



**GHADIALI**  
General Surgery

P R E S E N T S

Dr. Mufa T. Ghadiali is skilled in all aspects of General Surgery.  
His General Surgery Services include:

- General Surgery
- Advanced Laparoscopic Surgery
- Surgical Oncology
- Gastrointestinal Surgery
- Hernia Surgery
- Endoscopy

## Nissen Fundoplication Surgery for GERD

Multimedia Health Education

### ***Disclaimer***

This movie is an educational resource only and should not be used to manage your health. All decisions about the management of **GERD** must be made in conjunction with your Physician or a licensed healthcare provider.

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### MULTIMEDIA HEALTH EDUCATION MANUAL

#### TABLE OF CONTENTS

SECTION	CONTENT
<b>1 . Normal Anatomy</b>	
a. Introduction	
b. Normal Anatomy	
c. Heartburn	
<b>2 . Overview of GERD</b>	
a. What is GERD?	
b. Causes	
c. Symptoms	
d. Complications	
e. Tips for Control	
<b>3 . Treatment Options</b>	
a. Diagnosis	
b. Conservative Treatment	
c. Surgical Treatment	
d. Post Operative Precautions	
e. Risks and Complications	

### INTRODUCTION

**Nissen Fundoplication Surgery** is a procedure to treat gastroesophageal reflux disease (**GERD**). **GERD occurs** when stomach contents reflux and enter the lower end of the esophagus (LES) due to a relaxed or weakened sphincter. **GERD** is treatable disease and serious complications may occur if left untreated.

To learn more about this surgery, it is important to understand the upper gastrointestinal function and anatomy.

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### Normal Anatomy of Upper GI System

All food and drink that we consume are in the form that the body cannot use as nourishment. Digestion is the process by which food and drink are broken down into their smallest parts so that the body can use them to nourish cells and to provide energy. Parts of the upper gastrointestinal (GI) system include:

(Refer fig.1)

#### Esophagus (Food pipe)

The esophagus is a muscular tube that connects the pharynx (throat) to the upper end of the stomach. The esophageal wall is made up of layers of muscle which help push the food into the stomach by waves of peristalsis.

(Refer fig.2)

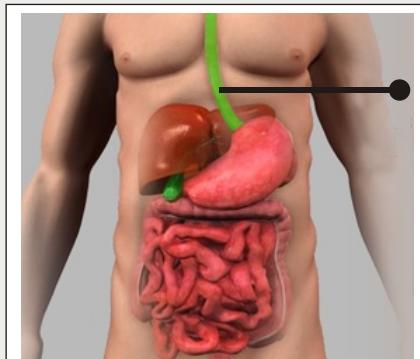


(Fig.1)

#### Lower esophageal sphincter (LES)

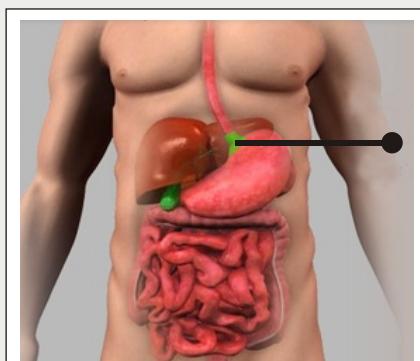
The lower esophageal sphincter (LES) is a band of muscles at the junction of the esophagus (food pipe) and the stomach. LES acts as a "valve" to prevent reflux of acid and chyme (food mixed with acid & digestive enzymes) from the stomach to the food pipe.

(Refer fig.3)



Esophagus

(Fig.2)



Lower  
Esophageal

(Fig.3)

#### Unit 1:

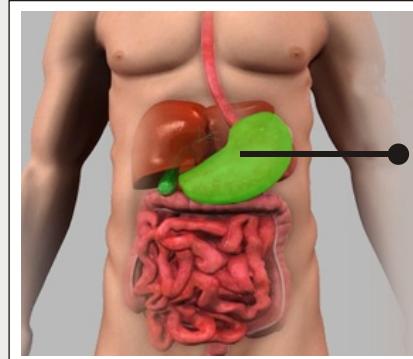
#### Normal Anatomy

##### Stomach

The stomach, apart from being a storage organ, secretes acid and other digestive enzymes for digestion of food.

