CONDITION

Anaplastic large-cell lymphoma

Learn about the types, symptoms, diagnosis, treatment, and follow-up care for anaplastic large-cell lymphoma, including skin and breast implant-associated forms.

WHAT IT IS
Uncommon type of non-Hodgkin lymphoma

BODY SYSTEM
Immune system

MAIN SYMPTOMS
Enlarged lymph nodes, fever, night sweats, weight loss

WHAT CAUSES IT
Mostly unknown

HOW IT IS DIAGNOSED
Tissue biopsy with CD30 and ALK testing

MAIN TREATMENT
Chemotherapy, targeted therapy, surgery, or radiation

CAN IT BE CURED?
Sometimes - localized disease may be removed

IS IT AN EMERGENCY?
Sometimes - with severe trouble breathing

LONG-TERM OUTLOOK
Varies by type and stage

Overview

Anaplastic large-cell lymphoma, or ALCL, is an uncommon type of non-Hodgkin lymphoma. It develops from T cells, which are white blood cells that help the immune system respond to infections and abnormal cells.

Under a microscope, ALCL cells are usually large and abnormal-looking. "Anaplastic" refers to this appearance. The cells also have large amounts of a protein called CD30 on their surface. Testing for CD30 and other proteins helps a pathologist, a doctor who examines tissue, identify the disease.

ALCL is not a single condition. The main types are:

These types can differ in their usual age at diagnosis, behavior, treatment, and outlook. For

example, systemic ALCL often requires treatment throughout the body, while a single area of primary cutaneous ALCL may be treated locally.

Accurate classification matters because other lymphomas and noncancerous conditions can also contain CD30-positive cells. Diagnosis therefore requires a tissue sample and specialized laboratory testing.

- Systemic ALK-positive ALCL , which can affect lymph nodes and organs and contains an abnormal protein called anaplastic lymphoma kinase, or ALK.
- Systemic ALK-negative ALCL , which behaves similarly but does not contain the ALK protein.
- Primary cutaneous ALCL , which begins in the skin and usually follows a slower course than systemic ALCL.
- Breast implant-associated ALCL , or BIA-ALCL, which develops in the scar tissue or fluid around a breast implant. It is not breast cancer.

Symptoms

Symptoms depend on where the lymphoma begins and whether it has spread.

Systemic ALCL often causes one or more enlarged lymph nodes. A node may feel like a firm lump under the skin, commonly in the neck, armpit, or groin. Enlarged nodes are often painless, although they can be tender.

Some people have general symptoms known as "B symptoms":

Other possible symptoms include fatigue, reduced appetite, itching, or discomfort caused by an enlarged lymph node or organ. Systemic ALCL can sometimes involve the skin, bone, lungs, liver, spleen, or bone marrow. Symptoms then depend on the affected area.

Primary cutaneous ALCL usually appears as one or more raised skin lumps or tumors. They may be red, purple, or brown and can break open or form an ulcer. These lesions often grow over several weeks. Some may shrink without treatment, but new lesions can develop.

BIA-ALCL most often causes a new collection of fluid around an implant, leading to breast swelling or a change in breast shape. This usually occurs years after implant placement. Less commonly, it causes a lump in the breast, implant capsule, or nearby armpit. Pain, firmness, or a skin rash can also occur.

Many common conditions can cause swollen lymph nodes, skin lumps, or breast changes. Symptoms that persist, enlarge, or do not have a clear explanation should be assessed by a healthcare professional.

- Fever without a clear infection
- Drenching night sweats
- Unintentional weight loss

Causes and risk factors

The exact cause of most ALCL is not known. It is not caused by anything a person did, and there is no established way to prevent the systemic or primary cutaneous forms.

In ALK-positive ALCL, a change in the lymphoma cells places the ALK gene next to another gene. This can create an abnormal ALK protein that tells the cells to keep growing. The gene change is acquired in the cancer cells and is generally not inherited from a parent.

