
CASE REPORT

Endothelial Cells: An Accidental Finding in Peripheral Smear

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Abstract:

Background:

Normal endothelial cells may be present as artifacts in peripheral smears prepared from venous blood sample. The interpretation of these cells in blood smears should be done cautiously. Endothelial or endothelial-like cells have also been described in few diseases, which may lead to erroneous diagnosis.

Case:

Thirty-eight years old male presented with symptoms of acute pancreatitis. Romanowsky stained peripheral smear revealed mild monocytosis and presence of elongated cells in sheets and singly which were diagnosed as endothelial cells.

Conclusion:

Differentiating artifact endothelial cells from diagnostically significant cells is utmost important in order to avoid diagnostic fallacies. This phenomenon can also be prevented by due caution during preparation of smears from venous blood samples.

Key words:

Endothelial cells, peripheral smear, Romanowsky stain

Introduction:

Normal endothelial cells presenting purely as artifact in smears prepared from venous blood, must be recognized, as they may simulate abnormal monocytoïd cells described in infectious

mononucleosis, acute lymphocytic leukemia or monocytic leukemia when appearing singly and may also simulate metastasizing malignant cells when present in sheets¹.

These cells are morphologically identical with the endothelial cells described in bone marrow smears, splenic aspiration material and tissue cultures².

In the present case, clusters of endothelial cells were seen present in sheets on peripheral smears with mild monocytosis on differential count.

Case Report:

A38-years-old man presented with acute abdominal pain with clinical diagnosis of acute pancreatitis correlated serologically by raised serum amylase level of 147.8 IU/L. Also reactivity for HBsAg was found. Complete blood count revealed Hemoglobin- 16.2 gram%, TLC- 7,860/cubic mm and Platelets count- 2,10,000/cubic mm. The peripheral blood smear showed predominantly normocytes, few macrocytic and normochromic erythrocytes. Mild monocytosis (12%) was present along with few clusters of elongated cells with moderate cytoplasm present in sheets were observed in the tail of the smear. Subsequently prepared few smears from same blood sample did not show any evidence of these cells. These elongated cells were diagnosed as normal endothelial cells as an artifact (Fig.1 A and B).

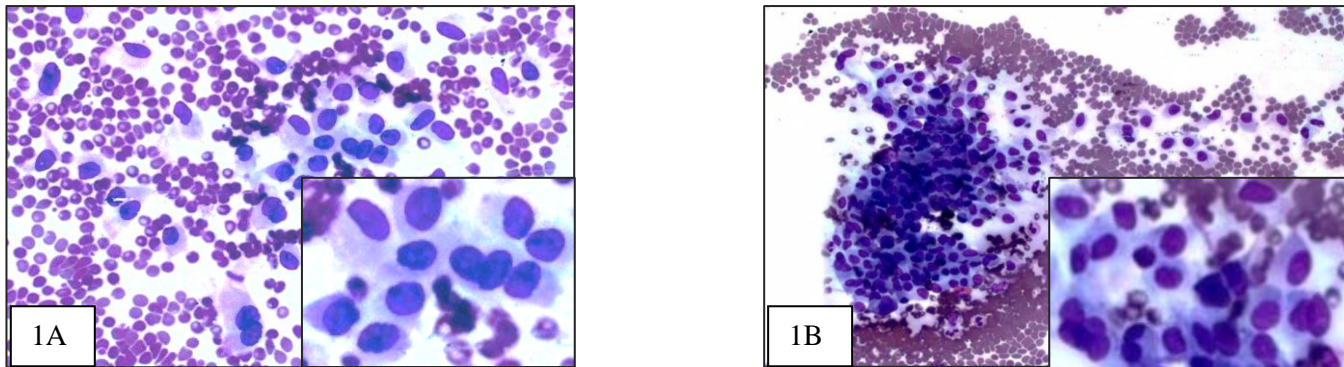


Figure No: 1 (A and B, 400x)

Romanowskystain: Peripheral smears from venipuncture showing 2 foci of medium to large sized bland spindle cell clusters with oval nuclei some showing nuclear grooves (A and B subset, 1000x).

Discussion:

Diseases which characteristically show vascular injury or vessel formation (e.g., infections, coronary angioplasty, unstable angina, acute myocardial infarction, peripheral atherosclerosis, vasculitis, systemic lupus erythematosus, malignancy, thrombotic thrombocytopenic purpura, and few others) may show endothelial cells in the peripheral blood sample, but even in such conditions, they are very sparse³.

