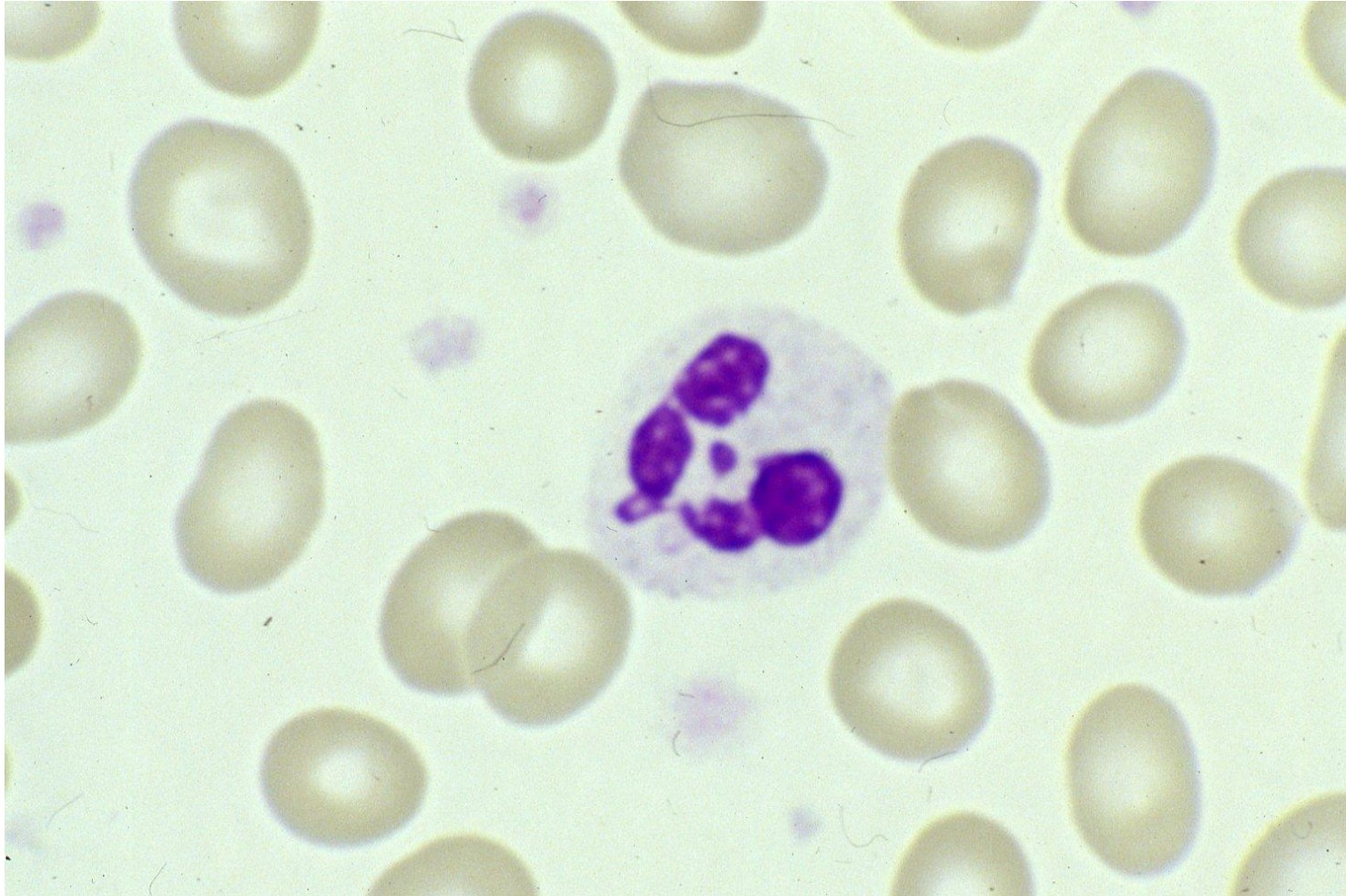


Thrombocyte variations in May-Giemsa-stained smears

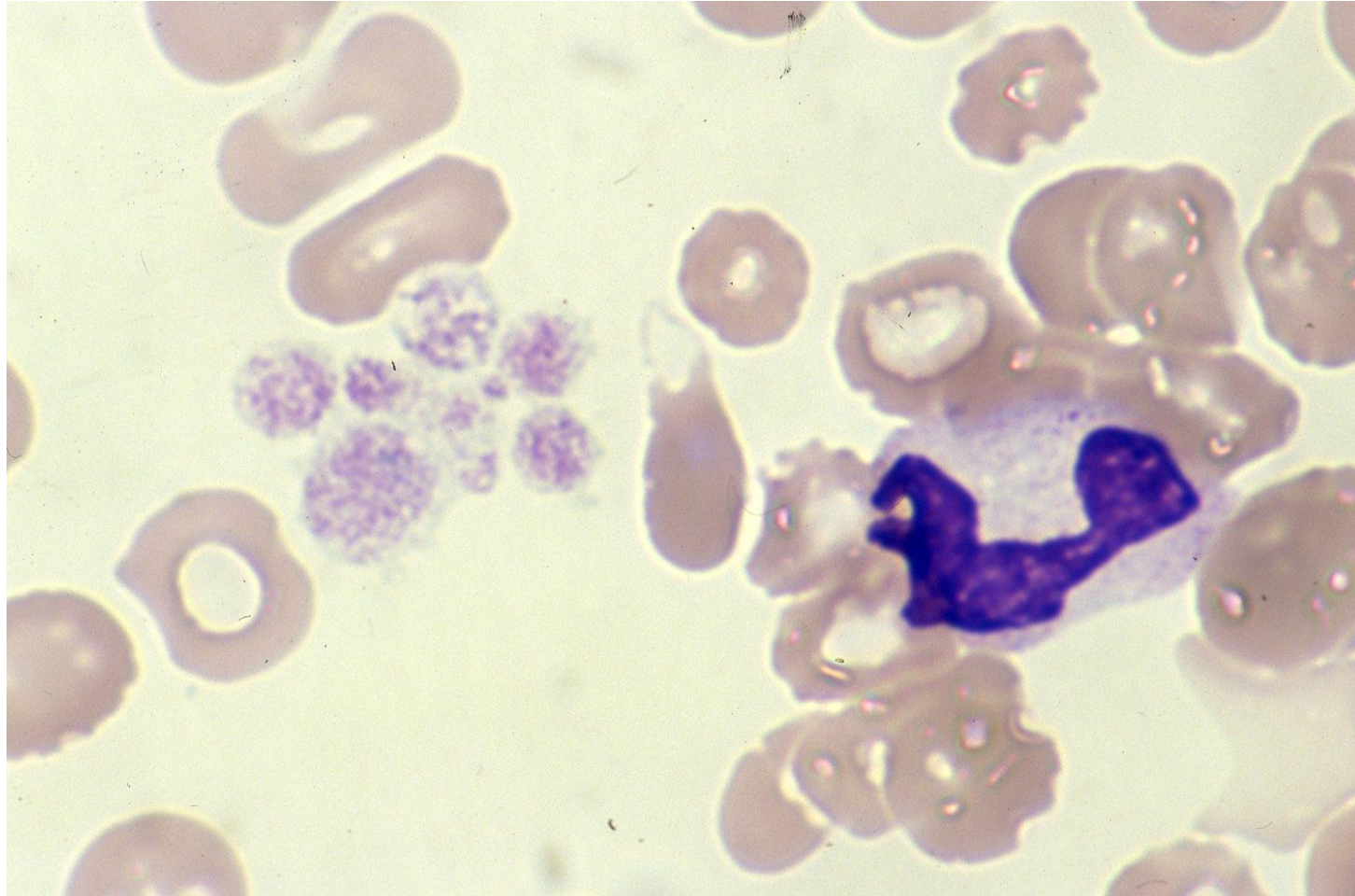
Platelets, small-sized anuclear cells with azurophilic granules, are continuously produced from megakaryocytes in the bone marrow. They are mainly involved in hemostasis and intravascular thrombosis.

