t(1;2)(q25;p23)

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Clinics and pathology

Disease
Inflammatory myofibroblastic tumors.

Clinics
Rare soft tissue tumor found in children and young adults.

Pathology
Spindle cell proliferation with myofibroblastic differentiation and an inflammatory infiltrate.

Prognosis
Low malignant potential and good prognosis.

Disease
Anaplastic large cell lymphoma: translocations involving 2p23 are found in more than half cases of anaplastic large cell lymphoma (ALCL), a high grade non Hodgkin lymphoma (NHL). They involve ALK, and are therefore called ALK+ ALCL.

The most frequent ALK+ ALCL being the the t(2;5)(p23;q35) with NPM1 -ALK fusion protein, which localises both in the cytoplasm and in the nucleus.

The t(1;2)(q25;p23) is very rare., and, like other t(2;Var) involving various partners and ALK, the fusion protein has a cytoplasmic localization; they are therefore called "cytoplasm only" ALK+ ALCL.

Epidemiology
A very few (four) cases known so far.

Clinics
ALK+ ALCL without the t(2;5) (so called cytoplasmic only ALK cases) show clinical features similar to those of classical ALK+ ALCL: young age, male predominance, presentation with advanced disease, systemic symptoms, frequent involvement of extranodal sites, and a good prognosis. Nothing in particular is known concerning t(1;2) cases, as cases are not documented.

Cytogenetics
Complex karyotypes and/or hidden translocation in the 2 cases with cytogenetic data; FISH analyses are essential.

Genes involved and proteins

**TPM3 (tropomyosin alpha chain)**

Location
1q25

Protein
284 amino acids, 33 kDa; coiled coil structure; role in Calcium dependant actin-myosin interaction.

**ALK**

Location
2p23

Protein
1620 amino acids; 177 kDa; glycoprotein (200 kDa mature protein); membrane associated tyrosine kinase receptor.

Result of the chromosomal anomaly

**Hybrid Gene**

Description
5’ TPM3 - 3’ ALK.

**Fusion Protein**

Description
104 kDa ; 221 (?) N-term amino acids from TPM3 fused to the 562 C-term amino acids from ALK (i.e. the...
entire cytoplasmic portion of ALK with the tyrosine kinase domain); homodimerization of the fusion protein.

**Expression / Localisation**
Cytoplasmic localisation (in contrast with the t(2;5)(p23;q35) with NPM1-ALK, which localizes both in the cytoplasm and in the nucleus).

**Oncogenesis**
TPM3-ALK is constitutively activated.

**References**

Lamant L, Dastugue N, Pulford K, Delsol G, Mariamé B. A new fusion gene TPM3-ALK in anaplastic large cell lymphoma created by a (1;2)(q25;p23) translocation. Blood. 1999 May 1;93(9):3088-95


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