

■ **Treatment of sphincter of Oddi dysfunction:** The sphincter of Oddi is the muscular valve surrounding the exit of the bile duct and pancreatic duct into the duodenum (papilla). The sphincter is normally closed, opening only in response to a meal so that digestive juices can enter the duodenum and mix with the food for digestion. When the sphincter of Oddi is too tight (dysfunction), there is a backup of bile and pancreatic juices, causing symptoms.

If sphincter of Oddi dysfunction is suspected, the doctor will examine the drainage hole at the papilla of Vater, and inject dye into the bile duct and pancreatic duct to look for stones and other forms of obstruction. The possibility of sphincter of Oddi dysfunction is considered only when these other conditions have been excluded. Dysfunction can be recognized by a special technique during ERCP, called sphincter of Oddi manometry. This involves passing a small catheter (tube) into the bile duct and pancreatic duct, to measure the sphincter pressure. If the pressure is very high (more than 40 mm Hg), the patient is diagnosed to have sphincter of Oddi dysfunction.

When sphincter of Oddi manometry has confirmed that the pressures are high, endoscopic sphincterotomy (cutting the sphincter) gives complete relief in 70 percent of patients; unfortunately, sphincterotomy also carries a significant risk of complications in this context, particularly the provocation of pancreatitis, and the possibility of perforation (hole in the intestine that needs surgical repair). Your doctors may leave a temporary stent in the pancreas, after a sphincterotomy, to decrease the chances of pancreatitis.

ARE THERE COMPLICATIONS?

Risk of complication is dependent on the reason why you are having the procedure, what is found during the procedure or any resulting intervention that the doctor conducts. Your doctor will discuss the complications related to your particular case before the ERCP. Complications needing hospitalization may happen but are not common. Some resulting complications include inflammation of the pancreas (pancreatitis), bleeding, bowel perforation and infection. ERCP in general is well tolerated and is performed by specially trained and experienced doctors.

WHAT HAPPENS AFTER AN ERCP?

After your procedure, due to the sedatives that may have been used, you will be taken to the recovery area and monitored until the medication effects wear off. Even though you may feel alert, the medication can still affect your judgment and reflexes, so you will require someone to drive you home. You may feel bloated or pass gas due to the air introduced by the endoscope during the procedure. You can eat after you leave unless told otherwise. Your doctor, in general, will discuss the results of the procedure the same day. Sometimes, depending on the treatment you may receive, you will be admitted to the hospital for observation. Most patients are discharged the following day if they feel well. In patients who have a severe attack of pancreatitis, hospitalization may be required for a longer period of time. You must come prepared for an inpatient admission following your ERCP.

IMPORTANT REMINDER:

The preceding information is intended only to provide you with general information and does not serve as a definitive basis for diagnosis or treatment in any particular case. It is very important to consult with your doctor about your specific condition.



Understanding Endoscopic Retrograde Cholangiopancreatography

(ERCP)



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WHAT IS AN ERCP PROCEDURE?

An ERCP allows your doctor to visualize the ducts (drainage system) of your liver and pancreas.

Your doctor will use an endoscope to conduct the study. An endoscope is a small, flexible tube with a camera that can be used to see the inside of your bowels. The endoscope will enter through your mouth and travel through your esophagus (or food pipe), then stomach, and end up in the first part of your small intestine (or duodenum). Once in the duodenum, your doctor will locate the common opening of the pancreas and bile (liver) duct system. Through this opening, your doctor can pass a small plastic tube known as a catheter, inject dye (contrast material), take pictures using X-ray and perform other treatment, if needed.

HOW DO I PREPARE?

You need an empty stomach for a successful ERCP. This requires you to fast (no food or water) a minimum of six hours before the procedure, or preferably, overnight. Before your procedure, it is important to discuss your medical history with your doctor, including any existing major diseases, such as heart or lung conditions. Most importantly, you should provide your doctor with a list of medications you are currently taking and communicate any allergies you have to medications, specifically iodine drug allergies, because of the dye that is used to perform an ERCP. The allergy will not keep you from having the procedure, but it is important that your doctor is made aware.

WHAT HAPPENS DURING AN ERCP?

You will be positioned on the X-ray table, lying on your stomach or your left side, to provide good pictures of your duct system. The endoscope will be introduced by the doctor into your mouth to reach the small intestine. To keep you comfortable during the passage of the endoscope, you will be given sedation through your veins, or the procedure will be done under anesthesia.

