ORIGINAL ARTICLE

Adrenal Tumors Clinical Presentation, Surgical Treatment and outcome

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ABSTRACT

Aim: To study the presentation, surgical treatment and outcome of patients with adrenal masses.
Methods: This is retrospective study of 15 patients who underwent adrenalectomy at Shaikh Zayed Hospital Postgraduate Medical Institute, Department of Urology over a period of six years between January 2006 to December 2011. In all cases adrenalectomy performed through open transabdominal approach.
Results: Among 15 cases there were 4(27%) males and 11(73%) were females. Nine (60%) patients presented with hypertension in, 4(27%) patients adrenal masse detected incidentally. Two patients (13%) presented with flank pain and flank mass. In all patients adrenalectomy performed through transabdominal approach employing chevron incision. Eleven (73%) patients had pheochromocytoma, 4(27%) had adrenocortical carcinoma. Hypertension cured in 9 (67%) and persisted in 1(7%). Colonic injury in 1 7%), wound infection 1 patient (7%) and pleural effusion occurred in 1 patient (7%).
Conclusion: Most of the pheochromocytoma presented with hypertension and raised urinary catecholamines and were surgically curable. Adrenal carcinoma in general carries poor prognosis. Transperitonael adrenalectomy provides safe and effective surgical treatment for large and bilateral adrenal tumors at lesser with experience in such surgery
Keywords: Adrenal tumours, pheochromocytoms, catecholamines

INTRODUCTION

Adrenal masses include functioning or non-functioning adrenal adenomas, adrenal carcinoma and metastases. Adrenal masses larger than 6 cm are almost always malignant.[1] Compared to renal cell carcinoma (RCC), large adrenal masses, especially those associated with tumor thrombus extending into the inferior vena cava (IVC) are rarely seen.[2] Similar to surgical management of renal carcinoma, complete surgical extirpation of the primary adrenal mass with the vena caval tumor thrombus is the mainstay of treatment, which improves survival.[3] However; this surgery is associated with significant morbidity and mortality.

In recent years, laparoscopic adrenalectomy (L-ADX) ha been promoted as being superior to traditional adrenalectomy, using either a transabdominal (TA-ADX) or a retroperitoneal (RP-ADX) approach. Although the operation time is still longer, post-operative pain and hospital stay are less than with any open technique. However, L-ADX is a less suitable technique for large and/or malignant adrenal lesions and its morbidity and mortality have not been evaluated in large series.[4]

Before the advent of laparoscopic adrenalectomy earlier reports comparing the open retroperitoneal with the open transabdominal approach have stated that an important disadvantage of the retroperitoneal approach was the impossibility of exploring beyond the ipsilateral adreanal gland. This has been considered a major drawback for the use of open retroperitoneal approach in the treatment of adrenal cancer and pheochromocytoma. However, improved pre-operative localization techniques have practically eliminated this disadvantage as they allow for pre-operative assessment of local and distant disease in both malignancy and pheochromocytoma. Until the recent advent of laparoscopic adrenalectomy, the open retroperitoneal approach had become the preferred approach for benign adrenocortical lesions because of its shorter operation time, lower blood loss, less post-operative stay[5,6] The transabdominal approach was reserved for pheochromocytoma or malignant adrenocortical disease as this approach permits wide exposure for “en bloc” excision in the case of malignant tumours, and allow exploration of the contralateral adrenal gland and extraadrenal sties in the case of pheochromocytoma[7,8]

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PATIENTS & METHODS

This is retrospective view of fifteen consecutive patients who underwent adrenalectomy in Urology Department Shaikh Zayed Postgraduate Medical Institute Lahore. In five years between January 2006 to December 2011. The clinical record of all the patients were retrieved and reviewed. Pre-op extensive work up was done in all patients including biochemical as well as radiological investigations. In biochemical work up 24 hour urinary VMA & catecholamine, cortisol and serum electrolytes were done. In radiological investigation CT scan abdomin and Pelvis with contrast were done.

All the patients were admitted one week before surgery in hospital to monitor blood pressure, blood sugar and for stabilization preoperatively before surgery. Blood pressure was controlled with alpha blockers drugs. Beta blocker drugs were also added when required.

Glycemic control was achieved with regular insulin. Insulin and blood sugar chart maintained. Good pre operative, intraoperative as well as postoperative hydration was maintained in co-ordination with anesthesia and

cardiology department. Adrenalectomies either unilateral (right or left sided only) were preformed using transperitoneal approaches. In all were approaches through extended chevron incision. Adreanlectmies were in addition subdivided into unilaterally (right or left sided) and simple verses adrenalectomies that were combined with other procedures. Biopsy reports were reviewed in all patients. Short term outcomes were assessed for 3 months in OPD for close follow up.

