

Leukaemias/malignancies

Blastic plasmacytoid dendritic neoplasm (BPDCN)



Clinical information and laboratory results

- An 80-year-old male patient presented in April 2020, with skin lesions – a rapidly growing nodule on the left arm and three lesions on the back.
- Histopathological examination showed a morphological and immunohistochemical profile best suited to a ‘blastic plasmacytoid dendritic cell neoplasm’. The treatment regimen started beginning of May with radiotherapy followed by chemotherapy and antifungal medication for six weeks.
- After the treatment, the complete blood count showed relatively normal numerical results for WBC ($5.98 \times 10^3/\mu\text{L}$), RBC ($4.13 \times 10^6/\mu\text{L}$), HGB 13.1 g/dL and PLT ($156 \times 10^3/\mu\text{L}$), but an abnormal cell distribution in the WDF scattergram. The XN analyser indicated the abnormality with the flags ‘Blasts?’ and ‘Abn Lympho?’. The subsequent manual smear review revealed the presence of blasts (see Fig. 1).
- Beginning of October during another follow-up, the analysis results showed a markedly increased WBC count (WBC $70.80 \times 10^3/\mu\text{L}$) with blastosis, anaemia (RBC $1.89 \times 10^6/\mu\text{L}$, HGB 5.9 g/dL) and severe thrombocytopenia (PLT&F $14 \times 10^3/\mu\text{L}$).
- Palliative treatment was then started because of deterioration of the patient and aggressiveness of the disease.

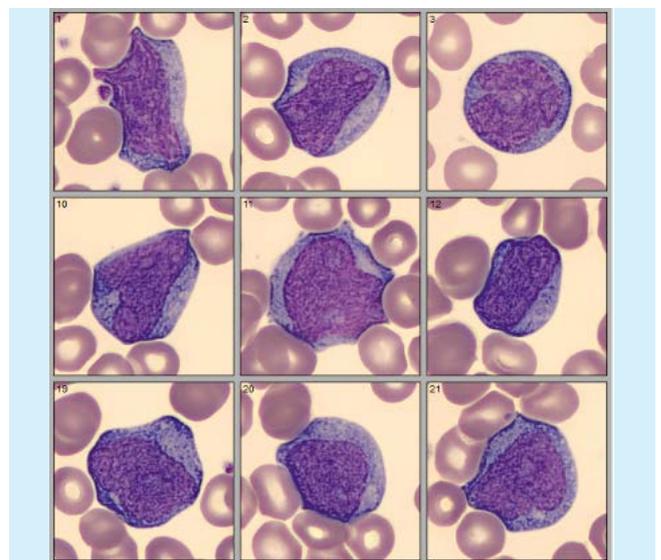


Fig. 1 Selected blast cells of the BPDCN patient as identified by the DI-60 digital imaging analyser.

Scattergram interpretation

Scattergrams can reveal very useful additional information as just numerical results. The position of the cell populations is defined by their measurement signals obtained by fluorescence flow cytometry.

The specially developed lysis reagent (Lysercell WDF) initially perforates the cell membranes while leaving the cells largely intact. The fluorescence marker (Fluorocell WDF) labels the intracellular nucleic acids (mostly RNA) in the second step. The composition of these two reagents effects a mild reaction with the blood cells, so that almost all of the blood cell structure remains intact. Cells are differentiated according to their fluorescence signal (SFL), their size (FSC) and their internal structure (SSC). The intensity of the fluorescence signal is directly affected by the nucleic acid content and membrane composition of the cell. Some of the strongest fluorescence signals are shown by immature and activated cells, so that these are successfully detected and can even be counted.

Forward-scattered light (FSC):	cell volume
Side-scattered light (SSC):	cell content, such as the nucleus and granules
Side-fluorescence light (SFL):	the amount of nucleic acids and cell organelles

An increased fluorescence signal can be easily recognised in the scattergram by an upward shift of the cell populations (see Fig. 2). When populations leave their original position it is indicated by the analyser with certain flag messages. ‘Blasts?’ and ‘Abn Lympho?’ were triggered in this case example pointing to the fact that significant clustering in the region for blasts and abnormal lymphocytes was detected in the scattergrams. Both flags are indicators for the suspicion of malignant cells in the sample and should be followed up for confirmation.

