

**Morphological findings in cases of
HIV infection referred for bone marrow
biopsy**

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Introduction

- **Infection with HIV is associated with wide range of hematological abnormalities.**
- **Impaired hematopoiesis, immune-mediated cytopenias, and altered coagulation mechanisms have all been described.**




The hematological abnormalities may be attributable to the:

- **Direct and indirect effect of HIV infection**
- **opportunistic infections**
- **Associated Malignancies**
- **Toxicity of the drugs**



General hematological features of AIDS

Peripheral blood

- **Anemia (usually normochromic/ normocytic)**
 - **Lymphopenia**
 - **Thrombocytopenia**
 - **Often Pancytopenia**
- 

Bone marrow aspirate


- **Initially Hypercellular, but Hypocellular in the later stages.**
- **Trilineage dysplasia is common.**

Reactive changes include:

- **Increased lymphocytes**
- **Increased plasma cells**
- **Increased macrophages**
- **Hemophagocytosis**



Opportunistic infections

- Mycobacterial and other bacterial infections
 - Viral infections
 - Fungal infections
 - Parasitic infections
- 

Lymphoma in AIDS patients

- Usually B-lineage.
- The strongest association is with
- Burkitt lymphoma
- Large cell lymphoma of B-lineage
- HL usually present in patients in advanced stage.
- The Trephine biopsy may be the initial or the only diagnostic material.




Aims & Objective


To look into various morphological changes in bone marrow biopsies in patients of HIV infection referred to us for marrow biopsy





Materials and Methods

- **A retrospective cross-sectional study**
 - **Conducted at Hematology Department
PIMS (Islamabad)**
 - **January 2005 to December 2008.**
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- **Already diagnosed at HIV center PIMS, referred for bone marrow examinations were evaluated for hematological changes and bone marrow findings.**
 - **The results were entered on SPSS, version 12 for further analysis.**

Clinical Features

| Symptoms | Number (Percentage) |
|---------------------------|---------------------------|
| | Total no. of patients: 21 |
| Symptoms of anemia | 15 (71.4) |
| Fever | 14 (66.7) |
| Wt .loss | 05 (23.8) |
| Vomiting | 05 (23.8) |
| Diarrhea | 05 (23.8) |
| Bleeding | 04 (19.0) |
| Abdominal pain | 03 (14.3) |
| Oral ulcers | 01 (4.8) |
| Aches & pains | 01 (4.8) |
| Anorexia | 01 (4.8) |
| Previous H/O tuberculosis | 05 (23.8) |
| Hepatitis B | 02 (9.5) |
| Hepatitis C | 01 (4.8) |
| Kaposi sarcoma | 01 (4.8) |

Clinical Parameters

| | |
|-------------------------------|---|
| Age (Years) | 11m – 70y (42.4) |
| Sex | Male (85.7%) Female (14.3) |
| Pallor | + (38%) ++ (47.6%) +++ (14.3%) |
| Jaundice | 9.5% |
| Lymph Node enlargement | 38% |
| Hepatomegaly | 43% |
| Splenomegaly | 14.% |

Hematological Parameters

| Parameters | Range | Mean \pm SD |
|------------|---------|------------------|
| TLC | 0.9-29 | 7.4 \pm 7.72 |
| Hb | 3.1-8.5 | 6.4 \pm 1.42 |
| Plt | 9-325 | 125 \pm 80.49 |
| MCV | 64-116 | 85.5 \pm 12.68 |
| HCT | 9.2-29 | 20.9 \pm 4.95 |
| MCH | 17-34 | 27.3 \pm 4.17 |
| MCHC | 27-35 | 31.6 \pm 2.15 |
| Retics | 0.2-8 | 1.28 \pm 1.69 |

Differential Leukocyte count

| Parameters | Range | Mean \pm SD |
|-------------|-------|-----------------|
| Neutrophils | 18-91 | 58 \pm 21.5 |
| Lymphocytes | 8-58 | 31.1 \pm 14.1 |
| Monocytes | 0-11 | 2.4 \pm 2.6 |
| Eosinophils | 0-8 | 1.61 \pm 3.8 |
| Basophils | 00 | 00 \pm .00 |

Indications for Bone marrow Biopsy

| Indication | Percentage |
|---------------------------|------------|
| Pancytopenia /Bicytopenia | 47.6% |
| PUO | 38.1% |
| Anemia | 9.5% |
| Staging of lymphoma | 9.5% |

