Case Series

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Pseudo Thrombocytopenia Due to Platelet Satelletism: A Rare Entity

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Abstract

Platelet Satellitism (PS) is a unique, uncommon phenomenon seen in peripheral blood smears prepared from Ethylene Diamine Tetra acetic Acid (EDTA) mixed blood. PS may lead to a misdiagnosis of thrombocytopenia unless peripheral smears are examined carefully. Here, we describe two case of PS incidentally detected during routine check-up

Keywords: Pseudothrombocytopenia; Satelletism; Platelet; EDTA.

Introduction

Adherence of platelet to polymorphonuclear leukocyte (platelet Satellitism) is a rare phenomenon. Platelet satellitism was first described by Field and Macleo in the year 1963 as an in vitro phenomenon seen in peripheral blood collected in Ethylene Diamine Tetra acetic Acid (EDTA) vial. Only few cases have been reported in literature. We came across two patients of platelet Satellitism who presented with thrombocytopenia which were later diagnosed of platelet Satellitism on peripheral blood smear examination.

Material and Method

Standard haematological methods are used for all patients (Outdoor+ Indoor emergency). CBC was done by hematology analyser(Medonic N series). Anticoguleted blood smear and finger prick smear were prepared in both cases. Sample were kept in 37^0C in incubator and smears prepared, stained with leishman stain (PH 7.2) and examined. Relevant clinical details were recorded.

Case 1: 5 year male child presented with fever. No previous history of medication. Physical examination was within normal limits except raised temperature. Laboratory tests showed neutrophilia and low platelet count (66000/Cu mm).

Case 2: 15 year female child presented with upper respiratory tract infection. Routine laboratory tests showed mild lymphocytosis with mid eosinophilia and platelet count 1 lakh / Cu mm.

Result

The Phenomenon is a light microscopic findings observed in ant-coagulated (EDTA) blood. It was not observed in finger prick smear and smear prepared after incubation of blood sample. On microscopy platelets were seen surrounding and adhering to polymorphs at some place completely and other ¾ of periphery (Figure 1; A,B,C). Occasional polymorphs showed engulfment of platelet (platelet phagocytosis) (Case 1) (Figure 1, C). Platelet adherence to other granulocytes and lymphocyte is rare. However in our case we have seen PS around lymphocytes, eosinophils and occasional monocytes (Case 2) (Figure 2; A, B,C, D). Phagocytosis of Platelet by lymphocytes and monocyte have also seen (Figure-2; B,D).

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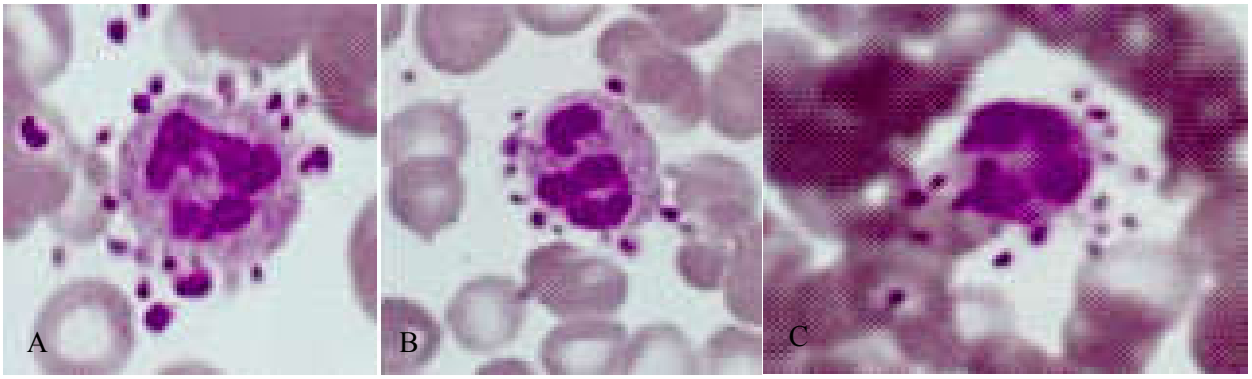

Fig. 1: *Microphotographs:* A -Platelets adhering to polymorphs at whole periphery. B- Platelets adhering to polymorphs at ¾th of periphery. C- Polymorphs showing engulfment of platelet and PS.

