CONDITION

Anaplastic thyroid cancer

Learn about anaplastic thyroid cancer, including symptoms, diagnosis, molecular testing, treatment options, complications, and when to seek urgent care.

WHAT IT IS
Uncommon fast-growing thyroid cancer

BODY SYSTEM
Hormone system

MAIN SYMPTOMS
Rapidly growing neck lump, trouble swallowing, hoarseness, shortness of breath

WHAT CAUSES IT
Usually unknown acquired DNA changes

HOW IT IS DIAGNOSED
Fine-needle aspiration or core biopsy

MAIN TREATMENT
Targeted therapy, surgery, radiation, chemotherapy

CAN IT BE CURED?
Sometimes - when all disease is removable

IS IT AN EMERGENCY?
Sometimes - severe breathing difficulty or major bleeding

LONG-TERM OUTLOOK
Often life-limiting, but course varies

Overview

Anaplastic thyroid cancer is an uncommon, fast-growing cancer that begins in the thyroid gland at the front of the neck. It is also called anaplastic thyroid carcinoma, or ATC.

Unlike more common thyroid cancers, ATC can quickly grow into nearby structures, including the windpipe, swallowing tube, voice box, muscles, and major blood vessels. It may also spread to other organs, especially the lungs.

ATC often requires treatment planning within days rather than weeks. Prompt care can help protect breathing and swallowing, identify treatments aimed at specific tumor changes, and control symptoms. Evaluation should involve specialists experienced in thyroid cancer, such as a head and neck surgeon, medical oncologist, radiation oncologist, endocrinologist, pathologist, and supportive-care team.[1]

Every ATC is classified as stage IV, but this does not mean every person has cancer throughout the body. Subgroups describe whether the cancer remains in the thyroid, has invaded nearby tissues or lymph nodes, or has spread to distant organs. Imaging is needed to determine its extent.

ATC can be life-limiting, but its course varies. Newer targeted medicines have improved outcomes for some tumors with specific genetic changes. Treatment also depends on whether the cancer can be removed safely, the person's health and symptoms, and their goals.

Symptoms

ATC commonly causes a firm neck lump that becomes noticeably larger over days or weeks. Some people previously had a thyroid lump or goiter before rapid growth began.

Other symptoms may include:

These symptoms can have other causes, but a rapidly growing neck mass, new hoarseness, or increasing difficulty swallowing needs urgent assessment.

Call emergency services for severe breathing difficulty, blue or gray lips, fainting, confusion, inability to speak because of breathlessness, or coughing up a large amount of blood. Do not drive yourself if breathing is severely affected.

- Neck pressure, swelling, or pain
- Trouble swallowing or a feeling that food is sticking
- Hoarseness or another voice change
- Cough, noisy breathing, or shortness of breath
- Enlarged neck lymph nodes
- Coughing up blood
- Fatigue, poor appetite, or unplanned weight loss

Causes and risk factors

ATC develops when thyroid cells acquire DNA changes that allow uncontrolled growth. Some cases appear to begin as ATC. Others may develop when a slower-growing papillary or follicular thyroid cancer becomes more aggressive.[1]

The cause of these changes is usually unknown. ATC is not caused by stress, injury, or something a person did.

Associated factors include older age, previous differentiated thyroid cancer, and a longstanding goiter or thyroid nodule. Most people with thyroid nodules or goiters do not develop ATC.

Tumors often contain several acquired genetic changes, which are generally present only in cancer cells and are not inherited. An important example is BRAF V600E . Other changes may involve RET, NTRK, RAS, TP53, or TERT. Testing can guide treatment, although not every tumor has a change that can currently be targeted.

Most ATCs are not inherited. Genetic counseling may be appropriate if personal or family history suggests a hereditary cancer condition.

Diagnosis

Diagnosis usually begins with a neck examination and imaging. Ultrasound assesses the thyroid and nearby lymph nodes. A contrast-enhanced CT scan of the neck and chest can show the tumor's relationship to the airway, swallowing tube, blood vessels, and lungs. Additional CT, MRI, or PET imaging may check for spread elsewhere.[1,2]

A tissue sample is required. Fine-needle aspiration uses a thin needle, while a core biopsy removes a larger piece of tissue. Because lymphoma and other cancers can resemble ATC, an expert pathologist may use special laboratory stains to confirm the diagnosis.

Other tests may include:

Tumor testing should begin promptly because results may change the first treatment offered. Testing usually uses biopsy tissue, although tumor DNA from blood may sometimes help. A blood test does not replace a biopsy when tissue can be obtained safely.

The team also assesses whether all visible neck disease can be removed without unacceptable harm. This depends on imaging, vocal-cord function, distant spread, and involvement of critical structures.