There is always some acid in the stomach, which normally does not enter the esophagus, not even when lying down. The mucus lining of the inner wall of the stomach prevents the stomach from being digested from its own acid.

(Refer fig. 4)



Stomach

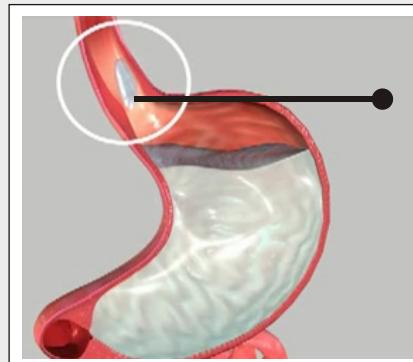
(Fig.4)

##### Heartburn

Heartburn is a form of indigestion and the most common symptom when acid from the stomach refluxes into the esophagus (food pipe).

It is usually temporary and if persistent or long standing (2 or 3 times a week) it could be gastroesophageal reflux disease or GERD.

(Refer fig. 5)



Heartburn

(Fig.5)

### What is GERD?

GERD is treatable disease and serious complications may occur if left untreated. GERD is a chronic condition where the stomach contents reflux into the esophagus. Normally, the stomach contents do not enter the esophagus (food pipe) due to a constricted lower esophageal sphincter. In GERD, the LES is weak or relaxed enabling stomach acids to reflux into the esophagus.

### Causes of GERD

The exact cause of what weakens or relaxes the lower esophageal sphincter in GERD is not known. However, the following triggers are known to make the reflux worse:

- **Lifestyle** - Use of alcohol or cigarettes, poor posture (slouching)
- **Certain medications** - NSAIDS (aspirin, ibuprofen), calcium channel blockers, theophylline, nitrates, and antihistamines
- **Diet** - spices, pepper, onions, tomato sauce, peppermint, fatty and fried foods, chocolates, drinks with caffeine, and acid foods such as citrus fruits & tomatoes
- **Eating habits** - large meals, sleeping or lying down soon after eating



Lifestyle



Certain Medications



Diet



Eating Habits

Other contributing factors for GERD include the following medical conditions



Hiatal Hernia



Pregnancy



Obesity



Diabetes



Rapid Weight Gain

### Symptoms

The main symptom of GERD is heartburn. Heartburn is a form of indigestion. It is usually felt as a burning pain in the center of the chest.

Other symptoms can include:

Symptoms tend to get worse after eating, especially after a large fatty meal. Some unusual symptoms may include:



An acid, sour taste  
in the mouth



Burning Pain in  
the throat



Bloating & Belching



Difficulty in Eating

### Complications

The esophageal lining is not meant to withstand acid and repeated reflux of stomach acid can lead to the following conditions:

- Esophagitis (Esophageal inflammation)
- Esophageal ulcer (break in the lining)
- Esophageal stricture (scarring and narrowing at the lower end of the esophagus near the stomach junction)
- Pulmonary aspiration (acid in lungs or lung cavity)
- Replacement of normal esophageal lining with abnormal (Barrett's) lining. This condition, Barrett's esophagus, is linked with Esophageal cancer.

### Tips for Control

Many people can relieve their symptoms by changing their habits and lifestyle. The following steps, if followed, may reduce your reflux significantly:



Don't eat within 3 hours of bedtime.  
This allows your stomach to empty and acid production to decrease.



Similarly, don't lie down right after eating at any time of day



Elevate the head of your bed 6 inches with blocks.  
Gravity helps prevent reflux.



Split meals or eat small meals. Eating a lot of food at one time increases the amount of acid needed to digest it.



