CONDITION

Duodenal atresia

Duodenal atresia is a blockage present at birth in the first part of the small intestine.

WHAT IT IS
Complete blockage of the first part of the small intestine

BODY SYSTEM
Digestive system

MAIN SYMPTOMS
Green vomiting, feeding difficulty, upper abdominal swelling, dehydration

WHAT CAUSES IT
Developmental change before birth, usually unexplained

HOW IT IS DIAGNOSED
Prenatal ultrasound; newborn abdominal X-ray confirms obstruction

MAIN TREATMENT
Surgery after fluids and stomach decompression

CAN IT BE CURED?
Yes - surgery usually corrects the blockage

IS IT AN EMERGENCY?
Yes - newborn green vomiting needs urgent assessment

LONG-TERM OUTLOOK
Most children do well after surgery and follow-up

Overview

Duodenal atresia is a complete blockage in the duodenum. The duodenum is the first part of the small intestine, just beyond the stomach.

The blockage develops before birth. Food, milk, and stomach fluids cannot move normally from the stomach into the rest of the intestine. A related condition, duodenal stenosis, causes narrowing rather than complete blockage.

Duodenal atresia is often suspected during pregnancy. An ultrasound may show an enlarged stomach and duodenum, sometimes described as a "double bubble." There may also be too much amniotic fluid around the baby because the baby cannot swallow and absorb fluid normally.

After birth, the condition usually causes vomiting and difficulty feeding. It needs prompt

hospital treatment because a newborn can quickly become dehydrated. Surgery is required to create an open route around or through the blockage.

Some babies have duodenal atresia alongside other conditions present from birth. These can include Down syndrome, heart differences, an annular pancreas, or an abnormal position of the intestines. Doctors therefore examine the baby for associated conditions before and after surgery.

Symptoms

Symptoms usually begin within the first hours or days after birth. They may appear after the first attempt at feeding.

Common signs include:

Vomiting is not always green. Its colour depends on whether the blockage is above or below the point where bile enters the duodenum. Green vomit in a newborn is particularly important because it can signal an intestinal blockage and needs urgent assessment.

The entire abdomen may not look very swollen because the blockage is close to the stomach. A baby may also pass meconium, the dark first stool, because material already present below the blockage can still leave the bowel. Passing meconium does not rule out duodenal atresia.

Before birth, possible signs include the double-bubble appearance on ultrasound and excess amniotic fluid, called polyhydramnios. Some pregnancies have no clear ultrasound signs.

- Vomiting, often green or yellow-green because it contains bile
- Difficulty keeping milk down
- Swelling or fullness in the upper abdomen
- Dehydration, including fewer wet nappies
- Poor weight gain if the blockage is incomplete and symptoms develop gradually

Causes and risk factors

Duodenal atresia develops while the baby's digestive system is forming. The inside of the duodenum normally opens during early development. In duodenal atresia, part of it does not open properly, leaving a complete blockage.

The exact reason this happens is usually unknown. It is not caused by something a parent ate, did, or failed to do during pregnancy.

Duodenal atresia is usually not inherited directly from a parent. However, it is associated with some chromosome and developmental conditions. An association means that the conditions occur together more often; it does not mean that one always causes the other.

Associated conditions can include:

Finding duodenal atresia before birth may lead to additional ultrasound checks and discussions about chromosome testing. Testing is optional, and the choices depend on the pregnancy, previous results, and the family's preferences.

- Down syndrome, caused by an extra copy of chromosome 21
- Heart conditions present from birth
- Annular pancreas, in which pancreatic tissue surrounds the duodenum
- Intestinal malrotation, meaning the intestines are positioned differently
- Other differences involving the digestive tract, kidneys, or urinary system

Diagnosis

During pregnancy, duodenal atresia may be suspected on an ultrasound. The stomach and the section of duodenum before the blockage can both fill with fluid, producing the double-bubble appearance. Excess amniotic fluid may become more noticeable later in pregnancy.

A prenatal ultrasound can strongly suggest the condition, but examination after birth confirms how the intestine is affected.

After delivery, an abdominal X-ray usually shows two enlarged, air-filled areas representing the stomach and duodenum. With complete atresia, little or no gas is seen farther along the intestine.

If the findings are less clear, the medical team may use a contrast study. This involves taking X-rays after a liquid that shows up on imaging is placed into the digestive tract. It can help distinguish duodenal atresia from malrotation, an incomplete narrowing, or another cause of obstruction.

The baby will also have blood tests to check hydration, salts in the blood, and general health. An echocardiogram, which is an ultrasound of the heart, may be recommended because heart conditions can occur alongside duodenal atresia. Other examinations or genetic tests may be discussed based on the baby's findings.

Treatment and management

A baby with suspected duodenal atresia is admitted to a hospital with neonatal and paediatric surgical care. Feeding by mouth is stopped because milk cannot pass through the blockage.

A soft tube is placed through the nose or mouth into the stomach. This removes swallowed air and digestive fluids, reduces vomiting, and lowers the risk of fluid entering the lungs. Fluids and glucose are given through a vein. Blood salt disturbances and dehydration are corrected before surgery.

These steps stabilise the baby. Surgery is usually urgent, but there is often time to make the baby as stable as possible and assess serious associated conditions first.

During surgery, the surgeon connects the parts of the duodenum on either side of the blockage. This is called a duodenoduodenostomy. The operation may be performed through an abdominal incision or, in selected babies, with keyhole surgery. The approach depends on the baby's size, anatomy, associated conditions, and the surgical team's assessment.

After surgery, the stomach tube usually remains in place while swelling settles and the intestine begins moving normally. Nutrition may initially be given through a vein. Milk feeds are then introduced gradually when the surgical team considers the bowel ready.

