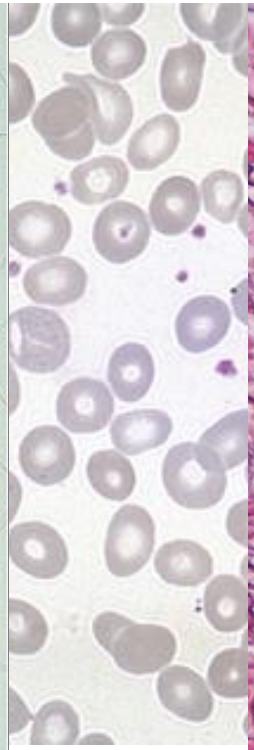


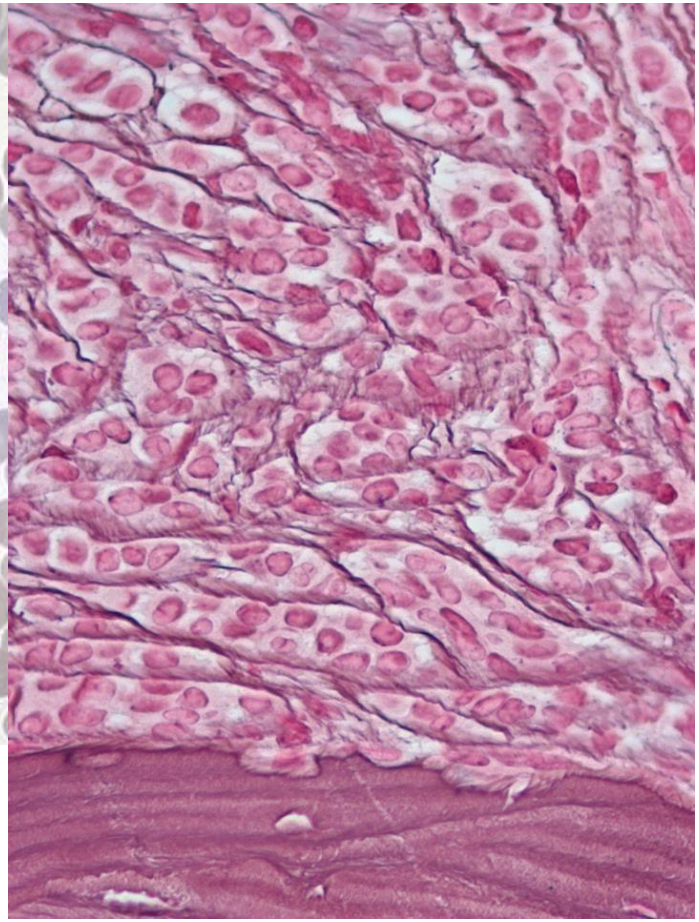
Bone marrow infiltration with follicular lymphoma



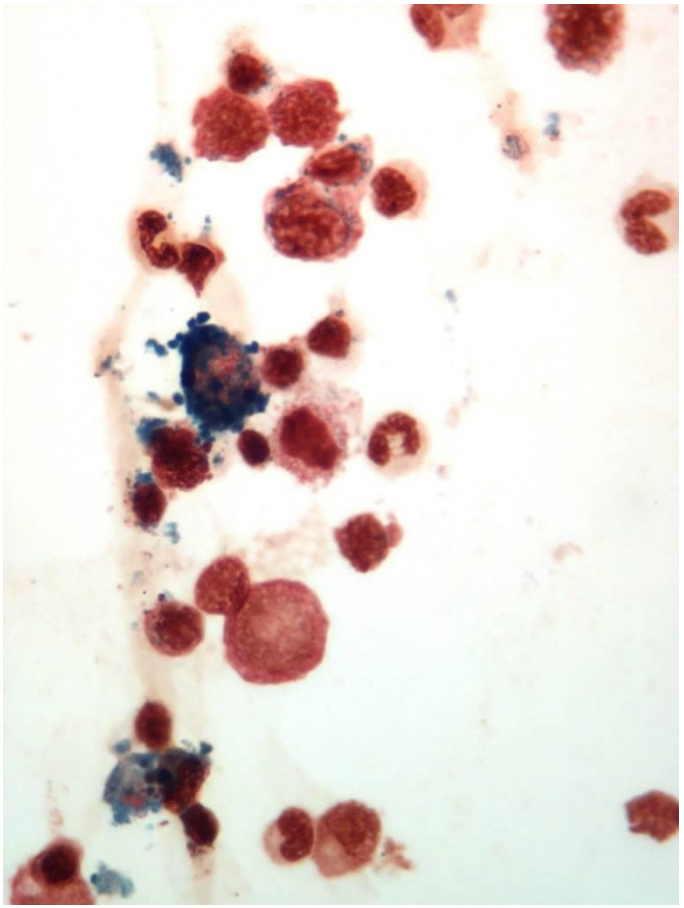
Why trephine biopsy (2)?
Hypocellular aspirate



