

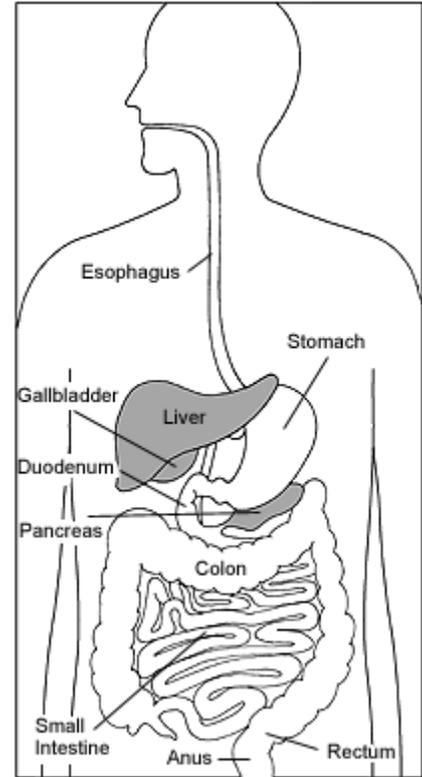
SOD

(Sphincter of Oddi Dysfunction)

SOD refers to the mechanical malfunctioning of the Sphincter of Oddi, which is the valve muscle that regulates the flow of bile and pancreatic juice into the duodenum. The sphincter can malfunction, not letting the digestive juices through as it should. Without proper regulation, bile and pancreatic enzymes do not drain properly, leading to symptoms such as pain, increased liver enzymes and/or recurrent pancreatitis.

What is the Sphincter of Oddi?

The Sphincter of Oddi is a cylindrical shaped muscle located where the bile duct and pancreatic duct meet at the entrance to the first part of the small intestine (duodenum). It functions like a one way valve, regulating the flow of bile and pancreatic enzymes from each of the ducts into your digestive tract. Bile is produced in the liver, and drains down the bile duct, where it is stored in the gall bladder or released directly into the duodenum. The pancreatic enzymes are made in the pancreas and flow down the pancreatic duct and into the duodenum. Food or liquid goes down your esophagus, into your stomach and into your duodenum. Your brain sends signals to the Sphincter of Oddi to regulate the release of the digestive juices according to your food intake, such as releasing more bile for a fatty meal. A properly functioning Sphincter of Oddi contracts and relaxes accordingly to let out the appropriate amounts of bile and enzymes to allow for the digestion of food. The Sphincter of Oddi also prevents contents from the duodenum from flowing back up into the bile duct and pancreatic duct.



What causes dysfunction?

SOD is the condition where the Sphincter of Oddi is not functioning properly. This can mean that the muscle is too tight and not letting enough of the digestive juices into the duodenum because the muscle has too much pressure or that it is rigid or stiff and narrowed. When the bile and pancreatic juices are not let through the Sphincter of Oddi into the duodenum, they can become backed up which can lead to abdominal pain, nausea and vomiting as well as increase in liver function tests and/or pancreatitis. It is not known why the muscle becomes too tight in some people.

What are the symptoms of SOD?

The most common and prominent symptom of SOD is upper abdominal pain. This is often experienced as a sharp pain in the middle of the abdomen right below the rib cage. Pain is often described as severe in nature and can radiate to either side of the abdomen and/or to the back. The pain often becomes worse after eating, and particularly worse after eating a fatty meal such as pizza.



Nausea and vomiting can accompany the abdominal pain but are usually not the predominant symptoms. The severe abdominal pain can last for several hours and often requires pain medication and anti-nausea medication for relief. The severe pain episodes can be constant or intermittent, occurring anywhere from once a day to weekly or monthly. Patients will often describe debilitating pain that brings them to the Emergency Department several times a year and/or keeps them from living their normal life. Another presentation of SOD can be acute recurrent pancreatitis, as diagnosed with lab tests and imaging studies, with no other clear cause. Fever, chills, extreme weight loss and/or jaundice are uncommon symptoms.

What kind of people are affected by SOD?

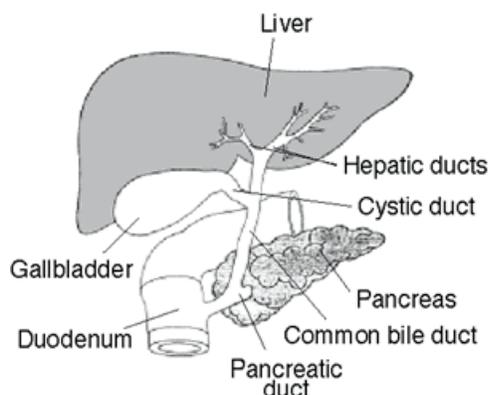
SOD is most often seen in women between the ages of 30 and 50, however, it can occur in anyone.

