

The Two Types of Detached Nuclear Fragments ‘Behind the Howell-Jolly Eponyme

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Case

We share the photographs of a blood film where the neutrophils exhibit morphological changes, including the rare Howell-Jolly like bodies. The patient was a 74-year-old man with a history of lymphoplasmacytic lymphoma treated with several chemotherapy regimens over the last 10 years. At the time he had disease progression and histological transformation to large B-cell lymphoma. He was under cytostatic treatment with R-CHOP protocol and G-CSF. He was admitted with neutropenic fever and the blood film showed neutrophils with dysplastic features. There were nuclear segmentation abnormalities (Figures 1-2), polarized granules and cytoplasmic vacuoles (Figure 2).

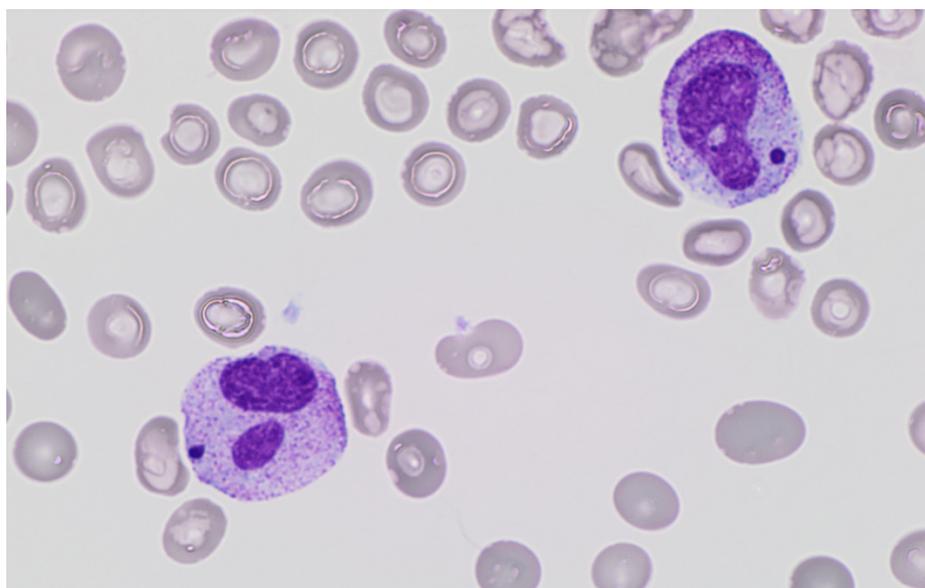


Figure 1: Neutrophils with abnormal nuclear segmentation, polarized granules and Howell-Jolly like bodies. Peripheral blood film, Wright-Giemsa stain, original magnification 400x.

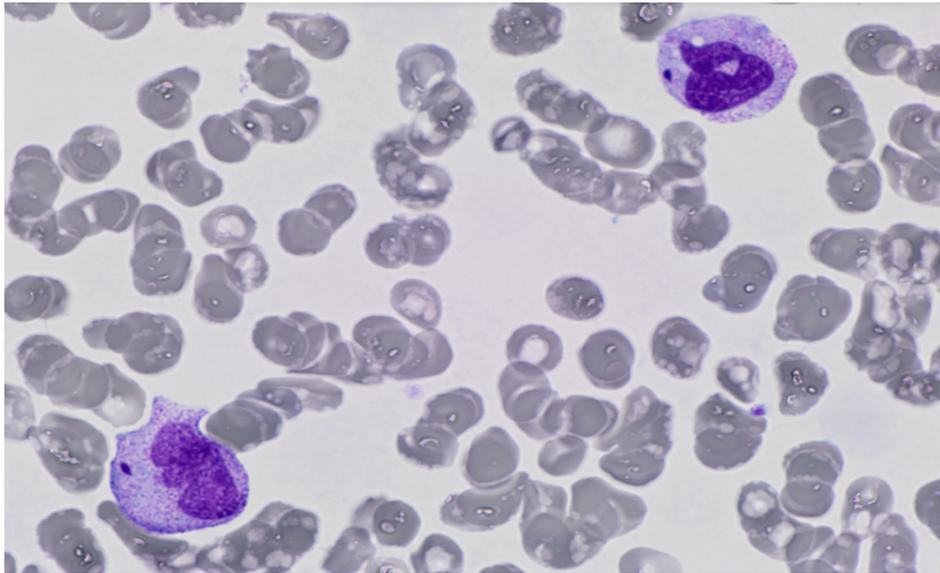


Figure 2: Howell-Jolly like bodies. Peripheral blood film, Wright-Giemsa stain, original magnification 400x.

