

## Adult T-cell leukemia/lymphoma (ATLL)

### Clinics and Pathology

Phenotype / cell stem origin	This is a T-cell lymphoid neoplasia caused by HTLV1 infection. The phenotype is CD3+, CD5+, CD7- with positivity for the CD4 and CD25 molecules in the majority of the cases.
Etiology	Pathogenesis of the disease: ATLL is associated with HTLV-1 infection of the tumour clone in 100% of the cases. The interval between HTLV-1 infection and the onset of lymphoma is long (10-40 years) and only <5% of infected people actually develops the disease. HTLV-1 produces a trans-regulatory protein (Tax) inducing interleukin-2 (IL-2) and IL-2 receptor expression and consequent polyclonal CD4 cell growth. This T-cell population is at risk for the development of genetic and cytogenetic changes leading to lymphoma.
Epidemiology	The disease affects adult people. Clusters were observed in Japan and in the Caribbean; sporadic cases were reported in Western countries.
Clinics	The disease usually runs an aggressive course, with peripheral blood and bone marrow involvement, diffuse adenopathies, hepatomegaly, bone lesions and hypercalcemia. Smouldering or chronic forms were also observed.
Pathology	The lymph node architecture is effaced by a diffuse proliferation of small and large lymphoid cells having pleomorphic cytological features. In the peripheral blood the neoplastic cells often display a lobated nucleus (flower cells); diffuse bone marrow infiltration is found in virtually all cases.
Treatment	Multiagent chemotherapy usually attains only partial, short lasting responses. Highly active anti viral therapy with zidouvidine and interferon-alpha may be beneficial in some cases.
Prognosis	Patients with aggressive disease usually survive less than 1 year; less than 10% of the patients survive more than 5 years. Longer survival (> 2 years) can be observed in rare patients presenting a chronic or a smouldering form.

### Cytogenetics

Note	The karyotype almost invariably shows a high degree of complexity and variability. Aneuploidy and more than 6 chromosome breaks were observed in the majority of cases. The most frequent gains include <a href="#">trisomy 3</a> , <a href="#">trisomy 8</a> , trisomy 9 and <a href="#">trisomy 21</a> ; monosomies involve chromosome 4, 8, 10 and 22. Breakpoints clusters are found at 1p and 1a. at 3a. 6a. 7a. 10p. 12a. 13a. 14a. 17p and 21p. Multiple breaks and
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aberrations of some of these chromosome regions may predict for an inferior outcome.

**Cytogenetics** Comparative genomic hybridization (CGH) studies revealed that the most frequent regions of DNA gains are located at 14q, 7q and 3p; whereas frequent losses involve sequences at 6q and 13q. Gain of 14q32 may be a recurrent specific abnormality in ATLL. Aggressive forms display more genomic aberrations than chronic forms. The number of chromosomal imbalances correlates with clinical outcome. Different hybridization patterns, suggesting clonal evolution, can be observed when analysing material from different sites or material taken at different time points in the same patient. Upregulation of gene encoding for ribosomal proteins, proteasome subunits, translation factors was identified in acute vs chronic phases of the disease. Many of these genes are located in regions amplified by chromosome rearrangements. Downregulation of genes involved in immune response was also documented.

### To be noted

Additional cases are needed to delineate the epidemiology of this rare entity:

**you are welcome to submit a paper to our new [Case Report section](#).**

### Bibliography

#### **Cytogenetic analysis and clinical significance in adult T-cell leukemia/lymphoma: a study of 50 cases from the human T-cell leukemia virus type-1 endemic area, Nagasaki.**

Itoyama T, Chaganti RS, Yamada Y, Tsukasaki K, Atogami S, Nakamura H, Tomonaga M, Ohshima K, Kikuchi M, Sadamori N.

Blood 2001; 97: 3612-3620.

Medline [11369658](#)

#### **Comparative genomic hybridization analysis in adult T-cell leukemia/lymphoma: correlation with clinical course.**

Tsukasaki K, Krebs J, Nagai K, Tomonaga M, Koeffler HP, Bartram CR, Jauch A.

Blood 2001; 97: 3875-3881.

Medline [11389029](#)

#### **Genetic instability of adult T-cell leukemia/lymphoma by comparative genomic hybridization analysis.**

Tsukasaki K.

J Clin Immunol 2002; 22: 57-63.

Medline [11998893](#)

#### **Identifying progression-associated genes in adult T-cell leukemia/lymphoma by using oligonucleotide microarrays.**

Tsukasaki K, Tanosaki S, DeVos S, Hofmann WK, Wachsmann W, Gombart AF, Krebs J, Jauch A, Bartram CR, Nagai K, Tomonaga M, Said JW, Koeffler HP.

Int J Cancer 2004; 109: 875-881.

Medline [15027121](#)

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