CONDITION

Branchial cleft cyst

Learn how branchial cleft cysts form, what symptoms they may cause, how neck lumps are evaluated, and when treatment or urgent care may be needed.

WHAT IT IS
Congenital fluid-filled neck lump

BODY SYSTEM
Head and neck

MAIN SYMPTOMS
One-sided neck lump, swelling or tenderness, skin drainage, trouble swallowing

WHAT CAUSES IT
Tissue left during development before birth

HOW IT IS DIAGNOSED
Tissue examination after surgical removal

MAIN TREATMENT
Complete surgical removal

CAN IT BE CURED?
Yes - complete removal is definitive

IS IT AN EMERGENCY?
Sometimes - difficulty or noisy breathing

LONG-TERM OUTLOOK
Usually benign, but recurrence can occur

Overview

A branchial cleft cyst is a fluid-filled neck lump caused by tissue left behind during development before birth. This tissue can form a cyst, an open channel called a sinus, or a passage with two openings called a fistula.

Although congenital, a branchial cleft cyst may not become noticeable until childhood or early adulthood. Some remain small, while others enlarge during a cold, throat infection, or other upper respiratory infection.

Branchial cleft anomalies are classified as first, second, third, or fourth based on their location and developmental origin. Second branchial cleft cysts are most common and usually appear on the side of the neck, often near the front edge of the sternocleidomastoid muscle.

Other types may lie near important structures. First branchial anomalies can be close to the ear, salivary gland, or facial nerve. Third and fourth anomalies may connect with the throat and cause repeated infections in the lower neck or thyroid area.

Most branchial cleft cysts are noncancerous. However, a new cyst-like neck mass in an adult should not automatically be assumed to be congenital. Some head and neck cancers, including human papillomavirus-related throat cancer, can spread to a lymph node and create a cystic mass. A new, persistent, growing, or unexplained lump needs careful evaluation.

Symptoms

A branchial cleft cyst often feels like a smooth, soft, or rubbery lump on one side of the neck. It is usually painless unless it becomes infected and may be easier to see or feel after an illness.

Possible symptoms include:

A sinus or fistula may appear as a small skin pit that drains clear fluid, mucus, or pus. Third or fourth branchial anomalies can cause repeated deep neck infections, inflammation near the thyroid gland, or pain with swallowing.

Arrange a timely medical assessment for any neck lump that persists, grows, returns after treatment, or has no clear relationship to a recent infection. Adults should be evaluated promptly when a neck mass has lasted two weeks or longer without clear improvement, or when its duration is uncertain.

Seek urgent medical care for rapidly increasing swelling, fever with worsening neck pain, trouble swallowing liquids, dehydration, or signs of spreading infection.

Call emergency services for difficulty or noisy breathing, inability to swallow saliva, severe swelling that may affect the airway, confusion, or blue or gray lips or skin.

- A slowly growing lump on the side of the neck
- Swelling, tenderness, warmth, or redness during infection
- Drainage from a small opening in the skin
- Repeated infections in the same area
- Discomfort when swallowing or turning the head
- A lump near the ear, jaw, or lower neck, depending on the type

Causes and risk factors

A branchial cleft cyst develops from tissue left behind during early formation of the head and neck. It is not caused by anything a person did after birth, and there is usually no preventable risk factor.

The types have different locations:

A cyst can enlarge when nearby immune tissue reacts to infection. Infection may also enter through a sinus or fistula connected to the skin or throat.

Most isolated branchial cleft cysts do not indicate a genetic disorder. Genetic evaluation may be considered when cysts occur on both sides, several relatives are affected, or there are associated hearing, kidney, or facial differences.

In adults, other possible causes of a cystic neck mass include inflamed lymph nodes, thyroid or salivary gland disorders, and cancer that has spread to a lymph node. Tobacco and heavy alcohol exposure raise the risk of some head and neck cancers, while human papillomavirus is associated with certain tonsil and tongue-base cancers. These factors do not prove that a lump is cancerous, but they affect how it is investigated.

- First branchial cleft anomalies occur near the ear canal, jaw, or parotid salivary gland and may pass close to the facial nerve.
- Second branchial cleft anomalies usually occur on the upper or middle side of the neck and may extend toward major blood vessels or the tonsil area.
- Third branchial cleft anomalies are uncommon and may pass through the lower neck toward the pyriform sinus in the throat.
- Fourth branchial cleft anomalies are also uncommon and can cause repeated infections low in the neck, sometimes near the thyroid. They more often affect the left side.

Diagnosis

Diagnosis begins with a medical history and physical examination. The clinician may ask when the lump appeared, whether it changes during infections, and whether there is pain, drainage, fever, trouble swallowing, voice change, ear pain, or weight loss. The ears, mouth, throat, thyroid, salivary glands, and lymph nodes may also be examined.

Imaging can show whether the mass contains fluid, how far it extends, and its relationship to nerves and blood vessels. Tests may include:

Fine-needle aspiration may be recommended. A thin needle removes fluid or cells for examination and, when needed, infection testing. This is generally preferred over cutting into an unexplained adult neck mass before the diagnosis is known.