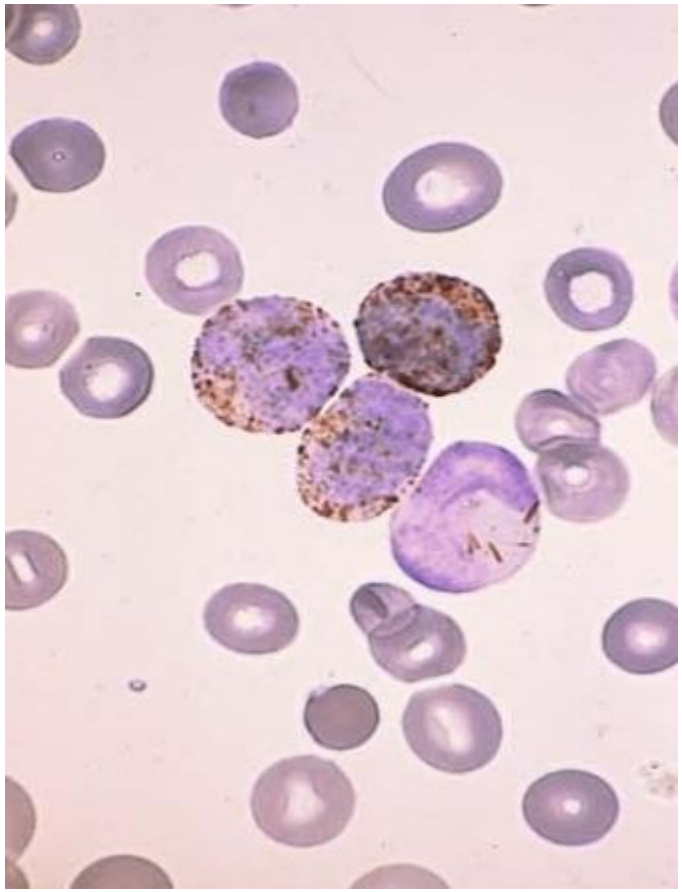




Auxiliary examinations of BM and peripheral blood - cytochemistry



Barvení na železo (RARS)



Myeloperoxidáza (AML)

Case report 2 – VK, 1956, female

- Followed from 2014 in primary hospital for T-lymphocytosis *without proven clonality*
- 2016 referred to secondary hospital for progressive lymphoocytosis and neutropenia
- KO + diff: Leu 11.1, Hb 163, thrombo 101, neu 2.5, band 1, lympho 93, mono 3.5, abs. neu 0.35