Cha CH described endothelial cells as medium- to large(20-30 n) sized cells frequently elongated, containing oval-grooved nucleus occasionally eccentric with uniform, moderately coarse and dark violet chromatin, appreciated on Romanowsky stains. One to 3 light blue nucleoli can be present, occasionally indistinct. Moderate amount of pale blue finely granular cytoplasm with fraying at the tapered ends of the cells can be seen with no distinct cell membrane³. The cell edges are quite irregular as if torn from an adjoining cell. These cells when found in groups, seemed to form syncytial sheets as was seen in our case. No azure granules or inclusions were noted².

Some authors believed that there is a constant shedding of endothelial cells into the blood stream homologous to the desquamation of serosal cells from the peritoneum, pleura and pericardium or similar to epithelial cells from the bronchi. These isolated

endothelial cells in normal blood do not have any clinical significance. The endothelial cells may be shed in increased numbers by irritation of both acute or chronic etiology^{2,4,5}. Ivaznelson observed that the endothelial cells in blood smears, often occurred in groups of upto 21 cells or more. Variety of diseases showed endothelial cells, but he found them in more numbers in infectious diseases. He postulated that the integrity of the vessel lining might be altered in disease processes, so that the sheets of endothelium become detached more easily and are torn from the vessel lining when the blood was drawn⁶. Ottander observed that there was a relationship between predominance of endothelial cells and monocytosis⁷.

Most of the standard textbooks of hematology and clinical pathology described the method of obtaining blood samples from the finger, ear lobe or heel with discarding or wiping away the first drop of blood. The purpose of discarding the first blood drop was initially explained by Seiverd. He stated that the first blood drop is diluted with tissue fluids and may be contaminated by foreign particles from the skin surface².

The probability of detecting endothelial cells is high, if the blood films are made using the first drop of blood and also if the needles are reused or barbed³.

Extraneous cells that are occasionally present in the peripheral smears include epithelial cells (either

nucleated or anucleated), endothelial cells and even subcutaneous fat cells⁸. Recognizing the nature of such cells is important in order to avoid misinterpretation as these cells are of pathological significance. The endothelial cells mostly occur in loose sheets of cytologically bland spindle cells with round to oval nuclei and variably condensed chromatin. Nuclei may be irregular or grooved and some may show multinucleation^{9,10}. Differential diagnosis in such conditions includes infectious mononucleosis, leukemia, or circulating malignant cells from sarcoma¹⁰. In the present case, the patient presented with acute abdominal pain with clinical diagnosis of acute pancreatitis. Hematological investigations were within normal limits except for mild monocytosis (12%). The peripheral smear showed presence of two foci of elongated cells in sheets and scattered singly. Endothelial cells in both clusters showed nuclear grooves and pale blue cytoplasm with irregular cytoplasmic membrane. The elongated cells were identified as endothelial cells due to its morphological similarity with endothelial cells elsewhere. There was no evidence of these cells in the subsequent smears. To conclude endothelial cells are very rarely seen on peripheral smears and if found, then they are an accidental artifacts. Such cells must not be confused with any other types of cells such as malignant cells. In the present case possibly acute inflammatory process with preceding Hepatitis B viral infection may have lead to fragility of the vascular endothelium resulting their detachment.

Conflict of Interest - Nil

Sources of Support - Nil

References:

1. LI JG, Mclaughlin RF, Wellings SR. Endothelial cells in blood smears. *California Medicine* 1958; 89(1):22.
2. Shanberge JN. Accidental occurrence of endothelial cells in peripheral blood smears. *American Journal of Clinical Pathology* 1955; 25:460-464.
3. Cha CH, Kim JU. Endothelial cells in peripheral blood smear: an artifact?. *Korean Journal of Hematology* 2010; 45(3):150.
4. Netousek M. Endothelia in the flowing blood. *Folia Haematologica* 1913; 17:407-408.
5. Netousek M. About endothelia and its relationship to monocytes (Clinical and microscopic observations). *Folia Haematologica* 1914; 19:1-11.
6. Kaznelson P. Rare cell forms of the flowing blood (Megakaryocytes, histiocytic endothelia). *German Archives of Clinical Medicine* 1917; 128:131-150.
7. Ottander O. High-grade endotheliosis in the blood in endocarditis lenta. *Acta Medica Scandinavia* 1926; 63:336-354.
8. Bain BJ. *Blood Cells: a Practical Guide*, 4th Edition, Blackwell Publishing, Oxford, 2006, pp 133-135.
9. Bain BJ. Endothelial cells. *American Journal of Hematology* 2013; 88: 517.
10. Sojitra P. Normal endothelial cells in blood smears. [Online]. Available from: <http://imagebank.hematology.org/image/62840/normal-endothelial-cells-in-blood-smears> [Accessed 09 July 2020].

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