

# Reflections about the Detection of Flower Cells in B-Cells Lymphomas

Miguel Augusto Pereira\*

Department of Medical, Medical School of Fluminense Federal University, Niterói, Rio de Janeiro, Brazil

## ABSTRACT

Flower or floral cells are multilobulated/petal-like nuclei, medium to large size cells usually present in cases of adult T-cell leukemia (ATL). However, since 2008, four cases of these cells, previously "restricted" to adult T leukemia, have been reported in B-cells lymphomas, many of them highly aggressive. Thus, this brief article aims to show how should be the assessment of these atypical cells in B lineage lymphomas and instigate more robust studies on the subject.

**Keywords:** B-cell Lymphoma; T-cell Lymphoma; Leukemia; Flow Cytometry

## INTRODUCTION

In 2019, we published a paper in the Journal Pathology Research and Practice, about a non-nodal leukemic mantle cell lymphoma (MCL), IV-B (Ann-Harbor) with high MIPI (Mantle Cell Lymphoma International Prognostic Index) risk, an exorbitant leukocytosis/lymphocytosis, and an unprecedented finding of a morphology mimicking adult T-cell leukemia (ATL), given the presence of multilobulated, medium to large size, petal-like nuclei, thick chromatin with imperceptible nucleoli cells, in other words "flower cells", in peripheral blood [1]. The MCL presentation was a rare disease itself, though, the evidence of flower cells aroused the attention of doctors since it is a phenomenon normally attributed to ATL, a T-cell malignancy associated with infection by the human T-lymphotropic virus type 1 (HTLV-1), with a high prevalence in tropical areas (Caribbean, South America, Japan, Central Africa) [2].

## DISCUSSION

An investigation in the medical Literature pointed out that although there are no other reports of MCL with this morphology, this was not the only case of B-cell lymphoma. Hence, we provide this short article in order to dissect all cases of B-cells lymphomas with this unusual and still uncertain floral cell morphology. This case is the most recent, it portrait an 81-year-old male patient, with weight loss, night sweats, abdominal pain accompanied by swelling (hepatosplenomegaly), asthenia, adynamia, generalized lymph node enlargement (paraesophageal, paratracheal, mesenteric, aortic) given by CT. [1] The laboratory tests showed mild anemia, slightly macrocytic (RDW of 18.4%), thrombocytopenia, intense leukocytosis (334,800 mm<sup>3</sup>). The peripheral blood

immunophenotyping showed B cells expressing high intensity CD45+, CD19+, CD20+, CD5+ (weak), CD38+ (partial), CD79b+, FNMC7+ (weak), CD22+, CD23, CD10, CD200 and CD43 [1].

Nevertheless, the first case mentioned in the Literature about these atypical lymphoid cells with nuclear morphology, some of them resembling "flower cells/clover-leaf cells" in B-cell lymphomas, was published in 2008 by the Pathology Research and Practice [3]. The case presented a 69-year-old male with shortness of breath, leukocytosis (61.7x10<sup>3</sup>/mL) with lymphocytosis (77.8%), thrombocytopenia (30x10<sup>3</sup>/mL) anemia (hemoglobin of 7.4g/dL) and lymphadenopathy by CT scan diagnosed with a marginal zone lymphoma with high-grade transformation at stage IV expressing CD20, bcl-2, and IgM. The bone marrow, lymph nodes, and spleen were infiltrated, but the origin could not be determined, as the lymphoma was disseminated (Table 1). Flow cytometry of these leukemic cells confirmed a B-cell phenotype (CD19+, CD20+, CD5+, CD10+, CD23+, CD43+) with monotypic kappa light chain expression [3]. A cytogenetic study using marrow aspiration specimens revealed 49, XY, +inv3(q21q26), +7, t(8;18)(q22;q21), add(19)t(9;19)(q13;p13), marker [cp20]. The authors also mentioned an unpublished data of an in a 16-year-old girl with precursor B-lymphoblastic leukemia with a "floral presentation" [3]. This case will not be commented on, but it also corroborates our conclusions

In 2014, the Blood Journal reported the second case: A 76-year-old men with a painful mass in scapular topography, B symptoms, thrombocytopenia, and a blood smear with medium to large atypical/flower aspect lymphoid cells (12% of leukocytes) [4]. She was diagnosed with a diffuse large B-cell lymphoma CD20+, CD3-, CD34- and Ki-67 of 40%. It was the only case in which a

**Correspondence to:** Dr. Miguel Augusto Pereira, Department of Medical, Medical School of Fluminense Federal University, Niterói, Rio de Janeiro, Brazil; E-mail: mappereira@icloud.com

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cytogenetic analysis was performed (Table 1). It identified an abnormal karyotype: 47, XY, t(1;6)(q32;q21), t(3;14)(q27;q32), 1der(3)t(3:14). Fluorescence in situ hybridization confirmed B-cell lymphoma 6/IgH fusion at t (3;14) [4].