Case report 2 – VK, female

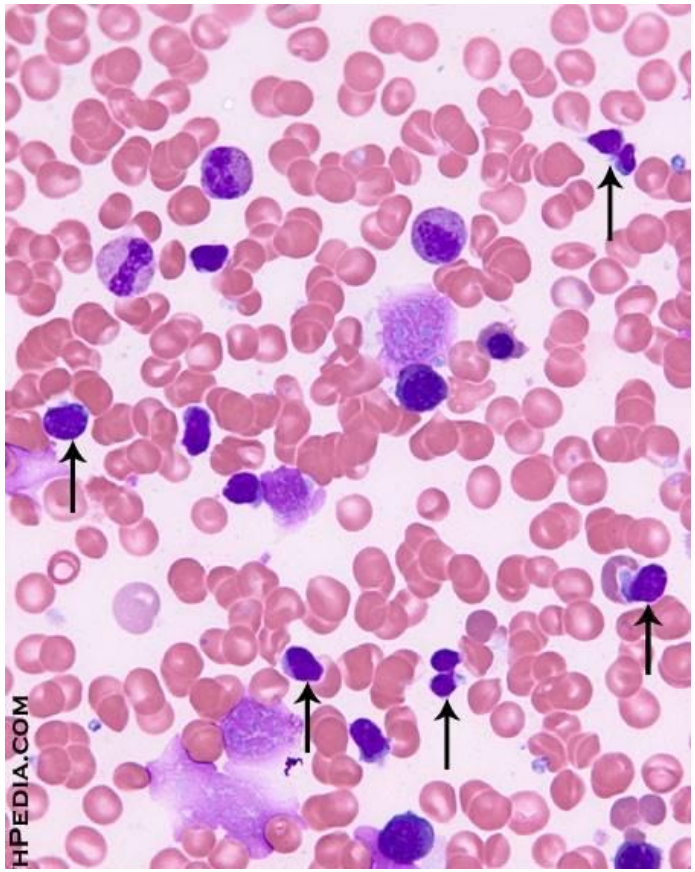
- 3-4x per year up to 2015, mild infections
- No infections in 2016 *(From the end of 2015 patient retired – she worked in a shop over-the counter*
- Trephine biopsy: 50% infiltration T-lymphocytes, PTCL-NOS
- FACS: evidense of clonality, most probably LGL
- Cytology of BM aspirate (by phone): lymphocytes do not look like LGL

Differential diagnosis

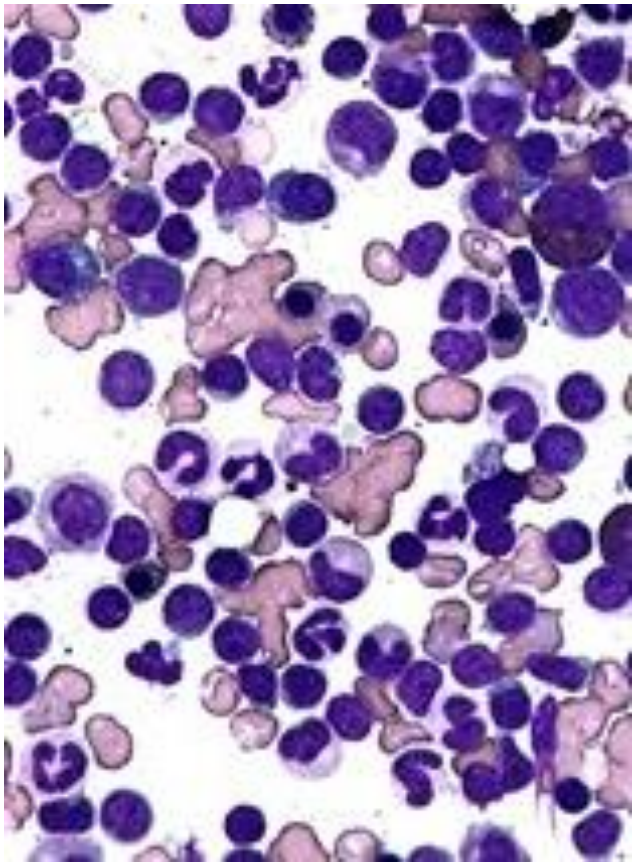
- LGL leukemia vs. peripheral T-cell lymphoma
- Practical implications:
  - indolent v. aggressive lymphoproliferation
  - Treatment oral cyclophosphamide v. intensive therapy ± auto., alloSCT

?? Cytology of peripheral blood??