The morphologic features of platelets in the peripheral blood and megakaryocytes in the bone marrow are presented.

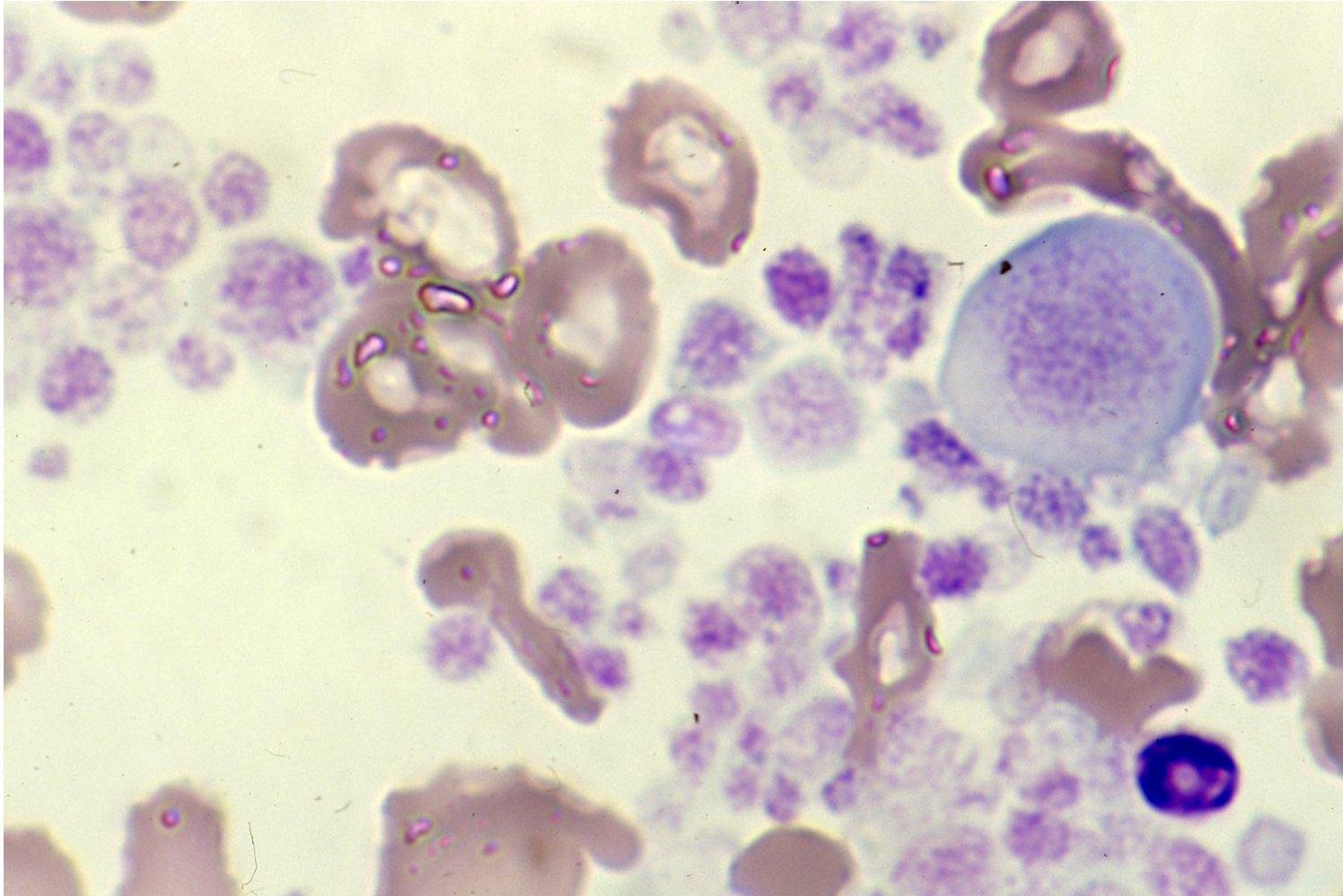
Ref.: van der Meijden PEJ, Heemskerk JWM. Platelet biology and functions: new concepts and clinical perspectives. *Nat Rev Cardiol* 2019; 16, 166-179. doi: 10.1038/s41569-018-0110-0