Stop smoking. Smoking weakens the lower esophageal sphincter and increases reflux.

Lose excess weight. Overweight and obese people are much more likely to have bothersome reflux than people of healthy weight.



Avoid fatty or greasy foods, chocolate, caffeine, mints or mint-flavored foods, spicy foods, citrus, and tomato-based foods. These foods decrease the competence of the LES.

Avoid drinking alcohol. Alcohol increases the likelihood that acid from your stomach will back up.



These changes may be difficult. Talk to your health care provider about the tips to avoid acid reflux.

### Unit 3:

### Treatment Options

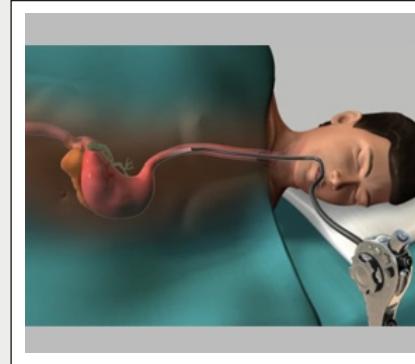
#### Diagnoses

Your doctor usually diagnoses GERD based on your medical history alone, but may ask you to undertake the following tests:

#### Endoscopy

A thin endoscope with a camera on the end is passed down the esophagus towards the stomach. It enables doctors to see the inside of your esophagus on a television monitor.

(Refer fig. 6)

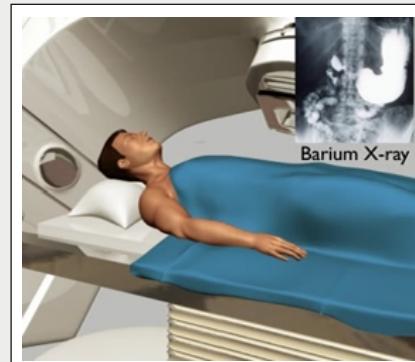


**Endoscopy**

(Fig.6)

#### Barium X-rays

These are diagnostic x-rays in which barium is used to diagnose abnormalities of the digestive tract.



**Barium X-rays**

(Fig.7)

The patient drinks a liquid that contains barium, which will coat the walls of the esophagus and stomach. X-rays are then taken, which can then show if there are strictures, ulcers, hiatal hernias, erosions, or other abnormalities.

(Refer fig. 7)

#### Esophageal Manometry

This is a test that measures the function of the lower esophageal sphincter and the motor function of the esophagus.

Esophageal manometry, also called Esophageal Motility Study or EMS, is a test to measure the motor function of the esophagus and lower esophageal sphincter. EMS is performed by a technician who places a small pressure sensitive catheter through the patient's nostril and advances it into the stomach.

(Refer fig. 8)

#### Unit 3:

#### Treatment Options

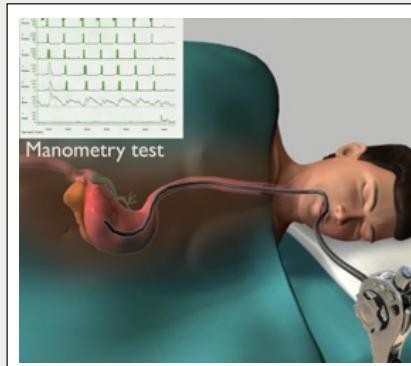
The catheter is then slowly withdrawn back up into the esophagus. The patient is asked to swallow at various times during the procedure and measurements are taken to assess the pressure of the muscle contractions in the esophagus.

(Refer fig. 8)

#### PH Study or Acidity Test

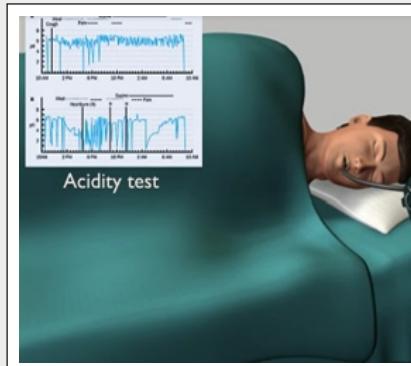
This is done on the inside of the esophagus by passing a thin wire through your mouth or nose and into your esophagus. The wire will measure how acidic your esophagus is and record the results electronically.

