

Soft tissue tumors: Inflammatory myofibroblastic tumor

Identity

Other names atypical fibromyxoid tumor
pseudosarcomatous fibromyxoid tumor
plasma cell granuloma
pseudosarcomatous 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 differentiation 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 (occurring 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 So far, [t\(1;2\)\(q25;p23\)](#), [t\(2;2\)\(p23;q13\)](#), [t\(2;11\)\(p23;p15\)](#),
Morphological [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

Gene Name [ALK](#)

Location 2p23

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

Gene Name [TPM3 \(tropomyosin alpha chain\)](#)

Location 1q25

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

Gene Name [RANBP2](#)

Location 2q13

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

Gene Name [CARS](#)

Location 11p15

Gene Name [CLTC \(clathrin heavy polypeptide\)](#)

Location 17q23

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

Gene Name [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

ALK and some of the above ALK partners, or closely related genes, are found implicated both in [anaplastic 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

Bibliography

Recurrent involvement of 2p23 in inflammatory myofibroblastic tumors.

Griffin CA, Hawkins AL, Dvorak C, Henkle C, Ellingham T, Perlman EJ. Cancer Res 1999, 59: 2776-2780.

TPM3-ALK and TPM4-ALK oncogenes in inflammatory myofibroblastic tumors.

Lawrence B, Perez-Atayde A, Hibbard MK, Rubin BP, Dal Cin P, Pinkus JL, Pinkus GS, Xiao S, Yi ES, Fletcher CDM, Fletcher JA. Am J Pathol 2000, 157: 377-384.

Aberrant ALK tyrosine kinase signaling. Different cellular lineages, common oncogenic mechanisms?

Ladanyi M.
Am J Pathol 2000; 157: 341-345.

ALK probe rearrangement in a t(2;11;2)(p23;p15;q31) translocation found in a prenatal mtofibroblastic fibrous lesion: toward a molecular definition of an inflammatory myofibroblastic tumor family?

Sirvent N, Hawkins AL, Moeglin D, Coindre JM, Kurzenne JY, Michiels JF, Barcelo G, Turc-Carel C, Griffin CA, Pedeutour F.
Genes Chromosom Cancer 2001; 31: 85-90.

Fusion of the ALK Gene to the Clathrin Heavy Chain Gene, CLTC, in Inflammatory Myofibroblastic Tumor.

Bridge JA, Kanamori M, Ma Z, Pickering D, D. Hill A, Lydiatt W, Lui MY, Colleoni GWB, Antonescu CR, Ladanyi M, Morris SW.
Am J Pathol 2001; 159: 411-415.

Anaplastic lymphoma kinase (ALK) expression in the inflammatory myofibroblastic tumor, a comparative immunohistochemical study..

Cook JR, Dehner LP, Collins MH, Ma Z, Morris SW, Coffin CM, Hill DA.
Am J Surg Pathol 2001; 25: 1364-1371.

Identification of novel fusion partners of ALK, the anaplastic lymphoma kinase, in anaplastic large-cell lymphoma and inflammatory myofibroblastic tumor.

Cools J, Wlodarska I, Somers R, Mentens N, Pedeutour F, Maes B, De Wolf-Peeters C, Pauwels P, Hagemeijer A, Marynen P.
Genes Chromosomes Cancer 2002; 34: 354-362.
Medline [12112524](#)

Fusion of ALK to the Ran-binding protein 2 (RANBP2) gene in inflammatory myofibroblastic tumor.

Ma Z, Hill DA, Collins MH, Morris SW, Sumegi J, Zhou M, Zuppan C, Bridge JA.
Genes Chromosomes Cancer 2003; 37: 98-105.
Medline [12661011](#)

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