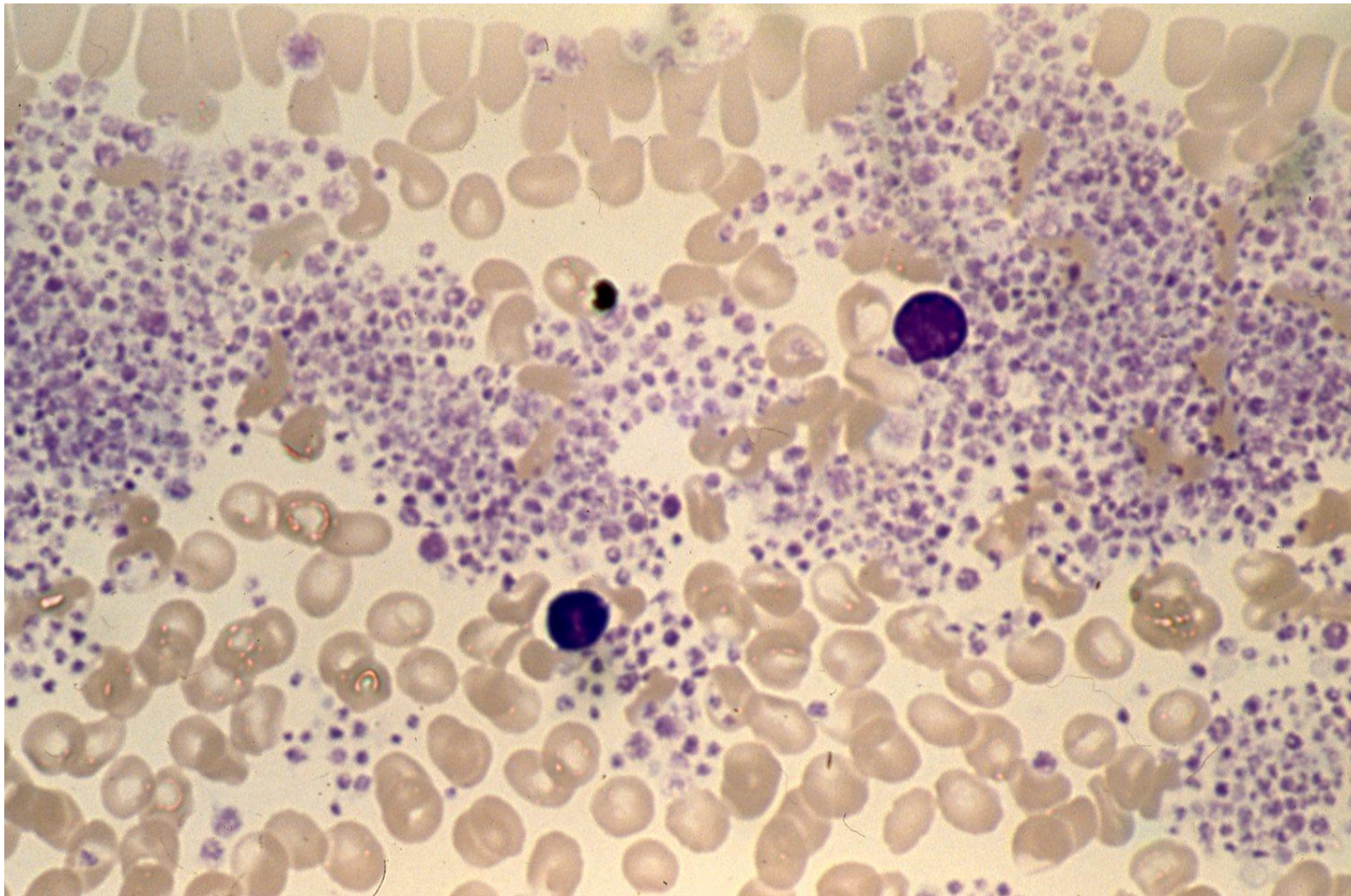
Normal platelets in the peripheral blood. Platelets are the smallest anucleated blood cells, around $2\ \mu\text{m}$ in diameter, derived from the cytoplasm of megakaryocytes in the bone marrow. They contain fine azurophilic granules. The average lifespan is 7 to 10 days.



