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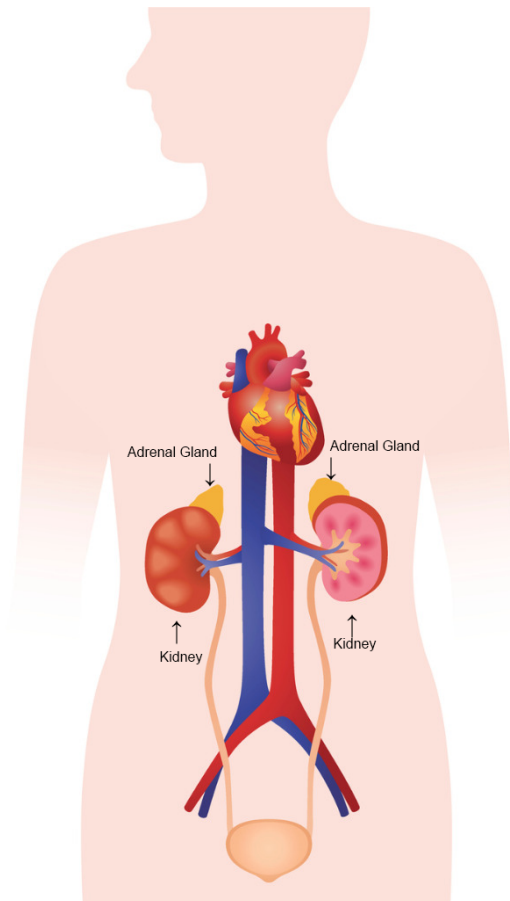
Adrenal Gland Removal (Adrenalectomy) Patient Information from SAGES

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About the Adrenal Glands

What are the adrenal glands?

Your adrenal glands are two small organs in your upper abdomen. Each one is about the size of your thumb and shaped like a triangle. You have one above each of your kidneys.



What do the adrenal glands do?

The adrenal glands make hormones that your body requires to work correctly. These hormones help control your blood pressure, blood sugar, and “fight or flight” reactions at times of stress. They also make male and female hormones.

What causes adrenal gland problems?

The most common cause of adrenal gland problems is a tumor in the gland. The tumor is usually small and benign (not cancer). However, it can make extra hormones that cause health problems. Tumors can also cause problems if they are large or might be cancerous (malignant). Fortunately, these are rare.

What are the symptoms of adrenal gland problems?

Symptoms are different depending on the type of tumor. Below are the symptoms of the most common types of adrenal gland tumors. Symptoms and signs of adrenal tumors that make extra hormones:

Pheochromocytoma

- Severe headaches
- Sweating
- Anxiety
- Pounding or fluttering heart (palpitations)
- Rapid heartbeat- this can last a few seconds or several minutes
- High blood pressure

Aldosteronoma

- High blood pressure
- Low potassium level
- Weakness
- Tiredness
- Muscle cramps
- Frequent urination

Cortisol – producing tumors cause a condition called Cushing syndrome

- Gaining weight in the face and center of your body (torso)
- Thinner skin
- Stretch marks – these are pink and purple marks on your skin
- Changes in your menstrual periods
- High blood pressure
- High blood sugar levels

Adrenal gland cancers are rare tumors. They are often large when doctors find them. They sometimes need to be removed with open surgery (one large incision).

How do doctors find adrenal gland problems?

Doctors find adrenal gland tumors when they cause symptoms. But some adrenal gland tumors do not cause symptoms. Doctors may find them when you get a CAT scan (CT scan) to look for something else.

These tumors could be any of the types listed above. Or, they might not make any hormones at all. Many of these tumors which don't produce hormones do not need to be removed. Your doctor might simply want to get blood or urine tests and scan them again later. The tumor may need to be removed if:

- Blood or urine tests show it is making extra hormones.
- It is larger than 2 inches across (4 to 5 centimeters)
- Your doctor thinks it might be cancer.

I have an adrenal gland tumor. What now?

If your doctor finds an adrenal gland tumor or thinks you might have one, you may need blood and urine tests. These will show if the tumor is making extra hormones. You might also need imaging tests, such as a CAT scan (CT scan), MRI, or other scans to find the tumor.

