

Patient's Guide to Thoracic Cancer

The Thoracic Oncology Program consists of an experienced team of nationally recognized cancer specialists experienced in the treatment of:

- Lung Cancer
- Tracheal Cancer
- Esophageal Cancer
- Mesothelioma
- Thymomas
- Other Mediastinal Tumors
- Chest Wall Tumors

Lung Cancer

Introduction

Lung cancer is one of the most common malignant tumors worldwide. Until recently, the detection of lung cancer occurred in its most advanced stages. But a new screening technique with low dose CT scanning is making it possible to detect lung cancer in its earliest stages, when it is most treatable.

There are several known risk factors for lung cancer, including:

Cigarette smoking-Smokers have a significantly higher risk of developing lung cancer than nonsmokers.

Passive smoke- Nonsmokers who are exposed to cigarette smoke may have an increased risk of lung cancer.

Exposure to a carcinogen, such as radon gas, asbestos, and talc dust, increase the risk of developing lung cancer.

What are the Symptoms of Lung Cancer?

Most patients with lung cancer will have one or more of the following symptoms:

Persistent cough and coughing up of blood

Wheezing and shortness of breath

Discomfort during breathing

Chest pain

Pneumonia symptoms, such as a fever and mucus-producing cough

Discomfort during swallowing

Hoarseness

Weight loss and poor appetite

The presence of these symptoms and a high risk medical history which includes long term exposure to cigarette smoke or other carcinogens, indicate the need for testing for lung cancer. Patients could also present with a very early lung cancer and be symptom free. These lesions are often found incidentally on routine chest x-ray or CT scan

Stages of Lung Cancer

There are many different treatments available for lung cancer- surgery, radiation therapy, and chemotherapy. The most important factor used to determine treatment is the stage of the tumor. The stage describes how advanced the cancer is at the time of diagnosis- the higher the stage the more advanced the cancer. Several factors determine the stage of lung cancer, such as: the size of the tumor, whether the tumor has spread to the lymph glands inside the chest, and whether the tumor has spread to other parts of the body. Since the proper therapy depends on the stage, it is important to determine the stage of the cancer as accurately as possible.

Diagnostic Tests

The final stage of the cancer can only be decided after surgery, when the tumor and lymph glands have been removed. However, the following tests help predict the stage and guide treatment recommendations:

- 1) **CT scan:** The CT scan is a simple and effective test that provides information about the size of the tumor, and can suggest whether the tumor has spread to nearby lymph glands or organs. Findings on a CT scan, however, must be interpreted with caution. For example, enlarged lymph nodes seen on a CT scan do not always imply spread of the cancer. They may be enlarged for other reasons, such as infection.
- 2) **PET Scan:** A relatively new technique, the PET scan is also used to help determine the stage of lung cancer. Unlike a CT scan, the PET scan can image the entire body at one time, and can indicate whether the cancer has spread to distant organs such as the bone or liver.
- 3) **Mediastinoscopy:** surgical procedure performed under general anesthesia- is one of the most important and accurate tools used to determine the stage of lung cancer. During the operation, a small incision is made above the breastbone. A telescope is then inserted, and samples are taken from the lymph glands within the chest. A pathologist will then determine whether the cancer has spread to these lymph glands. Mediastinoscopy is a simple procedure that usually requires less

than one hour. Mediastinoscopy may be performed as an outpatient procedure, or before a larger operation to remove the lung tumor.

- 4) **Needle Biopsy**- A needle biopsy is a procedure in which a piece of the tumor is removed using a small needle. The tumor is then examined under the microscope to determine if it is malignant. This test is often used to determine whether a “spot” seen on a CT scan or chest X-ray represents cancer.

Treatment Options for Lung Cancer

Doctors from several specialties, including radiology, oncology as well as surgery work together to treat patients with lung cancer. For cancer which has been detected at an early stage, surgery alone is the preferred treatment. However, if tests indicate that the tumor has spread to the lymph glands inside the chest, then surgery is not recommended as the initial therapy. Usually, these patients will receive chemotherapy in order to shrink the lymph glands and the tumor in the lung. In some cases, surgery may be performed after chemotherapy. For cancer that has spread to distant parts of the body, such as the bone or liver, chemotherapy alone is recommended.

