California Pacific Medical Center

A Sutter Health Affiliate

Laparoscopic Adrenalectomy

ADVANCED MINIMALLY INVASIVE SURGERY PROGRAM

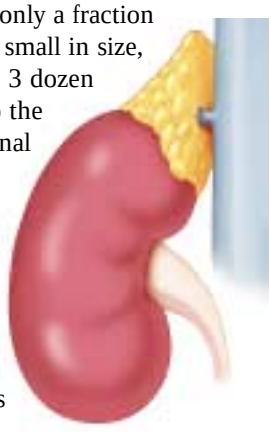
At California Pacific Medical Center we are committed to bringing new and advanced diagnostic tools, medical treatments and surgical options to the physicians we serve and the patients they care for. Through this procedure profile, our physicians illustrate actual medical situations that provide you with a window into their practice of diagnosis, treatment and patient follow-up.

For patient referrals:
(888) 637–2762

www.cpmc.org/lapsurg

What does the Adrenal Gland do?

The adrenal glands are small, triangular-shaped glands sitting on top of each kidney. The glands are typically about 1 to 2 inches in length, each weighing only a fraction of an ounce. Although small in size, they secrete more than 3 dozen hormones directly into the bloodstream. The adrenal gland can be divided into 2 parts. The outer region secretes hormones affecting the way energy is stored and food is metabolized and controls personal characteristics such as hair thickness and body shape. The smaller, inner region is part of the sympathetic nervous system, the body's first line of defense and response to physical and emotional stresses.



Why is a Laparoscopic Adrenalectomy done?

Adrenal glands usually need to be removed because they either have a tumor, are secreting too much of a particular hormone, or both. Once adrenal lesions are greater than 3 to 6 cm in diameter, the risk of malignancy increases to approximately 10% to 20%. Due to the increased cancer risk, patients should have them removed. All patients undergo biochemical testing of their blood and urine to determine if the adrenal glands are secreting too much of a particular hormone or if a tumor is secreting hormones. Baseline screening tests include a 24-hour urine for catecholamines and cortisol, as well as a serum aldosterone. All tumors that secrete hormones must be removed regardless of size. Benign tumors up to 15 cm or malignant tumors smaller than 8 cm can be removed safely using laparoscopic techniques. In addition, the following diagnoses can be treated using laparoscopic adrenalectomy: Cushing's Disease, adrenal adenoma, aldosteronoma, pheochromocytoma, leiomyoma, angiomyolipomas, adrenal cysts, and malignancies from other sites.

How is Laparoscopic Adrenalectomy performed?

Laparoscopic adrenalectomy involves the removal of the adrenal gland or glands through 3 or 4 incisions less than 1 cm each. A camera connected to a long, slender telescope is used for viewing inside the abdomen and long, slender instruments are used for performing the operation. These instruments are used to lift the pancreas and spleen allowing access to the adrenal gland. Clips are placed on the adrenal artery and vein and the adrenal gland is then dissected off of the kidney and removed. A small plastic bag is used to remove the gland through one of the small incisions in the abdominal wall.

In appropriate patients with smaller tumors, the adrenal gland can be removed using needlescopic techniques. These incisions are so small (less than 3 mm) there is virtually no scarring and very little pain which can usually be relieved with an over-the-counter analgesic.

What are the risks?

The risks unique to adrenalectomy include bleeding, infection, and conversion to open. These complications occur in less than 1% of patients treated laparoscopically. Other risks associated with surgery in general include pneumonia and blood clots, also occurring in less than 1% of patients.

What can the patient expect?

The operation takes about 1 to 2 hours. Most patients feel well enough to go home within 1 to 2 days and return to their normal activities within 2 weeks. Generally, patients can walk and start a regular diet a few hours after surgery. Pain is controlled with oral narcotic medications.

case studies

1: Bilateral Adrenal Masses

Case Overview

Our first case is a 42-year-old male who is HIV positive with hepatitis-C. He underwent a routine liver ultrasound for hepatoma screening. Bilateral adrenal masses were noted at the time of the liver ultrasound. Although he recently experienced a 10-pound weight gain, he did not have palpitations, flushing, tachycardia or diarrhea. In addition, there is no family history of endocrine disease.

