# Chronic myeloid leukaemia (CML) presenting in B-lymphoblastic crisis- a diagnostic challenge

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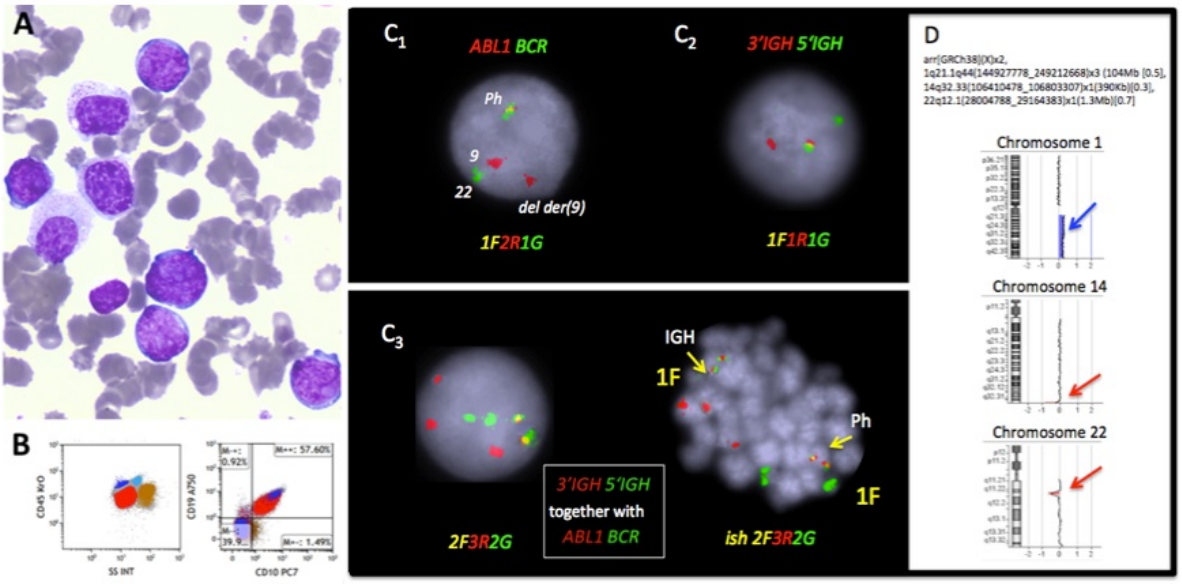


**Figure 1**. (A) Peripheral blood film (May-Grünwald-Giemsa stain 100× objective) (B) Immunophenotyping. (C) FISH analysis (100x objective, DAPI staining) (D) Molecular karyotyping

A 75-year-old female presented with lethargy, Hb 93 g/L, WBC 64 x $10^9$/L, platelet 110 x $10^9$/L. Blood film (figure **1.A** May-Grünwald-Giemsa stain 100× objective) showed blasts, myelocytes, metamyelocytes, neutrophils. Quantitative polymerase chain reaction (qPCR) detected p210 *BCR::ABL1* transcript. *BCR::ABL/ABL* Ratio International Scale (IS) was 29 in sorted CD19+ cells, and 32 in sorted CD19- cells. Bone marrow smear was packed with blasts. By flow cytometry (figure **1.B**), the blasts (red colour population) were positive for CD19, CD10, CD38 and cCD79a and negative for CD34, surface light chain, CD20, cCD3, cytoplasmic myeloperoxidase (MPO), cytoplasmic terminal deoxynucleotidyl transferase (TdT) and other myeloid/monocytic markers tested. Fluorescence *in situ* hybridisation (FISH) analysis and molecular karyotyping identified concurrent presence of

*BCR::ABL1* fusion and *IGH* gene rearrangement (figure **1.C** 100x objective, DAPI staining) in the same cell population along with 1q gain (figure **1.D**). Bone marrow histology revealed effacement by blasts. The blasts were positive for CD79a, PAX5, CD10, BCL6, but were negative for CD34, CD20, CD30, MUM1, BCL2, CD3 and myeloid markers (MPO, CD11c); nuclear TdT was strongly positive. The patient was diagnosed with CML B-lymphoblastic crisis.

The majority of CML cases are diagnosed in the chronic phase. A minority (2.2%) CML present with *de novo* blast crisis (BC) [1]. Lymphoid blast crisis accounts for almost 30% of CML BC, with the B-cell lineage being more common [2]. CML presenting in B-lymphoblastic crisis could resemble features of *de novo* Ph+ B-ALL, which makes the diagnosis challenging. These patients have inferior outcomes; therefore, it is important to distinguishing CML B -lymphoblastic crisis from *de novo* Ph+ B-ALL. Positive *BCR::ABL1* in both CD19+ and CD19- sorted cell populations support the diagnosis of CML B-lymphoblastic crisis in this case. The *IGH* rearrangement in the B-lymphoblast population in this case is likely a secondary event in the Ph+ clone.

**Declarations**

- Ethical Approval
  Not Applicable
- Consent to participate/Informed Consent
  Not Applicable
- Consent for publication
  Not Applicable. Patient unfortunately passed away.
- Competing interests/ Conflict of Interest
  Authors have no conflict of interest
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