(Refer fig. 9)



**Manometry Test**

(Fig.8)



**PH Study or Acidity Test**

(Fig.9)

#### Ambulatory 24 hr PH Probe Study

This study measures the acid that refluxes back up from the stomach. A very thin tube is inserted up through the nostril and then down the throat and esophagus until it reaches just above the stomach.

The tube has a very small probe at the end that will register any acids that are refluxed from the stomach. An x-ray is taken to make sure that the probe has been positioned correctly. The other end of the thin tube is attached to a small computer (small black box) for 12 or 24 hours. During this period you are given a diary sheet to complete, on which you should record the time of each activity that takes place, basically a running history.

#### PH Capsule

This is a new type of pH probe which requires no tube though the nose. It is a sensor that is attached to the lining of the esophagus, with an endoscope. Often this procedure is carried out at the same time as having an endoscopy (upper GI) performed. The pH sensor sends signals to a portable computer which collects the data about the acid exposure over the usual 24 hrs.

There is no removal procedure, the sensor will slowly detach itself from the esophagus with time and is then passed through a normal stool.

### Impedance Study

Similar to a standard pH test, but with two probes. One sits in the stomach and the other just above the stomach. The advantage of the dual sensor is that it can detect both acid and alkaline reflux travels. The tube is inserted through the nostril (this can be placed while still sedated after an endoscopy), and the other end is attached to a small computer.

### Conservative Treatment Options

GERD, in general, cannot be cured at present. The principles of GERD treatment are:

- Reducing reflux
- Relieving symptoms
- Preventing damage to the esophagus.

However, in temporary conditions such as in pregnancy, GERD may completely recover following delivery of the baby.

Treatments options include:

- **Antacids** - These medications neutralize the acid in the stomach and provide temporary relief for heartburn.
- **Other Medications**
- **H2 antagonists or Histamine receptor blockers** - These reduce the production of acid in your stomach by blocking a signal that leads to acid secretion.
- **Proton Pump Inhibitors** - Proton pump inhibitors (PPIs) are a group of prescription medications that prevent the release of acid in the stomach and intestines. Doctors prescribe PPIs to treat people with heartburn (acid reflux), ulcers of the stomach or intestine, or to decrease excess stomach acid.

### Surgical Introduction

Surgery - If the non invasive treatments are not effective, surgery may be an option. Talk to your surgeon about which procedure is best for your particular situation. Surgical options include:

### Surgical Introduction

#### **Endoluminal gastroplication:**

Also known as endoscopic fundoplication, this surgery involves the use of an endoscope with a small sewing device attached to the end, known as the EndoCinch device. The procedure stitches a pleat or plication just below the lower esophageal sphincter muscle. The process is repeated for the necessary amount of plications. The surgery can be performed on an outpatient basis under sedation.

#### **Nissen's fundoplication:**

The Nissen's fundoplication (fundo) is a surgical technique that strengthens the sphincter (LES). When performing a fundoplication, the part of the stomach that is closest to the entry of the esophagus (the fundus of the stomach) is gathered, and wrapped around the lower end of the esophagus and esophageal sphincter, where it is then sutured (sewn) into place. This surgery may be performed through a large, open abdominal incision or endoscopically, through 5 smaller incisions.

### Surgical Procedure:

Nissen Fundoplication is performed as day surgery either in the hospital or outpatient surgery center usually with the patient under general anesthesia.

The surgeon uses a needle to inject a harmless gas into the abdominal cavity near the belly button to expand the viewing area of the abdomen giving the surgeon a clear view and room to work.