We thank our customers for kindly providing their valuable input, which helped to present the clinical case featured in this case report.

You can find additional information on the case by visiting: www.sysmex-europe.com/Aug22

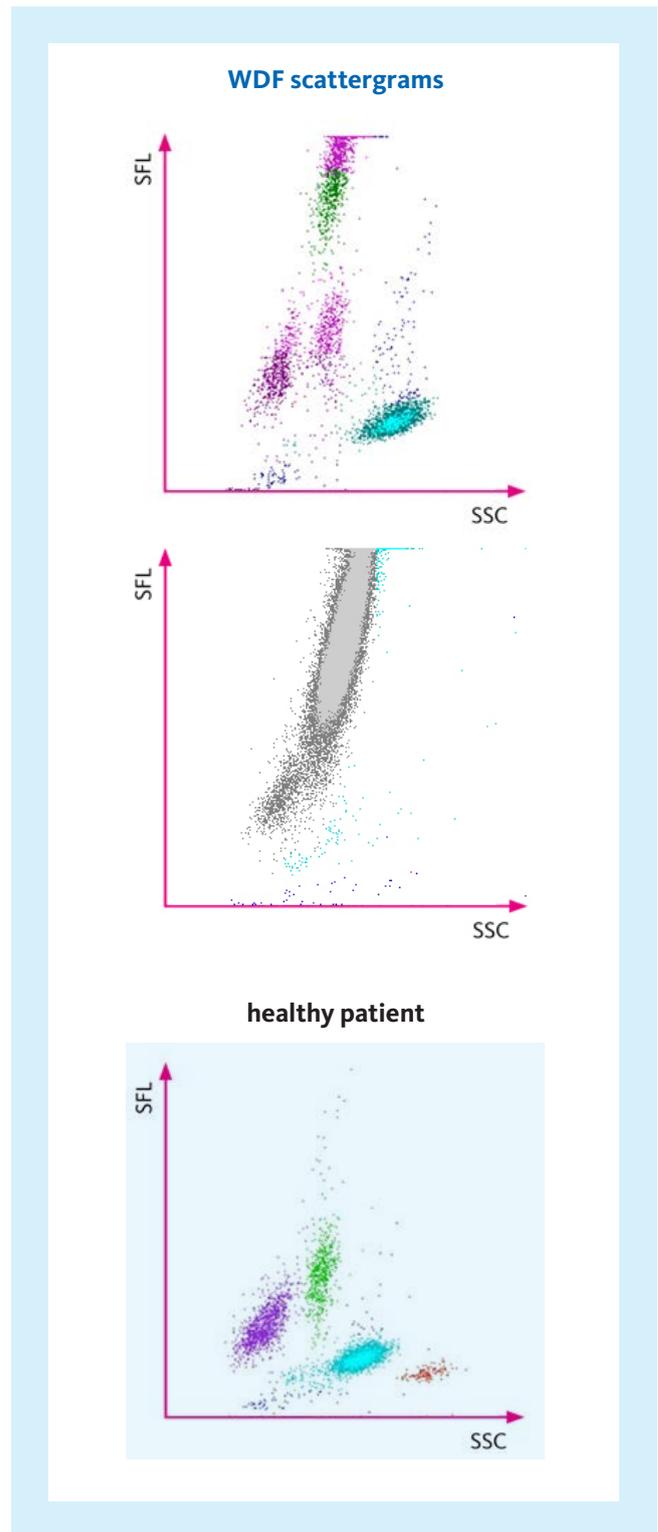


Fig. 2 XN-Series WDF scattergrams of measurements in June (top) directly after the initiation of chemotherapy and in October (middle) with markedly increased WBC count and abnormal white blood cell populations in the high fluorescence area (SFL) in the scattergram. The scattergram at the bottom shows a healthy patient for better comparability.