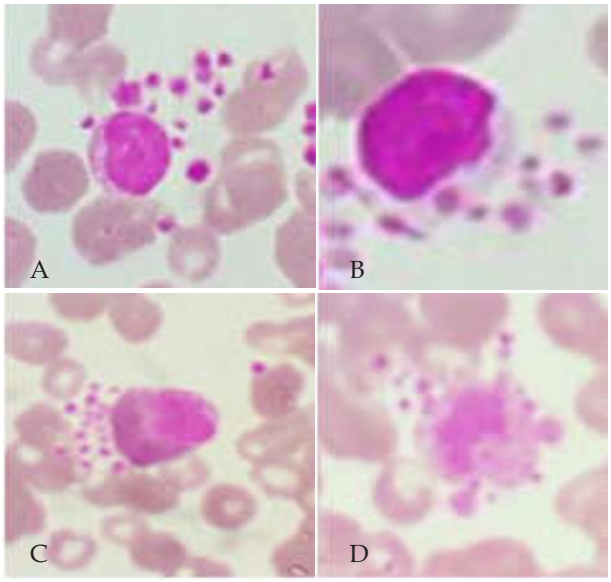

Fig. 2: *Microphotographs:* A- PS around lymphocyte B- Phagocytosis of platelets by lymphocyte C- PS around eosinophil,D- PS around monocyte with Phagocytosis

Discussion

PS is defined as an in vitro phenomenon of platelet surrounding and adhering to leukocyte found in peripheral smear with EDTA mixed blood at room temperature occurs mainly with

polymorph and other granulocytes and lymphocyte is rare. We have described two patients of platelet Satellitism who presented with thrombocytopenia and were later diagnosed with platelet Satellitism on peripheral blood smear examination. Platelet satellitism is associated with polymorphs and rarely with eosinophils, basophils, monocyte, lymphocyte and even atypical lymphocyte [1,2,3]. Sometimes PS is also associated with platelet phagocytosis by polymorphonuclear leucocytes and rarely by lymphocytes [1].

We found PS around polymorphs, lymphocyte, eosinophils and monocyte in EDTA blood smear. Bleeding time was normal in these patients. Platelet function test and electron microscopic study could not be performed as it is not available at our centre.

Kjeldsberg and Swanson et al [4] described electron microscopic features of the mode of adherence between platelet and polymorph in their study and stated that the areas of contact consist of blunt, rounded protuberances from the platelet surface. McGregor et al [5], demonstrated the morphologic sequence of events involved in PS. They showed that initial contact between platelet and polymorphs usually was made by the tip of platelet dendrite with a neutrophil pseudopod or inter-pseudopod area.

Exact etiology of the entity is unknown /poorly understood, thereby linking it to EDTA anticoagulant as described in literature would not be appropriate. Christopoulos and Mattock suggest etiology to be asscociated with a non-immunological process which includes linking of platelets via thrombospondin or some other alpha granule proteins such as P-selectine [6]. Adhesion of platelets to neutrophils is possible by existence of an active stimulus presented on the surface of platelets [6,7]. In the EDTA, Ca2+ ions, change the platelet membrane and antigenic structures on platelets and neutrophils, which are then recognized by antibody enabling a formation of a connection between the two cells. Bizzaro et al described immunological mechanism that states immunoglobin autoantibodies directed against the glycoprotein IIb/ IIIa complex of the platelet membrane and the neutrophil Fc gamma receptor play a role [8]. Antibodies that directly form a connection between platelets and neutrophils.Therefore these antibodies, which are present in some normal healthy individuals. In routine haematology we use EDTA, k2/k3 salt as main anticoagulant and may be seeing thousands of cases yet we have very few reported cases in literature [9-12]. Some author have linked with entity to EDTA

anticoagulant. It may not be appropriate since. PS has been observed in healthy persons [10,13] and association with a variety of disease like infection [9], Trauma patient [4,11] Malignancy [7]. We could establish the cause in our one case due to infection and other case have no particular illness. So far PS has been described in only few patients [1-12]. It is included in the list of spurious thrombocytopenia [13].

Conclusion

As PS has been found to be one of the causes of spurious thrombocytopenia. It is very important to identified diagnose/ report, this entity or else patient would be subjected to number of noninvasive/ invasive (Bone Marrow) test for establishing the cause of thrombocytopenia and adding to patient's expenditure for unwanted test. Both our patient, it was incidental finding picked up due to our regular protocol of confirming platelet on peripheral smear which is simple, low cost, age old/ gold standard haematology practice.

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