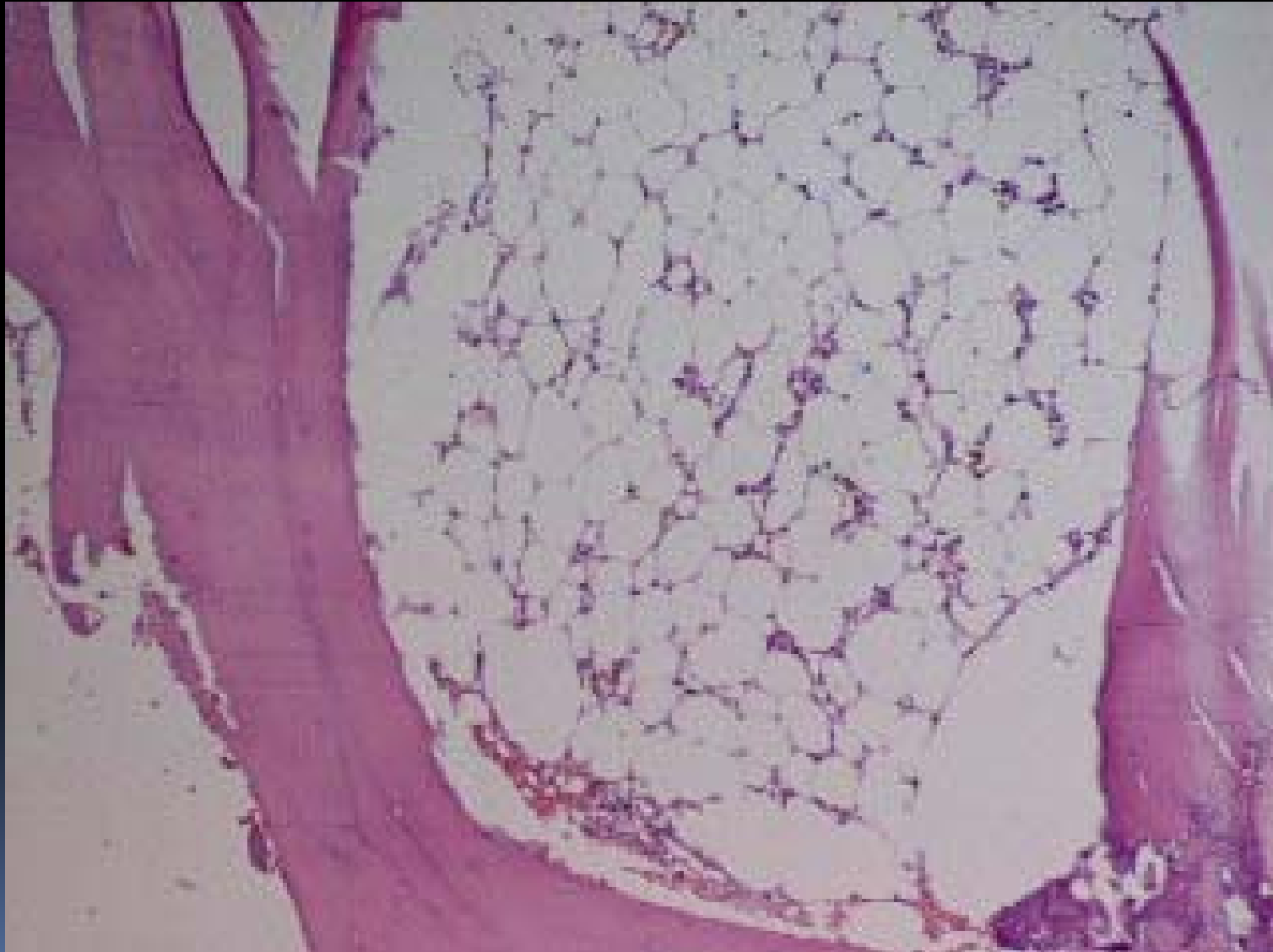
Bone Marrow Findings

| | | |
|-------------------------|-----------------------------|----------------|
| Cellularity | Hypercellular | (38.1%) |
| | Hypocellular | (33.3%) |
| | Moderately cellular | (28.6%) |
| Erythroipoiesis | NB | (81%) |
| | Megaloblastic change | (9.4%) |
| | Dysplasia | (4.8%) |
| Myelopoiesis | Normal | (80.9%) |
| | Dysplasia | (9.6%) |
| Megakaryopoiesis | Normal | (90.5) |
| | Dysplasia | (5%) |
| Lymphocytes | Increased | (19%) |
| Plasma cells | Increased | (43%) |

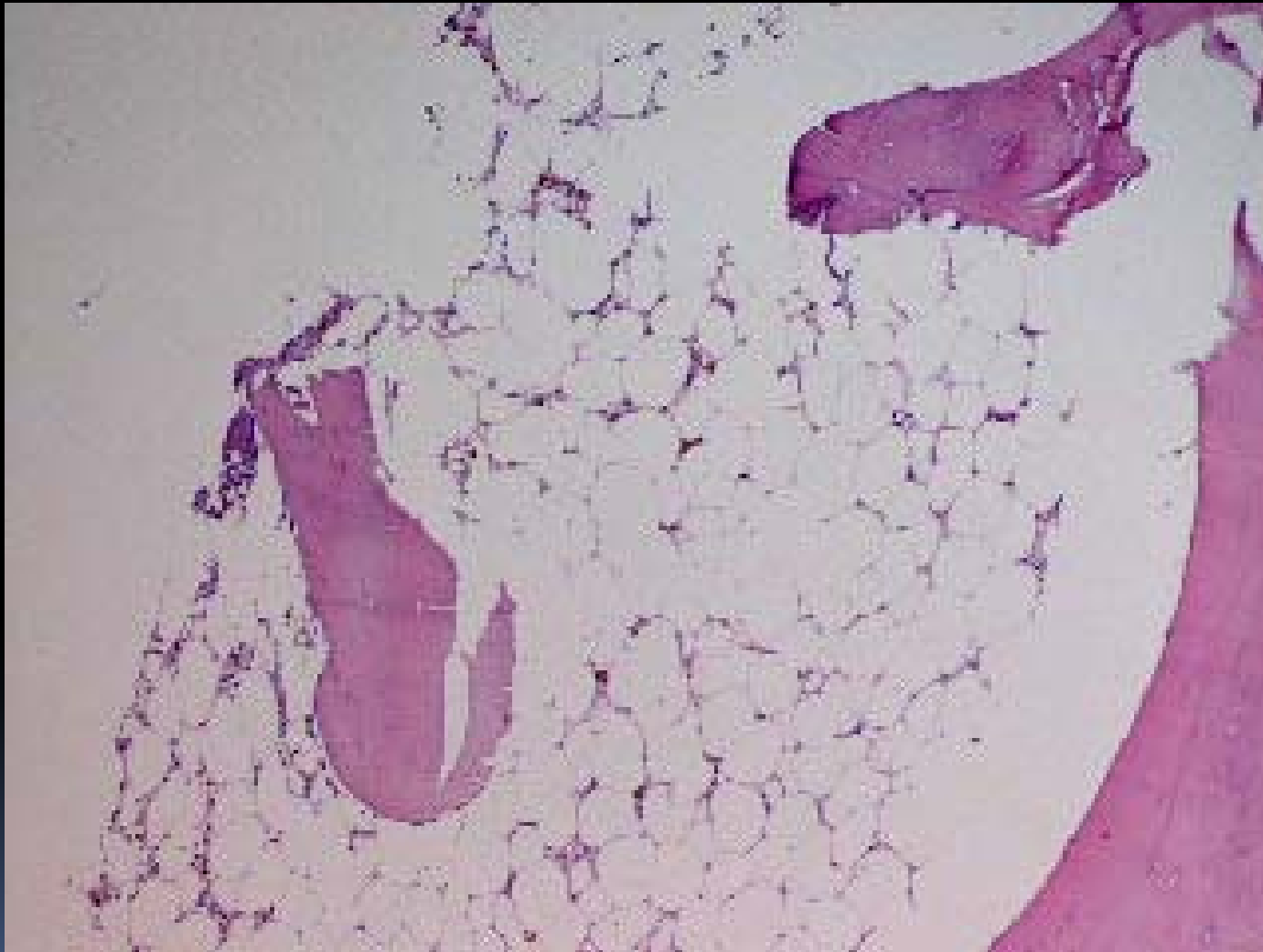
Final Diagnosis

| Diagnosis | Number (Percentage) |
|---------------------------|---------------------|
| Hypoplastic bone marrow | 8 (38.1%) |
| Underlying Disorder | 5 (23.8%) |
| Infection related changes | 3(14.3%) |
| ALL-L3 | 2 (9.5%) |
| ALL-L2 | 1 (4.7 %) |
| Aplastic anemia | 1(4.7 %) |
| Pure red cell Aplasia | 1(4.7 %) |
| Visceral Leishmaniasis | 1(4.7 %) |
| Megaloblastic change | 2 (9.5%) |