- Flexible laryngoscopy to examine the voice box and vocal cords
- Blood tests for thyroid function, blood counts, kidney and liver function, and general health
- Breathing or swallowing assessments
- Rapid testing for BRAF V600E
- Broader molecular testing for other potentially treatable changes

Treatment and management

Treatment is individualized by a multidisciplinary cancer team and may combine targeted therapy, surgery, radiation, chemotherapy, symptom management, and supportive care. Urgent local treatment may begin while some test results are pending.[1]

Targeted treatment

For BRAF V600E-positive ATC that cannot be managed adequately with local treatment, dabrafenib plus trametinib may be considered. Dabrafenib blocks abnormal BRAF signaling, while trametinib blocks the related MEK pathway. This combination is approved by the US Food and Drug Administration for appropriate BRAF V600E-positive ATC.[3]

Some tumors shrink substantially. In selected cases, treatment may make surgery possible. Adverse effects can include fever, chills, fatigue, rash, diarrhea, and high blood sugar, as well as less common heart or eye problems. The oncology team should explain which symptoms, including treatment-related fever, require immediate attention.

Broader molecular testing may identify targets such as NTRK or RET gene fusions. Directed medicines may be options depending on the finding, previous treatment, approval, and access. Immunotherapy or a clinical trial may also be considered. Having a biomarker does not guarantee that treatment will work.

Surgery

Surgery may be offered if all visible disease can be removed with acceptable risk. It may involve removing the thyroid, affected lymph nodes, and involved nearby tissue.

Surgery is less likely to help when the tumor surrounds major blood vessels, extensively involves the airway or swallowing tube, or has spread widely. Removing only part of a tumor without a clear goal may delay more useful treatment. An experienced head and neck surgeon should assess these risks.

Radiation and chemotherapy

External-beam radiation may be used after surgery, instead of surgery for disease that cannot be removed, or to relieve pain, bleeding, or pressure. It may be combined with chemotherapy.

Chemotherapy may include medicines from the taxane or anthracycline groups. Choice depends on tumor features, previous treatment, overall health, and treatment goals. Possible effects include fatigue, nausea, low blood counts, infection risk, hair loss, or nerve symptoms.

Airway, nutrition, and supportive care

Protecting breathing is a priority. A tracheostomy creates an opening into the windpipe but is not automatically appropriate for everyone. It can be difficult or risky when a large tumor affects the airway. Decisions should involve experienced surgeons, anesthesia specialists, and

the patient whenever possible.

Swallowing problems can cause dehydration, weight loss, or aspiration of food or liquid into the lungs. A dietitian and speech-language pathologist can recommend safer textures and swallowing strategies. A feeding tube may be considered based on expected benefit and treatment goals.

Palliative care can accompany cancer treatment and help with pain, breathlessness, sleep, nutrition, emotional distress, and caregiver support. Hospice may be appropriate when a person chooses comfort-focused care. These services reflect needs and goals, not "giving up."

Clinical trials may offer newer treatments or combinations. Asking early is useful because eligibility can depend on previous treatment and overall health.

Complications

ATC can narrow the airway, affect the vocal cords, or interfere with swallowing. It may cause bleeding, pain, dehydration, poor nutrition, or aspiration pneumonia.

Lung spread may cause cough or breathlessness. Bone spread can cause pain or weakness. Brain spread may cause headaches, seizures, confusion, vision changes, or changes in strength.

Treatment can also cause complications. Surgery may affect voice, swallowing, calcium levels, or wound healing. Radiation can irritate the skin, throat, and swallowing tube. Systemic medicines may cause infection, fever, organ effects, or other drug-specific problems.

The care team can often reduce symptoms even when the cancer cannot be eliminated.

Follow up

Follow-up is usually more frequent than for slower-growing thyroid cancers. The schedule depends on disease extent, treatment, symptoms, and how quickly the cancer is changing.

Visits may include a neck examination, review of breathing and swallowing, blood tests, and CT or other imaging. Targeted therapy, chemotherapy, and immunotherapy require monitoring for treatment-specific effects. After surgery or radiation, follow-up may address voice changes, thyroid hormone replacement, calcium levels, nutrition, and rehabilitation.

Contact the oncology team promptly for a growing neck mass, new hoarseness, worsening cough, fever during treatment, difficulty keeping down fluids, increasing pain, or changes in breathing or swallowing. Do not wait for the next routine appointment.

Seek emergency care for severe breathing difficulty, sudden inability to swallow saliva, major bleeding, fainting, a seizure, new confusion, or sudden weakness on one side.

Keep copies of pathology, imaging, and molecular test reports and an updated medication list. Advance care planning can identify who should make decisions if you cannot speak for yourself and which treatments fit your values.

Sources

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