Original Research Paper

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Urology

EVALUATION AND SURGICAL MANAGEMENT OF ADRENAL MASS: AN INSTITUTIONAL EXPERIENCE

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ABSTRACT **Introduction:** The widespread use of abdominal imaging has led to increased detection of adrenal tumors. Radiological evaluation by CT or MRI provides useful parameters to identify malignant lesions. Surgery is indicated for masses that are larger than 5 cm in diameter or suspected of malignancy. Fine-needle aspiration biopsy should be used when other extra-adrenal malignancies are suspected and after pheochromocytoma has been ruled out. We share our experience in evaluation and treatment of four cases of adrenal mass. **Methods:** Based on our institutional experience, we observed diagnostic, evaluation, and management options for treating adrenal masses. **Results:** The case series included 4 patients that underwent surgery for adrenal gland tumor. The surgical technique performed was the laparoscopic trans-peritoneal approach in 2 cases and the open retroperitoneal approach for 2 patients. In all the 4 cases tumor was seen arising from right adrenal. **Conclusions:** Careful analysis of each adrenal mass is essential to effectively avoid potential problems. Guidelines to manage patients with adrenal masses are needed.

KEYWORDS : Adrenal mass, Transperitoneal, Pheochromocytoma, Retroperitoneal

INTRODUCTION

Adrenal tumors are predominantly solid tumors. An incidentally discovered solid adrenal tumor is to be investigated in order to determine its origin, its hormonal status and the possibility of it harboring neoplasia. Adrenalectomy is indicated considering the functional status and malignancy suspicion (1). The clinician involved in the management of incidentaloma has to be well trained in differential diagnosis, treatment and follow-up of these patients (2). The majority of incidentally detected adrenal lesions are benign and nonfunctional (nonsecreting) adrenal adenomas. Adrenal gland cysts are benign lesions, with a suspicion of malignancy, with a predominantly unilateral and up to 15% bilateral localization. Most tumors are asymptomatic, nonfunctional and present with abdominal pain as the most common symptom (3). Cushing's syndrome is associated with the presence of adrenal adenomas in up to 15% of the cases and a multidisciplinary approach is required for an adequate management of these patients (4). Pheochromocytomas are tumors originating in medullar chromaffine-cells secreting catecholamines, thus necessitating preoperative α-blockade and surgical treatment is associated with blood pressure normalization and symptom remission (5). Almost up to 7% of the identified incidentalomas are proven to be pheochromocytomas and CT characterization or biochemical testing can be useful in their identification (6). Adrenal carcinomas are highly malignant tumors with origin in the adrenal cortex, discovered due to signs of secondary hormone excess synthesis, abdominal pain and local compression (7). Myelolipomas are rare , benign , metabolically silent lesions but may be associated with metabolically active adenomas or pheochromocytomas

IMAGING AND SIZE OF ADRENAL MASS: Adrenal incidentalomas are most commonly found on abdominal ultrasound, CT, or MRI, with an incidence of approximately 5%. CT, or MRI form the cornerstones for further characterization and evaluation for such adrenal masses. A homogenous mass with smooth borders , attenuation of <10 HU on unenhanced CT is strongly suggestive of a lipid-rich benign adrenal adenoma. The low attenuation on unenhanced CT corresponds to high intracytoplasmic lipid content. Overall, 98% of adrenal lesions with 10 HU on noncontrast CT are benign adrenal adenomas; Attenuation alone is not diagnostic because 15–30% of adrenal adenomas are lipid poor and thus may be interpreted as malignant [8]. On delayed contrast-enhanced CT, adrenal adenomas exhibit rapid washout of the intravenous contrast [8,9]. In comparison to CT, however, contrast-enhanced MRI with gadolinium washout studies does not appear to exhibit the same diagnostic strength as its CT counterpart. Consequently, CT washout studies remain the gold standard, especially in the evaluation of lipid-poor adenomas [8,10].

METHODS

Four cases(n=4) of adrenal mass were evaluated and operated in a single centre. Radiological Imaging for tumor characterization and evaluation of the malignancy suspicion relied on abdominal computed tomography (CT scan) and/or magnetic resonance imaging (MRI). Metaboloic workup and functional status evaluation was done in all cases in the form of serum cortisol, 24 hour urinary metanephrines and vinylmandelic acid (VMA). Prior to surgery, each patient signed an informed consent agreeing to the proposed surgical treatment, knowing all the other treatment possibilities and having been presented all the intraoperative and postoperative risks.

RESULTS AND OBSERVATION

The case series included 4(n=4) patients that underwent surgery for adrenal gland tumor (Table 1). Two of the patients were women (n=2) and an average age of 40.5 years (34-56 years). The surgical technique performed was the laparoscopic trans-peritoneal approach in 2 cases and the open retroperitoneal approach for 2 patients. In all the 4 cases tumor was seen arising from right adrenal. Two cases were asymptomatic, and the mass was incidentally detected. Other two cases were evaluated for right loin pain. Metabolic workup of all four cases suggested non-functional tumor. One 56 yr female was hypertensive, controlled with single drugs. No comorbidities for other cases.

