CONDITION

Bile duct stricture

Learn how a narrowed bile duct can affect bile flow, what symptoms may occur, how doctors find the cause, and how strictures are treated and monitored.

WHAT IT IS
Abnormal narrowing of a bile duct

BODY SYSTEM
Digestive

MAIN SYMPTOMS
Jaundice, itching, dark urine, upper abdominal pain

WHAT CAUSES IT
Scar tissue, inflammation, pressure, or cancer

HOW IT IS DIAGNOSED
MRCP, ERCP, EUS, tissue sampling

MAIN TREATMENT
Bile duct drainage and cause-specific treatment

CAN IT BE CURED?
Sometimes, depending on underlying cause

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

LONG-TERM OUTLOOK
Varies by cause and blockage may recur

Overview

A bile duct stricture is an abnormal narrowing of a bile duct. Bile ducts are small tubes that carry bile from the liver and gallbladder to the small intestine. Bile helps the body digest fats and remove certain waste products.

A stricture can slow or block bile flow. Bile may then build up in the liver and bloodstream, causing jaundice, itching, and abnormal liver blood tests. A blocked duct can also become infected.

Bile duct strictures are described as benign or malignant . A benign stricture is not caused by cancer. It may develop after surgery, inflammation, injury, or another medical condition. A malignant stricture is caused by cancer in or near the bile ducts. Benign does not mean harmless; any significant blockage may require treatment.

A stricture is a finding rather than a complete diagnosis. Doctors need to determine where the narrowing is, how severely it affects bile flow, and what caused it. This can take more than one test because inflammation and cancer may look similar on imaging.

Some strictures are found during routine blood tests or imaging before symptoms develop. Others cause clear signs of obstruction or infection. Treatment depends on the cause and may include opening or draining the duct, treating an underlying disease, or removing the affected area with surgery.

Symptoms

Symptoms depend on the location and severity of the narrowing. A partial blockage may cause few or no symptoms. Symptoms can also come and go if the degree of blockage changes.

Possible symptoms include:

These symptoms are not specific to a bile duct stricture. Gallstones, liver disease, pancreatic disease, medication effects, and other conditions can cause similar problems.

A blocked bile duct can lead to acute cholangitis , an infection within the bile ducts. Fever or chills together with jaundice or upper abdominal pain needs urgent medical assessment. Confusion, fainting, severe weakness, very low blood pressure, breathing difficulty, or rapidly worsening illness may signal a severe infection and require emergency care.

- Yellowing of the skin or whites of the eyes, called jaundice
- Dark urine
- Pale, gray, or clay-colored stools
- Itching, which may be widespread
- Pain in the upper abdomen, sometimes more noticeable on the right
- Nausea or reduced appetite
- Tiredness
- Unintended weight loss
- Fever or chills if an infection develops

Causes and risk factors

A bile duct may become narrow because of scar tissue, ongoing inflammation, pressure from a

nearby structure, or tumor growth.

Common noncancerous causes include injury during gallbladder, liver, or bile duct surgery. Scar tissue may form as the area heals. A stricture can appear soon after surgery or may not become noticeable until later.

Other benign causes include:

Cancer must be considered when a new stricture has no clear benign explanation. Cholangiocarcinoma begins in the bile ducts and may cause narrowing. Pancreatic, gallbladder, liver, or other nearby cancers can also press on or grow into a bile duct.

Features such as increasing jaundice, unexplained weight loss, a mass on imaging, or a new stricture in a person with primary sclerosing cholangitis may raise concern for cancer. However, these findings cannot confirm the cause by themselves. Benign inflammation can sometimes closely resemble a tumor.

Risk depends on the underlying condition. Previous bile duct surgery, chronic pancreatitis, primary sclerosing cholangitis, and liver transplantation increase the likelihood of certain types of stricture. A person can still develop a stricture without a recognized risk factor.

- Chronic pancreatitis, which is long-term inflammation and scarring of the pancreas
- Primary sclerosing cholangitis, a condition that causes inflammation and scarring in bile ducts
- IgG4-related disease, an immune-system condition that can affect the pancreas and bile ducts
- Complications after a liver transplant
- Previous radiation treatment or abdominal injury
- Repeated inflammation related to bile duct stones
- Reduced blood supply to a bile duct
- Certain infections, especially in people with specific immune or geographic risk factors

Diagnosis

Evaluation usually begins with a medical history and physical examination. The doctor may ask about previous abdominal surgery, pancreatitis, inflammatory bowel disease, liver disease, cancer, infections, and changes in weight or bowel movements.

Blood tests may measure bilirubin and liver enzymes. Bilirubin is a yellow waste product normally carried in bile. Levels may rise when bile flow is blocked. Blood tests can also look for

inflammation, infection, anemia, and problems with blood clotting. No single blood test can reliably show whether a stricture is benign or malignant.

Imaging helps locate the narrowing and identify possible causes. An abdominal ultrasound is often used to look for widened bile ducts, gallstones, or gallbladder changes. A normal ultrasound does not always exclude a stricture.

