



ALL CORRESPONDENCE & APPOINTMENTS:

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LAPAROSCOPIC ADRENALECTOMY

This document is an information sheet I have prepared about your adrenal operation to help you to make an informed decision. It describes the benefits and risks of surgery so you can decide whether to go ahead with the operation or not. If you have any further questions please let me know or consult my website at www.endocrinesurgery.net.au

What are the adrenal glands?

The adrenal glands are two small organs, one located above each kidney (Fig. 1). They are roughly triangular in shape and about the size of a thumb. The adrenal glands are known as endocrine glands because they produce hormones, which are directly released into the bloodstream.

These hormones are involved in the control of blood pressure, chemical levels in the blood, water use in the body, glucose usage, and the “fight or flight” reaction during times of stress. These adrenal-produced hormones include cortisol, aldosterone, adrenaline and noradrenaline, and a small fraction of the body’s sex hormones (oestrogen and androgens).

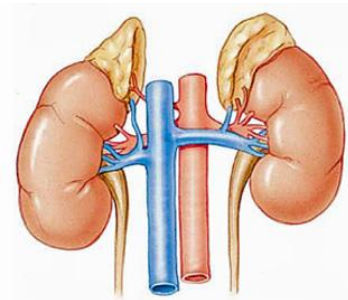


Figure 1: The adrenal glands found at the top of each kidney

What has gone wrong with my adrenal glands?

Diseases of the adrenal gland are relatively rare and there are only a few reasons to surgically remove one of them. The most common reason is because of excess hormone production by a tumour located within the adrenal. Most of these tumours are small and **not** cancers, and can usually be removed with laparoscopic (minimally invasive) techniques.

Removal of the adrenal gland may also be required for certain tumours even if they aren’t producing excess hormones, particularly when the tumour in the adrenal is large (>4cm) or if there is a suspicion that the tumour could be a cancer. Fortunately, malignant adrenal tumours are very rare.

Adrenal gland problems present in a variety of ways, depending on whether the tumour is producing excess hormones and which hormone is being secreted. An adrenal mass or tumour can also sometimes be found by chance when a patient gets a scan to evaluate another problem (called an *incidentaloma*).

Adrenal tumours associated with excess hormone production include phaeochromocytomas, aldosterone-producing tumours, and cortisol-producing tumours.

- Phaeochromocytomas produce excess adrenaline, which can cause very high blood pressure and periodic spells characterised by severe headaches, excessive sweating, anxiety, palpitations, and rapid heart rate that may last from a few seconds to several minutes.
- Aldosterone producing tumours cause high blood pressure and low serum (blood) potassium levels (called Conn’s syndrome). In some patients this may result in symptoms of weakness, fatigue, and frequent urination.
- Cortisol producing tumours cause a syndrome which includes obesity (especially of the face and trunk), high blood sugar, high blood pressure, menstrual irregularities, fragile skin, and prominent stretch marks (called Cushing’s syndrome). Most cases of Cushing’s syndrome, however, are caused by small pituitary tumours and are not treated by adrenal gland removal.

- An incidentally found mass in the adrenal may be any of the above types of tumours, or may produce no hormones at all (called an incidentaloma). Most incidentally found adrenal masses do not make excess hormones, cause no symptoms, are benign, and do not need to be removed. Surgical removal of incidentally discovered adrenal tumours is indicated only if:
 - the tumour is found to make excess hormones
 - is large in size (more than 3-4 centimetres in diameter, as the risk of cancer increases)
 - if there is a suspicion that the tumour could be malignant
- Adrenal gland cancers (adrenocortical cancers) are rare tumours which are usually very large at the time of diagnosis. Removal of these tumours is usually done by open adrenal surgery.

If an adrenal tumour is suspected based on symptoms or has been found on an X-ray, a number of blood and urine tests will be done to determine if the tumour is making excess hormones. Special X-ray tests, such as a CT scan, nuclear medicine scan, an MRI or selective venous sampling are commonly used to locate the suspected adrenal tumour.

Why should I have the surgery?

Surgical removal of the adrenal gland is the preferred treatment for patients with adrenal tumours which secrete excess hormones, and for primary adrenal tumours that are large or appear malignant. As the tumour gets larger there is a greater chance of finding a cancer.

By removing the tumour, the syndromes caused by the excessive amounts of hormones in the bloodstream can be stopped. Patients undergoing the surgery tend to feel better quickly afterwards, but some of the damage caused by longstanding excessive hormones can take a long time to reverse.

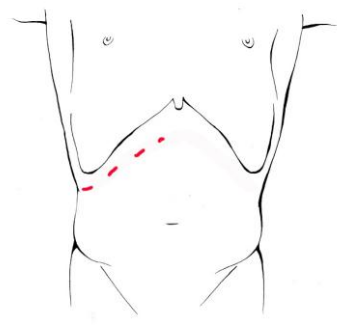


Figure 2: Diagram showing the four small incisions just under the ribs needed for right laparoscopic adrenalectomy; for operation on the left only three incisions are needed.

Up until fairly recently, patients requiring adrenal surgery had to have a large cut in the back or abdomen, requiring a long stay in hospital and a lot of pain and discomfort after the operation. Fortunately most of my patients are now suitable for minimally invasive surgery (laparoscopic adrenalectomy) using keyhole techniques, with only three or four small incisions, depending on the side (Fig. 2). Of course any adrenal gland removed is sent to the pathologist to be examined under the microscope.

