CONDITION

Choanal atresia

Learn how choanal atresia blocks the back of a baby's nasal passage, what symptoms it can cause, and how specialists diagnose, treat, and monitor it.

WHAT IT IS
Congenital blockage at the back of the nasal passages

BODY SYSTEM
Breathing and airways

MAIN SYMPTOMS
Difficult breathing, blue or gray coloring, pauses in breathing, trouble feeding

WHAT CAUSES IT
Unknown developmental cause, sometimes genetic

HOW IT IS DIAGNOSED
Nasal endoscopy and CT scan

MAIN TREATMENT
Airway support and surgical repair

CAN IT BE CURED?
Yes, surgery removes the blockage

IS IT AN EMERGENCY?
Sometimes, with blue or gray coloring or severe breathing difficulty

LONG-TERM OUTLOOK
Often good after successful treatment, but associated conditions may affect health

Overview

Choanal atresia is a condition present at birth in which one or both nasal passages are blocked at the back. This area, called the choana , normally allows air to move from the nose into the throat. In choanal atresia, bone, soft tissue, or a mixture of both closes the opening.

The blockage may affect one side of the nose, called unilateral choanal atresia , or both sides, called bilateral choanal atresia . The opening may also be narrowed rather than completely closed. This is sometimes called choanal stenosis.

Bilateral choanal atresia can cause serious breathing difficulty soon after birth. Newborns prefer to breathe through their noses, especially while feeding. A blockage in both nasal passages can therefore interfere with breathing and feeding. Symptoms may improve when the baby cries because crying opens the mouth and allows air to enter.

Unilateral choanal atresia is usually less urgent. A child can breathe through the open side, so the condition may not be found until later in infancy or childhood. Ongoing one-sided nasal congestion or discharge may be the main clue.

Choanal atresia can occur by itself. It can also be associated with differences involving the heart, ears, eyes, airway, kidneys, bones, or development. For this reason, a child diagnosed with choanal atresia may need evaluation by several specialists.

Symptoms

Symptoms depend on whether one or both nasal passages are affected and how narrow the airway is.

A newborn with bilateral choanal atresia may have:

An infant who is blue or gray, has pauses in breathing, is struggling for each breath, or is difficult to wake needs emergency medical help. These are not symptoms to monitor at home.

Unilateral choanal atresia may cause milder symptoms, including:

One-sided discharge can have several causes, including infection or an object placed in the nose. It should be assessed by a healthcare professional, particularly when it continues, smells unpleasant, or contains blood.

Symptoms of choanal stenosis may be less obvious than those of complete atresia. They can become more noticeable during a respiratory infection, when swelling and mucus further narrow the airway.

- Noisy or difficult breathing soon after birth
- Blue or gray coloring that improves during crying
- Pauses in breathing
- Trouble feeding because sucking closes off mouth breathing
- Choking, coughing, or tiring during feeds
- Inability to pass a small suction catheter through either nostril
- Constant blockage on one side of the nose
- Persistent discharge from one nostril
- Noisy nasal breathing
- Difficulty clearing mucus from the affected side

- Reduced sense of smell
- Repeated sinus or nasal symptoms on one side
- Feeding or sleep problems in some children

Causes and risk factors

Choanal atresia develops before birth when the back of the nasal passage does not form normally. The exact developmental process is not fully understood.

Nothing a parent did during pregnancy is known to directly cause most cases. There is also no established way to prevent choanal atresia.

Some children have choanal atresia as an isolated condition. Others have an underlying genetic or developmental syndrome. One important association is CHD7 disorder , which includes the pattern historically called CHARGE syndrome. CHARGE refers to a group of possible findings involving the eyes, heart, nasal passages, growth and development, genital development, and ears.

A child does not need to have all of these findings to have a CHD7-related condition. Choanal atresia can also occur with other, less common genetic conditions.

Because of these associations, the medical team may look for:

Having choanal atresia does not mean a child necessarily has a syndrome. The need for genetic testing depends on the child's examination, medical history, and other findings.

- Heart structure differences
- Hearing loss or ear differences
- Eye abnormalities
- Swallowing or airway problems
- Kidney or genital differences
- Differences in growth or development
- Other facial or skull-base abnormalities

Diagnosis

Bilateral choanal atresia is often suspected in the delivery room when a newborn has breathing difficulty that improves while crying. Clinicians may try to pass a small catheter through each

nostril. If it cannot pass into the throat, a blockage may be present. This bedside check alone does not confirm the diagnosis.

An ear, nose, and throat specialist may perform nasal endoscopy . During this examination, a thin camera is passed gently into the nose to view the nasal passages and locate the obstruction.

A computed tomography, or CT, scan is commonly used to confirm choanal atresia and show whether the blockage consists mainly of bone or soft tissue. The scan also helps the surgeon understand the surrounding anatomy and plan treatment. Mucus is usually cleared before imaging because thick secretions can sometimes look like a blockage.

Doctors must distinguish choanal atresia from other causes of nasal obstruction. These include swelling, mucus plugs, a deviated nasal septum, narrowing at the front of the nasal cavity, nasal masses, and rare skull-base conditions. Additional imaging may be needed when the anatomy is unusual or there is concern about a mass connected to structures above the nose.