ALK-positive systemic ALCL is more often diagnosed in children and younger adults, although it can occur at any age. ALK-negative systemic ALCL is more common in older adults. These patterns do not determine which type an individual person has; laboratory testing is needed.

BIA-ALCL is associated with breast implants, especially implants with textured outer surfaces. It develops in the capsule, the scar tissue the body naturally forms around an implant. The reasons textured implants increase risk are still being studied.

The US Food and Drug Administration does not recommend routine implant removal for people without symptoms solely because of concern about BIA-ALCL. Someone with implants can discuss the implant type, personal concerns, and appropriate follow-up with a qualified clinician.

Diagnosis

Diagnosis usually begins with a medical history and physical examination. The clinician may ask when symptoms began, whether lymph nodes or skin lesions have changed, and whether fever, night sweats, or weight loss are present.

A biopsy is needed to confirm ALCL. Whenever possible, an enlarged lymph node or a substantial piece of abnormal tissue is removed. A needle biopsy may not always provide enough tissue to distinguish ALCL from other lymphomas.

The pathology evaluation may include:

For a new fluid collection around a breast implant, imaging such as ultrasound is often used first. Fluid may then be removed with a needle and tested for abnormal cells and CD30. A mass or abnormal lymph node may also require biopsy.

After systemic ALCL is confirmed, tests help determine its stage, meaning how much of the body is involved. These may include blood tests and a PET/CT scan. PET/CT combines body imaging with a test that shows areas using increased amounts of glucose. Because lymphoma cells often use more glucose than nearby tissue, this can help locate involved areas.

A bone marrow biopsy is sometimes performed, depending on the scan results, blood counts, and treatment plan. Heart or lung tests may be needed before certain treatments.

Primary cutaneous ALCL should be evaluated to confirm that it began in the skin rather than representing systemic lymphoma involving the skin. This may require an examination of the lymph nodes, blood tests, and imaging.

- Examination of the cells under a microscope
- Testing for CD30, ALK, and other cell proteins
- Flow cytometry, which identifies proteins on individual cells
- Chromosome or gene testing when needed to clarify the subtype

Treatment and management

Treatment depends on the ALCL type, stage, symptoms, age, general health, and previous therapy. Care may involve hematologists, oncologists, dermatologists, radiation oncologists, surgeons, and other specialists.

For adults with previously untreated systemic ALCL, a common initial treatment combines brentuximab vedotin with chemotherapy medicines known as CHP. Brentuximab vedotin is an antibody-drug conjugate: it attaches to CD30 and carries a cancer-killing medicine into the lymphoma cell. CHP refers to cyclophosphamide, doxorubicin, and prednisone.

Treatment plans for children and adolescents use pediatric lymphoma protocols and may differ from adult treatment. An experienced pediatric cancer team should guide this care.

Possible effects of systemic treatment include low blood cell counts, infection risk, nausea, hair loss, fatigue, numbness or tingling from nerve damage, and effects on fertility or organ function. The likely effects depend on the specific medicines. Supportive treatments can help prevent or manage many of these problems.

If systemic ALCL returns or does not respond, options may include brentuximab vedotin if appropriate, other drug combinations, targeted treatment, or a clinical trial. ALK inhibitors, which block the abnormal ALK protein, may be considered in some people with ALK-positive disease. A stem cell transplant may also be discussed for selected patients.

A single primary cutaneous ALCL lesion can often be treated with surgical removal or local

radiation therapy. When several areas of skin are involved, management may include observation in selected cases, low-dose systemic treatment, radiation to symptomatic areas, or CD30-directed treatment. The approach should balance disease control against treatment effects because this form often behaves less aggressively than systemic ALCL.

Localized BIA-ALCL is usually managed by removing the implant and the entire surrounding capsule. A mass and involved lymph nodes may also need removal. Surgery should be planned by a team familiar with this disease. Lymphoma that extends beyond the capsule may require systemic treatment, radiation therapy, or both.