WHAT IS A THERAPEUTIC ERCP?

A therapeutic ERCP involves the physician not only taking X-ray pictures of your duct system, but also performing specific treatment in your ducts. The ducts that are examined are connected as follows (see figure): The duct that drains the gallbladder and the liver is called the bile duct. The duct from the pancreas (known as

the pancreatic duct) joins the bile duct to form a common opening, the papilla (sphincter of Oddi), to drain into the first part of your small intestine (duodenum).

WHAT INTERVENTIONS ARE PERFORMED THROUGH ERCP?

■ **Sphincterotomy:** Some treatments may require the doctor to enlarge the common opening to your duct system (also known as the papilla) found in your small intestine. The papilla is cut to accomplish this. The cut is made using a wire with an electric current that passes through it to cut the tissue. The procedure does not cause any pain, and the size of the cut is usually less than half an inch. The cut allows the doctor to pass instruments into your duct system to perform the treatment you need.

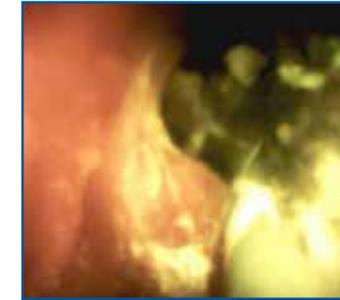
■ **Stone removal:** Stones that form in your gallbladder can travel into your bile duct system. Others can form in your bile duct even years after your gallbladder was removed. Therapeutic ERCP can remove these stones. After performing a sphincterotomy, the doctor will pass various instruments attached to a catheter through the papilla to remove the stones stuck in the duct. These instruments include baskets and balloons to pull the stones out, and sometimes even to crush the stones.

■ **Stent placement:** Sometimes you can develop a narrowing in your pancreatic duct or bile duct. These narrowed areas can be caused by tumors or scar tissue. To bypass these narrowed areas so that the ducts can drain, the doctor may place a small drainage tube called a “stent”. There are two types of stents used: a plastic stent, which resembles a straw, can be placed to allow drainage; this stent, however, is not permanent and can be easily removed. The other type is a metal stent, which has a wider diameter, is more flexible and sometimes is left permanently. Both type of stents, however, can become clogged and may require replacement or removal after a few months. Your doctor will discuss with you which stent will be placed, depending on your specific situation.

■ **Tissue samples/biopsies:** Narrowing in your duct system can be due to cancer. The doctor can use a brush or biopsy instrument to obtain a sample of cells from the narrowing to determine if there is cancer present.

■ **SPYGlass or cholangioscopy:** This is a “small” or “mini” endoscope, only three millimeters in diameter, that is passed through the biopsy channel of the ERCP endoscope to treat a variety of bile duct diseases. The SPYGlass catheter has a built-in camera to take pictures, a channel through which

laser fibers can be passed to crush large bile duct stones and another channel through which biopsy forceps can be passed to obtain biopsies. Depending on the treatment, the procedure can last anywhere from 30 to 90 minutes. This procedure requires particular expertise in order to obtain good results. The doctors at the Center for Interventional Endoscopy are experts in performing SPYGlass procedures. In addition to being involved in the development of this technology, the doctors perform



cutting-edge clinical research studies that evaluate the role of SPYGlass in the treatment of bile duct stones and tumors.

Figure 1: A tumor and stone is seen within the bile duct using SPYGlass

■ **Ampullectomy (papillectomy):** A tumor growth can develop in the papilla of Vater and cause blockage of the bile duct and pancreatic duct. As a result of this growth, patients can develop jaundice, pancreatitis or abnormal liver tests. If not treated in the early stages, this tumor can progress to become a cancer. However, if diagnosed early, the ampullary growth can be treated during ERCP by placing a noose around the tumor and removing it by applying cautery. This procedure is called “endoscopic ampullectomy” and carries a five to 10 percent risk of pancreatitis. To prevent pancreatitis, your doctor may leave behind a temporary stent in the pancreas to enable the flow of pancreatic juice. Other risks include bleeding and perforation, which may happen in 1-5% of patients.



Figure 2: Endoscopic Ampullectomy



Figure 3: Endoscopic Ampullectomy performed for the removal of a tumor mass