



LAPAROSCOPIC ADRENALECTOMY –DOES SIZE OF TUMOR MATTERS

Urology

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ABSTRACT

Laparoscopic adrenalectomy has become the gold standard for the surgical treatment of most adrenal conditions.. In this a retrospective study, we divided patients into two groups according to tumour size: < 5 or ≥ 5 cm, which was considered as the definition of large adrenal tumours. We compared demographic data and per- and postoperative outcomes. There was no difference between the two groups for per-operative complications , postoperative complications, postoperative length of hospital stay,mortality or oncologic outcomes. Laparoscopic adrenalectomy can be done for all patients with adrenal tumours regardless of tumour size, even it needs more time for large tumour but appears to be safe and feasible when performed by experienced surgeons.

KEYWORDS

Laparoscopic adrenalectomy, minimally invasive approach, oncologic outcomes

INTRODUCTION

Adrenalectomy is the standard treatment for adrenal gland disorders such as secretory tumors .Laparoscopic adrenalectomy has become the preferred technique due to quick recovery, short hospital stay, less pain and better cosmetics since its introduction in 1992 [1]. The main debate in the literature involves the surgical management of patients with large adrenal tumours. Although many studies have shown that large tumours are no longer a contraindication for laparoscopic adrenalectomy [2, 3] some authors reported laparoscopic approach for large tumours is not feasible due to the increased risk of malignancy, especially for the tumours that show infiltration to surrounding structures on computerized tomography (CT), which can also bring other risks as peritoneal dissemination or port site recurrence [4]. Based on our experience, we have been favouring laparoscopic approach in patients with adrenal tumours regardless of tumour size. The aim of this study was to evaluate the safety and efficacy of laparoscopy for large adrenal tumours by comparing the outcomes of laparoscopic adrenalectomy for tumours larger than 5 cm with those smaller than 5 cm.

From 2008 to 2018, we retrospectively evaluated 29 cases of adrenal diseases who underwent laparoscopic adrenalectomy.

METHOD

The patients are initially evaluated in OPD and then admitted for surgery. On admission a detailed history is taken from the patient including the presenting complaints, duration of complaints, past history especially with reference to previous surgery and any other associated conditions such as chronic ailment and any drug intake. General physical examination is done followed by systemic examination and a thorough abdominal and rectal examination.

Each patient is fully investigated to confirm the diagnosis and to rule out associated syndromes. Each patient and his attendants is fully explained about the nature of the procedure in the language which they understand and a written consent is taken from the patient before surgery. Patient should also be informed about the possible complications of the procedure.

The patient's age, sex, and other demographic features, anthropometry, underlying comorbid conditions, and relevant family history is be recorded.Clinical data and parameters like systolic/diastolic BP, heart rate, body temperature, and respiratory rate are noted. The presenting clinical features of the adrenal tumor and any treatment received for it prior to hospitalization should be recorded.

A complete blood count, microscopic examination of urine, blood chemistry including liver and kidney function tests, albumin, calcium, lactate dehydrogenase and random &/or fasting plasma glucose levels, chest radiograph, and 12 lead electrocardiogram should be obtained in all patients at admission and at subsequent times as required.

All patients need to be evaluated by physician and endocrinologist

preoperatively for workup. Endocrine workup should depend on the type of adrenal tumor suspected and should be done as per standard practice. The screening protocol in suspected pheochromocytoma will include measurement of urinary catecholamines metabolites (VMA).

The workup for adrenal cortical tumors will include dexamethasone suppression tests (DST), while for suspected aldosteronoma, a plasma-renin ration should be done. Patients with elevated catecholamine levels or a history of a prior radiographic abnormality in the adrenals should further be evaluated by imaging with CT or MRI. Patients who have elevated urinary VMA levels and a grossly visible pheochromocytoma on radiographic imaging are recommended for adrenalectomy.

Preparation for surgery pharmacologically is established by administration of α -receptor blockade. Beta-blockade will be added only after adequate α -receptor blockade. For patients with a unilateral tumor and no grossly visible disease in the contralateral adrenal, a unilateral approach to adrenalectomy will be undertaken. Laparoscopic adrenalectomy be carried out using a transabdominal lateral approach preferably.

Left adrenalectomy

We generally use three 5-mm working ports and one 10-mm camera port for left-sided procedures.The first 10-mm port is inserted in the umbilicus or at the lateral border of the rectus abdominal muscle just above the level of the umbilicus for the camera. Two subcostal 5-mm ports placed one in the midclavicular line and the other in the lateral border of the rectus abdominal muscle. The third 5-mm subcostal trocar is inserted in the anterior axillary line.