People receiving treatment should tell their care team about vitamins, supplements, and nonprescription medicines. Some products can interfere with cancer medicines or increase side effects.

Complications

Systemic ALCL may spread to organs, bone marrow, bone, or skin. Organ involvement can affect normal function depending on its location. Bone marrow involvement or treatment can lower red blood cells, white blood cells, or platelets.

Rapidly responding lymphoma can rarely cause tumor lysis syndrome. This occurs when many cancer cells break down at once and release their contents into the blood. Cancer teams assess this risk and may use blood monitoring, fluids, or preventive medicines when appropriate.

Treatment-related complications can include serious infection, bleeding, blood clots, nerve problems, heart effects, or later cancers. These risks vary widely by therapy and individual health. They should be discussed before treatment begins.

Primary cutaneous ALCL can return in the same area or appear elsewhere on the skin. Spread outside the skin is less common but requires reassessment because it can change treatment.

BIA-ALCL may spread beyond the implant capsule if it is not recognized or fully removed. New swelling around an implant should therefore be evaluated rather than managed by implant replacement alone.

The emotional effects of lymphoma can also be significant. Uncertainty, changes in appearance, and concerns about work, fertility, or recurrence may affect daily life. Oncology social workers, mental health professionals, and patient support programs can provide practical and emotional support.

Follow up

Follow-up is tailored to the ALCL type and treatment received. Routine visits may include a symptom review, physical examination, blood tests, and assessment for treatment effects. Imaging is used when clinically appropriate rather than automatically in every situation.

People with primary cutaneous ALCL usually need ongoing skin and lymph node examinations. New skin lesions may require evaluation or another biopsy because not every lesion has the same cause.

After treatment for BIA-ALCL, follow-up may include clinical examinations and imaging based on the original stage and surgical findings. People who still have a breast implant should report new swelling, a lump, firmness, pain, or a clear change in breast shape.

During or soon after cancer treatment, contact the oncology team immediately for a fever, shaking chills, unusual bleeding, inability to keep fluids down, rapidly worsening weakness, or other symptoms listed in the treatment instructions. A fever during chemotherapy can signal an infection even if the person otherwise feels well.

Call emergency services for severe trouble breathing, chest pain, fainting, confusion, uncontrolled bleeding, or signs of a severe allergic reaction. Persistent swollen nodes, new skin lesions, or gradual implant changes usually call for prompt clinical review, but they are not automatically emergencies.

Sources

- Alaggio R, Amador C, Anagnostopoulos I, et al. "The 5th edition of the World Health Organization Classification of Haematolymphoid Tumours: Lymphoid Neoplasms." Leukemia . 2022;36:1720-1748.
- Horwitz S, O'Connor OA, Pro B, et al. "Brentuximab vedotin with chemotherapy for CD30-positive peripheral T-cell lymphoma (ECHELON-2): a global, double-blind, randomised, phase 3 trial." The Lancet . 2019;393(10168):229-240.
- National Cancer Institute. "Adult Non-Hodgkin Lymphoma Treatment (PDQ®)-Health Professional Version." NCI Cancer Information Summaries.
- US Food and Drug Administration. "Questions and Answers About Breast Implant-Associated Anaplastic Large Cell Lymphoma." Updated March 23, 2023.
- US Food and Drug Administration. ADCETRIS (brentuximab vedotin) Prescribing Information . Revised November 2024.

- Willemze R, Cerroni L, Kempf W, et al. "The 2018 update of the WHO-EORTC classification for primary cutaneous lymphomas." Blood . 2019;133(16):1703-1714.
- Clemens MW, Jacobsen ED, Horwitz SM. "2019 NCCN Consensus Guidelines on the Diagnosis and Treatment of Breast Implant-Associated Anaplastic Large Cell Lymphoma." Aesthetic Surgery Journal . 2019;39(Supplement 1):S3-S13.