

## Last Month's Slides

### June 2020 Slide Summaries

#### Slide 1

Occasional myelocyte, relative monocytosis. Giant platelet

#### Slide 2

Generally normal film, occasional atypical lymphocyte

#### Slide 3

Acute myelomonoblastic leukaemia with 83% blasts and promonocytes. N'RBCs

#### Slide 4

Myelodysplastic blood film with excess blasts. Hypogranular myeloid cells 15% blasts

#### Slide 5

Eosinophilia+++  
IgE hypergammaglobulinemia syndrome

#### Slide 6

Myelocytes and occasional blast  
Some hypogranular polymorphs  
Myelodysplasia



### This issue

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Morphology in Covid 19 **P.2/3**  
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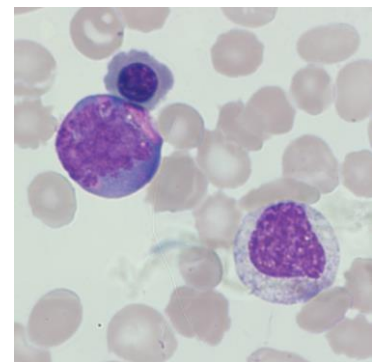
## Monthly Digital Case study June 2020 Slide 4

### Presentation

Male (87 years old)  
Follow up of known MDS with excess of blasts

### FBC Results

WBC	96.5 (10 <sup>3</sup> /mm <sup>3</sup> )	Neutrophils	44.2%
RBC	2.50 (10 <sup>6</sup> /mm <sup>3</sup> )	Lymphocytes	3.1%
HGB	82 (g/L)	Monocytes	20.6%
HCT	24.7 (%)	Eosinophils	0.8%
MCV	99 (fL)	Basophils	1.5%
MCH	33.0 (pg)	Metamyelocytes	2.3%
MCHC	33.4 (g/dL)	Myelocytes	9.2%
PLT	41 (10 <sup>3</sup> /mm <sup>3</sup> )	Promyelocytes	0.8%
N'RBCs	7/100 WBCs	Blasts	17.5%



### Slide review

A challenging slide with multiple dyscrasia  
Myelodysplastic blood film with hypogranular and hypersegmented neutrophils. Some with nuclear extensions  
No Auer rods seen.

Blasts and promonocytic cells present  
Monocytosis – monocytes with vacuoles

Blood film confirms thrombocytopenia

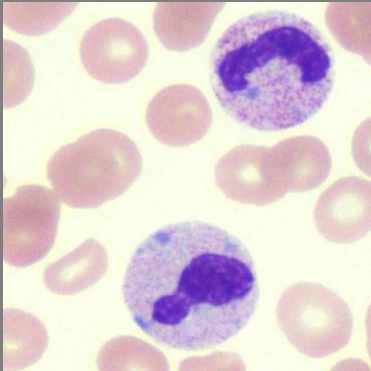
Anisocytosis +++ with microcytic and macrocytic RBCs, poikilocytosis and occasional spherocyte

### Diagnosis

Myelodysplastic syndrome in transformation to probable acute myeloid leukaemia.  
Immunophenotyping required

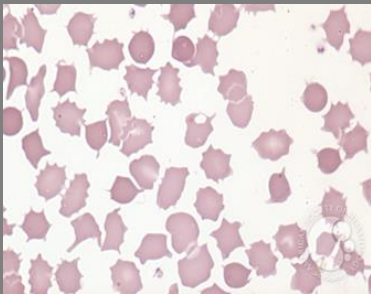
# Monthly Morphology Quiz

Look closely at these cells:



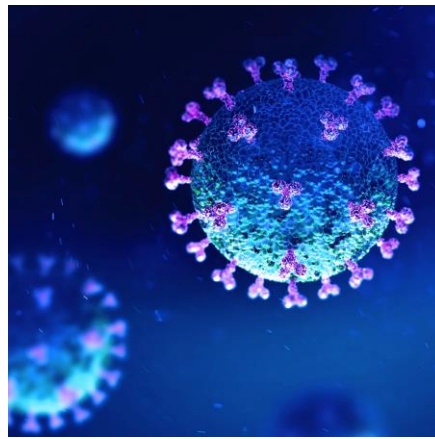
What is unusual about them and what could this indicate?

## Last month's cells:



The blood film shows acanthocytes and spherocytes.

The blood film was from a patient with haemolytic anaemia.



# Blood Morphology in Covid 19 patients

An overview of laboratory findings

## Introduction

Many quantitative hematologic abnormalities have been described in the first patient studies of COVID-19, the disease caused by the SARS-CoV-2 virus. In addition to this, a number of studies have explored morphological changes that accompany the disease at different stages and different degrees of severity.

## Haematology

From a haematology perspective, reduced levels of lymphocytes, haemoglobin and platelets have been noted. Lymphocytopenia has been indicated in up to 85% of severe cases, with its severity linked to outcome. The neutrophil/lymphocyte (N/L) ratio being cited as a useful indicator.