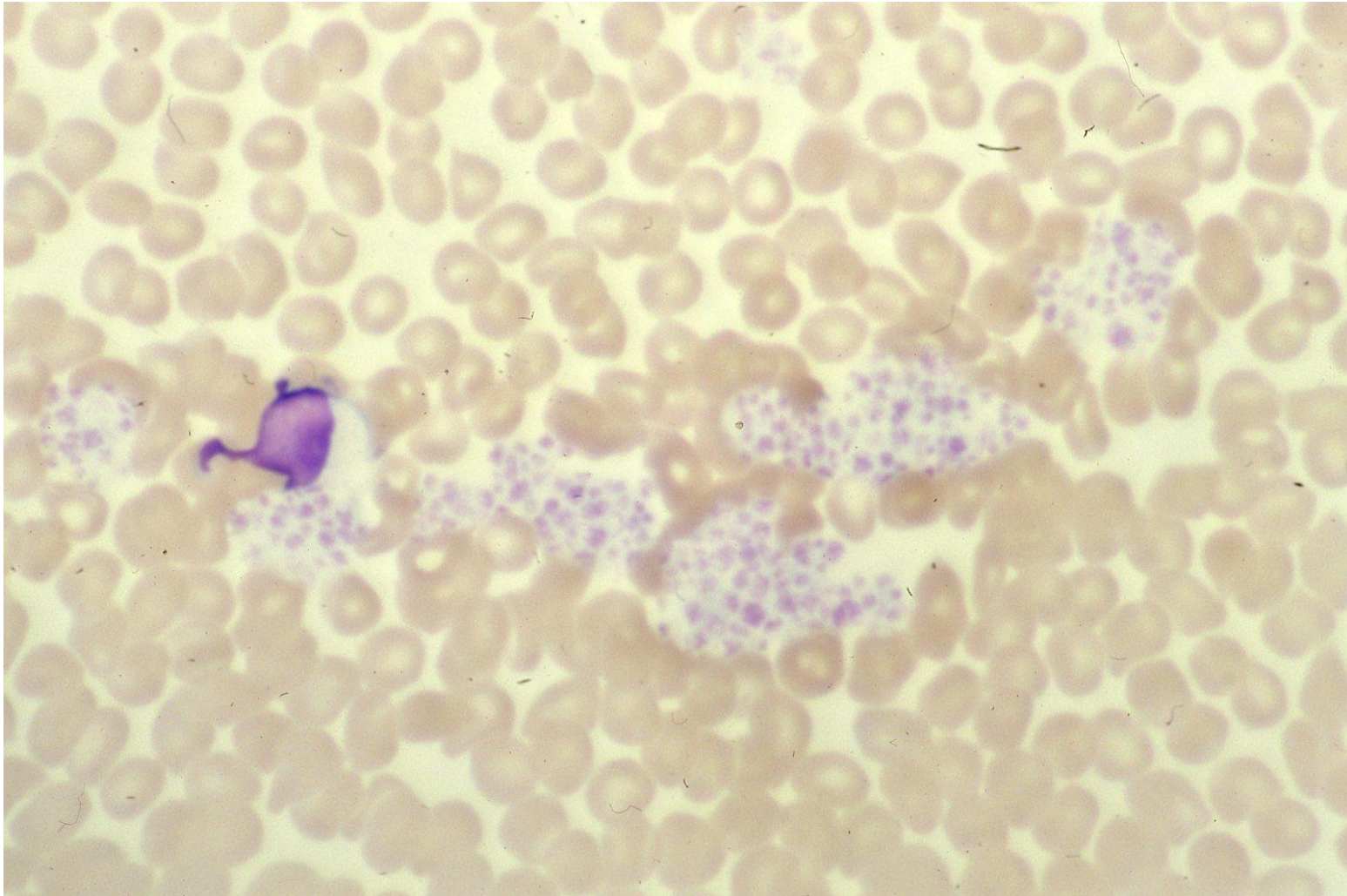
Large platelets in the peripheral blood. Large platelets have a diameter greater than 4 microns. When the size of the platelets exceeds the red blood cells (greater than 7 microns), they are called giant platelets. May-Giemsa



Giant platelets. The largest size of the platelet is greater than red blood cells. Giant platelets are seen in the present case of myelodysplastic syndrome. ITP may also accompany giant platelets. Bernard-Soulier syndrome, gray platelet syndrome and May–Hegglin anomaly are known to be hereditary thrombocytopenia with giant platelets. May-Giemsa