Surgery for Lung Cancer

Prior to surgery, patients will undergo several tests, such as routine blood work, an EKG and breathing tests, to determine whether surgery can be performed safely. The most important thing patients can do to prepare for surgery is to stop smoking. Patients who continue to smoke until the time of surgery have a much higher chance of developing pneumonia and other serious, potentially avoidable complications. All operations for lung cancer have three steps in common:

- 1) To gain access to the inside of the chest, an incision is made in the chest wall, called a thoracotomy. This incision is usually about 6 inches long, and extends from the bottom of the shoulder blade around to the side of your chest. The ribs are then spread, but not broken. On occasion, a small piece of a rib may be removed.
- 2) The tumor is then removed along with some surrounding lung tissue in case the cancer cells have spread. It is important to remove this tissue to decrease the likelihood that the tumor will recur.
- 3) The surgeon will also remove lymph glands within the chest in order to stage the lung cancer as accurately as possible.

Frequently Asked Questions About Surgery

Q: How much of the lung is removed during surgery?

The most common operation for lung cancer is called a lobectomy. There are 3 lobes, or segments, of the right lung and two lobes of the left lung. A lobectomy involves removing the tumor along with the lobe of the lung from which the tumor arises. On occasion, a lobectomy may not be sufficient to remove the entire tumor. In this case, removal of the entire lung may be recommended. This operation is called a pneumonectomy.

Q: Is it possible to breathe normally after part of a lung is removed?

Patients with healthy lungs will be able to breathe normally after removal of a lobe, or even an entire lung. Pulmonary function tests are used to determine how much lung can be removed without limiting your ability to breathe.

Q: What if the breathing tests show that a lobectomy cannot be performed safely?

If a lobectomy cannot be performed safely, another operation called a segmentectomy may be considered. A segmentectomy involves removing the tumor along with a segment of surrounding lung. This operation is safer in patients with a limited ability to breathe, because less of the lung is removed. However, the likelihood that the tumor will come back is somewhat higher after this procedure, compared to a lobectomy.

Q: What can be expected during and following surgery?

Typically, surgery for lung cancer takes approximately two to three hours. At the end of the procedure a drainage tube is placed to drain excess fluid from the site of surgery. This tube is usually removed two to four days after the operation. Patients are generally out of bed and walking the first day after the operation. A nurse instructs patients in deep breathing and coughing exercises, which are important to help prevent infection in the lungs. Most patients remain in the hospital for four to five days.

Q: Is there pain following surgery?

Many patients are concerned about the amount of pain they anticipate after the operation. However, many steps are taken to minimize post-operative discomfort. Often, an epidural catheter is used for pain control. This is a catheter placed into the small of the back through which pain medication is infused. An epidural catheter provides excellent pain relief for the first few days after the operation. Once the catheter is removed, pain pills are prescribed to limit the discomfort. Patients are likely to continue pain medication every day for four to six weeks following surgery.

Q: How long is the recovery period? Will help be needed at home?

When patients are discharged from the hospital following lung surgery they are able to walk on their own and breathe without difficulty. The incision is usually closed with dissolvable sutures. These sutures do not need to be removed and allow one to shower soon after the operation. Patients are advised not to drive until they no longer require pain medication every day. Although some help around the house for the first week or two may be necessary, there is no need for nursing care at home. It is recommended that patients plan to recover for four to six weeks at home after lung surgery, although some patients may return to work sooner.

Q: *Will I need follow-up care?*

Yes, follow-up care is essential for patients who have undergone lung surgery. Typically you will see your surgeon two weeks after your discharge from the hospital, and will continue to be seen by your doctor at regular intervals for at least five years after your operation.

Tracheal Cancer

Primary tracheal cancers are quite rare with squamous and adenoid cystic carcinomas accounting for the vast majority.

Symptomatic patients with tracheal tumors present with shortness of breath, wheezing and often blood tinged sputum. Biopsies can be obtained endoscopically and confirmed prior to proceeding with definitive therapy.

