

Stain Precipitate-misidentified as Degenerating Cell



Degenerating Cell

The top picture is a slide missed on our recent CAP survey. We identified it as a degenerating cell. The proper answer was stain precipitate. Notice how large the object is in relation to the RBC in the picture. Also note that there is no distinction that shows a difference in color or texture within the precipitate that would suggest a nucleus and cytoplasm were ever there. As you can see in the bottom picture, the cells that are breaking apart are still an appropriate size for a WBC, and there is still some distinction in color and texture between the nucleus and cytoplasm.



This peripheral blood smear is from an 82-year-old woman with an eight-month history of increasing fatigue and pallor. Laboratory data includes: WBC = 2.8 x 109/L; RBC = 2.98 x 1012/L; HGB = 7.9 g/dL; HCT = 29.2%; MCV = 121 fL; MCHC = 34.1 g.dL; RDW = 26; and PLT = 120 x 109/L. Additional testing showed a vitamin B12 level of <150 pg/mL (normal range 240-930 pg/mL) and the presence of anti-intrinsic factor autoantibodies.

Our lab identified these cells as macrocytes, oval or round (aka macro ovalocytes) in the CAP survey, but the answer according to CAP was simply ovalocytes. The highlighted portions above are the reasons we chose our answer. Below is the explanation from CAP. According to CAP, these cells are still not large or rounded enough to be considered macro ovalocytes, and the central pallor is too small (hemoglobin not concentrated enough).

“The arrowed cells are ovalocytes, as correctly identified by 77.1% of referees and 81.6% of participants.

A significant number of referees (22.9%) and participants (17.7%) identified the arrowed cells as macrocytes, oval or round. As noted in the glossary, there is often confusion in identification of oval macrocytes and ovalocytes. Oval macrocytes are usually much larger than ovalocytes, have more rounded cell contours (sides) than ovalocytes and the hemoglobin is often concerntrated at the ends of the cells. Oval macrocytes are associated with abnormal red cell maturation, such as in myelodysplastic syndromes or following chemotherapy. In addition, patients with Vitamin B12 or folate deficiency (as in the presented case) will have oval macrocytes. Distinguishing between ovalocytes and oval macrocytes requires close attention to subtle morphologic features but, as evidenced by the answers of the participants and referees, is often difficult.”

In our patient differentials, these would be classified as macro ovalocytes (MACO) due to their size and shape. We do not have a separate classification for ovalocyte. These would never be called elliptocytes because they are too large and rounded.