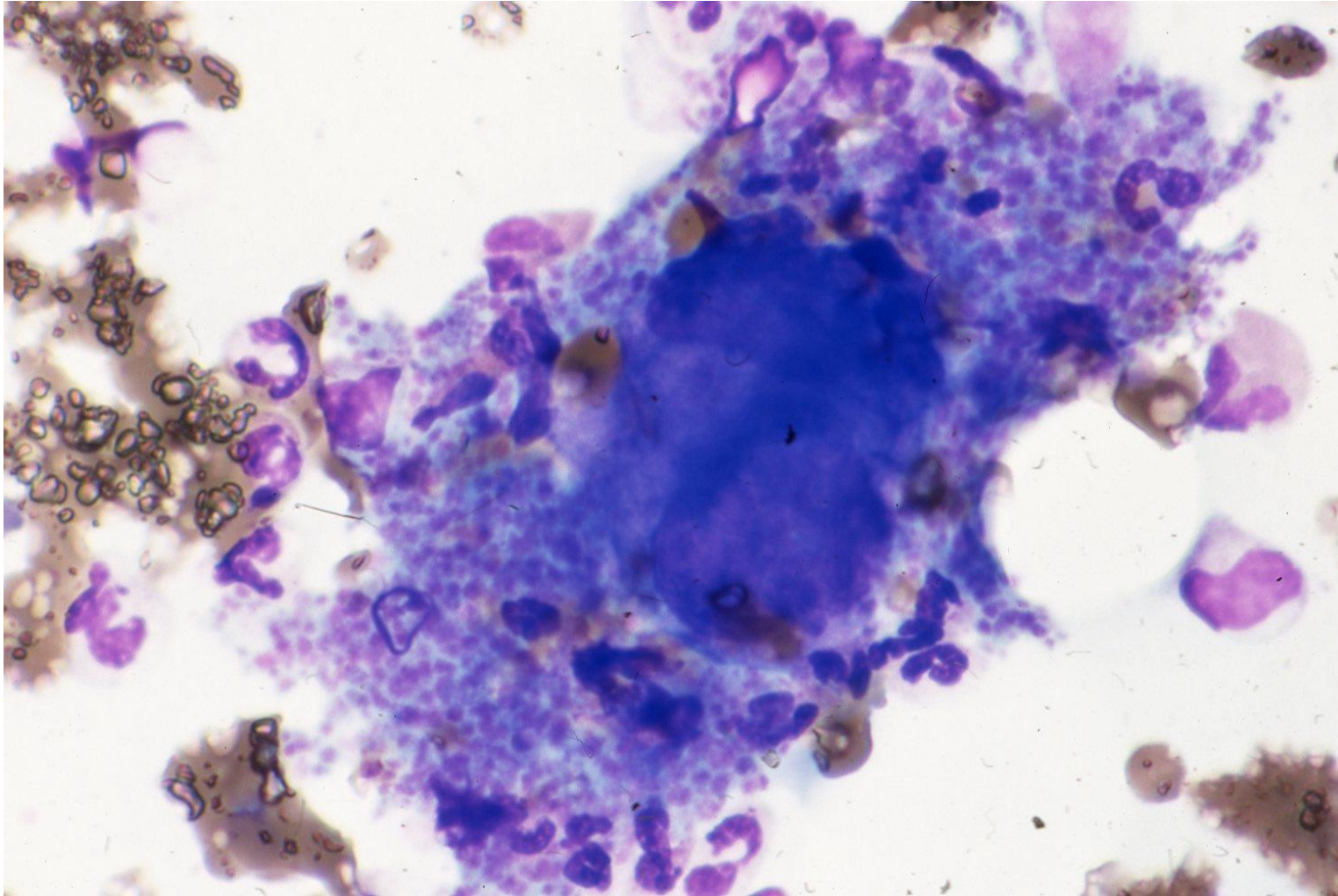
Pseudothrombocytopenia due to EDTA-dependent platelet clumping (1). Agglutination of platelets is caused by IgM/IgG autoantibodies directed against platelet surface glycoprotein (GP) IIb/IIIa. EDTA induces a conformational change in GPIIb/IIIa, exposing the epitopes and resulting in platelet agglutination. The use of an alternate anticoagulant, such as citrate or heparin, may be helpful. May-Giemsa



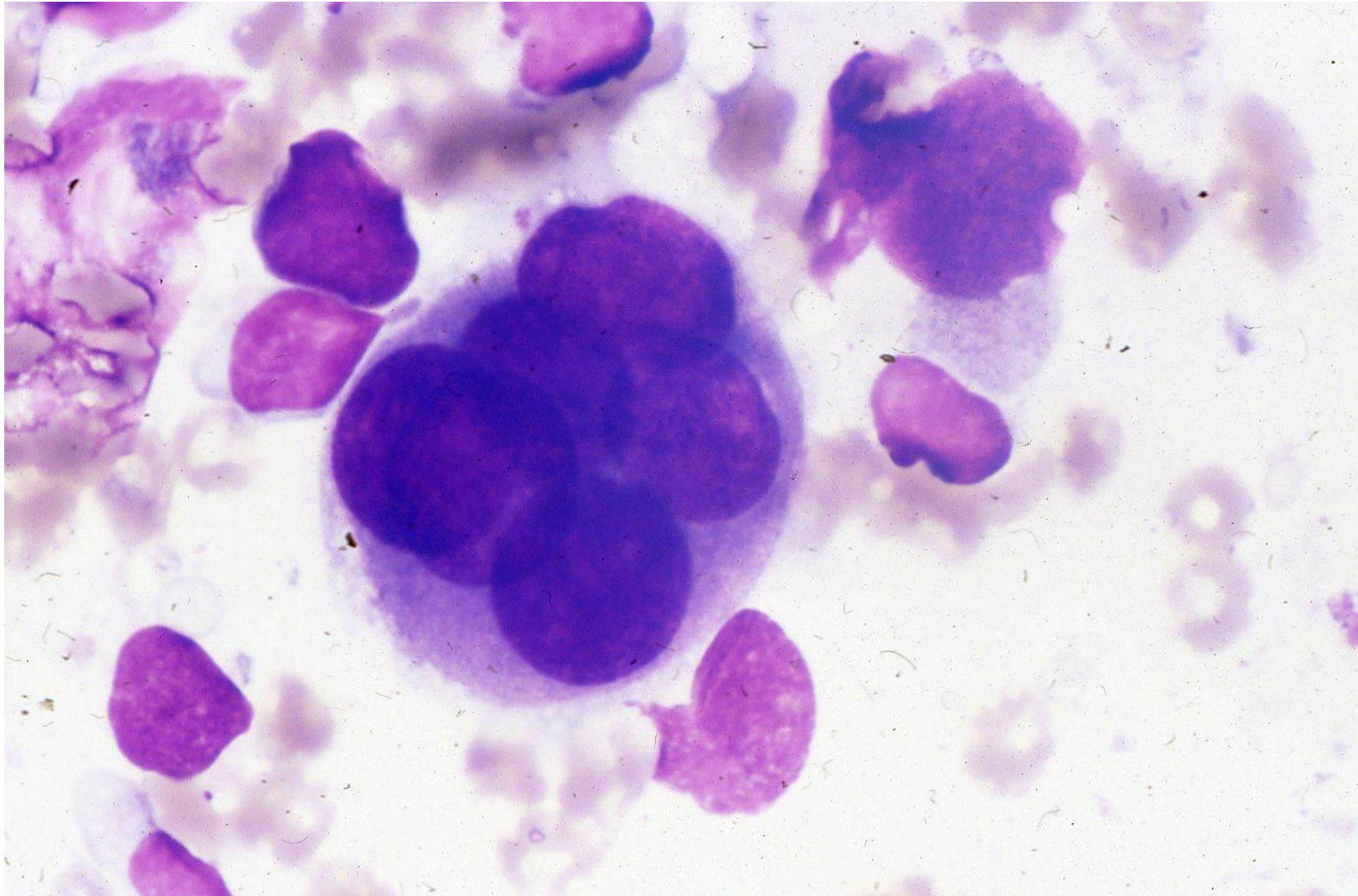
Pseudothrombocytopenia due to EDTA-dependent platelet clumping (2). Agglutination of platelets is caused by IgM/IgG autoantibodies directed against platelet surface glycoprotein (GP) IIb/IIIa. EDTA induces a conformational change in GPIIb/IIIa, exposing the epitopes and resulting in platelet agglutination. The use of an alternate anticoagulant, such as citrate or heparin, may be helpful. May-Giemsa