Treatment options include resection, endoscopic ablation, and stenting .

Complex tracheal reconstruction has been greatly facilitated by our close relationship with our highly specialized thoracic anesthesiology team.

Esophageal Cancer

Introduction

Esophageal cancer affects more men and women in the United States than ever before. Although not as common as other types of cancer, such as of the breast or lung, it is estimated that over 10,000 Americans are diagnosed with cancer of the esophagus each year. Physicians from a wide range of specialties, including surgery, radiation therapy and oncology, treat patients with esophageal cancer.

The esophagus is the muscular tube that conveys food from the mouth to the stomach. Portions of the esophagus are located, therefore, in the neck, the chest and the abdomen. Cancer of the esophagus may develop in any one of these areas. Usually, the cancer develops from the specialized lining of the esophagus, that is continuously exposed to

stomach acid and other chemicals, such as alcohol and cigarette smoke, that are known to increase the risk of cancer. Unfortunately, it is not possible to predict who will develop esophageal cancer. However, it is known that heavy alcohol use and cigarette smoking are risk factors. In addition, chronic acid reflux and a condition known as Barrett's esophagus, also increase the risk of esophageal cancer.

Barrett's Esophagus

Barrett's esophagus is a condition in which the lining of the esophagus becomes abnormal. It is known that after prolonged exposure of the esophagus to stomach acid, the delicate lining of the esophagus changes to a more protective, resilient type. This transformation is called Barrett's esophagus. This condition can only be diagnosed by endoscopy- a procedure in which the lining of the esophagus is examined with a telescope. Barrett's esophagus by itself produces no symptoms. Although patients with Barrett's may complain of heartburn, the majority of patients with heartburn do not have Barrett's. The reason why this condition is so important is that Barrett's esophagus increases the risk of developing esophageal cancer significantly. In fact, for some severe forms of Barrett's surgical removal of the esophagus is recommended to prevent the development of cancer.

Symptoms of Esophageal Cancer

Symptoms of esophageal cancer are often silent, masquerading as causes of less serious health problems. As a tumor grows in the esophagus, symptoms of cancer could include:

Persistent or intermittent difficulty swallowing

A feeling that food is becoming stuck during swallowing.

Regurgitation

Frequent choking, coughing, or gagging on food

Hoarseness

Frequent or long attacks of hiccups

Chest pain which may be chronic or occurs while eating

Diagnostic Studies

In addition to taking a complete medical history, the physician will order a number of tests to determine if cancer is present in the esophagus. These include:

- 1) *Barium swallow*- The barium swallow is a simple but extremely useful test. To perform a barium swallow, the patient is asked to swallow a liquid which will be visible on an X-ray. A series of X-rays are then taken. Any area of blockage of the esophagus, such as from a tumor, can be readily seen.
- 2) *Endoscopy*- This is a procedure in which a small, flexible telescope is passed through the mouth into the esophagus. The lining of the esophagus can then be examined directly, and suspicious areas can be biopsied and examined under the microscope. Endoscopy is a very versatile tool, and can also help determine whether the cancer has spread and whether Barrett's esophagus is also present. Once the sedation from endoscopy has worn off, patients are usually allowed to go home the same day.
- 3) *Endoscopic Ultrasound*- This procedure is usually performed in conjunction with the endoscopy. A probe at the end of the scope takes detailed ultrasound images through the tumor, surrounding tissue and lymph nodes in an attempt to better define the depth of tumor penetration. This information is very important in order to determine the appropriate stage of disease.
- 4) *Computer Tomography (CT Scan)*- The purpose of the CT scan is to give additional information about the size of the tumor and whether it has spread to distant organs such as the liver or the lungs.
- 5) *Positron Emission Tomography (PET Scan)* - PET scans utilize labeled sugar compounds that are taken up by tumor cells that are rapidly dividing. The PET scan is very sensitive and can detect even small metastases. The scan is a novel tool whose role is currently being defined.