Diagnostic Testing

CT scan and MRI confirmed the left mass was 10 cm in diameter and the right mass was 6 cm in diameter. The patient underwent a 24-hour urinary catecholamines, cortisol and aldosterone testing. These tests confirmed the tumors were not secreting excess hormones.

MRI of large bilateral adrenal tumors.

Treatment

Due to the large size of the tumors and the high risk of malignancy, bilateral laparoscopic adrenalectomy was recommended. The operation took 5 hours to complete.

Laparoscopic image of 10 cm left adrenal tumor.

Outcome

The patient tolerated the surgery well and was discharged home 3 days after his procedure. The tumors were found to be benign leiomyomas. Patient remains on long-term prednisone replacement therapy.

10 cm benign leiomyoma divided in half.

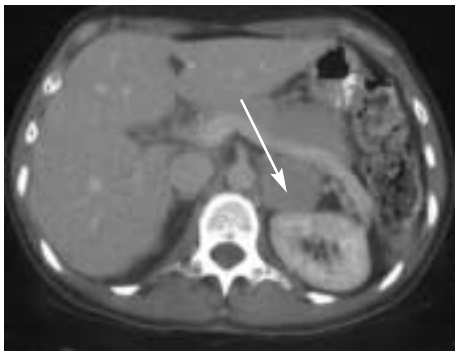
2: Left Adrenal Pheochromocytoma

Case Overview

Our next case is a 40-year-old woman who has been experiencing migraine headaches for the past 2 years. During a recent emergency room visit for treatment of her migraines, the patient's blood pressure was noted to be extremely elevated. She also reported palpitations and a rapid heart rate on several occasions over the past year.

Diagnostic Testing

She underwent 24-hour urinary catecholamines, cortisol, and aldosterone testing confirming the diagnosis of pheochromocytoma based on elevated catecholamines. A 6 cm left adrenal gland tumor was confirmed with abdominal CT scan and MRI.



CT scan of 6 cm left adrenal pheochromocytoma.

Treatment

Laparoscopic left adrenalectomy was recommended as the tumor was secreting excessive amounts of catecholamines and was the most probable cause of her symptoms. The procedure took $1^{1}/_{2}$ hours to complete.

Laparoscopic image of 6 cm left adrenal pheochromocytoma.

Outcome

She tolerated the procedure well and was discharged home 2 days after surgery. The tumor was a benign pheochromocytoma and her headaches and high blood pressure have since resolved.

3: Left Adrenal Incidentaloma

Case Overview

The third case reviews a 57-year-old woman with end-stage liver disease. During a routine liver CT scan she was noted to have an incidental 6 cm left adrenal tumor. The patient did not have palpitations, flushing, tachycardia, diarrhea or a family history of endocrine disease.

Diagnostic Testing

The patient underwent 24-hour urinary catecholamines, cortisol and aldosterone testing with normal results.

CT scan of 6 cm left adrenal tumor.

Treatment

Due to the adrenal tumor size, increased risk of malignancy, and suspicious characteristics as seen on CT scanning, a laparoscopic left adrenalectomy was recommended. The operation was completed in approximately 2 hours.

Outcome

The final pathology report showed the tumor to be a benign cortical adenoma.