LGL leukemia v. peripheral T-cell lymphoma bone marrow aspirate

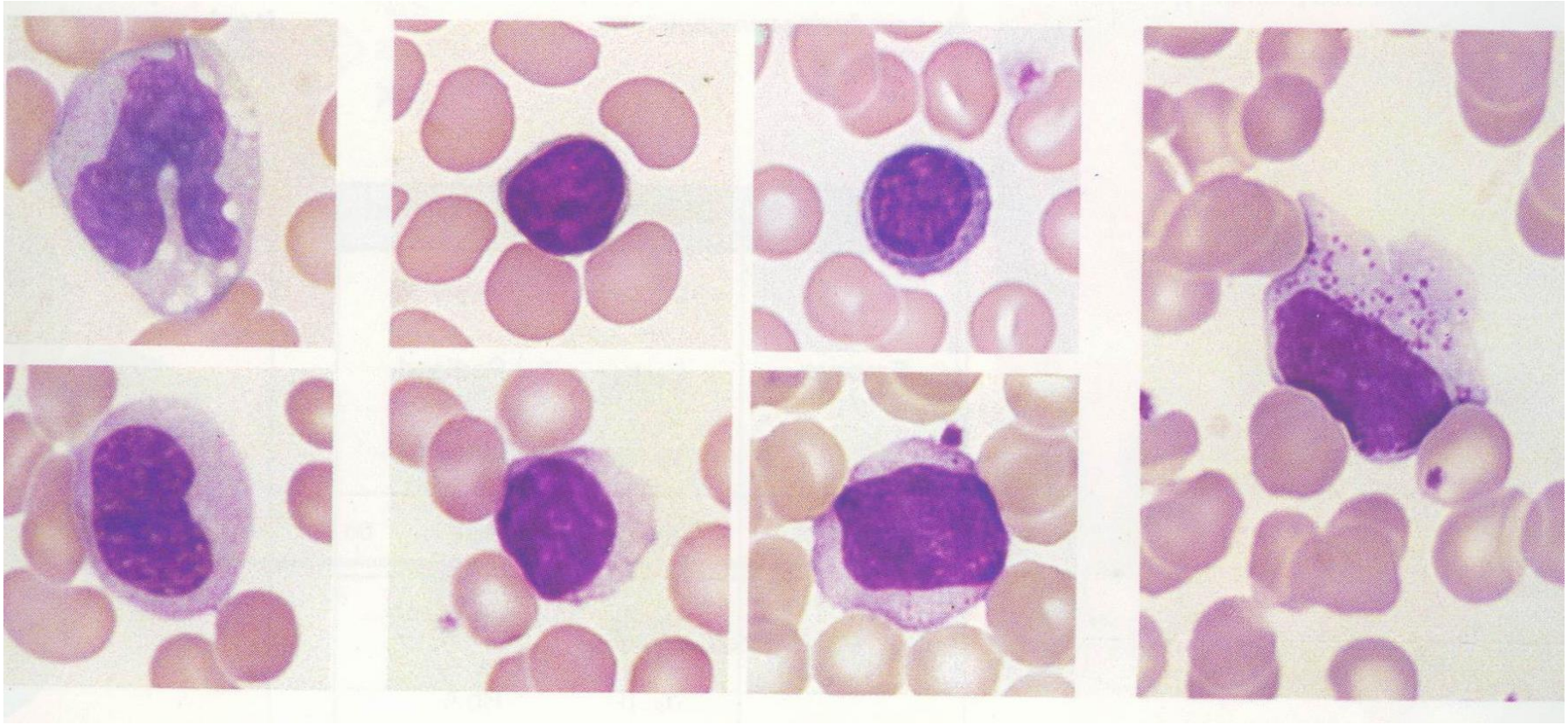


LGL leukemia

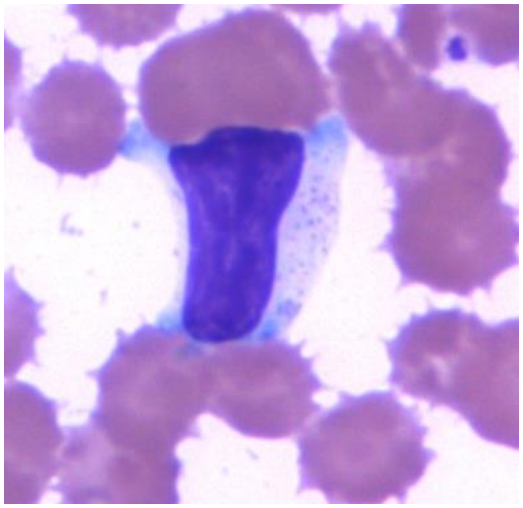