In 2017 was published the case of a 16-years-old female with breathlessness and abdominal distension [5]. The laboratory exams revealed anemia (hemoglobin of 10,1g/dL), leukocytosis, and markedly elevated LDH (1000 U/L). Similar to other cases, computed tomography showed lymphadenopathy, in this case, multiple conglomerated cervical and periportal lymph nodes. It was also found bilateral pleural effusion and significant ascites. [5] Over again, a peripheral smear examination revealed leukocytosis with 26% large-sized atypical lymphoid cells resembling “flower cells/clover-leaf cells”. The immunohistochemistry on bone marrow biopsy showed positivity for c-myc (70%), negativity for bcl-6, and high Ki-67 (99%). The flow cytometry study was CD20+, CD10+, surface IgM+, CD38+, CD79b+, and FMC-7+ with clonal restriction for kappa light chain [5]. Thus, the fluorescence in situ hybridization confirmed a c-myc translocation involving chromosome 8, and the final diagnosis of Burkitt lymphoma in leukemic phase (Stage IV) was made (Table 1).

As already mentioned, there are still no explanations for this phenomenon, but it is necessary to at least elaborate on some hypotheses. In all cases, the possibility of disease coexistence was somehow excluded. In the case of MCL, the peculiar morphology resembling flower cells may represent atypical lymphocytes inherent in the leukemic expression of the disease [6]. In contrast, in the cases of Burkitt's lymphoma and diffuse B-cell lymphoma, it could just be a phenomenon of “chance”/appearance given the marked nuclear pleomorphism of these variants of non-Hodgkins lymphomas.

## CONCLUSION

In conclusion, this brief review about the B-cell lymphomas with a flower cell presentation aims to demonstrate the importance of a simple blood smear followed by immunophenotyping and molecular tests in the classification of atypical mononuclear cells and also proves once again, assembling all cases, that flower cell morphology is not confined to adult T-cell leukemia/lymphoma but can also be seen in B-cell lymphomas.

It is essential to call attention to this phenomenon since all registered outcomes have evolved to death, and there is still little information available on the subject. Although some of the cases maintain some similarities, such as the fact that the most affected are old adults, and most patients have leukocytosis and anemia, the small sample is still a challenge to be overcome. Thus, we hope that this review will be an inspiration for more robust studies

## REFERENCES

1. Pereira MA. Mantle cell lymphoma mimicking adult T-cell leukemia. *Pathology Res Practice*. 2020;216(4):12-20.
2. Dahmouh L, Hijazi Y, Barnes E, Stevenson MS, Abati A. Adult T-cell leukemia/lymphoma: a cytopathologic, immunocytochemical, and flow cytometric study. *Cancer*. 2002; 96(2):110–116.
3. Chang ST, Hsieh YC, Lu YH, Tzeng CC, Lin CN, Chuanga SS. Floral leukemic cells transformed from marginal zone lymphoma. *Pathology Res Practice*. 2008;204(1)23–26.
4. Wong E, Juneja S. Diffuse large B-cell lymphoma in leukemic phase with flower cell morphology. *Blood*. 2014;123(22):3378.
5. Singh N, Gandhi J, Agrawal N, Panaych A, Tejwani N, Mehta A. Diagnostic Dilemma in the Morphological Detection of Flower Cells in Lymphomas. *Indian J Hematol Blood Transfus*. 2017;33(4):614–616.
6. Ferrer A, Salaverria, I, Bosch F, Villamor N, Rozman M, Beà S, et al. Leukemic involvement is a common feature in mantle cell lymphoma. *Cancer*. 2007;109:2473–2480.

**Table 1:** All cases of B-cell lymphomas with flower cell morphology in chronological order.

Lymphoma type	Age/ Sex	Author	Cytogenetic study	HTLV serology	Outcome
Marginal zone lymphoma	69/ Male	Chang S-T. et al	Abnormal	Not performed	1
Diffuse large B-cell lymphoma	76/ Male	Wong E et al	Abnormal	Not mentioned	Not mentioned
Burkitt lymphoma	16/ Female	Singh N et al	Abnormal	Not mentioned	Not mentioned
Mantle cell lymphoma	81/ Male	Pereira MA et al	Not performed	Negative	Died 4 months after diagnosis.