Treatment Options

Several options are available for patients with esophageal cancer- including surgery, radiation therapy and chemotherapy, or a combination of these treatments. The most important factor to determine the optimal treatment is the stage of the cancer. The stage of the cancer describes to what degree the tumor has spread to other parts of the body. For instance, a tumor that is confined to the thin lining of the esophagus is at an early stage, while one that has spread to another organ such as the liver is at an advanced stage. For cancer that has been detected at an early stage, surgery alone is the preferred treatment. For cancer that has spread to distant parts of the body, such as the bone or liver, chemotherapy and radiation therapy are recommended.

Surgery for Esophageal Cancer

Since a tumor of the esophagus may develop anywhere between the neck and the abdomen, there are many types of operations performed for esophageal cancer. Typically, however, the portion of the esophagus containing the tumor along with a variable amount of normal appearing esophagus is removed. It is important to remove some esophagus that appears normal to the naked eye, because it may contain cancerous cells only visible with the microscope. In the most common operation for esophageal cancer, three incisions are made- one in the neck, one in the chest and one in the abdomen. Through these incisions the majority of the esophagus is removed. In order to allow patients to swallow after the operation, a portion of the stomach is fashioned into a tube and used to replace the esophagus. This stomach tube is then brought in to the neck and connected to the small amount of remaining esophagus.

What Can I Expect after the Operation?

The purpose of the operation is both to remove the cancer and also to allow patients to eat after the operation. Usually, patients will be allowed to eat within a week after the operation. After this period patients are allowed to eat a modified diet that includes pureed foods and liquids and will progress to a regular diet within weeks after the operation. However, most people will need to eat smaller, more frequent meals. Often, a small tube is placed in the intestines at the conclusion of the operation, which allows for additional nutrition while patients recover from their operation. It is not uncommon for patients to lose some weight after surgery. After several months the lost weight is usually regained.

Is the Operation Painful?

Many specialized techniques are available to limit the amount of pain patients experience after surgery. Often, an epidural catheter is used for pain control. This is a catheter placed into the small of the back through which pain medication is infused. An epidural catheter provides excellent pain relief for the first few days after the operation. Once the catheter is removed, pain pills are prescribed to limit the discomfort. Patients are likely to continue pain medication every day for four to six weeks.

Radiation Therapy

Radiation therapy utilizes high-energy rays to destroy cancer cells, shrink tumors and stop the progression of the cancer. It can be used prior to surgery to shrink the tumor or following surgery to wipe out any cancer cells that remain. If surgery is not recommended, radiation therapy can help relieve pain and ease swallowing. Radiation therapy can be applied externally or radioactive materials can be implanted in the tumor.

Chemotherapy

Chemotherapy, is administered as a combination of drugs to kill cancer cells throughout the body. As with radiation therapy, chemotherapy for esophageal cancer may be

administered before or after surgery to shrink the tumor or destroy remaining cells, or if surgery is not possible.

Mesothelioma

Mesotheliomas are very rare tumors involving the lining of the chest cavity surrounding the lung with an annual incidence of 2,000-3,000 cases. Asbestos exposure has been strongly linked as a risk factor for the development of the disease with a latency from exposure to disease onset of at least 20 years.

Patients with mesothelioma will often present with shortness of breath and chest discomfort. The diagnosis of mesothelioma can be quite elusive. Patients will often require video-assisted thoracoscopic surgery (VATS) with biopsy for diagnosis. Treatment options include a variety of surgical techniques. *Pleurectomy* and *decortication*, a surgical stripping of the tumor and chest wall lining from the lung, *extrapleural pneumonectomy* (EPP), removal of the lung and lining en mass, or control of symptoms alone with the instillation of chemical agents to prevent fluid from re-accumulating. Other treatment options that are currently being investigated include the addition of radiation and chemotherapy to surgery to aid in tumor control.

Thymomas

Thymomas are rare slow growing tumors of the thymus gland, a gland which resides in front of the heart. These tumors most commonly present in adults in the fifth decade of life. Patients are often only mildly symptomatic with chest discomfort cough, and shortness of breath. Interestingly, patients with thymoma may present with an associated autoimmune syndrome known to cause muscle weakness known as myasthenia gravis. The evaluation of a patient with thymoma begins with a detailed history and physical and chest x-ray. Next, in patients suspected to have a thymoma a CT scan of the chest is essential.