How is the operation done?

1. Before surgery

Some patients will require special preparation with medications before having a laparoscopic adrenalectomy to counteract the effects of some of the hormones being secreted and to make the anaesthetic and the operation as safe as possible (you will be advised what may be required).

Phaeochromocytoma patients will need to take medication for a few weeks before surgery to control the blood pressure and heart rate, patients with Conn's syndrome may need extra potassium and blood pressure medications, while Cushing's syndrome patients will require extra cortisol during the operation, and also after the surgery until the other adrenal gland has a chance to recover its normal function.

2. During the surgery

The operation takes place under a general anaesthetic with you lying on your side. While you are asleep a number of laparoscopic ports (like small tubes) are placed through small incisions, just under the ribs, to allow access to the adrenal gland inside the abdomen. A laparoscope (a tiny telescope)

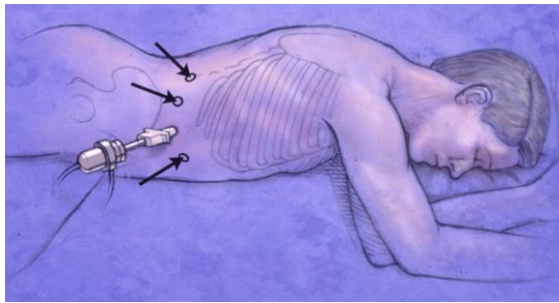


Figure 3: The port sites needed for a right laparoscopic adrenalectomy; on the left only three are used.

connected to a special camera is inserted through one of the ports, which gives me a magnified view on a television screen. The other ports are used for the surgical instruments and an ultrasound dissector (harmonic scalpel) to allow me to delicately separate the adrenal gland from its attachments (Fig. 3).

Once the adrenal gland has been freed, it is placed in a small bag and then removed through one of the incisions. It is usually necessary to remove the entire adrenal gland in order to

safely remove the tumour, but occasionally it is possible to leave some of the adrenal behind.

If there is difficulty with the dissection it may be necessary to convert from a keyhole operation to the traditional open operation, with a bigger cut. This is most unusual however, occurring in less than 1% of cases.

At the end of the operation I use a lot of local anaesthetic in the wounds to minimise discomfort, and the small incisions are closed with dissolving stitches that do not need to be removed. I do not generally place any drainage tubes after the surgery.

What can go wrong with the operation?

We aim to make the operation as safe as possible, but very occasionally things can go wrong and a complication can occur. These fall into three main areas:

1. *Complications of the anaesthetic:*
Your anaesthetist will discuss with you any possible complications related to the anaesthetic.
2. *General complications of any operation:*

Bleeding

- can occur during or after the operation, causing a bruise or collection of blood (haematoma) to form in the abdomen or in the wounds. This usually gets better by itself, but occasionally a second operation may be needed to control the bleeding.

If you are taking warfarin, clopidogrel or any other blood thinning drug, these can increase the risk of bleeding in adrenal surgery. Please tell me if you are taking either of them so that I can advise you about stopping these medications prior to the operation.

Pain

- is very unusual after minimally invasive surgery as the cuts are small, I don't cut the muscles, and I use lots of local anaesthetic in the wounds to minimise discomfort after surgery. Generally only paracetamol (Panadol) is needed to control any pain.

Infection

- in the wounds is extremely rare.

3. *Complications specific to adrenalectomy:*

Injury to other organs

- because the adrenal is at the back of the abdomen and covered by several other structures it is possible to damage surrounding organs such as small and large intestines, kidney, liver, spleen, pancreas and blood vessels. This is extremely rare however, and can be repaired during your operation if necessary.

What happens after the operation?

After the surgery you will be transferred to the recovery room and then to the ward. Occasionally, particularly if you have had an adrenal gland removed for phaeochromocytoma, you will be admitted to the intensive care unit for monitoring of your blood pressure and heart function for 24 hours or so.

You will be able to drink and eat soon after the operation, and can often go home within a few days of the surgery, depending on the reason for the adrenalectomy. Some patients need to stay in hospital a little longer to stabilise their cortisol levels, particularly if the reason for the surgery was Cushing's syndrome.

The wounds are covered with waterproof dressings, allowing you to shower, and you generally will not need to touch the dressings before I see you again. I will arrange to see you in the rooms a few days after discharge to check the wounds, change the dressings and make sure all is well. As you will have dissolving stitches, I will not need to remove any stitches at this visit.

Most people feel fine after the surgery and can return to work and normal activities after two weeks. Some however, still feel a bit tired after an operation and anaesthetic, which is quite normal, but this gets better with time and regular exercise. The wounds are usually fully healed in about 6 weeks.

Since most people have two functioning adrenal glands, the removal of one adrenal gland does not usually require long term hormone supplementation, although if the overactive adrenal gland suppresses the function of the other adrenal gland, it may require several months for the remaining adrenal gland to regain function. This means that you may require hormone (usually steroids) pills during that period. After removal of both adrenal glands you will require life-long steroid replacement to prevent complications of steroid insufficiency.

Finally, if you are worried about anything at all please ring or email the office for information.