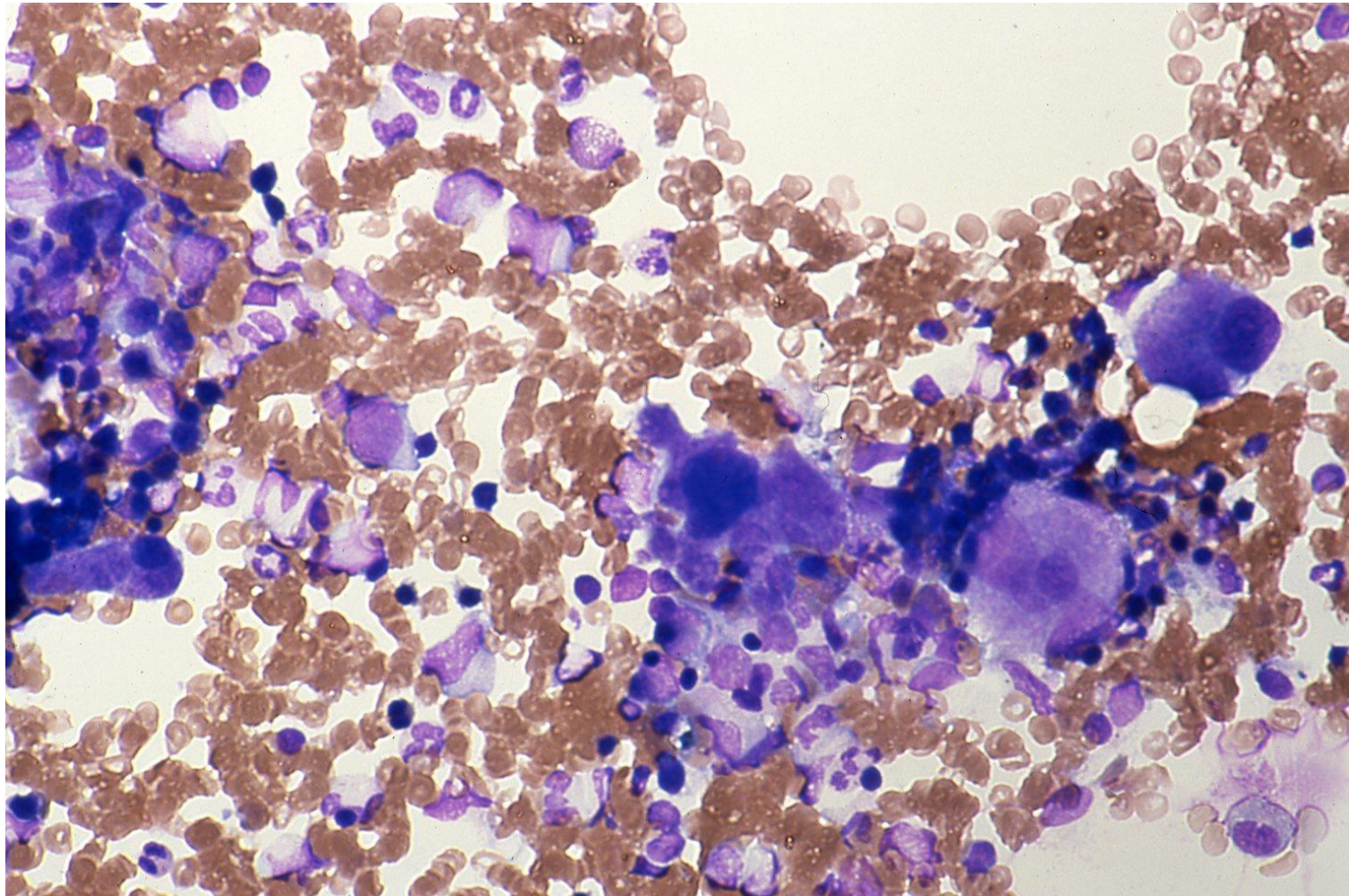
Pseudothrombocytopenia due to EDTA-dependent platelet clumping (3). Platelet satellitism is a phenomenon platelets rest around polymorphonuclear neutrophils as a rosette. The same mechanism as platelet clumping causes rosette formation on the neutrophils. May-Giemsa