How do doctors treat adrenal gland problems?

If the tumor is small and not causing health problems, your doctor might just check it with repeat blood or urine tests and a scan every year. If it is large, might be cancerous, or makes extra hormones, your doctor will probably recommend surgery to remove it.

Laparoscopic Adrenal Gland Removal

What are the advantages of laparoscopic adrenal gland removal?

In the past, removing the adrenal glands meant a large incision in the abdomen, side or back. Today, doctors often do minimally invasive surgery. They use tiny instruments and a video camera placed inside your body through several small incisions. "Laparoscopic surgery" is another name for this type of surgery. The advantages include:

- Less pain after surgery
- Less time in the hospital- you may go home in a day or two
- Quicker return to work and other activities
- Smaller scars
- Lower risk of problems during healing

Your surgeon might use a surgical robot to do your operation. It is done the same way as the description above. Your doctor guides the robot instead of guiding the instruments by hand. This is commonly referred to as robotic surgery.

Is laparoscopic adrenal gland removal right for you?

Laparoscopic adrenal gland removal has many benefits. However, it might not be an option if:

- The tumor is very large
- You are quite overweight

- The surgeon believes open surgery is safer for other reasons

Talk to a surgeon who is trained and qualified in laparoscopic adrenal gland removal. Finding an experienced surgeon is important, because adrenal gland surgery is not common. The surgeon and your family doctor can help you decide if this operation is right for you.

How should I prepare for laparoscopic adrenal gland removal?

You will need a full physical examination. You might need some tests to make sure you are healthy enough for surgery.

The surgeon who will do your laparoscopic adrenal gland removal will talk with you about the risks and benefits of surgery. Then you will sign a form saying you understand and agree to the operation. Your surgeon's office will tell you what to do and avoid before surgery. The exact instructions depend on your surgeon, but here are some common things to do:

- Take a shower the night before surgery or the same morning. Your surgeon might ask you to use an antibiotic soap.
- Stop eating and drinking at the time your doctor tells you before surgery.
- The morning of your surgery, you may take medications your doctor told you are allowed. Take them with just a sip of water.
- You might need to stop taking certain medicines before surgery. These include blood thinners, supplements, and medicines that affect your immune system. Talk to your surgeon when you schedule your laparoscopic adrenal gland removal.
- Ask your doctor or nurse how much help you might need after going home from the hospital.
- You might need to start medications to control the symptoms of the tumor before surgery. Here are examples for different types of tumors.
- If you have a pheochromocytoma , you need to start taking medications to control your blood pressure and heart rate.
- If you have an aldosteronoma, you might need to take potassium. This type of tumor can cause low levels of this important electrolyte.
- If you have Cushing syndrome , you need extra cortisone medication on the day of surgery. You will need extra cortisone medication until your remaining adrenal gland is working normally again. This usually takes a few months.

About Laparoscopic Adrenal Gland Removal

How is laparoscopic adrenal gland removal done?

You will have general anesthesia for your laparoscopic adrenal gland removal. This means you are asleep during surgery.

Once you are asleep, the surgeon makes an incision in the belly and inserts a small device called a port. This looks like a small narrow tube.

Next, they insert a small camera through the port. This is the laparoscope. The camera shows the surgery on a screen in the operating room. Once the surgeon can see clearly, they put in more ports to insert long, narrow instruments. These allow your surgeon to delicately separate the adrenal gland from its attachments.

After the adrenal gland is completely free, the surgeon places it in a small bag. Then they remove it through one of the skin incisions. Your surgeon almost always needs to remove the entire adrenal gland. This helps make sure all the tumor is removed. Finally, the small incisions are closed. It is important to know about your surgeon's training and experience before your surgery. Ask about their experience doing both laparoscopic and open adrenal gland removal.

What is robotic adrenalectomy?

Your surgeon might use a surgical robot to do your operation. It is done the same way as the description above. Your doctor guides the robot instead of guiding the instruments by hand. This is commonly referred to as robotic surgery.

What if I cannot have laparoscopic adrenal gland removal?