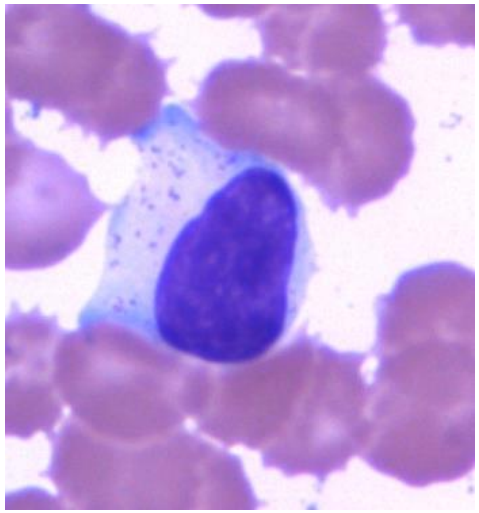
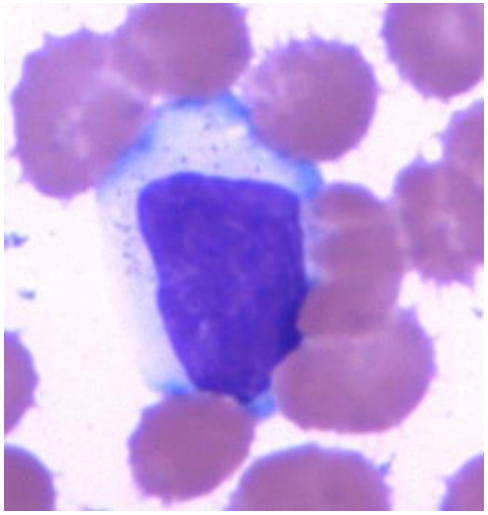
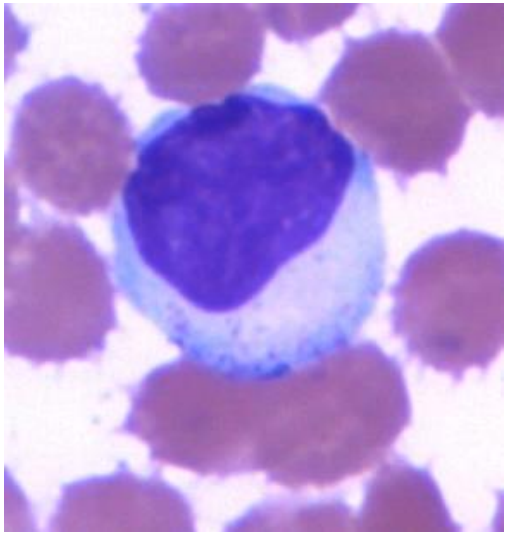
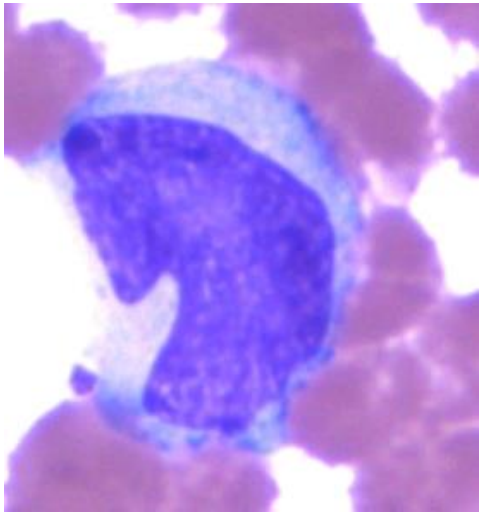


