

# Last Month's Slides

## Side 1

See case study on right

## Slide 2

Patient in intensive care unit.

Neutrophilia. Anaemia.

Thrombocytopenia.

Expert comment: Presence of vacuoles in neutrophil + echinocyte: Septic shock?

## Slide 3

Lymphopenia.

Aniso-poikilocytosis (++)

anisochromia (++)

Elliptocyte (++)

Echinocyte (++)

## Slide 4

Normal

## Slide 5

Emergency, Lymphopenia (0.49 G / L).

## Slide 6

Normal



## This issue

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## Monthly Digital Case study July 2021

### Atypical Lymphocytes

## Presentation

Female (81 years old)

## FBC Results

WBC 26.2 ( $10^3/\text{mm}^3$ )

RBC 4.05 ( $10^6/\text{mm}^3$ )

HGB 12.2 (g/dL)

HCT 36.5(%)

MCV 90 (fL)

MCH 30.1 (pg)

MCMH 33.4 (g/dL)

PLT 38 ( $10^3/\text{mm}^3$ )

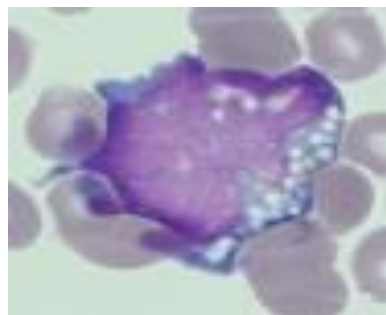
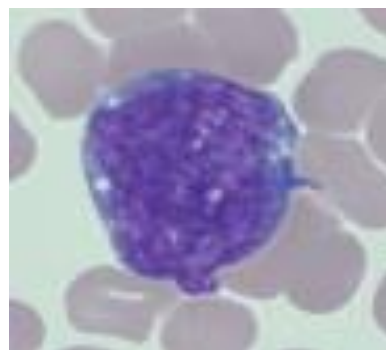
Neutrophils 31. 9%

Lymphocytes 13.3 %

Monocytes 5.2%

Eosinophils 1.5%

Basophils 0.7%



## Slide review

Patient hospitalised in Clinical Haematology

unit. **Analyser alarms:** WBC (Blasts / Abn Lympho?).

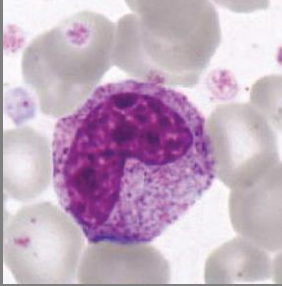
**Clinician comment :** EMERGENCY (+++).

**Diagnosis:** Burkitt's lymphoma. Read a case of Burkitt's Lymphoma [here](#).

Burkitt lymphoma (BL) is a rare type of [non-Hodgkin lymphoma \(NHL\)](#). BL develops when B-cells become abnormal (cancerous). B-cells are white blood cells that normally help fight infection. They are sometimes called B-lymphocytes.

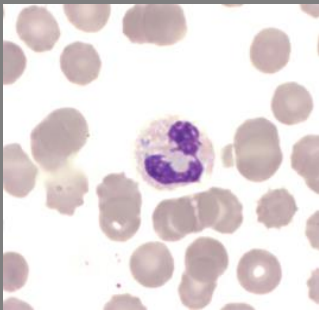
## Cell Quiz

This cell is characterised by abundant granular cytoplasm with predominance of specific granules, kidney-shaped or indented nucleus, coarser chromatin, and lack of distinct nucleoli. Name the cell:



## Last Month's Cell Quiz

From the following choose the description to best describe the prominent feature in the displayed Neutrophil:



Answer:

Neutrophil Toxic Granulation.

Toxic granulation refers to the dark coarse granules found in granulocytes, especially neutrophils.

The presence of this granulation in a peripheral blood film is suggestive of an inflammatory process. Toxic granulation is commonly found in patients with bacterial infections & sepsis, although it's findings can be non-specific.

Patients receiving chemotherapy or CSF may often show toxic granulation.

## slide review continued

There are different types of BL:

- Sporadic BL – this is the most common type of BL. It usually develops in the tummy (abdomen), where it may form a large tumour. It can also affect other parts of the body
- Immunodeficiency-related BL – this type develops in people who have a weakened immune system
- Endemic BL – this type mainly affects children in Africa and is very rare in the symptoms

BL generally develops in the tummy area (abdomen). Symptoms include:

- Tummy pain
- Swelling of your tummy caused by a build-up of fluid (ascites)
- Feeling sick (nausea)
- Diarrhoea

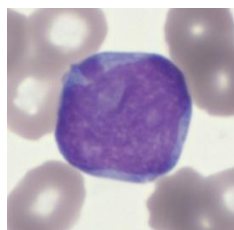
BL may also cause painless swellings in the neck, armpit or groin. This happens due to lymphoma cells building up in the lymph nodes, which makes them bigger. Often [lymph nodes](#) in more than one part of the body are affected. The symptoms of BL can often develop very quickly.