The surgeon makes a small incision in the upper abdomen and inserts a tube called a trocar through which the laparoscope is introduced into the abdomen.

Additional small incisions may be made for a variety of surgical instruments to be used during the procedure.

(Refer fig. 10 to 12)



(Fig.10)

### Unit 3:

### Treatment Options

#### Surgical Procedure:

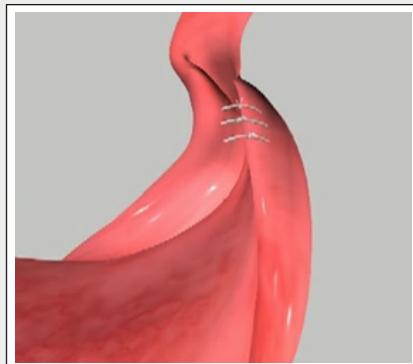
With the images from the laparoscope as a guide, your surgeon wraps the upper part of the stomach, the fundus, around the lower esophagus to create a valve, suturing it in place.

The hole in the diaphragm through which the esophagus passes is then tightened with Sutures.

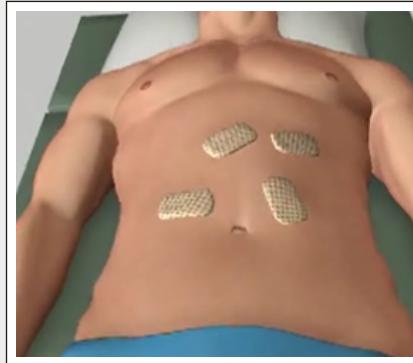
The laparoscope and other instruments are removed and the gas released. The tiny incisions are closed and covered with small bandages.

Laparoscopy is much less traumatic to the muscles and soft tissues than the traditional method of surgically opening the abdomen with long incisions (open techniques).

(Refer fig. 10 to 12)



(Fig.11)



(Fig.12)

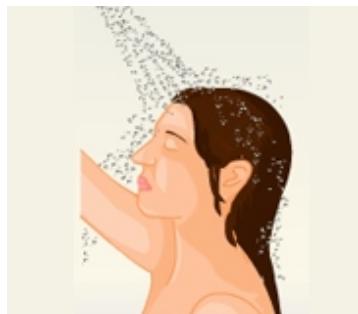
#### Post Operative Guidelines

After surgery, your surgeon will give you guidelines to follow. Common post-operative guidelines following laparoscopy include the following:



You will need someone to drive you home after you are released as the anesthesia may make you feel groggy and tired.

Do not remove the dressings over the incisions for the first two days and keep the area clean and dry. No showering or bathing during this time. The incisions usually heal in about 5 days.



### Post Operative Guidelines



Your surgeon may give you diet and activity restrictions. It is very important that you follow your surgeon's instructions for a successful recovery.

You may feel soreness around the incision areas. Your surgeon may give you a prescription pain medicine or recommend NSAID's (non-steroidal anti-inflammatory drugs) for the first few days to keep you comfortable..



If the abdomen was distended with gas, you may experience discomfort in the abdomen, chest, or shoulder area for a couple days while the excess gas is being absorbed.

Contact your doctor immediately if you have a fever, chills, increased pain, bleeding or fluid leakage from the incisions, chest pain, shortness of breath, leg pain, or dizziness..



### Risks & Complications

As with any surgery there are potential risks involved. The decision to proceed with the surgery is made because the advantages of surgery outweigh the potential disadvantages. It is important that you are informed of these risks before the surgery takes place.

Most patients do not have complications after Nissen Fundoplication; however complications can occur and depend on which type of surgery your doctor performs as well as the patient's health status. (i.e. obese, diabetic, smoker, etc.) Complications can be medical (general) or specific to Nissen Fundoplication. Medical complications include those of the anaesthesia and your general well being.