PTCL, NOS

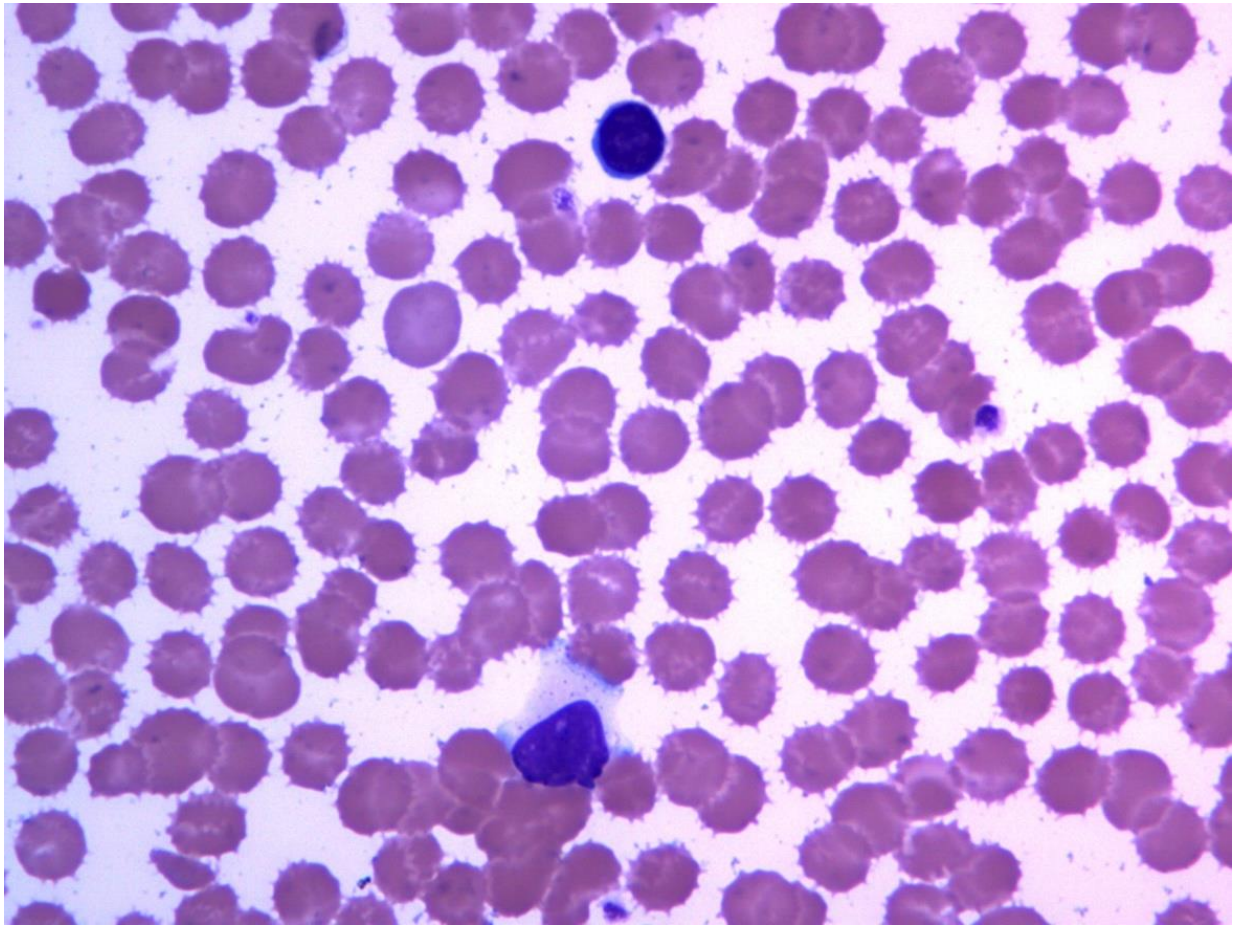
Monocytes and different morphology of lymphocytes



VK, 1956 – peripheral blood 1

VK, 1956 – peripheral blood 2



Final diagnosis:

LGL leukemia

Key examination:

Peripheral blood morphology

Blood and bone marrow – what is the correct answer?

1. Bone marrow is allways better than peripheral blood
2. Before morphological examination of BM, PB should be first examined

3. Bone marrow aspirate and biopsy is essential for diagnosis of anemia

0

4. We can damage aorta when we do BM aspiration from sternum

0

What is your take-home message?

1. I will not forget the simplest examinations

0

2. I will not rely (too much) on BM examination, especially not in anemias

0

3. I will not request other examination, when I have already sound diagnosis

0

4. In anemias, I will request retikulocyte examination

0

5. Two to four from above

0

6. Nothing

0


Thank you
for your
attention!