What are the types of SOD?

There are three classifications for SOD patients. Type I patients have biliary pain, elevated liver enzymes at least twice normal levels on two occasions, dilated common bile duct and delayed drainage of the common bile duct. Type II patients have pain in addition to one or two of the criteria listed above. Type III patients have only biliary pain and no other documented abnormalities. These classifications help in predicting the likelihood of SOD before diagnosis with ERCP.

How is SOD II diagnosed & treated?

SOD type II is diagnosed by measuring the pressure in the sphincter muscle using Manometry during an ERCP (Endoscopic Retrograde Cholangio-Pancreatography). Like a regular ERCP, the doctor passes an endoscope (a thin flexible lighted tube with a camera on the end) into your mouth and down your esophagus to inspect your stomach and duodenum to where the opening of the sphincter is. With Manometry, the doctor utilizes a special catheter and apparatus for measuring the pressures of the sphincters in the bile duct and pancreatic duct at the time of the ERCP. In order for pressures to be accurate, you must be off any pain medication for 12 hours before the procedure



because the pain medication can affect the pressure reading and lead to improper diagnosis. If the sphincter pressures are higher than normal, the doctor will treat the SOD.

If pressures are found to be higher than normal in the bile duct or the pancreatic duct, the doctor can enlarge the openings (sphincters) by cutting the duct (a Sphincterotomy). This procedure is done with an electrically heated wire, which you will not feel. Performing a small cut in the sphincter can release the increased pressure and allow the pancreatic and bile juices to flow easier. A temporary pancreatic stent is

often put in place during the ERCP to reduce the chances of pancreatitis. It is designed to fall out by itself, but an x-ray within 3 weeks of your ERCP will make sure of this. Additionally, an



indomethacin suppository is placed after the procedure, which has been shown to decrease the rate of post-ERCP pancreatitis.

How is SOD III diagnosed and treated?

SOD III is no longer diagnosed with manometry and treated with sphincterotomy since a recent NIH study showed that this procedure was more risky than beneficial for this specific group of patients. SOD type III is now usually diagnosed based on clinical symptoms and treated medically with medications such as anti-spasmodics and/or medicine that deals with the nerves of the digestive system.

Do all people respond to treatment?

Two-thirds (66%) of patients with SOD type II and documented high pressures who undergo ERCP with Sphincterotomy will experience some sort of relief. This is not usually a complete cure, but often, it is a reduction in severity or frequency of symptoms. Many patients report a significant improvement in their symptoms post procedure. The remainder (33%) of patients with SOD type II and documented high pressures, report no change at all in symptoms after treatment.

Are there risks associated with the treatment?

All ERCP's can result in complications, the most common (6-10%) being inflammation of the pancreas (pancreatitis) which causes abdominal pain with nausea and vomiting. Pancreatitis can be mild to severe with treatment including hospitalization, observation, rest, IV hydration, and medication for abdominal pain. It usually resolves spontaneously within a few days. People with SOD have been found to have an increased (10-30%) propensity for getting pancreatitis after ERCP's. Most episodes of post ERCP pancreatitis are not severe. Other less common risks include reactions to the anesthesia medications, making a hole in the bowel wall (perforation of the esophagus, stomach or intestines), bleeding, infection and inflammation of the bile duct (cholangitis). While these complications are not common, in certain cases they can be very serious and may require urgent treatment, an extended hospitalization, or even an operation. Very rarely, serious injury or even death has resulted from a serious complication.

Can SOD be treated without an ERCP?

There is an option for medical therapy for SOD. Drugs that relax smooth muscle have been found to relieve SOD symptoms for some people. This is likely due to the fact that the sphincter itself is composed of smooth muscle. However, these drugs also can have side effects. Additionally, just as ERCP with Manometry and Sphincterotomy does not cure all patients, only some people will see a decrease of symptoms from medical therapy.

What can I expect if I have an ERCP with Manometry?

Before

It is extremely important NOT to take any pain medication 12 hours before your procedure (including long or short acting pills, patches, creams or analgesic lollipops) as this can affect the pressure readings and make them appear falsely low. Do not eat or drink anything after midnight



the night before your procedure. On the day of your ERCP with Manometry, you will arrive 60 minutes before the procedure is scheduled. The doctor and/or nurse will explain the procedure again and answer any questions you might still have. You will be asked to sign a consent form giving your permission for the procedure. You will need to put on a hospital gown and remove any jewelry, eyeglasses, contacts, and dentures. A nurse will put in an IV in your arm before the procedure starts for hydration and for the anesthesiologist to administer the sedation medication. You will be connected to a machine that will monitor your heart rate, blood pressure and blood oxygen level throughout the procedure.