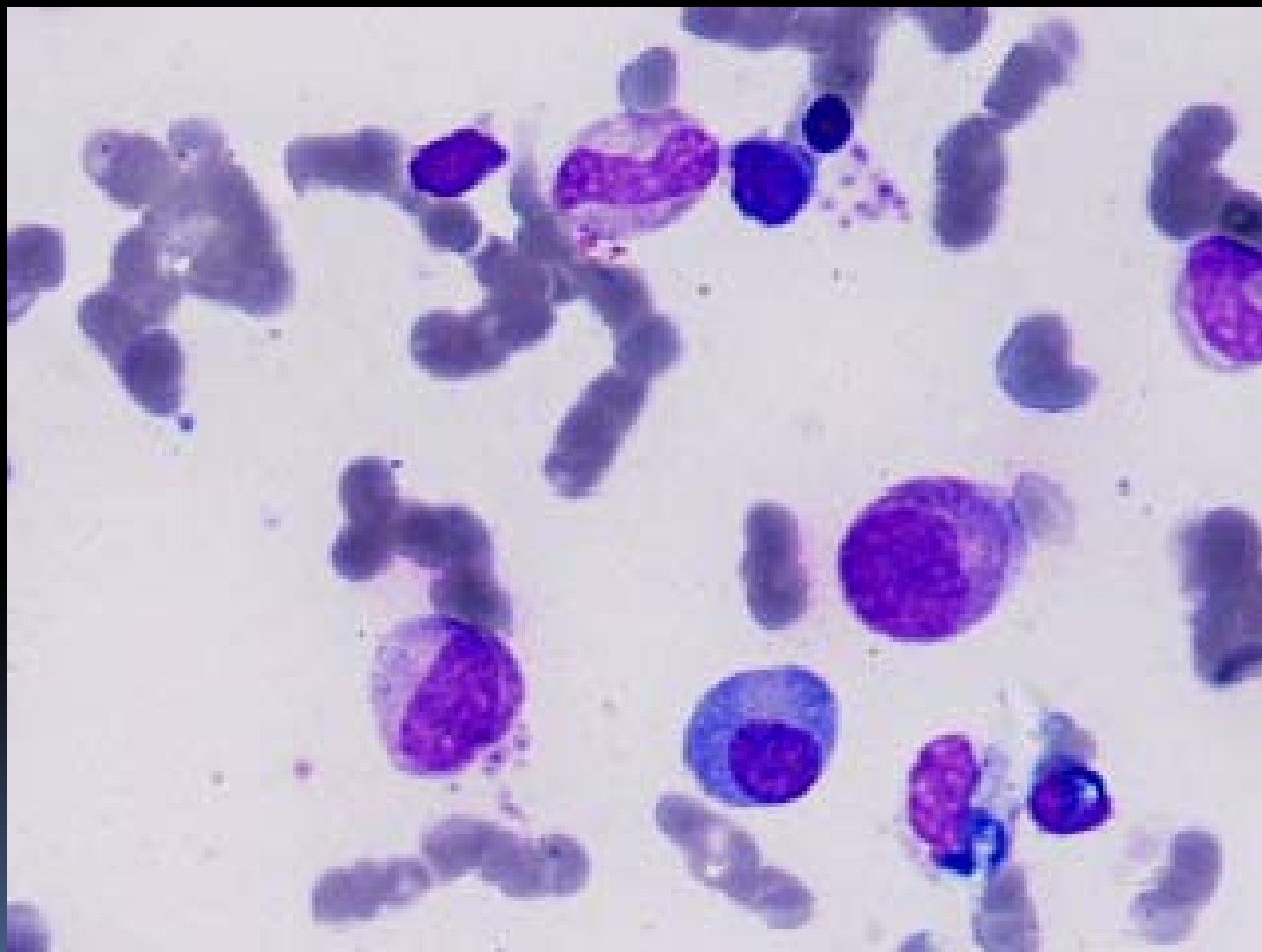
Aplastic anemia



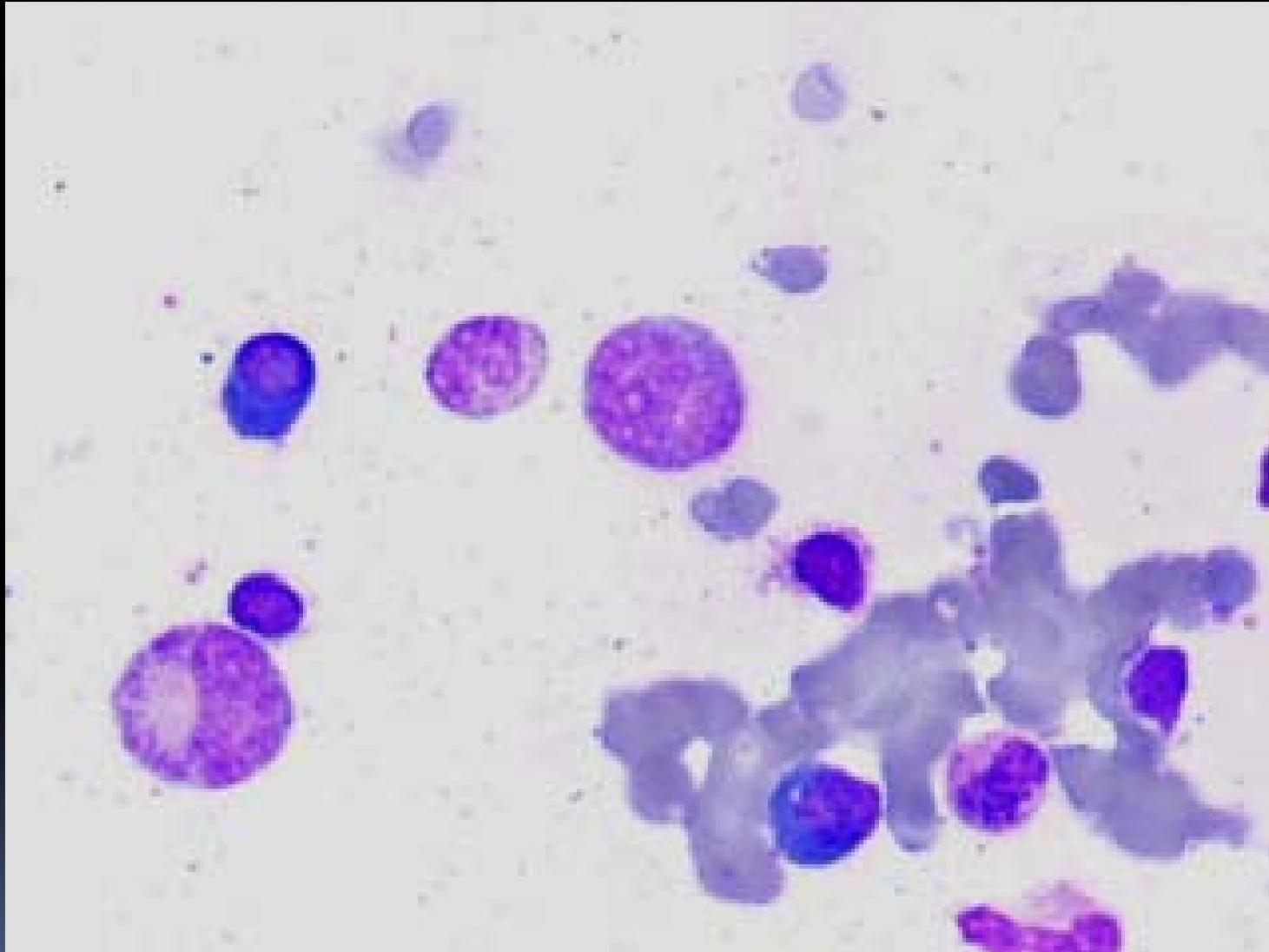
Aplastic anemia