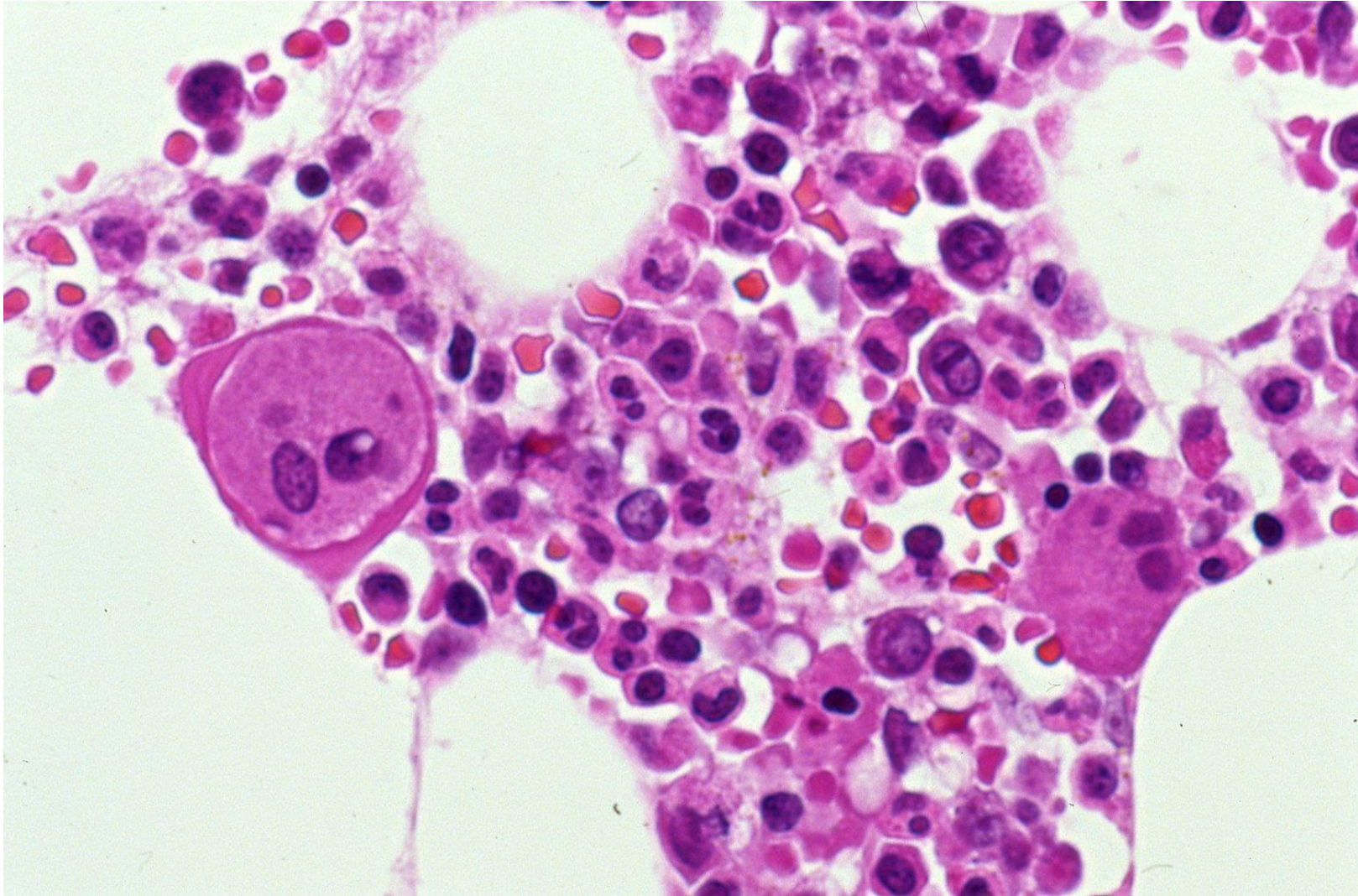
Normal megakaryocyte in the bone marrow smear. Large lobulated nucleus and granular cytoplasm are characteristic. Platelets are released from the periphery of the cytoplasm. May-Giemsa