In addition to low lymphocytes, blood counts may also show leucocytosis with neutrophilia and monocytopenia initially with subsequent improvement in the number of monocytes from the fifth day onwards.

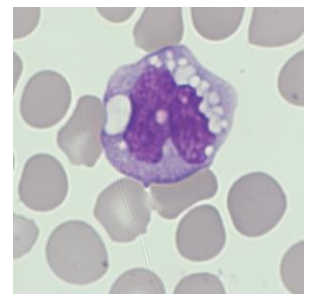
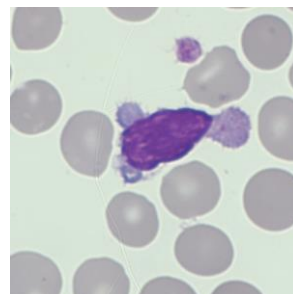
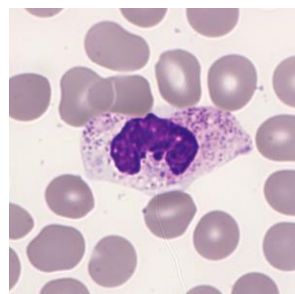
The most common haematological findings include:

- Lymphocytopenia, neutrophilia
- Mild thrombocytopenia (35%) or, less common, thrombocytosis.
- The occasional presence of atypical, reactive lymphocytes
- A mild leuco-erythroblastic picture was observed in the peripheral blood film in a report from California

## Blood Morphology

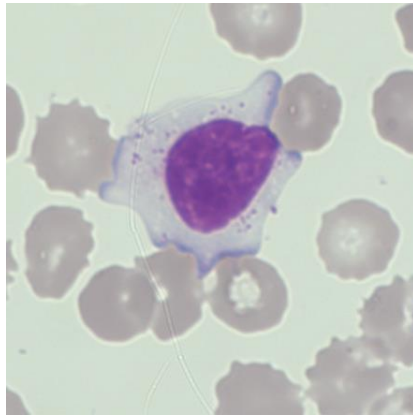
Early research suggests that peripheral blood films of a patient with COVID-19 may show certain morphological features:

- Neutrophils may show heavily clumped chromatin with toxic granules and cytoplasmic vacuoles
- Abnormal Neutrophils with C-shaped, foetus-like nuclei have been noted, some with nuclear projections, named by one study as 'COVID nuclei'
- Activated monocytes could be a favourable sign
- Large granular lymphocytes with some atypical features



# Blood Morphology in Covid 19 patients

Continued from page 2



## Blood Morphology Continued...

Lymphocytes were described as large granular lymphocytes (LGL) with round to indented nuclei, condensed chromatin, prominent nucleoli in a few, along with abundant pale blue cytoplasm with distinct variably sized azurophilic granules (see above). Cytoplasmic pod formation and apoptosis were also observed in a few lymphocytes. These could represent natural killer cells or cytotoxic T lymphocytes.

## Conclusion

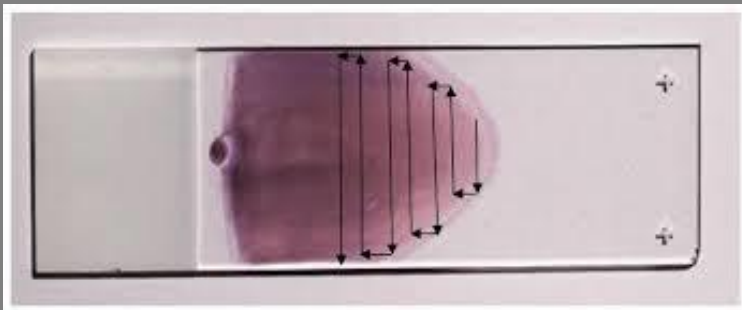
The understanding haematological changes in SARS-CoV-2 is still evolving. To reach a definite conclusion regarding the specificity and reliability of these abnormal features in peripheral smears, more COVID-19 positive patients need to be evaluated in larger studies.

If confirmed, these morphological features along with blood count will be helpful in the screening, diagnosis, and management of these patients

## This Month's Top Morphology Tip

### Performing a manual differential

- Usually done by counting 100 leukocytes
- Scan the slide to find where the cells are optimally spread (monolayer) and switch to 50 or 100x oil immersion objective
- Begin counting the white cells moving back and forth across the slide in a pattern that avoids covering the same area
- Ideally this is done by moving sideways in a "battlement pattern"
- Identify each leukocyte 100 cells have been counted, identified by type
- This will provide a percentage of each leukocyte type or a relative differential leukocyte count



## Other News

### QSP 2.0

Available now!

Options for a single operator or site license which allows up to 10 concurrent users

## Bibliography

BMJ Morphology of COVID-19-affected cells in peripheral blood film  
Aminder Singh et al

AJH - Morphological anomalies of circulating blood cells in COVID -19  
Gina Zini et al

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