## Granulocyte Development

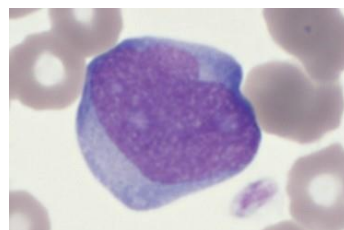
Myelopoiesis occurs in the bone marrow and is a regulated process. Approximately  $10^8$  to  $10^9$  cells are produced per hour in order to keep the necessary number of circulating cells at normal levels. Haematopoietic growth factors, such as Stem Cell factor (SCF), interleukin (IL-3), granulocyte-macrophage colony stimulating factor (GM-CSF), and granulocyte colony stimulation factor (G-CSF) play an important role in the amplification of the progenitor cells. G-CSF is essential for the amplification and terminal differentiation of neutrophil progenitors and precursors.

### Myeloblast

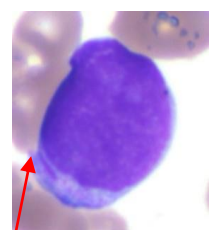
The Myeloblast is the earliest morphological identifiable cell. Myeloblasts are 10 – 20  $\mu\text{m}$  in diameter. There is little cytoplasm which is basophilic in colour and may contain fine azurophilic granules, nucleus: cytoplasm ratio (N:C ratio) approx. 4:1. The nucleus is round to oval and situated either centrally or to one side of the cell and has loose open reddish purple stained chromatin and may contain 1 – 5 nucleoli. Occasionally, Auer rods may be seen in Myeloblasts, Auer rods are distinctive needle like crystals that are specific and virtually diagnostic for Myeloid leukaemia. The crystals are composed of peroxidase proteins.



Myeloblast



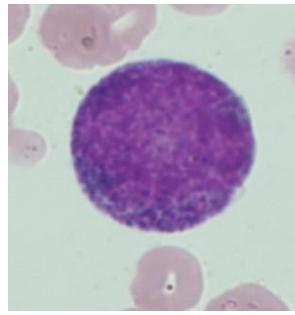
Myeloblast with Auer rod



Auer Rod

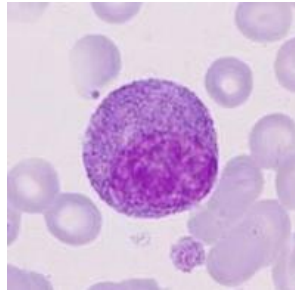
## Promyelocyte

The Promyelocyte is larger than a Myeloblast (diameter 15-25  $\mu\text{m}$ ) with more abundant cytoplasm and abundant azurophilic primary granules. The N:C is approx. 3:1 With more cytoplasm present than in a Myeloblast and is slightly less basophilic.



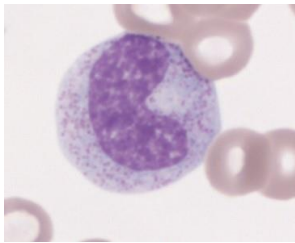
## Myelocyte

Myelocytes are smaller than the earlier precursors, (diameter 10 -20  $\mu\text{m}$ ) the cytoplasm is eosinophilic and the predominant feature is the presence of fine secondary granules (N:C ratio 2:1). The nucleus has coarse chromatin with no prominent nucleoli. The myelocyte is the last stage where the cell undergoes mitosis. A myelocyte can be identified as Neutrophilic Eosinophilic and Basophilic based upon the characteristics of its granules.



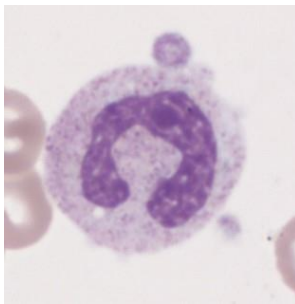
## Metamyelocyte

The Metamyelocyte measures 10-12  $\mu\text{m}$  in diameter, the nucleus is indented or U shaped (kidney bean shaped). The cytoplasm is filled with primary, secondary and tertiary granules.



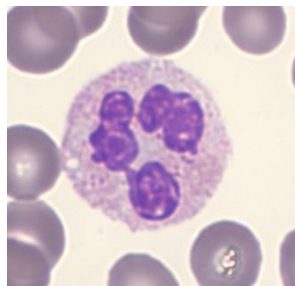
## Band Form

The Band Form or Stab cell is the final stage prior to a mature Neutrophil and is characterised by an indented, unsegmented C or S shaped nucleus.



## Mature Neutrophil

Most prevalent white cell in normal adults. 12-15  $\mu\text{m}$  in diameter, cytoplasm contains numerous fine granules. The nucleus is divided into 2 to 5 distinct lobes.



## Haematopoiesis

**Haematopoiesis** comes from the Greek meaning "blood" and "to make". This process is the formation of blood cellular components. Every cellular component originates from haematopoietic stem cells. As the stem cell multiplies, some cells transform into the precursor cells. These are destined to become a particular type of blood cell. They will divide and mature into blood components, such as white cells, red cells and platelets. Haematopoiesis occurs within the haematopoietic system, which includes organs, such as the bone marrow, liver and the spleen.

A free copy of our haematopoiesis poster suitable for your lab is available for download on our [web](#).

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## Bibliography

Burkitt Lymphoma: [Diagnosis, Prognosis, Symptoms, and ...](#)  
<https://www.webmd.com>

[Chase the Case, HORIBA Medical](#)

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