



HEMATOLOGY, TRANSFUSION AND CELL THERAPY

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Images in Clinical Hematology

Howell-Jolly-like inclusions in granulocytes of a liver transplant recipient

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1 A 38-year-old woman with history of a liver transplant per-
2 formed four months earlier, presented with fever and multi-
3 ple lymphadenopathies. She was taking mycophenolate,
4 tacrolimus and prednisone for chronic rejection, lamivudine
5 because of hepatitis B virus serology, and valganciclovir due
6 to recent reactivation of cytomegalovirus.

7 On admission the complete blood count findings included:
8 hemoglobin 9.7 g/dL, platelets $260 \times 10^9/L$, leukocytes $1.5 \times 10^9/L$
9 with $0.2 \times 10^9/L$ neutrophils and elevated C-reactive protein
10 (120 mg/L).

11 Peripheral blood examination showed hyposegmentation
12 in neutrophils with Howell-Jolly body-like inclusions
13 (Figure 1).

14 Blood cultures for bacteria and fungus did not support
15 growth of any organism and serologic tests were negative.
16 Additionally, lymph node aspiration cytology did not

reveal tumoral cells however, a polymerase chain reac- 17
tion-based assay to detect *Mycobacterium tuberculosis* in 18
the ganglion was positive. With the diagnosis of ganglionic 19
tuberculosis, the patient received treatment with isonia- 20
zid, pyrazinamide, myambutol and levofloxacin. After 21
one year of treatment, the leukocyte count is normal 22
and the adenopathies have disappeared in a full body 23
scan. 24

Howell-Jolly body-like inclusions in granulocytes are 25
small dense basophilic inclusions similar to Howell-Jolly 26
in erythrocytes. Their appearance in neutrophils may indi- 27
cate a nuclear fragmentation induced by antiviral treat- 28
ment with nucleoside analogs, which act on viral DNA. 29
They arise secondary to stressed granulopoiesis often 30
induced by immunosuppressive states including congeni- 31
tal conditions or acquired due to drugs for HIV infection or 32
chemotherapy [1,2]. They are also been described in 33
patients with *Mycobacterium avium* infection and more 34
rarely in myelodysplastic syndromes [3]. These inclusions 35
must be differentiated from other neutrophil inclusions 36
such as those observed in intracellular bacterial infec- 37
tions, those found in genetic conditions such as Chédiak- 38
Higashi syndrome, or Döhle bodies [1]. 39

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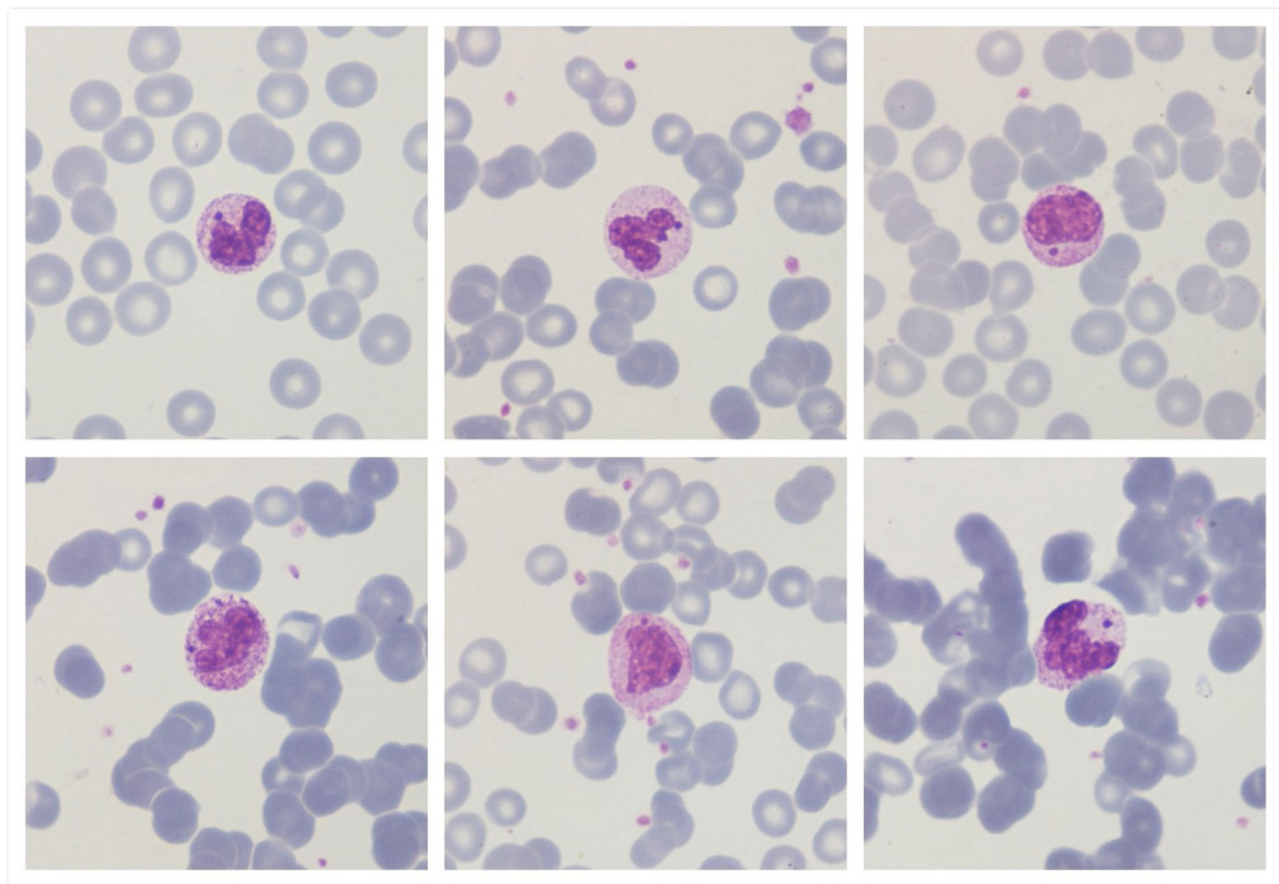


Figure 1 – Peripheral blood smear showing atypical inclusions (“Howell-Jollylike-bodies”) in granulocytes

(Optical microscopy images using May-Grünwald Giemsa stain - x1000 magnification).

Conflicts of interest

The authors of this paper have no conflicts of interest, including specific financial interests, relationships, and/or affiliations relevant to the subject matter or materials included.

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