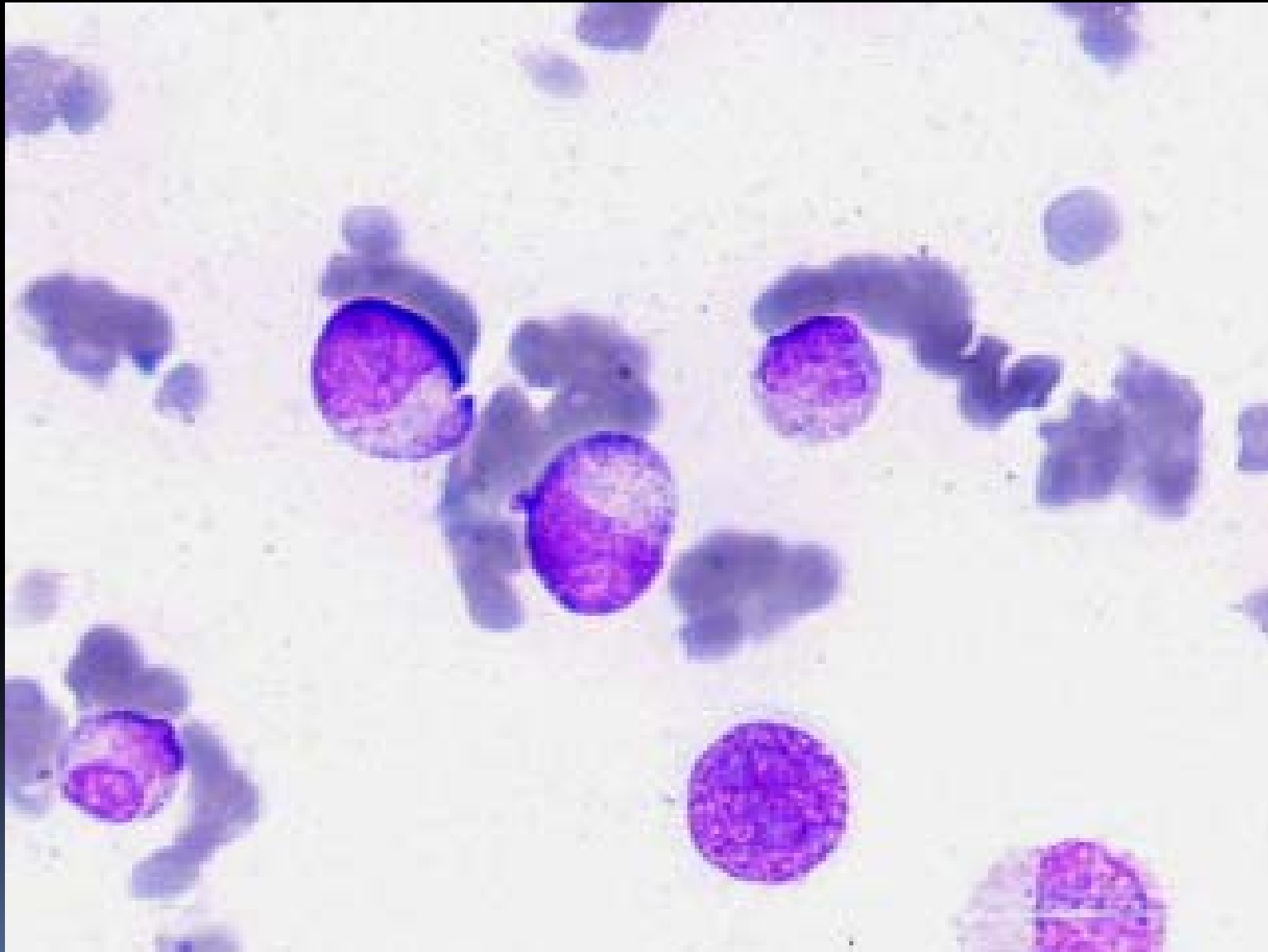
Pure Red cell Aplasia



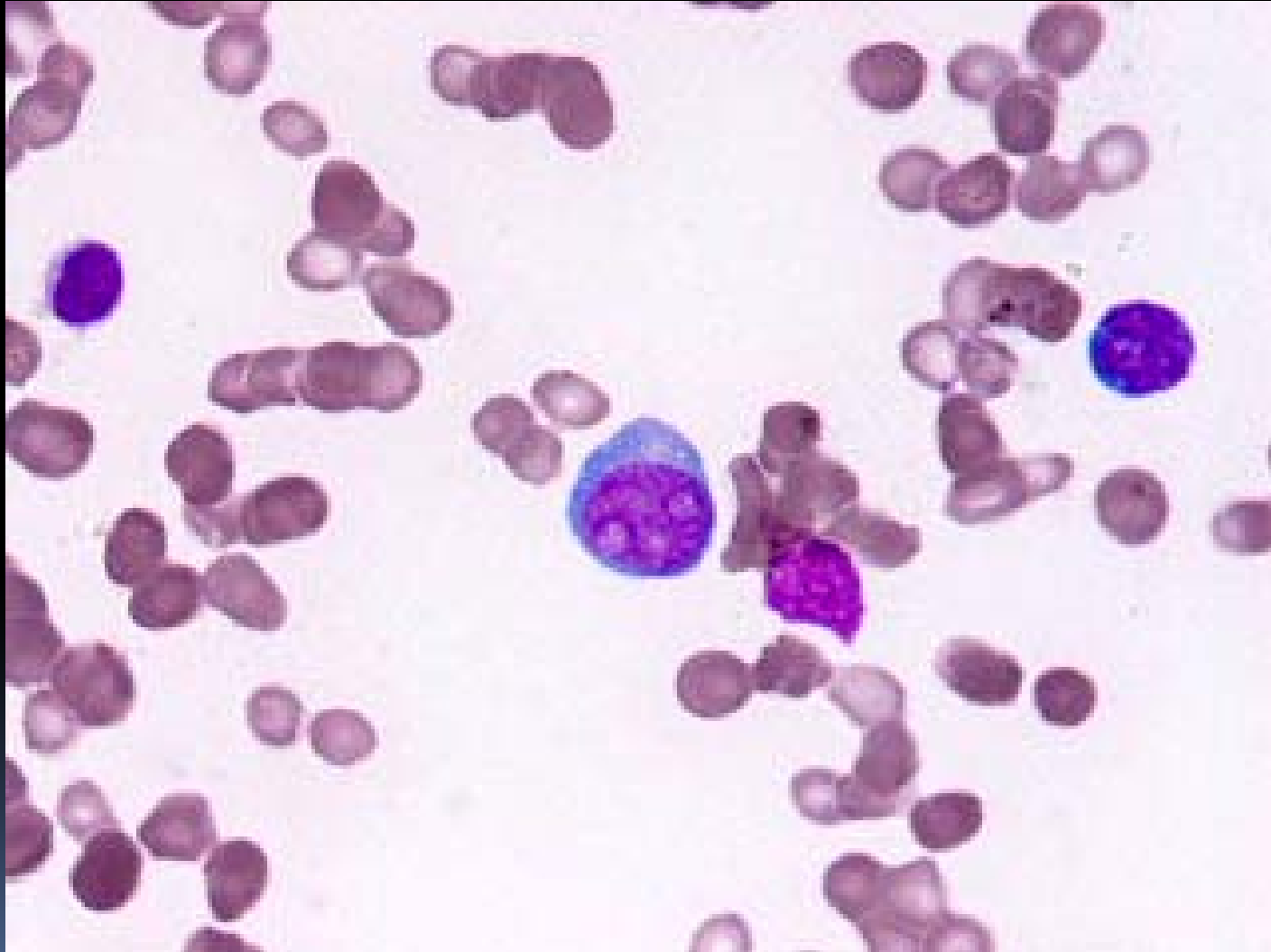
Pure Red cell Aplasia



