

Clinical Image

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Trypanosomes or platelet artefacts? A morphological dilemma!**Shruti Agrarwal¹; Neha Singh²; B Priyavadhana³; Kriti Kaira^{4*}**¹Consultant Pathologist, Bansal Hospital, Bhopal 462016, India.²Additional Professor, Department of Pathology and Laboratory Medicine, All India Institute of Medical Sciences, Rishikesh 249203, India.³Assistant Professor, Department of Pathology and Laboratory Medicine, All India Institute of Medical Sciences, Rishikesh 249203, India.⁴Post Doctoral Fellow in Oncopathology, Department of Pathology, Nizam's Institute of Medical Sciences, Hyderabad 500082, India.***Corresponding Author: Kriti Kaira, MBBS, MD**

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Keywords: Peripheral smear; Platelets; Artefacts.**Abbreviations:** PS: Peripheral Smear; K2-Edta: Dipotassium Ethylenediaminetetra acetic Acid.**Description**

Peripheral Smear (PS) examination still remains a cornerstone and first step towards diagnostic work-up of patients. However, presence of artefacts in PS can sometimes prove perplexing for the pathologists [1]. In one such experience, early morning blood sample in K2-EDTA vial of a 23-year-old female was sent to hematology lab. Prepared PS revealed numerous extracellular, elongated, slender eosinophilic 'flagellated' structures measuring 4-5 μ , closely mimicking trypanosomes, but looking like miniature forms! With nondiscernible kinetoplasts

(Figure 1A,B,C). Her hemoglobin was 11.5 g/dL, total leukocyte count 14.2×10^9 /L and platelet count was 381×10^9 /L. She presented with abdominal distention, mild icterus and had mildly elevated total and direct bilirubin. There was no history of thrombocytopenia or fever and blood loss.

Three pathologists studied the smear, and their consensus that these structures were much smaller than the usual 10 μ size of trypanosomes [2], led to request for a repeat fresh blood sample. On repeat smear, these structures turned out to be normal round to oval platelets! (Figure 1D).

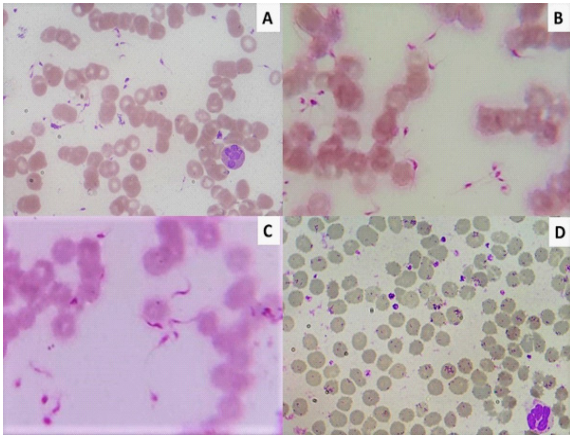


Figure 1: (A,B,C) Peripheral smear showing numerous elongated “flagellated” structures resembling miniature trypanosomes, produced because of smearing artefacts. (D) Repeat peripheral smear showing normal platelets. (x1000, Leishman stain).

The patient was diagnosed eventually with choledochal cyst of liver with no evidence of any parasitic infection. Extensive smearing can cause platelet elongation, giving them a trypanosome-like appearance, which could be one of the contributing factors. Also, few studies suggested platelet morphogenesis takes place in plasma exhibiting platelets at various stages of maturation ranging from elongated proplatelets to curved fusiform disk shaped platelets which again can be mistaken for flagellated forms [3,4].

Various work on animal models stated platelets gets slightly activated by contact with the glass slide during smearing (as is common in feline samples) can acquire stellate form with dendritic processes [5].

According to Behnke’s hypothesis proplatelets appeared in plasma in a circadian rhythm, particularly during a few hours after sunrise in human blood. In this patient also, early morning sample showed elongated and spindled forms of platelets but repeat late morning sample was devoid of these flagellated forms [4].

Our observation emphasises the need for the pathologist to be aware of possible artefacts on PS. Each smear must be meticulously reviewed keeping in mind the clinical scenario and the limitation of the procedure, to avoid a misdiagnosis.

Declarations

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms.

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References

1. Mc Namara C. Collection and handling of blood. In: Bain BJ, Bates I, Laffan MA, editors. *Dacie and Lewis practical hematology*. 12th ed. Edinburgh; Elsevier: 2017; 1-7.
2. Bogitsh BJ, Carter CE, Oeltmann TN. *Human parasitology*. 5th ed. London; Elsevier: Chapter 6, Blood and tissue protozoa I: Hemoflagellates; 2018; 85-110.
3. Wright JH. The histogenesis of the blood platelets *J Morphol.* 1910; 21: 263-278.
4. Behnke O, Forer A. From megakaryocytes to platelets: Platelet morphogenesis takes place in the bloodstream. *Eur J Haematol Suppl.* 1998; 61: 3-23.
5. Italiano JE Jr, Lecine P, Shivdasani RA, Hartwig JH. Blood platelets are assembled principally at the ends of proplatelet processes produced by differentiated megakaryocytes. *J Cell Biol.* 1999; 147: 1299-312.