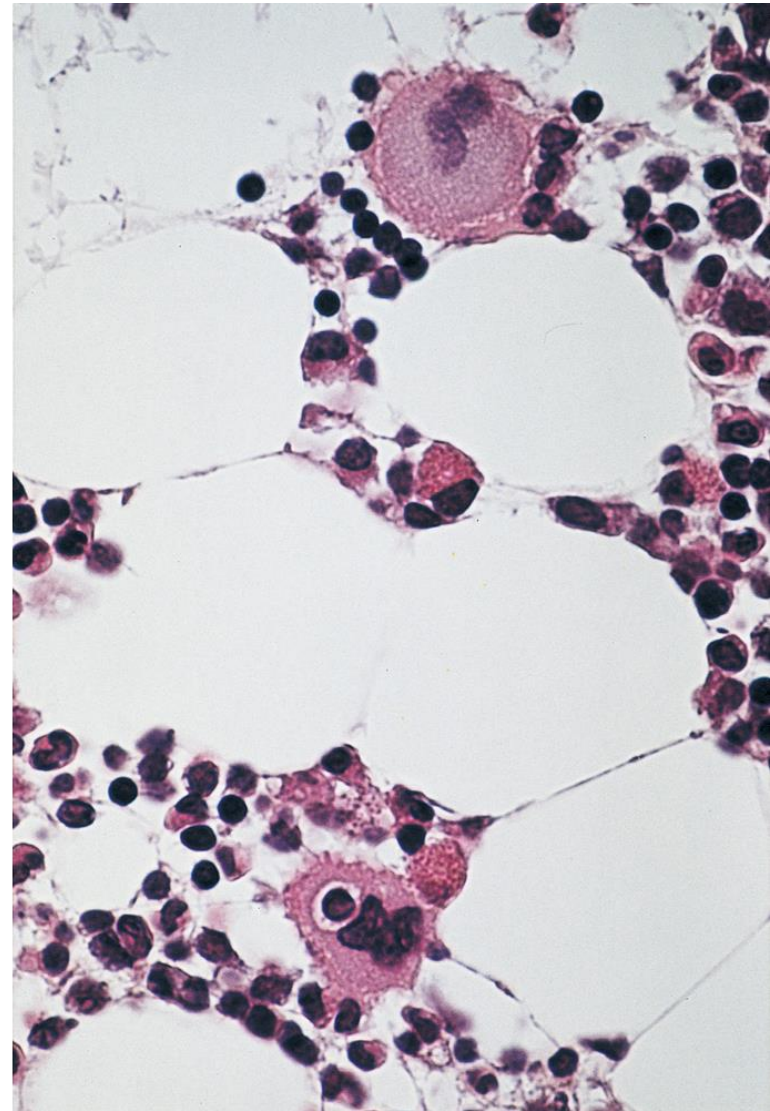
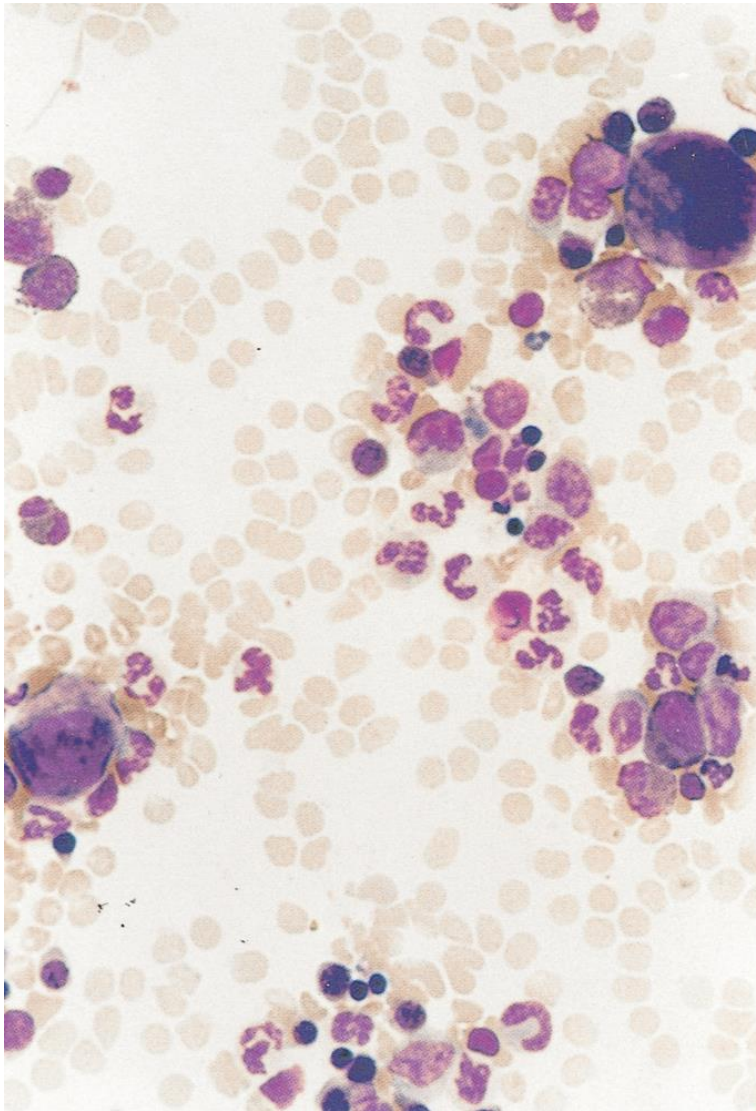
A megakaryocyte in idiopathic thrombocytopenic purpura (ITP). In ITP, the size of megakaryocytes is smaller than normal, and no features of platelet production are recognizable. Azurophilic granules are scarcely seen in the cytoplasm. May-Giemsa



Idiopathic thrombocytopenic purpura (ITP). In ITP, the size of megakaryocytes is smaller than normal, and small megakaryocytes are increased in number. Features of platelet production are scarcely recognizable. May-Giemsa



Idiopathic thrombocytopenic purpura in an adult. The aspirate bone marrow tissue contains an increased number of small-sized megakaryocytes. One megakaryocyte reveals double contour of the cytoplasm: The peripheral cytoplasm is densely eosinophilic, and may represent decreased production of platelets. H&E



Idiopathic thrombocytopenic purpura in a 3-year-old girl. The aspirate bone marrow contains an increased number of small-sized megakaryocytes. Emperipolesis of a lymphocyte is observed in one megakaryocyte (right). Left: May-Giemsa, right: H&E