After diagnosis, the child may have other assessments based on the clinical findings. These can include hearing tests, heart imaging, an eye examination, feeding and swallowing assessment, or genetic evaluation. These tests look for associated conditions and help the care team plan safe anesthesia and surgery.

Treatment and management

Treatment depends on whether the condition affects one or both sides, the severity of breathing or feeding problems, and the child's overall health.

Bilateral choanal atresia requires prompt airway management. The immediate goal is to help the newborn move air through the mouth or another secure airway. The neonatal team may use a specially positioned oral airway. Some babies need a breathing tube until surgery can be performed. Feeding support may also be necessary to reduce breathing effort and the risk of milk entering the airway.

Surgery creates an opening between the nasal passage and the throat. The most common approach is transnasal endoscopic repair . The surgeon works through the nostrils using a small camera and instruments. Blocking tissue is removed, and the opening may be enlarged to improve airflow. This approach avoids an external incision.

The timing of surgery is individualized. Bilateral disease is usually treated early because it directly affects breathing. Surgery for unilateral choanal atresia may be planned less urgently, especially when the child is breathing and feeding well. The surgeon considers symptoms, the

child's size, associated medical conditions, and the anatomy of the blockage.

Some surgeons place temporary tubes called stents in the new openings. Stents may help hold the airway open, but they can also irritate tissue, collect mucus, or contribute to scarring. Evidence does not support one approach for every child, so practices differ among surgical centers.

After surgery, care may include saline to keep the nose moist, gentle suctioning, and scheduled endoscopic examinations. The team may prescribe other nasal treatments depending on swelling and healing. Parents and caregivers should follow the surgeon's instructions rather than placing unapproved drops, tools, or suction devices in the child's nose.

Follow-up procedures are sometimes needed to remove crusts or scar tissue. If the opening becomes narrow again, treatment may include dilation or revision surgery. The need for another procedure does not necessarily mean the original operation was performed incorrectly; young children heal quickly, and scar tissue can reform in this small space.

There is no medicine that can remove the congenital blockage. Medicines may be used around surgery to manage inflammation, infection, discomfort, or other medical needs, but they do not replace airway treatment.

Complications

Before treatment, severe bilateral choanal atresia can interfere with oxygen delivery and feeding. Possible problems include poor weight gain, dehydration, exhaustion during feeds, and milk or stomach contents entering the airway.

The main concern after repair is restenosis , meaning that the new opening narrows again. This may happen because of swelling, crusting, or scar tissue. Smaller openings, unusual anatomy, and other medical conditions may make postoperative care more complex.

Other possible surgical complications include:

Serious injury to the skull base or leakage of the fluid surrounding the brain is uncommon but important. Surgery is therefore performed by clinicians experienced with pediatric nasal and skull-base anatomy.

Associated conditions can affect long-term health more than the nasal blockage itself. Hearing loss, swallowing problems, heart disease, and developmental differences may require separate care.

- Bleeding
- Infection

- Scar tissue between nearby nasal surfaces
- Injury to surrounding nasal structures
- Persistent nasal blockage or discharge
- Problems related to anesthesia
- The need for repeat procedures

Follow up

Regular follow-up with the ear, nose, and throat team is important after surgery. The clinician checks that the opening remains clear, removes crusting when necessary, and monitors breathing, feeding, sleep, and growth.

Families may be given a specific plan for nasal saline, suctioning, feeding, and activity. The plan can change as healing progresses. Keep scheduled appointments even if breathing appears normal, because early narrowing may be easier to manage before symptoms become severe.

Contact the care team promptly if the child develops increasing nasal blockage, worsening noisy breathing, difficulty feeding, poor weight gain, persistent foul-smelling discharge, fever after a procedure, or bleeding that does not quickly stop. These symptoms need medical assessment but are not always emergencies.

Seek emergency help for blue or gray coloring, severe breathing effort, long pauses in breathing, inability to stay awake, collapse, or heavy bleeding. A baby who cannot breathe well enough to feed also needs urgent assessment.

Long-term follow-up may involve audiology, cardiology, genetics, speech and feeding specialists, or developmental services when related conditions are present. Children with isolated, successfully treated choanal atresia may need less intensive follow-up once the airway has healed and remained open.

Sources

- Moreddu E, Rossi ME, Nicollas R, et al. "International Pediatric Otolaryngology Group consensus recommendations: Diagnosis, pre-operative, operative and post-operative pediatric choanal atresia care." International Journal of Pediatric Otorhinolaryngology . 2019;123:151-155.

- Vozel D, Urban i J, Battelino S. "Management of Choanal Atresia: National Recommendations with a Comprehensive Literature Review." Children . 2023;10(1):91.
- Kwong KM. "Current Updates on Choanal Atresia." Frontiers in Pediatrics . 2015;3:52.
- Ramsden JD, Campisi P, Forte V. "Choanal atresia and choanal stenosis." Otolaryngologic Clinics of North America . 2009;42(2):339-352.
- van Ravenswaaij-Arts CMA, Hefner M, Blake K, et al. "CHD7 Disorder." GeneReviews , National Center for Biotechnology Information Bookshelf. Updated 2022.
- Great Ormond Street Hospital for Children NHS Foundation Trust. "Choanal atresia." Patient information reviewed by the hospital's clinical information team.