Cyst fluid does not always provide a definite answer. Cancerous cystic lymph nodes may contain few abnormal cells, so an initial sample can be nondiagnostic. If an adult neck mass persists despite an uncertain or apparently benign result, additional imaging, repeat sampling, upper-throat examination, or other tests may be necessary.

When cancer is a concern, an ear, nose, and throat specialist may use a thin flexible camera to examine the throat, including the tonsils and base of the tongue. In children and younger adults, location and imaging may strongly suggest a congenital anomaly. The final diagnosis is often confirmed after removal by examining the tissue under a microscope.

- Ultrasound , which uses sound waves without radiation and can help distinguish a cyst from a solid mass.
- Computed tomography (CT) , which provides detailed cross-sectional images. Contrast material may be used to show inflammation, blood vessels, and the mass boundaries.
- Magnetic resonance imaging (MRI) , which gives detailed soft-tissue images without ionizing radiation and can help define complex channels.

Treatment and management

Management depends on age, symptoms, infection, location, imaging findings, and certainty of the diagnosis. Care is often provided by an otolaryngologist, also called an ear, nose, and throat specialist.

Complete surgical removal is the standard definitive treatment for many branchial cleft cysts, sinuses, and fistulas. Removing the entire cyst and tract reduces the chance of recurrence.

Surgery may be complex if the tract passes near the facial nerve, major blood vessels, nerves serving the voice box, tonsil area, or thyroid gland. Imaging helps the surgeon plan a safe approach. Some third and fourth anomalies that open into the throat may be treated endoscopically through the mouth, depending on their anatomy and available expertise.

An active infection is usually treated before planned surgery. Treatment may include antibiotics like amoxicillin or doxycycline for suspected bacterial infection and drainage if an abscess has formed. Surgery is often delayed until significant inflammation settles because infection can make important tissue planes harder to identify.

Needle drainage may temporarily relieve swelling, but it does not remove the cyst lining or tract. Repeated drainage can allow the cyst to refill and create scarring that complicates later surgery.

An asymptomatic lesion may sometimes be observed after a specialist has established the

likely diagnosis and discussed the risks and benefits. Observation requires a clear follow-up plan and is less appropriate when the diagnosis is uncertain, infections recur, the mass grows, or swallowing or breathing is affected.

After surgery, follow instructions for incision care, bathing, activity, and pain control. A temporary drain may be placed to prevent fluid buildup. Removed tissue is usually sent for pathology testing.

Complications

A branchial cleft cyst may remain stable, but it can enlarge or become infected. Repeated infections can cause pain, redness, drainage, an abscess, or scarring. A large cyst can press on the throat or airway, although severe airway problems are uncommon.

Treatment risks include bleeding, infection, fluid collection, scarring, and recurrence. Recurrence is more likely if part of the cyst or tract remains or if previous infection or surgery caused extensive scarring.

Depending on location, nearby nerve injury could affect facial, shoulder, or tongue movement, voice, or swallowing. The surgeon should explain the individual risks before treatment.

A presumed branchial cleft cyst in an adult can occasionally be a cancerous cystic lymph node. This reflects mistaken identity rather than a tendency for ordinary branchial cysts to become cancerous, and it is why complete evaluation is important.

Follow up

During observation, report growth, pain, drainage, skin changes, or repeated infections. Keep scheduled visits even if the lump shrinks, because temporary improvement does not mean the cyst or tract is gone.

After infection treatment, follow up to confirm that swelling and tenderness have resolved. Definitive treatment may then be discussed once inflammation improves.

After surgery, attend the postoperative visit to review healing and pathology results. Contact the surgical team promptly for increasing redness, worsening pain, pus-like drainage, fever, rapidly enlarging swelling, new facial weakness, voice change, or trouble swallowing.

Seek emergency help for breathing difficulty, severe or rapidly expanding neck swelling, inability to swallow saliva, or significant bleeding.

If pathology confirms a benign branchial cleft cyst and healing is complete, long-term testing

may not be needed. Additional follow-up may be recommended for a complex fistula, recurrent symptoms, uncertain diagnosis, or unexpected pathology result.

Sources

- Pynnonen MA, Gillespie MB, Roman B, et al. "Clinical Practice Guideline: Evaluation of the Neck Mass in Adults." Otolaryngology-Head and Neck Surgery . 2017;157(2 Suppl):S1-S30. doi:10.1177/0194599817722550.
- Adams A, Mankad K, Offiah C, Childs L. "Branchial Cleft Anomalies: A Pictorial Review of Embryological Development and Spectrum of Imaging Findings." Insights into Imaging . 2016;7(1):69-76. doi:10.1007/s13244-015-0454-5.
- Goff CJ, Allred C, Glade RS. "Current Management of Congenital Branchial Cleft Cysts, Sinuses, and Fistulae." Current Opinion in Otolaryngology & Head and Neck Surgery . 2012;20(6):533-539. doi:10.1097/MOO.0b013e32835873fb.
- Allen SB, Jamal Z, Goldman J. "Branchial Cleft Cysts." StatPearls . StatPearls Publishing; updated regularly. National Center for Biotechnology Information Bookshelf.
- American Academy of Otolaryngology-Head and Neck Surgery Foundation. "Neck Mass in Adults: Evaluation and Treatment." Patient information accompanying the clinical practice guideline. Reviewed 2017.