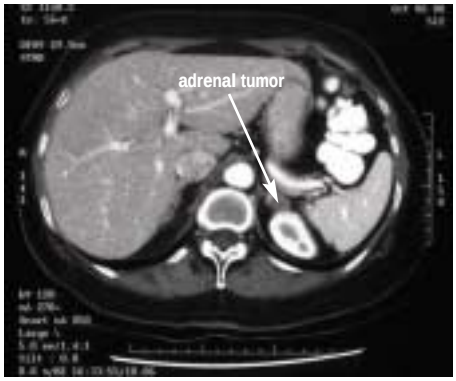
4: Left Adrenal Aldosteronoma (Conn's Syndrome)

Case Overview

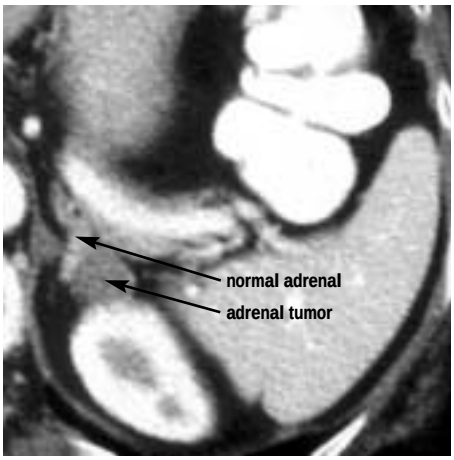
This case concerns a 63-year-old woman with a 3-year history of high blood pressure. She was noted to have persistently low potassium on laboratory testing. The patient did not have palpitations, flushing, tachycardia, diarrhea or a family history of endocrine disease.

Diagnostic Testing

She underwent 24-hour urinary catecholamines, cortisol and aldosterone testing in addition to an abdominal CT scan. The laboratory tests showed an elevated aldosterone level and CT scan revealed a 2 cm left adrenal tumor.



CT scan of small left aldosteronoma and normal adrenal.



Magnified view of CT scan of small left aldosteronoma and normal left adrenal.

Treatment

Laparoscopic left adrenalectomy was recommended due to tumor's secretion of aldosterone, contributing to the patient's hypertension and hypokalemia. The procedure took one hour to complete.

Outcome

The final pathology report showed the tumor to be a benign cortical aldosteronoma. Postoperatively, the patient's potassium returned to normal and she was able to discontinue her antihypertensive medications 2 months later.

5: Right Adrenal 10 cm Cyst

Case Overview

Our last case is a 30-year-old woman with 3-year history of mild hypertension developing shortly after the birth of her first child. She recently developed right back and flank pain over the past year. She did not have palpitations, flushing, tachycardia, diarrhea or a family history of endocrine disease.

CT scan showing 10 cm right adrenal mass.

Diagnostic Testing

The patient first underwent a right upper quadrant ultrasound revealing a 10 cm right adrenal mass. Subsequent to ultrasound, she underwent 24-hour urinary catecholamines, cortisol and a serum aldosterone testing with normal results. An abdominal CT scan confirmed the 10 cm mass adrenal mass.

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Laparoscopic Adrenalectomy

RIGHT ADRENAL 10 cm Cyst (continued)

Treatment

Due to the large tumor size and the possibility that the mass could be the source causing her right back and flank pain, a laparoscopic right adrenalectomy was recommended. The operation was completed in approximately 2 hours and the patient was discharged home after a 2-day inpatient hospital length of stay.

Outcome

The final pathology revealed a right adrenal cyst. Postoperatively her pain syndrome resolved and remarkably her hypertension resolved 2 months after surgery.

Patient referral and insurance coverage

Patients will need a referral from their primary care provider or physician specialist prior to scheduling their laparoscopic adrenalectomy surgical evaluation. Many pre-evaluation laboratory and radiological results can be forwarded to Dr. Jossart's office prior to consultation. These include abdominal ultrasound and the patient's most recent lab results.

Laparoscopic adrenalectomy is a surgical option covered by Medicare, Medi-Cal and most private insurance companies. In order to avoid unexpected medical expenses, it is always best for your patients to contact their insurance company prior to treatment to confirm coverage for this service and obtain prior authorization.

For more information

Please contact the Minimally Invasive Surgery Program

Gregg Jossart, M.D.
Director, Minimally Invasive Surgery,
Advanced Laparoscopic and
Endocrine Surgery
(415) 561–1310 *tel*
(415) 561–1713 *fax*
Email: jossarg@sutterhealth.org

2100 Webster Street, Suite 518
San Francisco, CA 94115
www.cpmc.org/lapsurg

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