

# Peripheral Smear In The Diagnosis Of Macrothrombocytopenia

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## Abstract

The congenital macrothrombocytopenias are a group of rare disorders characterised by thrombocytopenia, macrothrombocytes, leucocyte inclusions and variable clinical features of nephritis, deafness and cataract. Here we present a case of a 32 year old woman with history of menorrhagia. Her complete blood count revealed thrombocytopenia with a mean platelet volume of 15fl. The peripheral smear showed prominent Dohle body inclusions in most of the neutrophils, in few eosinophils and monocytes along with many macrothrombocytes.

## INTRODUCTION

A normal platelet varies in size from 1.5-3 $\mu$ m whereas a macrothrombocyte is a platelet with a size exceeding 4 $\mu$ m. The congenital macrothrombocytopenias are a group of rare disorders with abnormal giant platelets, thrombocytopenia and a variable bleeding tendency [1,2]. Authors Mhawech and Saleem classified these inherited giant platelet disorders into four groups. The first group included structural abnormalities and glycoprotein abnormalities like Bernard-Soulier syndrome (BSS) and grey platelet syndrome. The second group had neutrophil inclusions in addition to macrothrombocytes like May-Hegglin anomaly (MHA) and Sebastian syndrome (SS) and the third group included Fechtner syndrome (FS) and Epstein syndrome (ES) where, in addition to macrothrombocytes there were systemic manifestations. The fourth category was Mediterranean macrothrombocytopenia which was considered a benign entity [2]. In MHA the average mean platelet volume (MPV) is around 12.5fl and bright blue 2-4 $\mu$ m, spindle shaped neutrophil inclusions (Dohle body) are seen. In SS the MPV is around 18fl and the neutrophil inclusions are faint blue. In FS the MPV is around 20fl and pale blue inclusions in neutrophils are associated with clinical findings of deafness, cataract and nephritis. ES is characterised by deafness, nephritis, macrothrombocytes and absence of neutrophil inclusions [2,3]. Mutations in the myosin heavy chain gene 9 (MYH9) leading to alterations of protein non muscle myosinII A were identified in these congenital macrothrombocytopenias [4,5]. The neutrophil inclusions are due to aggregates of this protein and can be detected by

immunofluorescence [6]. After this discovery it was proposed that MHA, SS, FS and ES form a spectrum of related disorders and hence may be termed MYH9- related disorders[7].

## CASE REPORT

The complete blood count of a 32 year old nulliparous female, on a routine health check revealed a hemoglobin of 12.5gm/dl, a total leucocyte count of 8600 cells/cumm and a platelet count of 80,000/cumm. Her platelet indices showed a MPV of 15fl. The peripheral smear did not reveal any platelet clumps or platelet satellitism. Individual platelets were well granulated, abnormally large (5-6 $\mu$ m) with a few exceeding the size of red cells. The neutrophils had prominent, rod shaped and spindled out, multiple bright blue Dohle bodies which were randomly distributed in the cytoplasm (fig 1 and 2). There were no toxic granules or myeloid left shift in the neutrophilic series. These inclusions were demonstrable in more than 90% of the neutrophils. A little less prominent Dohle bodies were evident in the eosinophils, basophils and monocytes also (fig 3). Neutrophils constituted 67%, lymphocytes 20%, eosinophils 4%, monocytes 8% and basophils 1% of the differential count. On further questioning the patient admitted to having menorrhagia in the past with similar complaints in her mother. She denied having any other history of bleeding tendency. She was not on any medication and afebrile. Her general and physical examination did not reveal any abnormalities. There was no history of bleeding tendencies in the other family members.

Figure 4

Table 1: Differential diagnosis of other conditions with Dohle bodies or macrothrombocytes.