Complete surgical resection for small well encapsulated lesions has been the mainstay of treatment for patients with thymoma. Recently, attempts at first shrinking large lesions or lesions suspicious for invasion into surrounding organs with chemotherapy prior to surgery has been investigated. Overall, survival is quite good with complete surgical resection.

Other Mediastinal Tumors

The mediastinum is the central cavity of the thorax bounded by the breast plate in front, the spine in back and both lungs to each side. Many vital structures reside in this central location. Most commonly, masses in this location can represent cysts (of the airway, esophagus or heart sac), or tumors. These tumors can be benign or malignant in behavior. The incidence of these tumors varies by patient age and includes thymic tumors, (thymomas) lymphomas, neurogenic lesions and germ cell tumors.

Patients with mediastinal masses may present with a variety of symptoms such as chest pain, cough and shortness of breath. Most symptoms are related to compression of vital surrounding structures.

Diagnostic evaluation includes a thorough history and physical along with a chest x-ray and CT scan of the chest. Surgical biopsy may be essential to diagnosis.

Treatment for each entity varies and may include simple surgical removal or a combination of medical and even surgical treatments.

Chest Wall Tumors

Chest wall masses may be benign entities such as infections or growths such as fibrous dysplasia, osteochondromas, chondromas or desmoid tumors. They may also represent malignant lesions such as sarcomas, or metastatic cancers (ie. Breast, lung, colon, or prostate).

The diagnosis of these lesions can be difficult and often start with a thorough history and physical and chest CT scan. A surgical biopsy may be appropriate if there is suspicion of malignancy.

Surgical resection of chest wall masses with reconstruction has become quite standard. Advanced reconstructive techniques performed in conjunction with our plastic surgeons have enabled us to repair nearly any chest wall defect. Often, multimodality therapy including chemotherapy and radiation may also play a role.

Common Thoracic Problems

Pulmonary Nodules

Pleural Effusion

Pericardial Effusion

Pneumothorax

Pulmonary Nodules

Pulmonary nodules are usually identified by chest x-ray or CT scan. These lesions can be single or multiple and represent either a benign process such as, fungus, bacteria or non-malignant growth or they can be malignant in origin. Evaluation must include a detailed history, including travel and smoking history as well as any past malignancy or previous lung disease.

Further evaluation when appropriate usually includes a high resolution CT scan. Positron emission tomography or PET has recently been introduced to assist in the evaluation of pulmonary nodules. This test is a relatively new technique that can image the nodule and

determine if it is exhibiting active growth consistent with a malignancy or relatively dormant such as in a benign process.

Often a biopsy will be the next step for suspicious lesions. Biopsies may be performed with bronchoscopy, fine needle aspiration, or even surgically through minimally invasive, thoroscopic surgery.. After a definitive diagnosis is obtained surgery may be required for removal.

Pleural Effusions

Fluid may accumulate in the chest cavity as a result of several abnormal conditions which include, heart failure, infection or even cancer. Symptoms, such as shortness of breath and chest discomfort may result from the increased pressure on the lungs.

Drainage of the fluid can be performed at the bedside with a chest tube or in the operating room with video thoracoscopy, a minimally invasive surgical approach. Either way a diagnosis can be obtained and often medication instilled to prevent the reaccumulation of the fluid. For effusions caused by cancer (malignant effusion) the optimal approach is video-assisted thoroscopic surgery with insufflation of talc directly into the pleural space. Success is achieved in >90% of these cases.

Pericardial Effusions

Fluid that accumulates abnormally around the heart as a result of inflammation or malignancy is termed a pericardial effusion.. The fluid can reach levels that restrict the normal function of the heart and cause significant and even life threatening consequences. If this occurs drainage must be performed either in the operating room by creating a pericardial window or at the bedside with catheter drainage.

