CONDITION

Bile duct obstruction

Learn how a blocked bile duct can affect the liver and digestion, including symptoms, causes, tests, treatments, warning signs, and follow-up care.

WHAT IT IS
Partial or complete blockage of bile ducts

BODY SYSTEM
Digestive

MAIN SYMPTOMS
Jaundice, dark urine, pale stools, itching

WHAT CAUSES IT
Gallstones, duct narrowing, inflammation or tumors

HOW IT IS DIAGNOSED
Ultrasound, CT, MRCP, endoscopic ultrasound or ERCP

MAIN TREATMENT
Endoscopic, radiologic or surgical drainage

CAN IT BE CURED?
Sometimes, if underlying cause is treatable

IS IT AN EMERGENCY?
Sometimes, with jaundice, fever or severe pain

LONG-TERM OUTLOOK
Cause-dependent with possible liver damage from prolonged blockage

Overview

A bile duct obstruction is a partial or complete blockage in the tubes that carry bile from the liver and gallbladder into the small intestine. Bile is a digestive fluid made by the liver. It helps the body digest fats and remove bilirubin, a yellow substance produced when old red blood cells break down.

The bile ducts form a branching drainage system. Small ducts inside the liver join larger ducts outside the liver. The common bile duct carries bile toward the first part of the small intestine. It passes close to the pancreas and often joins the pancreatic duct before reaching the intestine.

A blockage can occur anywhere in this system. Common causes include gallstones, narrowing of a duct, inflammation, and tumors pressing on or growing within a duct. The blockage may

develop suddenly or gradually.

When bile cannot drain normally, bilirubin and other bile components can build up in the blood. This may cause yellowing of the skin or eyes, dark urine, pale stools, and itching. Trapped bile can also become infected. A prolonged blockage may injure the liver, so finding and treating the cause is important.

Symptoms

Symptoms depend on where the blockage is, how quickly it developed, and whether infection or pancreatic inflammation is present. A partial or slowly developing blockage may cause mild symptoms at first. Some blockages are found during blood tests or imaging performed for another reason.

Possible symptoms include:

Gallstones in the common bile duct may cause sudden, intense upper abdominal pain. A blockage caused by a narrowing or tumor may be less painful and develop more gradually. However, symptoms alone cannot show what is causing the obstruction.

Contact a healthcare professional promptly for new jaundice, dark urine with pale stools, ongoing upper abdominal pain, unexplained weight loss, or worsening itching. These symptoms need timely assessment even when there is no fever.

Seek emergency care for jaundice combined with fever, shaking chills, or significant upper abdominal pain. This combination may indicate acute cholangitis, an infection in an obstructed bile duct. Confusion, fainting, severe weakness, very low blood pressure, or difficulty staying awake can be signs of a severe infection and require immediate emergency care.

- Yellow skin or yellowing in the whites of the eyes, called jaundice
- Dark brown or tea-colored urine
- Pale, gray, or clay-colored stools
- Itching, which may be widespread or worse at night
- Pain in the upper right or upper middle abdomen
- Pain that spreads to the back or right shoulder
- Nausea, vomiting, or reduced appetite
- Fever or chills
- Tiredness

- Unintended weight loss

Causes and risk factors

Gallstones are a common cause of bile duct obstruction. A stone may leave the gallbladder and become trapped in the common bile duct. This is called choledocholithiasis. Small stones may pass on their own, while others remain lodged and block bile flow.

Other causes include:

Risk depends on the underlying cause. Factors associated with gallstones include increasing age, pregnancy, obesity, rapid weight loss, certain blood disorders, and a personal history of gallstones. Previous bile duct procedures or upper abdominal surgery can increase the chance of a stricture. Chronic pancreatitis can also lead to narrowing near the pancreas.

Having a risk factor does not mean that a person has, or will develop, an obstruction. The same symptoms can also occur with hepatitis, medication-related liver injury, and other liver or blood conditions.

- Benign strictures: A stricture is an abnormal narrowing. It may form after bile duct surgery, liver transplantation, abdominal injury, repeated inflammation, or procedures involving the ducts.
- Pancreatitis: Inflammation or swelling of the pancreas can compress the lower common bile duct. A pancreatic fluid collection may also press on it.
- Primary sclerosing cholangitis: This long-term disease causes inflammation and scarring in bile ducts inside and outside the liver.
- Tumors: Pancreatic cancer, bile duct cancer, gallbladder cancer, and tumors near the point where the bile duct enters the intestine can obstruct bile flow. Noncancerous growths can occasionally do the same.
- Bile duct injury: Surgery or trauma may damage a duct, causing leakage, narrowing, or blockage.
- Sludge or debris: Thickened bile, blood clots, or material from an infection may block a duct.
- Parasites: Certain parasitic infections can affect the bile ducts, but this is uncommon in many countries. Risk depends on travel, residence, and food or water exposure.
- Developmental conditions: Rarely, a person is born with an abnormal bile duct structure that later interferes with drainage.

Diagnosis

Diagnosis begins with a medical history and physical examination. A clinician may ask when symptoms started, whether pain comes and goes, and whether there has been fever, itching, weight loss, surgery, travel, or a history of gallstones or pancreatitis.