Magnetic resonance cholangiopancreatography, or MRCP , is a special type of MRI that creates detailed images of the bile and pancreatic ducts without placing an instrument inside them. A CT scan may show tumors, inflammation, enlarged lymph nodes, or other structures near the bile duct.

Further procedures may be needed:

Tissue samples are important when cancer is possible, but a negative sample does not always rule it out. Bile duct tumors can be difficult to sample because they may grow along the duct wall rather than form a distinct mass. Doctors may combine imaging, ERCP-based sampling, EUS, blood tests, and follow-up findings.

The risks and order of tests depend on the stricture's location and the person's health. ERCP can provide treatment, but it also carries risks such as pancreatitis, bleeding, infection, or a tear in the digestive tract. It is generally used when drainage or tissue sampling is needed rather than only to obtain an image.

- Endoscopic ultrasound , or EUS, uses an ultrasound device on the tip of a flexible scope. It can examine the pancreas, bile ducts, and nearby lymph nodes. A needle may be used to collect tissue from a mass or lymph node.
- Endoscopic retrograde cholangiopancreatography , or ERCP, uses a scope passed through the mouth into the small intestine. Dye is placed into the bile ducts to outline the narrowing. During the same procedure, the doctor may collect cells, take small tissue samples, widen the stricture, or insert a drainage stent.
- Cholangioscopy involves passing a very small camera into the bile duct during ERCP. It allows direct inspection and targeted biopsies in selected cases.
- Percutaneous cholangiography accesses the bile ducts through the skin and liver. It may be considered when endoscopic access is not possible or has not provided adequate drainage.

Treatment and management

Treatment has two main goals: restore bile flow and address the cause of the narrowing. The plan may involve a gastroenterologist, surgeon, radiologist, liver specialist, or cancer team.

A blocked duct can often be drained during ERCP. The doctor may widen the narrowed area with a small balloon and place a stent. A stent is a short tube that keeps the duct open. Some stents are plastic and need scheduled removal or replacement. Certain metal stents can remain open longer, although the appropriate type depends on whether the stricture is benign or malignant and whether surgery is planned.

Some benign strictures require more than one endoscopic procedure. Repeated widening and temporary stenting may gradually remodel scar tissue. A stricture that cannot be managed endoscopically may need drainage through the skin or reconstructive surgery.

Treatment of the underlying cause is also important. This may include care for chronic pancreatitis, immune-directed treatment for confirmed IgG4-related disease, management of primary sclerosing cholangitis, or treatment of bile duct stones. Antibiotics like amoxicillin or doxycycline may be used when cholangitis is suspected or confirmed, but antibiotics alone do not reliably correct an ongoing mechanical blockage.

For a cancer-related stricture, treatment depends on the cancer's type, location, extent, and whether it can be removed. Options may include surgery, endoscopic or skin-based drainage, chemotherapy, radiation therapy, or other cancer treatments. Drainage may relieve jaundice and itching or make other treatment safer. Decisions are often made by a multidisciplinary cancer team.

Patients should not try to treat jaundice or itching with supplements or "liver cleanses." Some products can harm the liver or interact with treatment. A clinician can assess itching and discuss suitable symptom relief while the blockage is addressed.

Complications

The most immediate concern is cholangitis. Bacteria can grow in bile trapped above a blockage. Infection may spread into the bloodstream and become life-threatening if drainage and medical treatment are delayed.

Long-lasting or repeated obstruction can injure the liver. Over time, this may contribute to scarring, reduced liver function, or cirrhosis. Severe blockage may also affect digestion because less bile reaches the intestine. This can contribute to greasy stools, poor absorption of fats, or nutritional problems.

Procedures and stents have their own possible complications. A stent can move or become blocked, causing jaundice or infection to return. ERCP may cause pancreatitis, bleeding, infection, or perforation. The care team should explain expected benefits, alternatives, and procedure-specific risks.

If the stricture is caused by cancer, complications may also relate to tumor growth or spread. Early investigation matters because treatment options depend partly on the cancer's location and stage.

Follow up

Follow-up is needed even after bile flow improves. The care team may repeat liver blood tests and imaging to confirm that drainage is working. If a temporary stent was placed, it must be removed or exchanged on schedule. Missing a planned stent procedure can increase the risk of blockage and infection.

Routine follow-up may also include reviewing biopsy results, monitoring symptoms, and deciding whether more sampling is necessary. People with chronic conditions such as primary sclerosing cholangitis or recurrent pancreatitis may need longer-term specialist care.

Contact the treating team promptly if jaundice, dark urine, pale stools, itching, abdominal pain, or reduced appetite returns. These symptoms may mean that the stricture or stent has become blocked again.

Seek urgent medical assessment for fever or chills with jaundice or upper abdominal pain. Seek emergency care for confusion, fainting, severe weakness, breathing difficulty, persistent vomiting, or rapidly worsening symptoms. These can be signs of severe infection or another serious complication.

Sources

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