Pneumothorax

A pneumothorax is a collapse of a portion of the lung. A patient's lung may collapse spontaneously or as a result of underlying lung disease or an intervention such as a biopsy. Patients are usually moderately symptomatic with complaints of shortness of breath and chest discomfort. A chest x-ray is initially performed and will usually be diagnostic. A CT scan of the chest may be appropriate to better discern any underlying pathology. Treatment is individualized and based on whether a patient has experienced a similar episode previously and by the presence of underlying lung pathology. Options include observation, tube placement for drainage, and minimally invasive surgery-video assisted thoracic surgery (VATS).

Reflux and Swallowing Problems

Repeated bouts of heartburn, sour tasting fluid in your throat and difficulty swallowing are all classic symptoms of gastroesophageal reflux disease or GERD.

What Causes GERD?

Reflux is a result of acid backing up through a weakened stomach valve into your esophagus or swallowing tube. Smoking, caffeine, and alcohol can all exacerbate GERD. Lifestyle changes, medication, and possibly surgery all have role to play in the treatment of reflux.

Diagnosis

A thorough history and physical with special attention on your symptoms and what alleviates and stimulates your discomfort.. To confirm a diagnosis of GERD diagnostic tests will be ordered . Based on these results a treatment plan can be outlined.

Barium swallow – Patients are asked to swallow a liquid which will be visible on an X-ray. A series of X-rays are then taken. If reflux exists it should be captured on film. The x-rays will also document if you have a *hiatal hernia*; herniation of the stomach into the chest which makes one prone to GERD

Esophageal Endoscopy (EGD) – This is a procedure in which a small, flexible telescope is passed through the mouth into the esophagus. The lining of the esophagus can then be examined directly, and inflamed or abnormal areas can be biopsied and examined under the microscope. Endoscopy is a very versatile tool, and can also help determine whether Barrett's esophagus is also present. Once the sedation from endoscopy has worn off, patients are usually allowed to go home the same day.

Esophageal Manometry – Pressure recordings are assessed in this exam through a small catheter placed into the esophagus. The muscle tone of the esophagus and lower esophageal sphincter are assessed and allows your doctor to custom tailor surgery for you.

24 Hour pH Monitoring – A thin acid-measuring probe is placed in the esophagus for up to 24 hours to record how much acid washes back from the stomach into the esophagus.

Lifestyle Changes

A patient can significantly improve GERD symptoms with lifestyle modifications. Often improvements will be seen after weight loss, smoking cessation, avoidance of food close to bedtime and even by sleeping with your head elevated.

Foods to avoid if you have GERD

- Alcohol
- Coffee, tea, and soda
- Fried fatty and spicy foods
- Citric fruits and tomatoes
- Chocolate

Medication

Over the counter and prescription acid blockers have a significant role to play in those patients whose symptoms are more recalcitrant to lifestyle modification. If antacids alone do not work you may require H-2 blockers or even proton pump inhibitors to eliminate almost all stomach acid production.

Surgery

If lifestyle changes and medication do not alleviate symptoms you may be a candidate for reflux surgery or laparoscopic fundoplication. This surgical procedure recreates your lower esophageal sphincter by wrapping the top of your stomach around the esophagus . Because the surgery is done through small incisions with telescopes placed in the belly, patients can often be discharged within 48 hours of surgery. The procedure is thoroughly detailed in the section titled laparoscopic fundoplication.

Minimally Invasive Thoracic Surgery

Thoracoscopic Lobectomy

Minimal Access Esophagectomy

Thoracoscopic Sympathectomy

Laparoscopic Nissen Fundoplication

Laparoscopic Myotomy for Achalasia

Minimal Access Thymectomy for Myasthenia Gravis

Thoracoscopic Lobectomy

Lung cancer is one of the most common tumors worldwide. Until recently the standard surgical approach for the treatment of lung cancer included a large rib spreading incision called a thoracotomy.