The time needed to reach full feeds is not the same for every baby. Prematurity, heart conditions, bowel movement, and recovery from surgery can all affect it. Breast milk may be expressed and stored until feeding can begin. Feeding and lactation support can help families through this period.

Complications

Without treatment, the blockage can cause severe dehydration, abnormal blood salt levels, breathing problems from inhaled vomit, and damage to the stomach or intestine.

Possible complications after surgery include:

Some babies need longer support with feeding. A small number require another procedure because of a leak, narrowing, persistent obstruction, or a later adhesion.

The baby's overall outlook can also be affected by prematurity or associated heart, chromosome, and digestive conditions. These may require separate treatment and follow-up.

- Infection or bleeding
- Leakage where the intestine was joined
- Narrowing at the repaired area

- Slow movement of food through the stomach and duodenum
- Reflux or repeated vomiting
- Bowel obstruction caused by internal scar tissue, called adhesions

Prevention

Duodenal atresia cannot currently be prevented. It develops early in pregnancy, and there is usually no identifiable action or exposure that caused it.

Routine pregnancy care cannot guarantee prevention, but ultrasound may detect the condition before birth. Early detection allows delivery and newborn care to be planned at a hospital with suitable neonatal and surgical services.

If chromosome testing finds an inherited or chromosome-related condition, genetic counselling can explain what the result may mean for the family and future pregnancies. Most cases of isolated duodenal atresia are not passed directly from parent to child.

Living with it and what to expect

In the early weeks, care focuses on recovery from surgery, establishing feeds, and gaining weight. The hospital stay may be longer for babies born prematurely or with heart or other medical conditions.

Many children feed normally and grow well after recovery. The repaired duodenum remains in place as the child grows, and routine daily restrictions are not usually needed once feeding and healing are established.

Some children have slower stomach or duodenal movement. This may cause reflux, fullness, vomiting, or difficulty moving to larger feeds. Feeding specialists and dietitians can support children who need extra help with feeding skills or growth.

Follow-up may include checks of weight, length, feeding, bowel symptoms, and surgical healing. Children with Down syndrome, heart conditions, or other associated findings will have additional care related to those needs.

Later bowel obstruction from scar tissue is possible after any abdominal operation, including duodenal atresia repair. It may occur months or years later, although many children never experience it. Families are usually taught to recognise repeated green vomiting, increasing abdominal swelling, and significant abdominal pain as reasons for urgent assessment.

When to get medical help

Go to an emergency department now if a newborn has green vomit. Do not wait for a routine appointment. Green vomiting can be caused by duodenal atresia or another intestinal obstruction that needs prompt testing.

Call emergency services if a baby is difficult to wake, has blue or grey skin, is struggling to breathe, or becomes limp or unresponsive.

After surgery, seek urgent medical assessment for:

Contact the child's usual surgical or paediatric team for non-urgent concerns such as ongoing reflux, constipation, slow feeding, poor weight gain, or questions about the wound. These concerns still deserve review, but they are different from sudden green vomiting or signs of severe illness.

- Repeated green vomiting
- A rapidly swelling or tender abdomen
- Vomiting with an inability to keep feeds down
- Much fewer wet nappies or other signs of dehydration
- Blood in vomit or stool
- Fever in a young baby or concern that the baby is becoming unwell

Common questions

Can duodenal atresia be seen before birth?

It can sometimes be seen during a pregnancy ultrasound. The main clue is a double-bubble appearance caused by fluid in the stomach and upper duodenum. Too much amniotic fluid may also be present.

Prenatal imaging does not always detect it. The diagnosis and the exact type of blockage are confirmed after birth.

Does duodenal atresia always mean Down syndrome?

No. Duodenal atresia can occur on its own, but it has a recognised association with Down syndrome. Testing during pregnancy or after birth may be offered. A healthcare professional or genetic counsellor can explain the available tests and what their results can and cannot show.

Is duodenal atresia life-threatening?

It is a serious newborn condition because the baby cannot feed normally and may become dehydrated. Vomit can also enter the lungs. Prompt stomach decompression, intravenous fluids, and surgery usually correct the blockage.

The overall outlook is influenced by prematurity and any associated heart, chromosome, or digestive conditions.

Will my baby be able to eat normally after surgery?

Many babies eventually take milk normally, but feeding does not usually restart immediately. The duodenum may be slow to begin working after the repair. Feeds are introduced gradually, with nutrition through a vein when needed.

Some children have temporary or longer-lasting reflux, slow feeding, or problems gaining weight and may need additional support.

Can duodenal atresia come back?

The original atresia does not grow back after a successful repair. However, narrowing at the join, slow duodenal movement, or scar tissue elsewhere in the abdomen can cause later symptoms.

Repeated green vomiting, marked abdominal swelling, or severe abdominal pain needs urgent medical assessment, even years after surgery.

Will future pregnancies be affected?

Most cases are isolated developmental events, so another pregnancy is not certain to be affected. The chance may be different when the baby has a chromosome or genetic condition. Genetic counselling can provide information based on the child's test results and family history.

Sources

- U.S. National Library of Medicine, MedlinePlus Medical Encyclopedia. "Duodenal atresia"
- American Pediatric Surgical Association, Pediatric Surgery Library. "Duodenal Atresia"
- International Society of Ultrasound in Obstetrics and Gynecology, Patient Information Series. "Duodenal Atresia"
- National Center for Biotechnology Information, StatPearls. "Duodenal Atresia and Stenosis"
- Great Ormond Street Hospital for Children. "Duodenal atresia"