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Indications

- Aldosteronoma
- Cortisol-secreting adenoma (Cushing's syndrome or subclinical Cushing)
- Pheochromocytoma (sporadic or familial)
- Virilizing or feminizing tumors
- Nonfunctioning unilateral tumor size >4 cm
- Adrenal nodule with imaging features atypical for adenoma, myelolipoma, or cyst
- Adrenocortical carcinoma
- Solitary unilateral adrenal metastasis

Essential Steps

1. Prepare the patient adequately (e.g., correct electrolyte abnormalities, control hypertension, preoperative alpha-blockade in pheochromocytoma, stress steroids in Cushing's disease).
2. Enter the abdomen through an extended right subcostal incision. Exposure for this approach may be facilitated by elevating the right flank using a roll under the right side.
3. Explore the abdomen.

4. Mobilize the triangular ligament of the liver and medial rotation of the right liver lobe to expose IVC.
5. Dissect the right border of the IVC.
6. Identify, dissect, and clip the right adrenal vein.
7. Dissect all the right suprarenal tissue, including the right adrenal gland and en bloc resection of retroperitoneal fat and any attached organ (liver, kidney, diaphragm) as needed to ensure complete tumor resection.

Note These Variations

- Large malignant tumors on the right may require en bloc resection of a liver segment (segment VIII) and even the kidney.
- Adrenal tumors should be removed along with a generous margin of retroperitoneal fat and Gerota's fascia.
- In cases of primary adrenal cortical malignancies, periaortic lymph nodes medial to the right renal hilum should be removed along with the tumor.

Complications

- Tumor rupture with spillage and seeding
- Injury to the right hepatic vein or IVC
- Bleeding from large raw surface in the retroperitoneum or from accessory lumbar veins

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- Right diaphragmatic injury leading to the pneumothorax
- Injury to renal hilar vessels

Template Operative Dictation

Preoperative Diagnosis List specific pathology indicating surgery (*see indications above*), e.g., *pheochromocytoma of the right adrenal gland*.

Procedure Open right adrenalectomy

Postoperative Diagnosis List specific intraoperative findings, e.g., *pheochromocytoma of right adrenal gland*.

Indications This ___-year-old *male/female* patient was found to have a *specific diagnosis of right adrenal gland pathology*. Preoperative biochemical workup showed evidence of (*list specific hormonal activity if present*). Imaging confirmed a ___ cm right adrenal lesion. The patient underwent preoperative preparation (*see point one of essential steps*) and is now presenting for elective right adrenalectomy. The indications, alternatives, risks, and benefits of the surgery were discussed with the patient and informed consent was obtained.

Details of Operation The patient was brought to the operating room and placed on the operating table in the supine position. Time-outs were performed using both preinduction and pre-incision safety checklist to verify correct patient, procedure, site, and additional critical information prior to beginning the procedure. Intravenous antibiotic and subcutaneous heparin were administered. After induction of general endotracheal anesthesia, a Foley catheter was inserted. A roll (or beanbag) was placed under the patient's right flank to allow slight medial rotation of the right side. All extremities were well padded. The abdomen was clipped and prepped in the usual sterile fashion.

The abdomen was approached via a standard extended subcostal incision. The skin was incised

two fingerbreadths below the right costal margin starting from the mid-axillary line and extending to the midline. The incision was deepened through the skin and subcutaneous tissue. Scarpa's fascia was opened and the incision taken down to the level of the abdominal wall. The anterior rectus sheath was opened and the right rectus muscle was split using electrocautery with control of the epigastric vessels. The posterior rectus sheath was also divided. Using electrocautery, the lateral abdominal wall musculature was divided. The external, internal, and transversalis fascia were divided using electrocautery.

Exploration of the abdominal cavity was then carried out to rule out evidence of metastatic disease. The procedure was started by mobilizing the triangular ligament of the liver and rotating the right hepatic lobe medially to allow exposure of the IVC and of the adrenal gland in the retroperitoneum. Dissection of the right border of the IVC was then carried out by incising the peritoneal reflection overlying the suprarenal lodge along the right border of the IVC all the way up to the diaphragm. Care was taken not to injure the right hepatic vein. Gentle dissection along the right border of the IVC led to the identification of the right adrenal vein which was then ligated and divided. The dissection along the right border of the IVC was then carried further posteriorly until reaching the quadratus lumborum muscle and then inferiorly until reaching the right renal hilum.

The right suprarenal lodge was then dissected and removed as one block. Using *electrocautery/energy device*, the retroperitoneal fat of the right suprarenal lodge was elevated off the superior pole of the right kidney and gently dissected off the lateral abdominal wall, posteriorly off the right quadratus lumborum muscle, and superiorly off the diaphragm. The arterial supply of the right adrenal gland was controlled and divided as it was encountered along this dissection. (*It usually consists of three main arterial branches, from the right renal artery, the aorta, and the right phrenic artery.*) Care was taken not to injure any accessory right renal arteries that may easily be confounded for adrenal arterial branches originating from the renal artery. Care was also taken to

avoid injury to the capsule of the adrenal gland. *If cancer: An en bloc dissection of the para-aortic nodes was also carried out as part of the medial extent of the dissection of the suprarenal tissue. The specimen is then removed en bloc (when indicated for ACC).*

Irrigation of the suprarenal region was carried out and confirmation of hemostasis was achieved. The right lobe of the liver was then allowed to return back to its normal anatomical position.

Closure of the abdomen in layers was then carried out using a running 0 PDS/ ___ stitch. The patient tolerated the procedure well. There were no complications and the blood loss was minimal. The instrument and sponge count was correct. A debriefing checklist was completed to share information critical to postoperative care of the patient. The patient was extubated and returned to the recovery room in stable satisfactory condition.