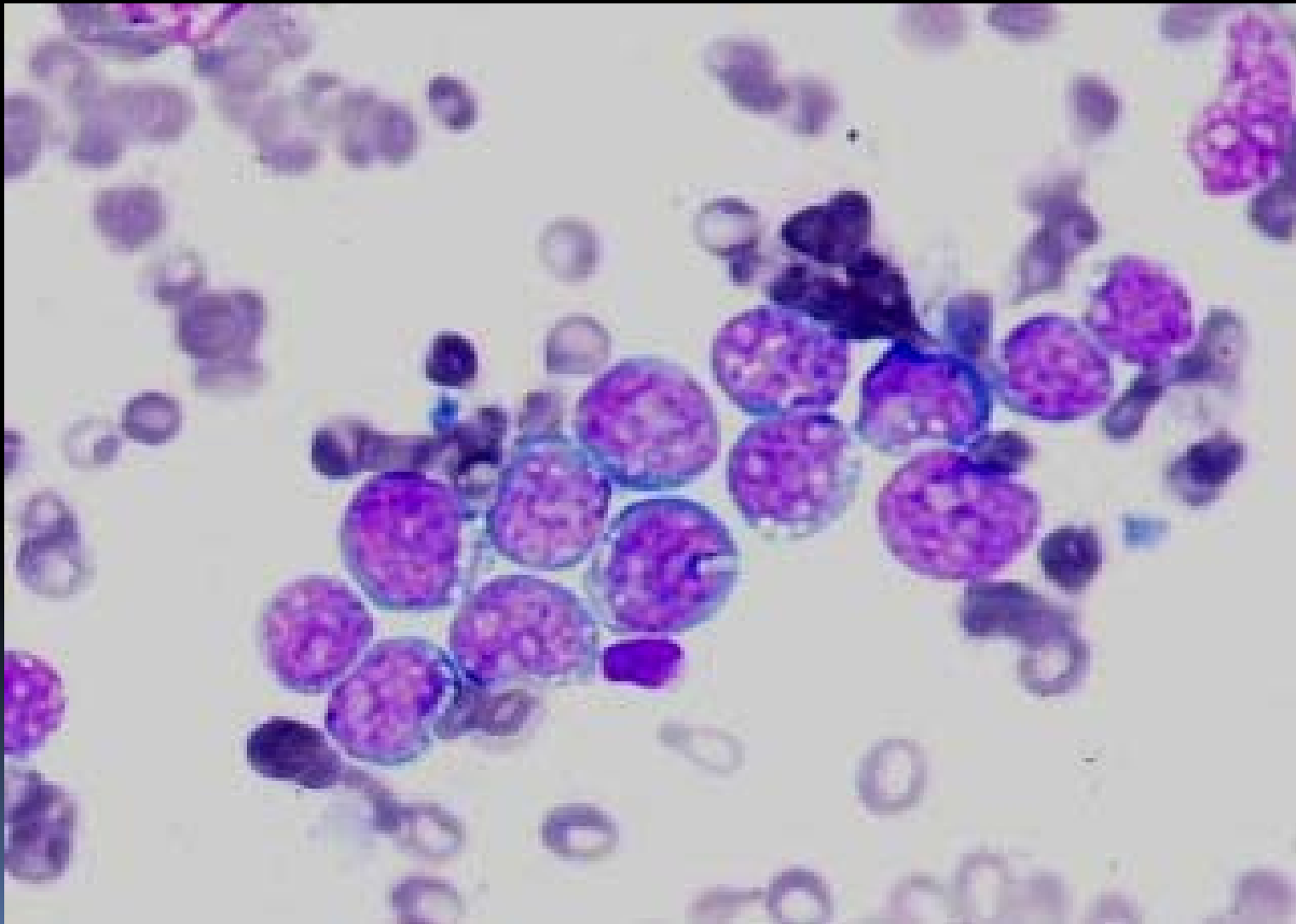
Pure Red cell Aplasia



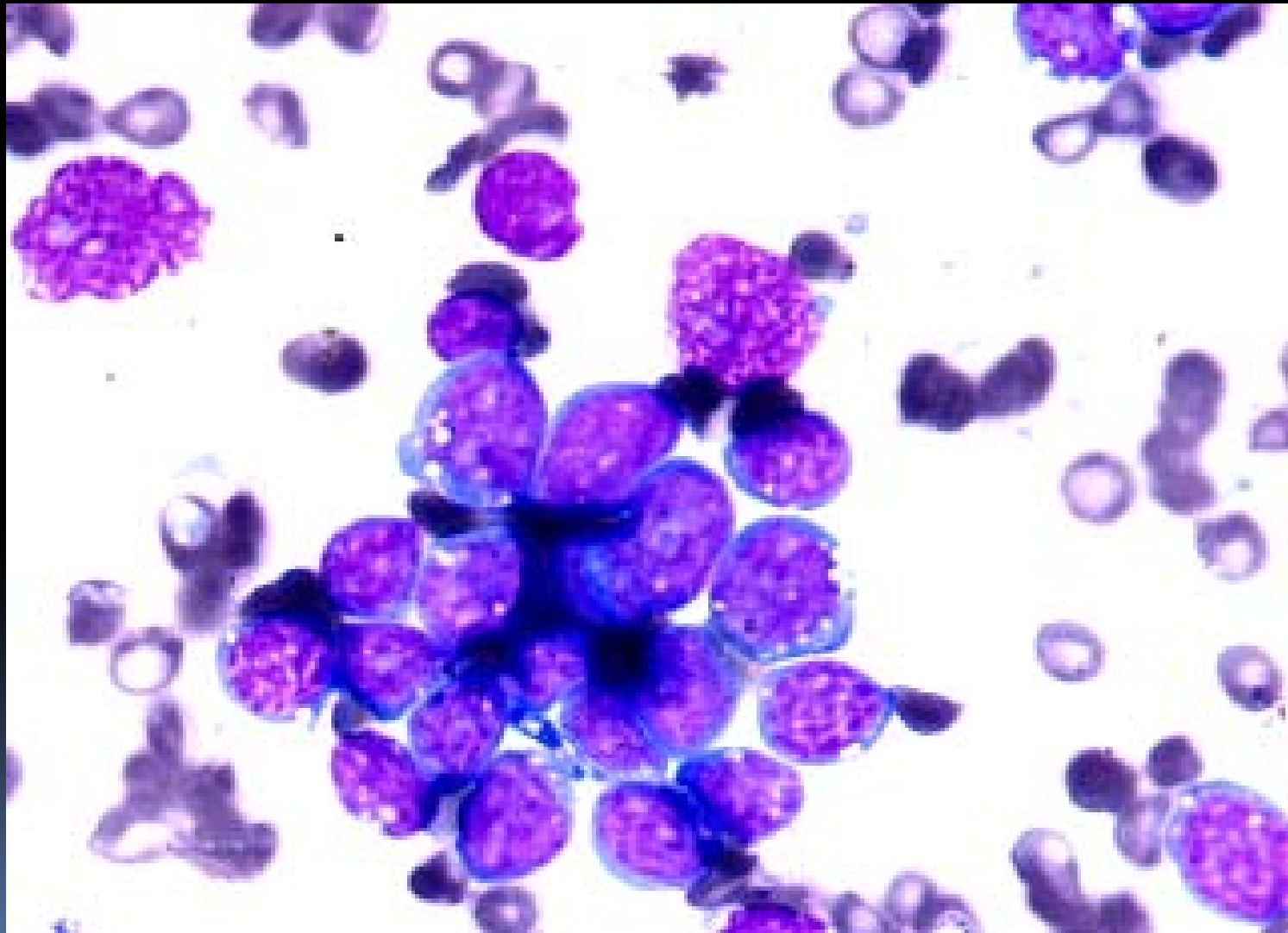
Acute Lymphoblastic Leukemia (ALL-L3) Peripheral film



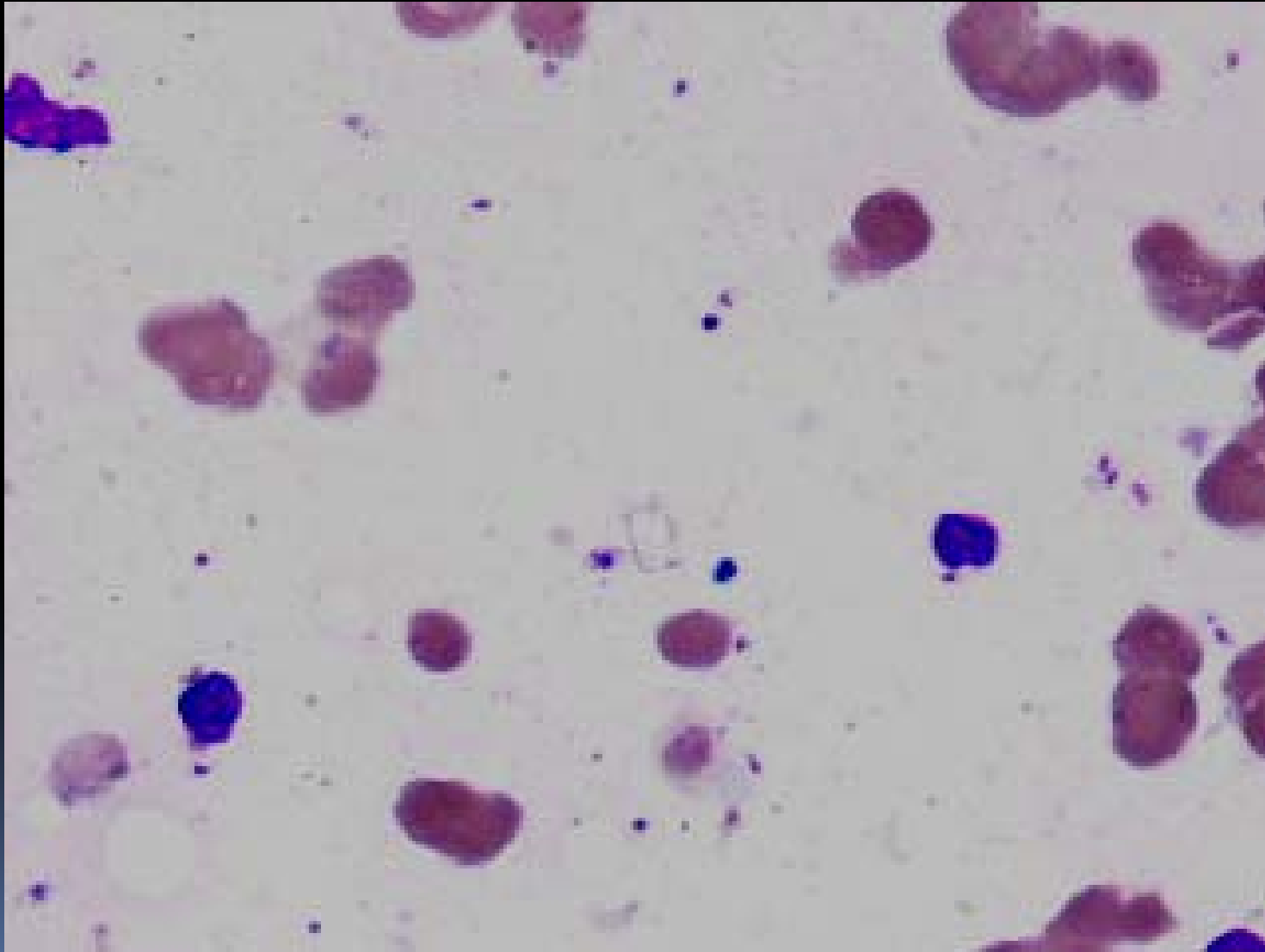
Acute Lymphoblastic Leukemia (ALL-L3) Bone Marrow Aspirate