The initiation of the left adrenalectomy requires incising along the white line of Toldt from the splenic flexure to the sigmoid junction to allow mobilization of the left colon. The descending colon is reflected medially and subsequent division of the phrenocolic and splenorenal ligaments allows the colon to fall away out of the visual field. Dissection is carried out between the Gerota's fascia and the mesocolon. Dissection in this plane will facilitate access to the renal and adrenal vein. The retractor is used to retract the kidney laterally, correct identification of the vasculature must be confirmed prior to isolation and clipping of the adrenal vein. The inferior dissection is performed after the adrenal vein has been controlled. Bipolar diathermy is adequate to control the left adrenal vein before it is divided by endoshears or the ultrasonic shears. Dissection is carried out just superior to the renal vein until the post abdominal wall is identified. Hilar lymphatics of the kidney are avoided unless adrenocortical carcinoma is suspected. Care is taken not to injure branches of the renal artery. Attempts are made to leave periadrenal fat surrounding the gland, to ensure a complete and wide excision of the adrenal gland. This technique allows the surgeon to manipulate the tissue without directly grasping the adrenal, avoiding annoying bleeding. Once the inferior dissection is complete the medial dissection is carried out from the renal vein in a cephalad direction. The medial border for this dissection is the crus of the diaphragm overlying

the suprarenal aorta. The lateral dissection is in a plane extending between the renal cortex and the perinephric fat adjacent to the adrenal gland.

This region is usually avascular, but care must be taken to avoid upper pole renal vessels. The superior dissection is the last step before the adrenal gland is free within the abdomen along with periadrenal fat. The left inferior phrenic vein is generally present during the superior dissection and must be carefully identified and divided to avoid troublesome bleeding. The dissected gland is placed in an Endopouch that is inserted through the camera port.

Right adrenalectomy

Five ports are used for right-sided procedures. The trocars are placed in a mirror image to the left side with the addition of a 5mm in the epigastrium for liver retraction. The epigastric trocar is inserted just to the left of the midline in relation to the lower edge of the liver, so that it does not interfere with the right-handed instrument and trocar. The first step is division of the triangular ligament and careful cephalad retraction of the liver using a locking grasper that is inserted through the epigastric trocar. The grasper holds a fold of the peritoneum or the diaphragm on the lateral abdominal wall, and retracts the liver.

Unlike the left side, the colon rarely requires significant mobilization. At this point, the subhepatic inferior vena cava (IVC) should be identified, lateral and posterior to the gall bladder. This phase can be difficult in obese patients or those with Cushing's syndrome where excess adipose tissue is present.

The peritoneum along the lateral aspect of the IVC is incised to expose the IVC just below its intrahepatic course. The duodenum often needs to be mobilized to expose the IVC.

Dissection is next carried inferiorly by incising the peritoneum along the lateral edge of the vena cava to the superior edge of the renal vein. Further dissection extends posteriorly, bordering the superior aspect of the renal vein, for the inferior adrenal dissection. The posterior abdominal wall is encountered, ensuring that the renal artery or its branches are safeguarded.

The inferior adrenal gland and periadrenal tissue is retracted laterally with the PEER retractor, as the medial dissection is performed in a cephalad direction. The dissection proceeds superiorly just lateral to the cava until the short right adrenal vein is identified its divided. Dissection of the gland is subsequently carried out with care taken at the medial aspect where the wall of the IVC closely approximates the adrenal. The adrenal may extend posterior to the cava and this dissection is completed by following the wall of the cava and gentle medial retraction of the IVC. Once the medial dissection is completed, the lateral dissection is performed just as described for the left adrenalectomy. Once complete mobilization is accomplished and hemostasis is achieved, the specimen is removed with the EndoPouch

RESULTS

Our series consisted of 29 patients, 17 women and 12 men, with a mean age of 32.6 years (Range 8-48 years), who underwent Laparoscopic adrenalectomy between 2008 and 2018. Comparison of outcome between small and large tumors was done. Comparing the two groups of patients, we found that the mean operative time was longer in the large-tumour group, conversion rate was same in both group, per-operative complications like Per operative hypertension, Hypoglycemia, Minor liver or spleen tears, Bleeding, cardiovascular events (myocardial infarction or cerebrovascular accident) were compared in both groups in both groups 1 per operative complications was found, post operative complications was also same in both groups, oncologic outcomes in form of recurrence, peritoneal dissemination, metastasis and malignancy was compared.

Comparasion of outcomes between small and large adrenal tumors

Variables	Small tumor <5 cm	Large tumor > 5cm
Number of patients	13	16
Per operative complications	1	1
Conversion, n	1	1
Mean operative time, min	160	180
Post-operative complications, n	1	1

Median (range) post-operative stay, days	4	4
Oncologic outcomes	1	1

CONCLUSIONS

Laparoscopic adrenalectomy can be done for all patients with adrenal tumours regardless of tumour size, even it needs more time for large tumour but appears to be safe and feasible when performed by experienced surgeons.

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