Atlas of Genetics and Cytogenetics in Oncology and Haematology

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Solid Tumour Section

Mini Review

Soft tissue tumors: Inflammatory myofibroblastic tumor

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Identity

Alias: atypical fibromyxoid tumor; pseudosarcomatous fibromyxoid tumor; plasma cell granuloma; pseudo-sarcomatous myofibrotic proliferation; postoperative spindle cell nodules; inflammatory pseudotumor

Clinics and pathology

Disease

Rare soft tissue tumour of controversial nosology; at the edge between benign and malignant tumours, with a possible heterogeneity.

Epidemiology

Found in children and young adults.

Clinics

Occurs in the soft tissue and viscera; the tumour is localized in lungs, mesentery, retroperitoneum, and pelvis.

Pathology

Spindle cell proliferation with myofibroblastic differenciation with a collagen stroma and an inflammatory infiltrate of lymphocytes, eosinophils, and plasma cells

Treatment

Surgical excision.

Prognosis

This tumour has an indeterminate or low malignant potential; tumour related deaths (occuring in less than 10% of cases) are due to local invasion, not to distant metastases.

Genetics

Note

About one 50 to 60 % of the cases present with a 2p23 rearrangement involving the gene ALK; this subset of tumours should have a different genetic background, and may have a different behaviour, in terms of epidemiology (younger age?), prognosis.

Cytogenetics

Cytogenetics Morphological

So far, t(1;2)(q25;p23), t(2;2)(p23;q13), t(2;11)(p23;p15), t(2;17)(p23;q23), and t(2;19)(p23;p13.1) have been described; the t(1;2)(q25;p23) with TPM3 involvement would be the most frequent.

Genes involved and proteins

Note

These translocations involve ALK in 2p23, and either TPM3 in 1q25, CLTC in 17q23, or TPM4 in 19p13.

ALK

Location

2p23

Protein

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

TPM3 (tropomyosin alpha chain)

Location
1q25

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

RANBP2

Location
2q13

Protein
3224 amino acids, 358 kDa; nuclear pore protein involved in nuclear export.

CARS

Location
11p15

CLTC (clathrin heavy polypeptide)

Location
17q23

Protein
1675 amino acids, 191 kDa; mediate endocytosis of transmembrane receptors.

TPM4 (tropomyosin fibroblast, non muscle type)

Location
19p13.1

Protein
248 amino acids, 29 kDa; coiled coil structure.

Result of the chromosomal anomaly

Hybrid Gene

Description
5' partner - 3' ALK

Fusion Protein

Description
N-term amino acids from the partner gene 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 is known or suspected.

To be noted

Note
ALK and some of the above ALK partners, or closely related genes, are found implicated both in anaplasic large cell lymphoma and in inflammatory myofibroblastic tumours; this is a new concept, that 2 different types of tumour may result from the same chromosomal/genes.

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