Blood tests can help show whether bile flow is impaired and whether complications are present. These may include:

No single blood test confirms the cause. Results are interpreted together with symptoms and imaging.

An abdominal ultrasound is often used to look for gallstones and widening of the bile ducts. It does not always show stones in the common bile duct, particularly if bowel gas blocks the view.

Other imaging may include computed tomography, known as CT, to assess the liver, pancreas, gallbladder, and nearby structures. Magnetic resonance cholangiopancreatography, or MRCP, is a specialized MRI that provides detailed pictures of the bile and pancreatic ducts without placing an instrument inside them. Endoscopic ultrasound uses a small ultrasound device passed through the mouth into the stomach and small intestine. It can detect small stones or growths near the bile duct.

Endoscopic retrograde cholangiopancreatography, or ERCP, uses an endoscope and X-rays to reach the bile duct through the small intestine. Because ERCP can cause pancreatitis, bleeding, infection, or a tear in the digestive tract, it is generally most useful when treatment is likely to be needed. During ERCP, a clinician may remove a stone, collect cells or tissue, widen a narrowing, or place a drainage tube called a stent.

If ERCP is not possible or does not provide drainage, a radiologist may access the ducts through the skin and liver. This is called percutaneous transhepatic cholangiography. Suspected strictures or tumors may require brush samples, a biopsy, or additional imaging to identify the cause.

- Bilirubin and liver enzyme tests
- Alkaline phosphatase and gamma-glutamyl transferase, which often rise when bile flow is blocked
- A complete blood count to look for signs of infection or anemia
- Pancreatic enzyme tests when pancreatitis is possible
- Blood-clotting tests, especially when jaundice has been present for some time

Treatment and management

Treatment depends on the location and cause of the blockage, the person's overall health, and whether infection or liver dysfunction is present. The main goals are to restore bile flow, treat infection when present, and manage the underlying condition.

Acute cholangitis usually requires hospital treatment. Care may include intravenous fluids, antibiotics like amoxicillin or doxycycline , monitoring, and prompt drainage of the obstructed duct. Antibiotics treat infection but do not remove the physical blockage.

ERCP is commonly used to treat stones in the common bile duct. The clinician may make a small opening at the duct outlet, remove stones with a balloon or basket, and place a temporary stent if drainage remains limited.

When gallstones caused the obstruction, gallbladder removal may be discussed after the bile duct has been cleared. This can reduce the chance of additional gallbladder stones causing future problems. The timing depends on the person's condition and the reason for the obstruction.

Benign strictures may be treated by widening the narrowed area and placing one or more temporary stents. Some strictures require repeated procedures or surgery. A stent must be monitored because it can become blocked or move out of position.

Treatment for a tumor is planned according to its type, location, extent, and whether surgery is possible. Care may involve surgery, endoscopic or radiologic drainage, chemotherapy, radiation therapy, or other cancer treatments. A stent may relieve jaundice and itching even when the tumor cannot be removed.

If endoscopic drainage is unsuccessful or not suitable, drainage may be performed through the skin or during surgery. Treatment of itching and nutrition problems may also be needed, but symptom relief does not replace treatment of the obstruction.

Patients should not start supplements, herbal products, or medicines intended to "cleanse" the liver or gallbladder without medical advice. Such products do not remove a blocked duct, and some can cause liver injury or interact with other treatment.

Complications

An untreated or recurring obstruction can lead to complications. Acute cholangitis can spread into the bloodstream and cause sepsis, a serious whole-body response to infection. Gallstones near the shared opening of the bile and pancreatic ducts can also trigger acute pancreatitis.

Ongoing blockage may damage liver cells and cause scarring. Poor bile flow can interfere with

the absorption of fats and fat-soluble vitamins. In some cases, this contributes to weight loss, nutritional problems, or abnormal blood clotting.

Possible complications include:

ERCP and other procedures also have risks. The care team should explain the expected benefit, alternatives, and signs of a procedure-related complication.

- Bile duct infection
- Sepsis
- Pancreatitis
- Liver inflammation, scarring, or reduced liver function
- Gallbladder inflammation
- Problems absorbing fats and certain vitamins
- Recurrent stones or strictures
- Blockage, movement, or infection of a bile duct stent

Follow up

Follow-up is based on the cause and the treatment performed. Blood tests may be repeated to confirm that bilirubin and liver enzyme levels are improving. Additional imaging may be needed if symptoms continue or laboratory results do not return toward normal.

Temporary bile duct stents often need planned removal or replacement. Missing this follow-up can allow a stent to clog and cause another obstruction or infection. Patients should know what type of stent was placed, why it was used, and when the next procedure is expected.

After treatment, contact the care team promptly if jaundice, itching, dark urine, pale stools, abdominal pain, or vomiting returns. Fever or chills with these symptoms requires urgent assessment. Severe weakness, confusion, fainting, or difficulty staying awake warrants emergency care.

Long-term care may involve a gastroenterologist, liver specialist, surgeon, cancer specialist, or interventional radiologist. People with chronic bile duct disease may need regular blood tests, imaging, or endoscopic procedures. Follow-up should also address nutrition, medication review, and the condition that caused the blockage.

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