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Leukaemia Section

Short Communication

t(2;8)(q12;p11) RANBP2/FGFR1

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Clinics and pathology

Disease

Myeloid and lymphoid neoplasms with FGFR1 abnormalities (previously: 8p11 myeloproliferative syndrome)

Note

Different disease phenotypes according to the FGFR1 partner gene.

Phenotype/cell stem origin

Pluripotent haematopoietic stem cell.

Epidemiology

Only one case to date, a 63 years old female with myeloproliferative/myelodysplastic neoplasm (Gervais et al., 2013).

Clinics

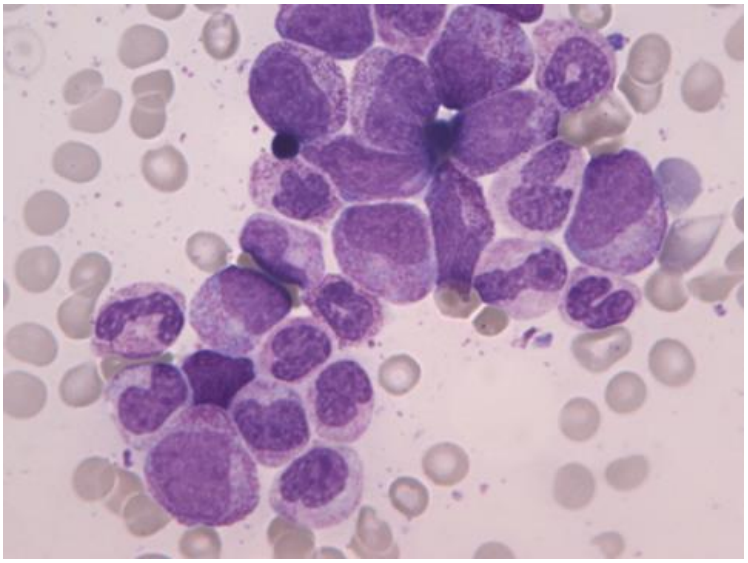
Splenomegaly, dyspnea, impaired general condition at diagnosis. Rapid disease progression despite chemotherapy.

Evolution

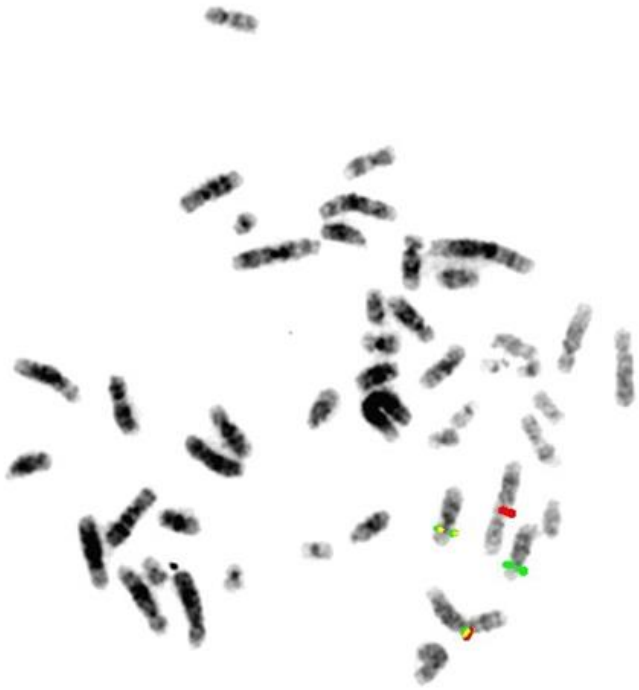
Disease progressed rapidly and the patient died 6 months after the diagnosis.