All these changes are often seen after cytotoxic chemotherapy, G-CSF and severe infection. Additionally, the cells showed what is known to be detached nuclear fragments (Figures 1-3). This is quite rare and might confuse an unaware microscopist. These fragments are named Howell-Jolly like bodies due to their morphological similarity to the erythrocytic Howell-Jolly bodies. In this article we review the two types of detached nuclear fragments named after the Howell-Jolly eponyme.

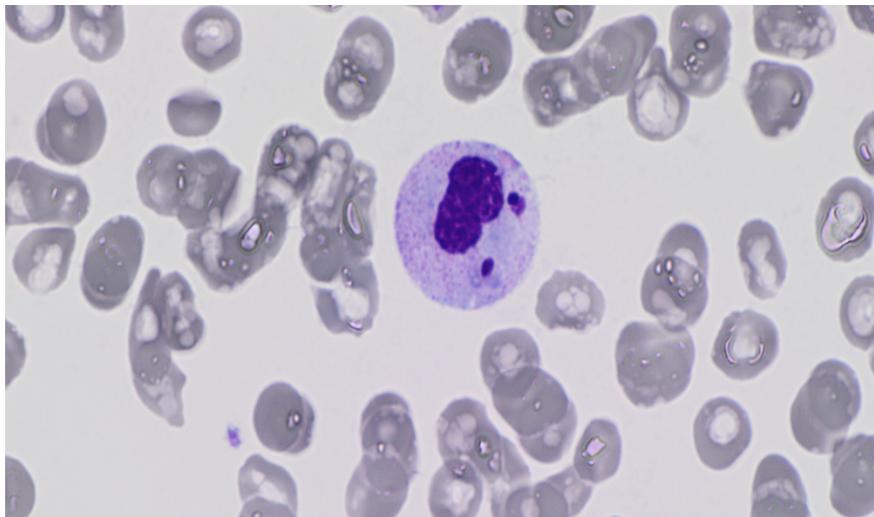


Figure 3: Howell-Jolly like bodies. Peripheral blood film, Wright-Giemsa stain, original magnification 400x.

The Howell-Jolly bodies are found in red cells and were first described in the early years of the 20th century [1]. They are nuclear remnants and can arise as a result of chromosomes separated from the mitotic spindle during abnormal mitosis or as a result of karyorrhexis at terminal stages of maturation [2]. This morphological finding is rather common in red cells and often related with increased red cell production (hemolytic anemia) or abnormal nuclear maturation (as megaloblastic anemia, where sometimes there are multiple Howell-Jolly bodies in a single red cell). It is seen in asplenic patients or patients with decreased splenic function. It can be a clue to functional hyposplenism as seen in poorly controlled celiac disease, ulcerative colitis and Crohn's disease, where the severity of the hyposplenism fluctuates with the activity of the disease [3-4]. It is a morphological finding that can be diagnostically important and should alert the physician [5].

Howell-Jolly like bodies in neutrophils have been reported in a small number of case reports [6-10]. It is proven that they are nuclear fragments, but the mechanism that causes the occurrence of these structures remains unknown [11-12]. They do not represent a specific disease entity, but are invariably associated with impaired immunity. They can appear as feature of dysplastic granulopoiesis secondary to immunosuppressive therapy as chemotherapy [6] azathioprine [5] tacrolimus monotherapy [8] or in combination with mycophenolate mofetil [10]. Howell-Jolly like bodies are also reported in patients with acquired immunodeficiency syndrome [7-13], after G-CSF [14] and in cases of ganciclovir induced neutropenia [15]. Howell-Jolly like bodies have been described in the whole granulocytic lineage [16].

They are not a typical feature of myelodysplastic syndrome. In certain geographical regions this morphological finding can raise alarm for infectious diseases that can course with cytoplasmic inclusions in neutrophils as Anaplasmosis or Ehrlichiosis [17]. We believe the Howell-Jolly like bodies were secondary to chemotherapy or G-CSF in our patient's case. A blood film some weeks after was morphologically unremarkable.

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