During

The examination is performed on an x-ray table. Local anesthetic will be sprayed onto your throat to make it numb, and you will be given medication through the IV by the anesthesiologist to make you fall asleep. A mouth guard will be placed to protect your teeth and gums. While in a comfortable position on your stomach, the doctor will pass the endoscope through your mouth and down your throat. The endoscope will not interfere with your breathing and generally causes only mild throat and abdominal discomfort. The doctor will guide the endoscope through your esophagus, stomach and duodenum until it reaches the papilla/Sphincter of Oddi where the pancreas and bile ducts meet. A thin tube will be passed through the endoscope and into the Sphincter of Oddi to measure the pressures of the muscle in the bile duct and the pancreatic duct. The doctor can inject contrast dye through another small tube into the ducts so that when the x-ray is taken, any abnormalities can be seen. If pressures are normal, no treatment is necessary. If the pressures are found to be high, a small cut (sphincterotomy) is made in the duct to relieve the pressure. Before the doctor takes the endoscope out, a small pancreatic stent will be placed in the pancreatic duct to minimize the risk of pancreatitis. This stent is designed to fall out on its own; however, you should schedule an x-ray in three weeks to be sure it has fallen out. Additionally, you may have an indomethacin suppository placed after the procedure, which has been shown to decrease the rate of post-ERCP pancreatitis. The ERCP with Manometry generally takes 60-90 minutes depending on findings and treatment.

After

You will wake up from the sedation in the recovery room. Your throat may feel sore. Because of the local anesthetic and sedation, you should not attempt to take anything by mouth for at least one hour from the time you first wake up. It is wise to take clear liquids for the remainder of the day. Your belly may also feel bloated and full from air inflated through the endoscope during the procedure. You will be admitted to the hospital overnight for observation and will be allowed to go home the next day if you show no signs of complications.

Please take the time to consider the benefits and risks this procedure has to offer you.

Drs. Jamidar, Aslanian & Farrell want you to have the best procedure experience possible.

Please call with any questions, concerns or problems.

M-F 8:30 am-4:30 pm at (203) 200-5083



Your ERCP with Manometry is scheduled for
_____ at _____ am/pm; _____ am/pm arrival
with Dr. Jamidar/ Dr. Aslanian/ Dr. Farrell
at the Yale Center for Advanced Endoscopy on Smilow 4.

Instructions for your ERCP with Manometry

Two Weeks before your ERCP with Manometry

1. Call us if you have **allergies** or bad reactions to antibiotics, medications or anesthesia.
2. Call us if you have **heart or breathing** problems, as we will need recent records of tests and visits from your heart and lung doctor before the procedure.
3. Call us if you take **blood thinners** like Coumadin/warfarin or Plavix or aspirin, as they may need to be adjusted before your procedure.
4. Call us if you have **diabetes**, as your medications may need to be adjusted the AM of, or PM before your procedure.
5. Call us if you are on **dialysis** or have **kidney** problems, as you will need bloodwork before your procedure.

The Night before your ERCP with Manometry

1. Do not eat or drink ANYTHING after midnight, including gum/candy or cigarettes. You may take regular PM and AM medications with a small sip of water (though blood thinners and diabetes medications may have to be adjusted).
2. Do not use ANY PAIN MEDICATION within 12 hours of your ERCP (including long or short acting pills, patches, creams, or analgesic lollipops) as it alters the pressure readings.

The Day of your ERCP with Manometry

1. Arrive at the Center for Advanced Endoscopy 60 minutes before your ERCP is scheduled.
2. Validated parking is available at the Smilow Cancer Hospital Valet Service.

After your ERCP with Manometry

1. You will stay overnight in the hospital for monitoring after the procedure.
2. If you have any increased pain, rectal bleeding, tarry stools, vomiting blood, fever, chills or jaundice please call Dr. Jamidar immediately at 203-200-5083.
3. It is your responsibility to call and schedule an X-Ray and upper endoscopy in 16-23 days from your ERCP to ensure pancreatic stent removal.

Following these instructions is very important; not doing so may result in delaying, rescheduling or canceling the procedure.

Drs. Jamidar, Aslanian & Farrell want you to have the best procedure experience possible. Please call with any questions, concerns or problems.

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February 2017