We are currently performing thoracoscopic lobectomies for appropriately selected patients with lung cancer and have been deeply involved with the development of a robotic system to further improve our techniques.. The operation involves three basic steps:

- 1) First three small incisions are created between the ribs that allows for the insertion of a small camera and telescopic instruments.
- 2) Next, the lobe within which the tumor resides is then removed. It is important to remove this tissue to decrease the likelihood that the tumor will recur.

- 3) Finally, the surgeon will also remove lymph glands within the chest in order to stage the lung cancer as accurately as possible.

Most patients following a thoracoscopic lobectomy can anticipate a three to four day length of stay. We are hopeful that those patients who undergo a thoracoscopic lobectomy may have improved breathing function earlier as a result of the less invasive and less painful procedure. We have also noted a decrease in the need for narcotics in patients who have undergone thoracoscopic resection.

Overall, we have been impressed by the decrease length of stay and have also noted a decrease in pain in our patients in comparison with patients who have undergone the traditional open approach. We are confident that the thoracoscopic lobectomy technique will soon become the standard means by which early lung cancers are removed

Minimal Access Surgery for Esophageal Cancer and High Grade Dysplasia

Esophageal cancer affects more men and women in the United States than ever before. Although not as common as other types of cancer, such as of the breast or lung, it is estimated that over 10,000 Americans are diagnosed with cancer of the esophagus each year. Resection of the esophagus for cancer has traditionally required a thoracotomy, an incision in the chest, as well as, a laparotomy or an abdominal incision. These incisions offer maximal exposure however may contribute to significant post operative pain and pulmonary complications including pneumonia.

Laparoscopy and thoracoscopy offer an alternative to conventional open surgery for the treatment of early esophageal cancer or dysplasia. Small incisions are placed in the chest and abdomen through which telescopes are placed to visualize, manipulate, and remove the esophagus and surrounding lymph nodes. We are currently performing a minimal access approach for those patients with early esophageal cancer or dysplasia and have been deeply involved with the development of a robotic system to further improve our techniques.

Most patients following minimal access esophagectomy can anticipate shorter length of stay in comparison with conventional resection. We are hopeful that those patients who undergo this approach will have improved breathing function earlier as a result of the less invasive and less painful procedure. We have also noted a decrease in the need for narcotics in patients who have undergone a minimal access approach.

Overall, we have been impressed by the decrease length of stay and have also noted a decrease in pain in our patients in comparison with patients who have undergone the traditional open approach. We are excited by the future technical advances which will allow us to offer this novel approach to even more patients.

Laparoscopic Myotomy for Achalasia

Achalasia is a disease of the muscle of the esophagus that affects primarily the lower esophageal valve separating the esophagus and stomach. The resulting spasm of the valve prevents ingested food from reaching the stomach easily. The cause of this disorder is

unknown. Patients usually complain of intermittent regurgitation and food “sticking” after swallowing.

Diagnostic Studies

Barium Swallow – Patients are asked to swallow a liquid which will be visible on an X-ray. A series of X-rays are then taken. Achalasia patients will often demonstrate abnormal valve relaxation and an absence of normal contractions.

Esophageal Manometry – Pressure recordings are assessed in this exam through a small catheter placed into the esophagus. Characteristic findings in patients with achalasia include an elevated lower valve pressure and failure of the valve to relax with swallowing.

Endoscopy - This is a procedure in which a small, flexible telescope is passed through the mouth into the esophagus. The lining of the esophagus can then be examined and biopsied

Management

Medical therapy for achalasia with drugs that relieve the spasm of the sphincter has largely been unsuccessful and associated with numerous side effects. The classical method for treatment remains endoscopic balloon dilation and surgery. While dilatation can achieve a good result in up to 60% of patients the results are frequently not durable. Also, dilatation carries the risk of esophageal perforation which would require emergency surgery.

Historically, definitive surgical treatment for patients with achalasia included a formal rib spreading incision to perform an esophageal myotomy or splitting of the abnormally thickened esophageal muscle at the lower sphincter. Recent improvements in laparoscopy have allowed for significant advances in the treatment of achalasia. We are currently performing a laparoscopic myotomy for most of our achalasia patients. This approach requires small abdominal incisions for the placement of a camera and telescopic instruments. The abnormally thickened muscle surrounding the esophagus is incised to allow for improved swallowing. After completion of this myotomy a gastric fundoplication or loose stomach wrap is created around the esophagus to minimize reflux.