Prognosis

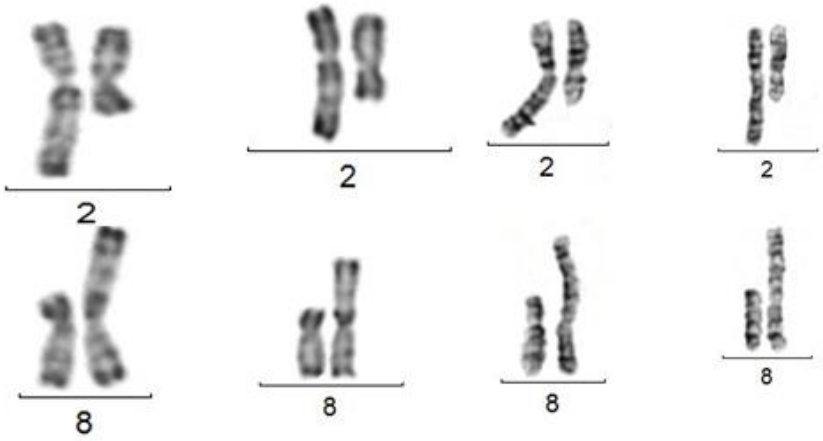
Undetermined (myeloid and lymphoid neoplasms with FGFR1 abnormalities prognosis is currently poor).



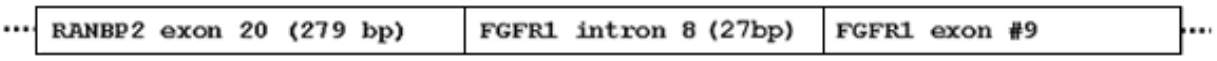
Bone marrow (MGG): hypercellularity with granular hyperplasia, dysgranulopoiesis and few eosinophils.



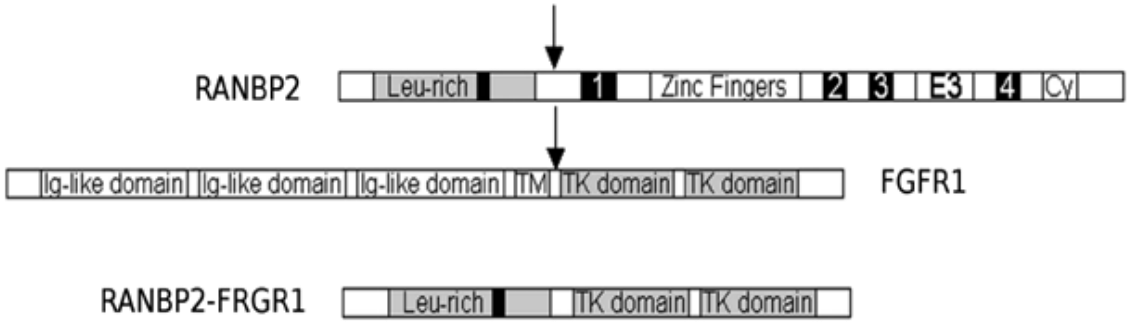
R and G-banding showing t(2;8)(q12;p11).



Cohybridization of FGFR1 BAC RP11-350N15 (8p11, green) and RANBP2 RP11-84C2 (2q12, red) showing a dual fusion signal.



Schematic representation of RANBP2-FGFR1 fusion transcript.



Schematic representation of RANBP2, FGFR1 and RANBP2-FGFR1 predicted fusion protein.

Cytogenetics

Cytogenetics morphological

t(2;8)(q12;p11) without additional abnormality.

Genes involved and proteins

FGFR1

Location
8p11.23

Note
Receptor tyrosine kinase.

DNA/RNA
18 exons.

Protein
Extracellular ligand-binding domain (with the N-terminus).
Unique transmembrane domain.
Catalytic (tyrosine kinase) cytosolic domain.

RANBP2

Location
2q12.3

Note
Implicated in various cancers, inflammatory myofibroblastic tumors (with ALK 2p23), JMML and AML with RANBP2-ALK fusion (Rottgers et al., 2010; Maesako et al., 2014; Lim et al., 2014).

DNA/RNA
31 exons.

Protein
Component of the nuclear pore complex, localised at its cytoplasmic side.

Result of the chromosomal anomaly

Hybrid gene

Description
5' RANBP2 - 3' FGFR1; fusion of RANPB2 exon 20 to FGFR1 exon 9.

Transcript
Detection of both RANBP2-FGFR1 transcript and FGFR1-RANBP2 reciprocal transcript.

Fusion protein

Description
RANBP2 N-terminal (leucine-rich region) - FGFR1 C-terminal (TK domain).

Oncogenesis
Constitutive activation of FGFR1 kinase activity.

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