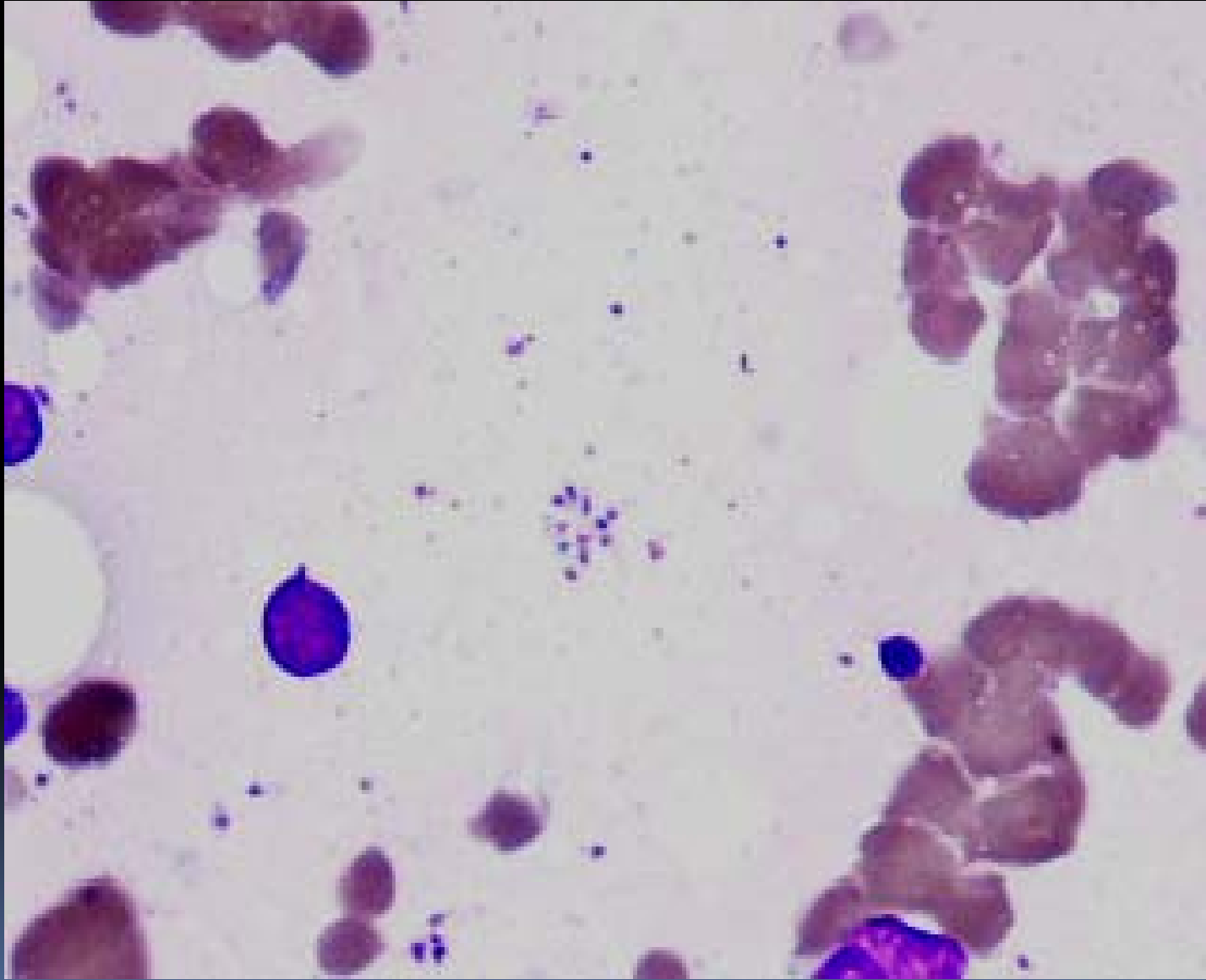
Acute Lymphoblastic Leukemia (ALL-L3) Bone Marrow Aspirate