Length of stay has been reduced to two days with minimal post-operative discomfort.

Also, patients are tolerating regular food at the time of discharge.

Laparoscopic Nissen Fundoplication

Gastroesophageal reflux disease (GERD) is a disorder that affects the lower esophageal sphincter or valve separating stomach from esophagus. This valve normally prevents food from regurgitating back into the esophagus. Patients with GERD have a weakened sphincter that allows for stomach acid to flow back into the esophagus. The esophageal lining becomes inflamed and patients experience heartburn, chest pain, and even a sour taste in their mouth. If left untreated GERD can lead to ulcer formation, bleeding, and scarring.

GERD is most commonly managed by medication and lifestyle changes such as weight loss and diet modification. However, these treatments may not be completely successful

at controlling gastroesophageal reflux disease (GERD) and surgery may then be appropriate.

Laparoscopic antireflux surgery is a minimally invasive approach to correct GERD. Most commonly a laparoscopic Nissen fundoplication is performed. In this procedure the weakened lower esophageal sphincter is supported by wrapping the top portion of the stomach around the lower esophagus as a bolster. At the same time if there is a hiatal hernia or part of the stomach residing in the chest cavity, this hernia will be returned to the abdomen and the abdominal opening secured.

The surgery involves several small holes in the abdomen with the placement of telescopic instruments. Surgeons utilize video monitors to perform the surgery. Patients undergoing the laparoscopic approach experience less pain and scarring than the traditional open operation. Most patients begin oral intake the next morning following surgery and are discharged within 48 hours to home.

Thoracoscopic Sympathectomy for Hyperhidrosis

Primary palmar hyperhidrosis is a pathological condition of overperspiration caused by excessive secretion of the sweat glands, the etiology of which is unknown. This disorder affects a small but significant proportion of the young population all over the world. Hyperhidrosis is often a debilitating condition in which patients suffer from the social stigmata associated with excessive hand and underarm sweating. The cause of the sweating is believed to be over stimulation of the sympathetic nerve which supplies the offending sweat glands. Patients will often be advised that little can be done for the condition that they must endure. However, a minimally invasive thoracoscopic approach allows for division of the nerves and relief from this disorder.

Minimal Access Thymectomy for Myasthenia Gravis

Myasthenia gravis (MG) is a chronic disease affecting neuromuscular transmission resulting in debilitating weakness. The thymus gland is thought to play a key role in the disease. The basic problem involves blockade of muscle (acetylcholine) receptors by antibodies formed by our own immune system. Damage to the receptor and impaired neuromuscular transmission leads to symptoms of weakness and fatigue.

Treatment of this potentially debilitating disorder includes anticholinesterase drug therapy, steroids immunosuppressive agents, plasmapheresis, and surgical removal of the thymus (thymectomy).

Thymectomy is now recommended for most patients with generalized symptoms.

Approximately 80% of patients will enjoy a significant benefit and even remission from their myasthenic symptoms following thymectomy. Interestingly, the benefits of the procedure may not be seen for months following resection.

Numerous surgical options exist for MG. The *transternal* approach is via a midline incision in the sternum and is the most widely utilized. However, recently we have applied minimal access approaches that allow for equivalent resection of the thymus through small less invasive incisions. These include the *transcervical* approach, where a small incision is created in the neck only as well as *video-assisted thoracoscopic*

approaches that utilize small chest incisions and operating telescopes. We are very enthusiastic about these approaches and have been impressed by our patients' quick recovery and decreased postoperative discomfort.

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Support Groups

The diagnosis of cancer can be quite overwhelming. We have recently established a lung cancer support group which meets regularly to assist patients with issues regarding diagnosis, treatment, and living with lung cancer. It provides emotional and psychological support and distributes educational material. If you would like to participate in our group please call Jodi Kaplan at 212-746-5982. Meetings take place on the first of every month. Please call for details or return to this web page for updates.