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Journal of Clinical and Cellular Immunology

Image Article

Doughnut Cells or Ring Neutrophil by Immunofluorescence

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CLINICAL IMAGE

The presence of ring-shaped nuclei neutrophils or doughnut cells (Figure 1) is well known in rats and mousesgranulopoiesis, and it was later described in humans. Ring and/or hyposegmented neutrophils are already well-known findings in leukemia patients, [1] megaloblastic anemia and myeloproliferative diseases [2,3]. An occasional occurrence is also present in patients with myelodysplastic syndrome (MDS) or chronic granulocytic leukemia (CGL). Besides there are still reports on infectious mononucleosis, Chagas disease, [4] and lymphoproliferative disorders (multiple myeloma and monoclonal gammopathy of undetermined significance) or even in healthy individuals. [5,6] Thus, this peculiar morphological presentation can be considered a nonspecific finding of several hematological diseases. Hence, we present not only the hematoxylin and eosin stain representation but a unique point of view (by immunofluorescence) of a ring-shaped nuclei neutrophil in a years old male patient with multiple myeloma suspicion.

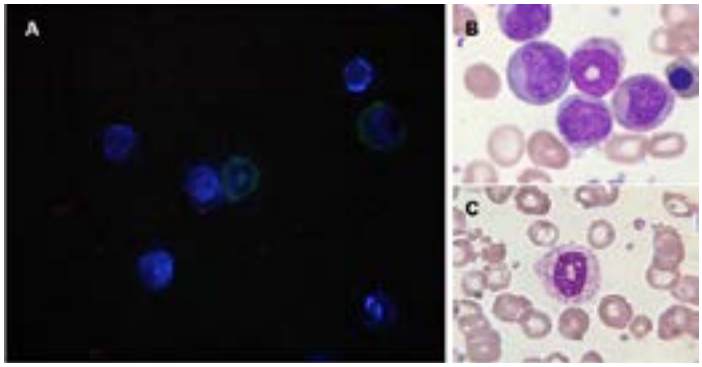

Figure 1: Flow Diagram.

TRANSPARENCY

Declaration of funding

This study had no funding resources.

Adherence to national and international regulations

Not applicable.

Authors' contributions

All authors read and approved the final manuscript.

Acknowledgment

None.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate

Written informed consent was obtained from the patient for participation in the study.

Consent for publication

The authors declare that they have no competing interests.

Competing interests

The authors declare that they have no competing interests.

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Received: August 27, 2020; **Accepted:** September 10, 2020; **Published:** September 17, 2020

Citation: Nascimento SB, Pereira MAM, Kang HC (2020) Doughnut Cells or Ring Neutrophil by Immunofluorescence. J Clin Cell Immunol. 11:597. DOI: 10.35248/2155-9899.20.11:597.