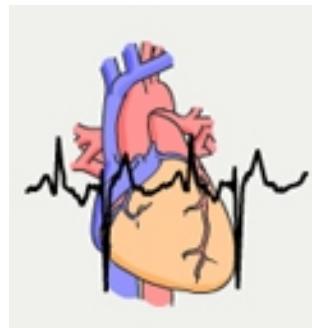
Almost any medical condition can occur so this list is not complete. Complications include:



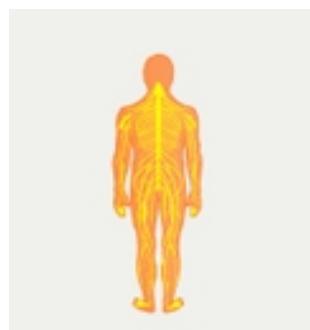
Allergic reactions to medications



Blood loss requiring transfusion with its low risk of disease transmission



Heart attacks, strokes, kidney failure, pneumonia, bladder infections



Complications from nerve blocks such as infection or nerve damage



Serious medical problems can lead to ongoing health concerns, prolonged hospitalization, or rarely death.

### Risks & Complications

Because the abdominal muscles are not cut in laparoscopic surgery, the pain and complications associated with abdominal surgery are lessened. However, complications can occur with any surgery. Your surgeon feels that you should be aware of complications that may take place so that your decision to proceed with this operation is taken with all relevant information available to you. Specific complications for Nissen Fundoplication include:

- **Post-operative fever and infection** - Antibiotics given at the time of surgery lessen this risk but symptoms of infection should be reported to your physician and can include: fever, chills, increasing pain, bleeding, and foul smelling drainage.
- **Surgical injury to blood vessels** - A rare complication that is usually recognized during surgery and repaired. Rarely, a blood transfusion may be necessary.
- **Surgical injury to stomach or esophagus** - Also a rare complication that is usually recognized during surgery and repaired.
- **Swallowing difficulties** - If the new valve is too tight, swallowing can be difficult and may require dilation to loosen the valve.
- **Gas embolism** - If gas is used to distend the abdominal cavity for better viewing there is a risk of gas embolism or gas bubbles in the bloodstream. This is a serious condition that can impede blood flow to vital organs or cause a blood clot to occur in a blood vessel.
- **Adhesions** - Extensive scar tissue formation can form in the surgical area. Rarely adhesions can obstruct the valve opening requiring additional surgery.
- **Conversion to Laparotomy** - There are occasions when a laparoscopy cannot be completed successfully without converting to a traditional "open" surgery called a laparotomy. A laparotomy is similar but is done through a larger abdominal incision.
- **Repeat Surgery** - Sometimes the new valve weakens or loosens months or years after the surgery causing symptoms again. If symptoms are severe, the surgery may need to be repeated.

Risk factors that can negatively affect adequate healing after surgery include:



### Summary

A good knowledge of this procedure will make the stress of undertaking the procedure easier for you to bear. The decision to proceed with the procedure is made because the advantages of the procedure outweigh the potential disadvantages. It is important that you are informed of these risks before the procedure.

Although every effort is made to educate you on **Nissen Fundoplication** and take control, there will be specific information that will not be discussed. Talk to your doctor or health care provider about any concerns you have about this surgery.



### YOUR SURGERY DATE



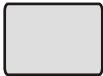
**READ YOUR BOOK AND MATERIAL**



**VIEW YOUR VIDEO /CD / DVD / WEBSITE**



**PRE - HABILITATION**



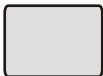
**ARRANGE FOR BLOOD**



**MEDICAL CHECK UP**



**ADVANCE MEDICAL DIRECTIVE**



**PRE - ADMISSION TESTING**



**FAMILY SUPPORT REVIEW**

**Physician's Name :** \_\_\_\_\_

**Patient's Name :** \_\_\_\_\_

**Physician's Signature:** \_\_\_\_\_

**Patient's Signature:** \_\_\_\_\_

**Date :** \_\_\_\_\_

**Date :** \_\_\_\_\_