Table1

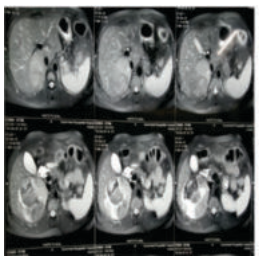
Case	Age (yrs)	Sex	Side	Size (cms)	Symptoms	Metabolic workup	CT impression	Surgery(open/lap)	HPE	Hospital stay
1	35	M	R	15.3x9 x 10	Rt loin pain	wnl	Myeolipoma	open	Myeolipoma	7
2	56	F	R	4.8x9x 6.6	asymptomatic	wnl	Myeolipoma	lap	Myeolipoma	5
3	37	M	R	5x4	Rt loin pain	wnl	Fat ensity lesion	lap	Myeolipoma	5
4	34	F	R	10.8x8.5x7.0	asymptomatic	wnl	Myeolipoma	open	Myeolipoma	8

Open adrenalectomy was done by retroperitoneal approach and lap-adrenalectomy was done by transperitoneal approach. A tube drain was placed in all cases which was removed on POD 3 in all 4 cases. Both the lap cases were discharged on POD 5 and open cases on POD 7 and 8 . Mean hospital stay was 6.25 days. Patients were followed up for 12 weeks and no immediate or delayed complication were noted.

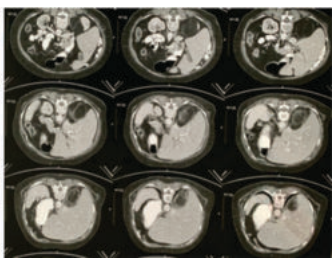
DISCUSSION

Adrenal tumors are common findings, with a reported CT scan incidence of 4%. The indication for surgical resection of adrenal tumors is based on the following criteria: hormone secretion, suspected or biopsy-proven malignancy and large tumor size - between 4 and 6 centimeters with cortical cancer suspicion - or symptoms generated by tumor size (11). The laparoscopic transabdominal

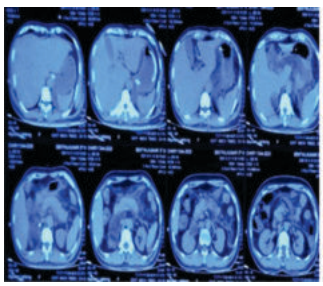
approach is an easier technique because it offers a better view of the abdominal anatomy and allows the resection of large tumors. The retroperitoneoscopic approach avoids intraabdominal organs and ensures a direct accessibility to the gland (12). In our series open procedure was done using the retroperitoneal approach And laparoscopic resection by transperitoneal approach , team being more familiarized with this technique. In the surgical literature, the size threshold for resection varies from 3—6 cm [1,3]. A lower threshold of 3 cm is recommended for younger patients with no other contraindications, while a 4-5 cm criterion is applied to older patients, particularly since CT typically underestimates the diameter of incidentalomas [1]. For simple adrenal cysts or myelolipomas, surgery is indicated only when the diameter exceeds 8—10 cm with resultant local symptoms [1]. Minimally invasive surgery is contraindicated in adrenal neoplasia due to the risk of capsular disruption, incomplete resection or tumor fragmentation with a high risk of local recurrence and distant metastasis (8). Taffurelli et al. showed in their study that open adrenalectomy is performed in almost 46% of the cases and is indicated in patients with absolute contraindications for laparoscopic resection, such as severe coagulopathies, cardiac disease or intracranial hypertension (9). In adrenal tumors larger than 5 cm diameter, the conversion rate may vary from 4 to 16%; a tumor size of more than 5.5 cm is considered to be an independent risk factor for conversion from laparoscopic to open surgery (8). In our study, patients with tumors even larger than 5 cm were operated through a minimally invasive approach (2 cases). We report nil conversion rate in our cohort. The proportion of open surgery in our study (n=4, 50%) is more than the percentage reported by Taffurelli et al. Adrenal tumors of large size pose difficulties for laparoscopic resection because of the risk of capsular effraction which increases the risk of locoregional recurrence [10,11]. This controversy has become less of an issue as specialized teams have gained experience and skill [10]. Even the definition of what constitutes "large size" has evolved with this learning curve. In the first publications in 1992, a tumor diameter of more than 4 cm was considered "large". At the present time, the threshold of what is judged "large" varies from 5 to 10 cm in different services with a consensus of 6 cm [10]. A tumor diameter more than 6 cm is therefore not an absolute contraindication to the laparoscopic approach.



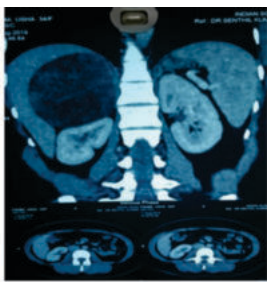
Case 1



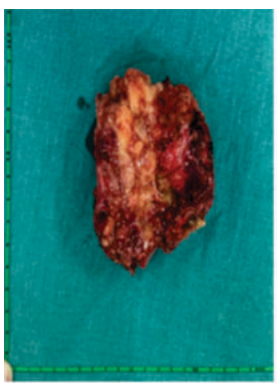
Case 2



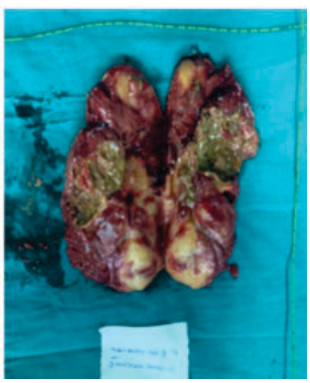
Post op specimen



Post op specimen 1



Case 3



Case 4

CONCLUSION

In conclusion, the laparoscopic approach represents the gold standard in adrenal tumors and the patients should be treated in specialized centers, by multidisciplinary teams. It is recommended that LS being preferred in primary adrenal tumors less than 5 centimeters in size. Adrenalectomy is mostly performed by LS and LS has a significantly reduced overall and postoperative length of stay.

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