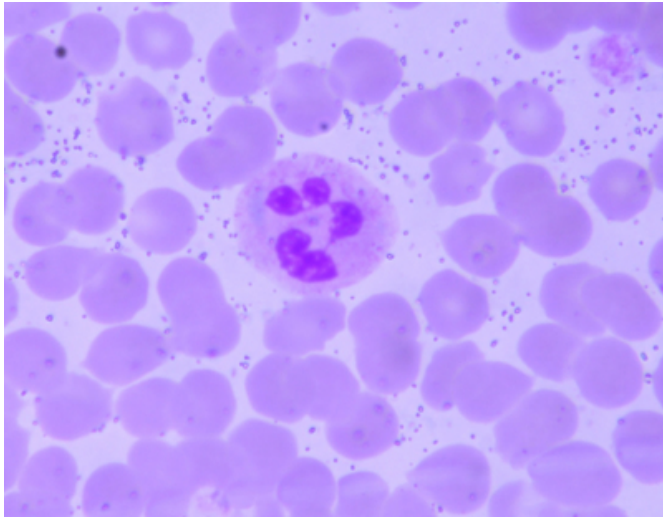


Figure 5

Table 2: Differential diagnosis of MYH-9 related disorders

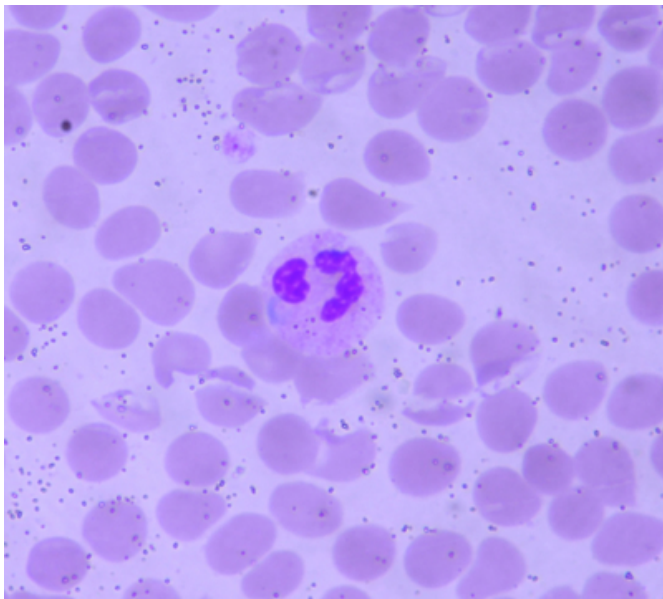
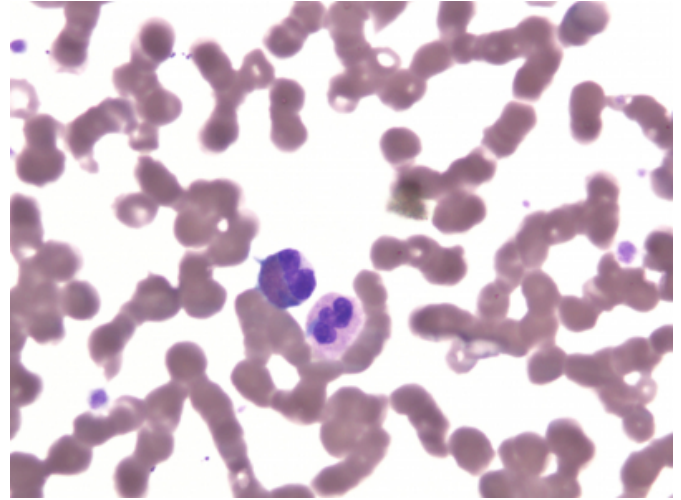


Figure 3

Figure 3: eosinophils with Dohle body.



### DISCUSSION

{image:4}

{image:5}

The congenital macrothrombocytopenias are a rare group of disorders and need to be differentiated from the more common immune thrombocytopenic purpura. This distinction is important as the treatment modalities vary for both. The congenital macrothrombocytopenias need only supportive therapy with platelet transfusions during surgeries. They do not benefit from steroids or splenectomy or intravenous immunoglobulin which is beneficial in immune thrombocytopenic purpura. Furthermore some of these inherited disorders have other clinical manifestations such as deafness, cataract and nephritis which may present later in life and hence they have to be monitored[8].

With macrothrombocytopenia and prominent Dohle inclusions we concluded that our patient is having a MYH9-related disorder, probably May- Hegglin anomaly. The presence of prominent Dohle bodies in the absence of infection, drug medication and a myeloproliferative disorder rules out BSS(table 1). The platelets were well granulated unlike that seen in grey platelet syndrome. Predominance of macrothrombocytes and the neutrophil inclusions are not consistent with a diagnosis of immune thrombocytopenic purpura. Among the other congenital macrothrombocytopenias, nephritis, deafness and cataract are seen in ES and FS. Our patient at presentation did not have any of these findings. SS also lacks clinical manifestations. The Dohle bodies seen in SS however are not as prominent as seen in this patient(table 2).

For logistic reasons no further investigations such as immunofluorescence could be undertaken for confirmation.

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