A few people cannot have laparoscopic adrenal gland removal. You might have open surgery if you are one of these people. Some reasons for having or switching to open surgery are:

- You have obesity – This means being very overweight.
- You have scar tissue in your abdomen from past surgery.
- The surgeon cannot see very well inside your body through the laparoscope.
- You have bleeding problems during surgery.
- The tumor is large or starting to grow into the nearby tissues.

It is not a complication (problem) if your surgeon decides to switch to open surgery. They will switch if open surgery is the safest option for you. They might not know this until after the laparoscopy starts. They will use their best judgment about the safest surgery for you.

What are the possible complications of laparoscopic adrenal gland removal?

Complications are problems that happen during medical care or afterward. Complications of laparoscopic adrenal gland removal can include:

- A reaction to general anesthesia
- High or low blood pressure
- Bleeding
- Injury to nearby organs
- Infection or problems with your incisions healing
- Blood clots, heart attacks, and complications with your lungs can rarely occur after this surgery

What to Expect After Surgery

What should I expect after laparoscopic adrenal gland removal?

After the operation, it is important to follow your doctor's instructions. You might feel better in just a few days, but your body needs time to heal.

Your hospital stay and going home

You will probably go home from the hospital a day or two after surgery. Before going home, you will probably stay in the regular surgery unit of the hospital. Some people need to stay in the ICU (intensive care, also called critical care). If you have a pheochromocytoma removed, you might need to stay in the ICU so your doctor can keep track of your blood pressure.

Medications after adrenal gland removal

If your tumor made the hormone aldosterone, you need to have your potassium level checked after surgery. You might need to keep taking blood pressure medications.

If your tumor made cortisol and you have Cushing syndrome, you must take prednisone or cortisol pills after surgery. You will take a smaller and smaller dose over time, until your remaining adrenal gland is making a normal amount of cortisol.

Will I be in pain?

Pain after this surgery is usually mild to moderate. You can take non-prescription medications for pain, unless your doctor tells you not to. Acetaminophen (Tylenol®) and ibuprofen (Advil®) are non-prescription pain medicines. Putting ice on your incisions can also help. Ask your doctor or nurse about the correct way to use ice.

Your surgeon might prescribe a small amount of narcotic pain medicine to help you with pain. Many people recover from surgery without taking any narcotic pain medicine, but some will need narcotics for a few days. If you have questions about pain after surgery, ask the surgeon or your nurses.

They should be able to tell you how long the pain will last and what to expect. You might feel sick to your stomach (nauseated) or throw up (vomit) after your surgery. Having surgery and anesthesia can make this happen.

You should feel better in a day or two. Tell your doctor or nurse know if you keep vomiting or feeling nauseated.

Activities

You can do light activities when you go home from the hospital. This includes walking around your home, going up and down stairs and lifting light items such as a gallon of milk or a small pet. You may take your bandages off and shower the day after your

surgery.

You can probably go back to normal activity within one (1) week of having surgery. This includes driving and going to work. You can expect to feel a little better each day after going home. If not, please call your doctor.

When to see your doctor after surgery

You should schedule an appointment with your surgeon 2 to 3 weeks after surgery. When to call your doctor after laparoscopic adrenal gland removal Be sure to call your surgeon or family doctor if you have any of the problems below.

- Fever of 101 degrees F (39 C) or higher
- Bleeding
- Increasing belly swelling
- Pain that your medications do not help
- Feeling sick to your stomach or throwing up (nausea or vomiting). Call your doctor if you cannot eat or drink.
- Chills
- Difficulty breathing or a cough that does not go away.
- Creamy drainage or pus coming from an incision
- Redness (like a sunburn) around any of your incisions that gets worse or spreads
- Severe weakness or tiredness that prevents you from getting out of bed and doing normal activities

This brochure is not intended to take the place of your discussion with your surgeon about the need for adrenal gland surgery and the details of this surgery. If you have questions about your need for adrenal gland surgery, your alternatives to surgery, billing or insurance coverage, or your surgeon's training and experience, do not hesitate to ask your surgeon or his or her office staff about it. If you have questions about the operation or subsequent follow-up, please discuss them with your surgeon before or after the operation.

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