

A Staining Artefact Presumed to be Pathology in a Patient Investigated for Megaloblastic Anaemia and Myelodysplastic Syndrome: A Case Study at

Abstract

Artefacts are structures that are not normally present in well prepared smears. Well stained smears are the cornerstone of diagnostic haematology and this requires properly stained smears achieved by adherence to standard operating procedures (SOPs) to ensure reliability of results. Artefacts on smears may baffle the examiner and may in fact be assessed as real pathology by an inexperienced examiner or conceal real pathology. This case report describes a patient who was referred to the haematology department for work-up of a macrocytic anaemia to exclude megaloblastic anaemia and myelodysplastic syndrome. The initial blood smear processed consisted of numerous basophilic stippling-like inclusions which was perplexing as the degree of BS has never been encountered before. This prompted a repeat of the blood smear which showed resolution of the artefact. Basophilic stippling can be seen in megaloblastic anaemia and myelodysplastic syndromes.

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of diabetes, hypertension, nephrotic syndrome and is partially blind. She was on no drugs that could cause the anaemia and there was no history of haemorrhage (Table 1).

Table 1: A full blood count and differential count.

FBC		Differential count	
WCC	4.25 × 10 ⁹ /L	Neutrophils	62%
Hb	5.2 g/dL	Lymphocytes	29.40%
MCV	108.2 fL	Monocytes	4.90%
PLT	189 × 10 ⁹ /L	Eosinophils	1.60%
		Basophils	0%
		Immature	2.10%

The peripheral blood smear was repeated and the correct procedure was followed in the preparation and processing of the smear and showed resolution of both the drying artefact and the basophilic stippling artifact (Figure 5).

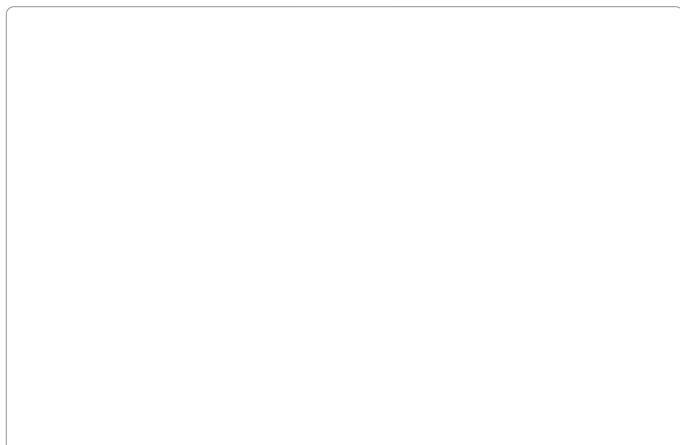
Figure 1: A full blood count and differential count.

Figure 2: Peripheral blood smear showing numerous basophilic stippling like inclusions.

Of note on the peripheral blood smear were numerous basophilic stippling like inclusions which were identified as basophilic stippling initially in a background of a drying artefact. My concern was the numerous red cell inclusions (Figure 3). At this stage the results for the B12 and folate levels became available and showed no deficiencies in the two vitamins. Other possible causes of BS were entertained at this point and the clinicians were advised on further investigations. A decision was eventually made to repeat the peripheral blood smear (Figure 4).

Other tests and results relevant to the case were:

1. Coombs test: Negative (repeated twice)
2. LDH: 231



12. Cytogenetics showed a normal female karyotype.

Background

A PAS (Periodic Acid Schi) stain was also performed and showed no granular staining on erythroid precursors. Normal erythroid cells are PAS negative. Positivity is seen in disease states such erythroleukemias, acute lymphoblastic leukemias, thalassaemias, certain lymphomas etc.

A diagnosis of MDS with multilineage dysplasia with possible underlying low grade hemolysis was made. The patient is managed by the clinical hematologists.

Discussion

Artefacts on peripheral blood smears may come from improper processing of smears and can be mistaken for real pathology. The BS artefact was caused by improper drying of the smear before staining it. Drying artefact is recognised in red blood cells as round to crescent shaped punched out regions or refractile vacuole like structures.