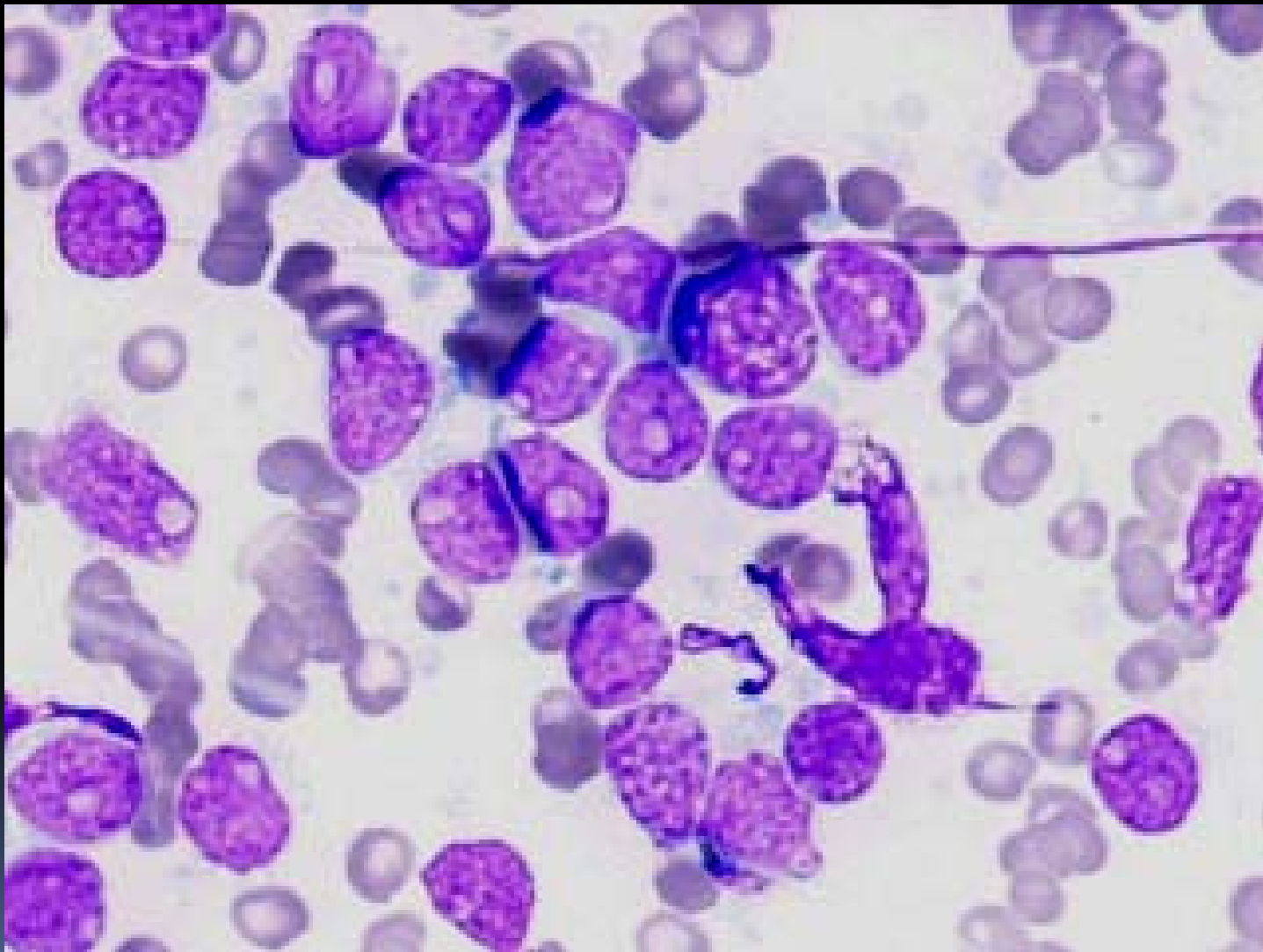
Visceral leishmaniasis



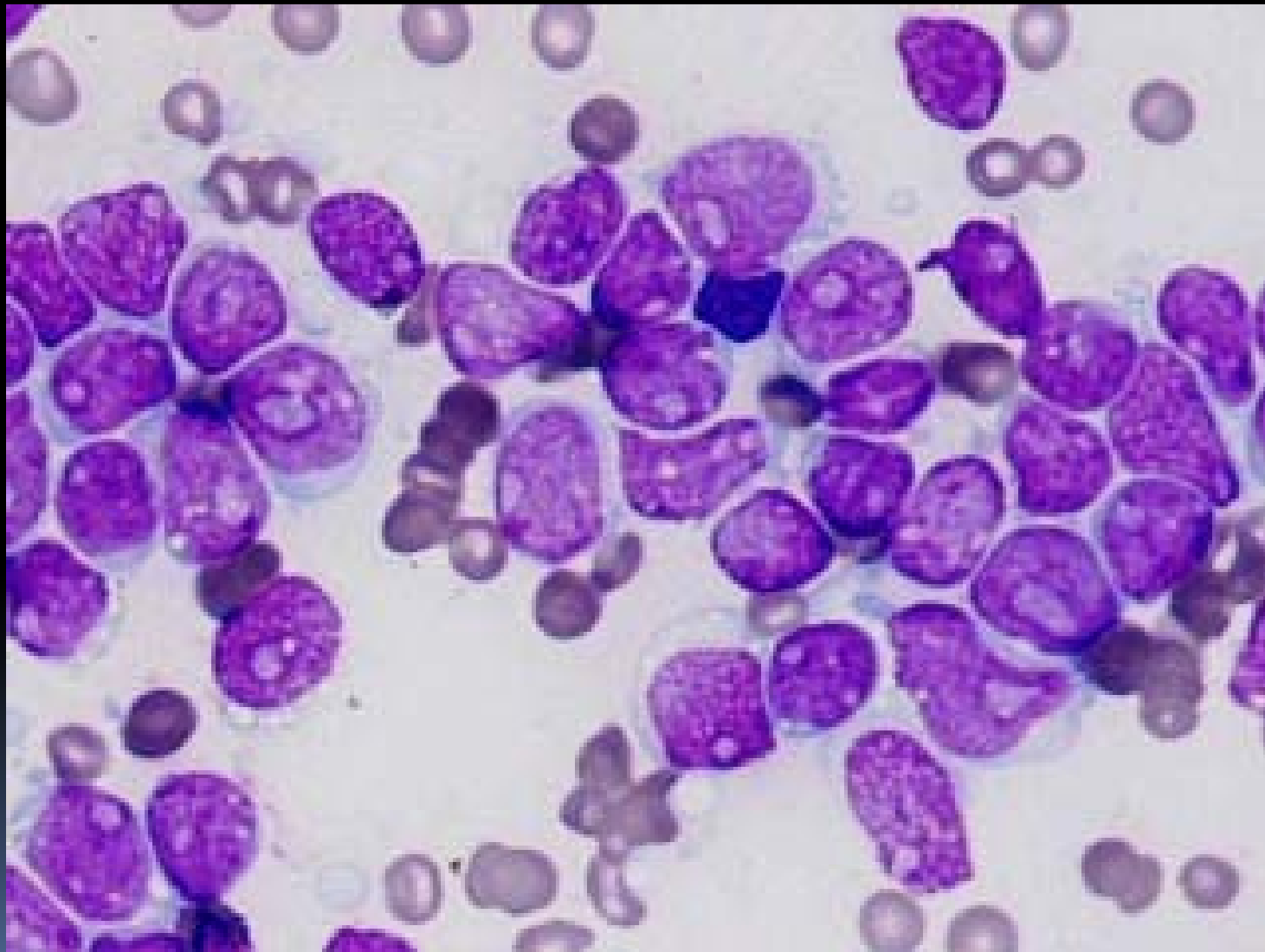
Visceral leishmaniasis



**Acute Lymphoblastic Leukemia (ALL-L2)
Bone Marrow Aspirate**



**Acute Lymphoblastic Leukemia (ALL-L2)
Bone Marrow Aspirate**



Discussion

- Total number of patients referred for Bone marrow Biopsy during four year period was 21.
- Among them 86% were males and 14% were females with M:F Ratio of 6:1.
- Mean age at bone marrow examination was 42 years ranging from 11m to 70 yrs.

The most common symptoms at presentation were symptoms of anemia and fever.

| | |
|-----------------------------|-----------------------------|
| Palpable Lymph Nodes | 38% |
| Palpable Liver | 43% |
| Palpable Spleen | 14% |
| Mean Hemoglobin | 6.4G/DL |
| Mean TLC | 7.4X10⁹/L |
| Mean PLT count | 124x10⁹/L |

Bone Marrow Examination

| | |
|---|-------------|
| Hypercellular | 38% |
| Hypocellular | 33% |
| Erythroid & Megakaryocytic Dysplasia | 5% |
| Myeloid Dysplasia | 9.5% |
| Increased Plasma cells | 43% |

The common Indications for Bone marrow

Biopsy

| | |
|---------------------------------|------------|
| Pancytopenia/Bicytopenia | 48% |
| PUO. | 38% |

➤ **The most common findings were Hypoplastic Bone marrow and findings consistent with underlying disorder.**

➤ **Others findings included**

ALL-L3

ALL-L2

Visceral leishmaniasis

Pure Red Cell Aplasia

Aplastic anemia.

➤ **None of patients showed infiltration by Granulomatous Disease or lymphoma.**

| | Paris T.NO:85 | London T. NO:122 | India T. NO: 74 | France T. NO: 55 | PIMS T. NO: 21 |
|-------------------|------------------------------------|------------------------|--------------------|------------------------|-------------------|
| | Arch Anat Cytol Pathol. 1991 | Int J STD AIDS 2005 | JAPI. 2005 | Int Conf AIDS. 1992 | - |
| Hypercellular | 73% | - | 18% | - | 38% |
| Hypocellular | 21% | - | 7% | - | 33% |
| Myelodysplasia | 79% | - | 21% | 76% | 9.5% |
| Aplastic BM | - | - | - | - | 4.7% |
| Plasma cells | 98% | - | 65% | 70% | 43% |
| Lymphoma | 3.5% | 6% | - | 7.3% | - |
| Leukemia | - | - | - | - | 14% |
| Granulomas | 1.2% | 14% (MB) | - | 13% | - |
| Parasitic disease | 3.5% | 1% | - | - | 4.7% |

Thank YOU