RESULTS

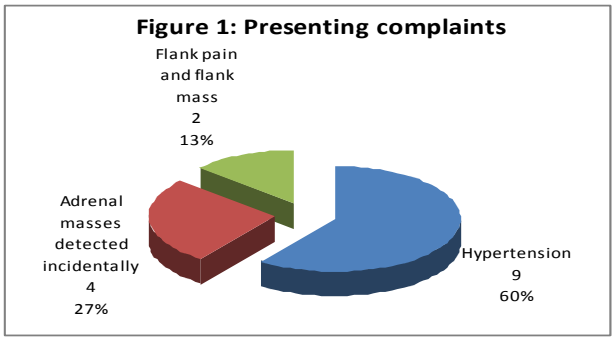
Among 15 patients there were 4 (27%) males and 11 (73%) females. The sex ratio (female to male) was 2.75:1 (Table 1). Mean age at diagnosis was 37.4 years (range 22-65 years). We found that 9 (60%) patients had hypertension, 4 (27%) had adrenal masses detected incidentally when work up was done for other reasons and among them 2 (13%) were found to be hypertensive as well. Two patients (13%) presented with flank pain and flank mass (Figure 1). Eight (53%) patients had tumor on left side, 6 (40%) on right and 1 patient (7%) had bilateral tumors. Ten patients (67%) had hypersecreting tumors (9 catecholamines and 1 cortisol) and 5 (33%) were non-secreting. Mean tumor size was 8.52±2.77cm (range 5-15cm). All patients underwent adrenalectomy through open transabdominal approach. Colonic injury occurred in 1 patient (7%), pleural effusion postoperatively in 1 patient (7%), Wound infection in 1 patient (7%) (Figure 2). Biopsy showed that 11 (73%) patients had pheochromocytoma, 4 (27%) had adrenocortical carcinoma (Table 2). In 10 (67%) patients hypertension was cured and persisted in 1 (7%). Two patients (13%) with adrenal carcinoma died within 1st year, one due to distant metastasis at presentation and other developed local recurrence.

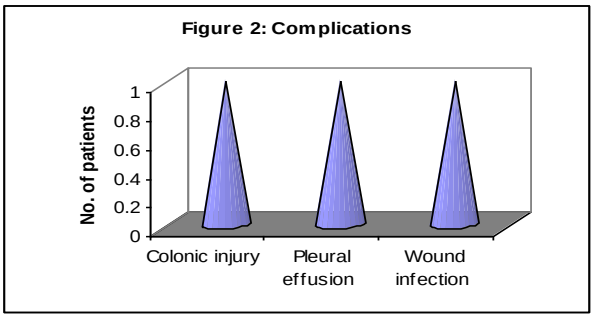
Table 1: Sex distribution of patients (n=15)

Sex	=n	%age
Male	4	27.0
Female	11	73.0

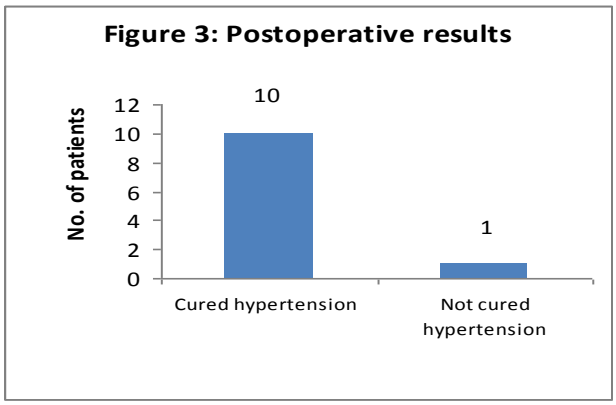
Table 2: Biopsy findings (n=15)

Biopsy findings	=n	%age
Adrenocortical carcinoma	4	27.0
Pheochromocytoma	11	73.0





In all patients hypertension cured postoperatively except in one patient (Figure 3).



DISCUSSION

Adrenal tumors are among the most common endocrine neoplasm in humans. However only small proportion of these tumors causes endocrine manifestations and less than 1% are malignant.[9] Endocrine manifestations are due to secretion of hormones native to adrenal gland. The principle hormones secreted by adrenal gland are adrenaline, aldosterone, cortisol and androgens. An open surgical approach through posterior, anterior transabdominal, thoracoabdominal route was considered as gold standard for adrenal surgery until 1990. The choice depends upon pathology, size of tumor, morphology of the patient and expertise available.[10] World wide laparoscopic adrenalectomy is increasingly being performed day by day for small adrenal tumors. When retrospectively compared to open surgery, laparoscopic resection employing the transperitoneal or retroperitoneal approach is superior in terms of postoperative pain, hospital stay, return to normal activity and morbidity[11,12]. Open surgical approach still recommended in tumors greater than 8 to 10 cm in diameter, adrenocortical carcinomas, ganglioneuromas of adrenal origin[4].

This study highlights the audit of open adrenalectomy carried out at Department of Urology Shaikh Zayed Hospital Lahore over period of six years between January 2006 to December 2011. Mean age was 37.4±13.94 years and female preponderance (F:M 2.75:1) similar to regional and international experience.[5] Hypertension was the commonest clinical presentation and was seen in 60% of the cases. This incidence has also been reported in most western studies[13]. With increasing use of radiological

diagnostic modalities (USG, CT, MRI) clinically silent adrenal tumors (incidentalomas) are being diagnosed. The older studies reported prevalence of incidenatalomas ranging from 1 to 10%.[14] However certain new series are reporting incidental diagnosis of adrenal tumors in up to 71% of cases.[15] In our study prevalence of incidental tumors was 26%. Pheochromocytoma was most common pathology seen in 73% of these cases, adrenocortical carcinomas 27% which is high as compared to other reported series. In a study done by Suresh et al incidence of adrenocortical carcinoma was 13%.[4] The simple screening test of respective hormones and their metabolites in urine and serum samples were diagnostic in 81.1% of cases. CT scan was able to localize tumor in 100% cases. The over all sensitivity of CT scan for detecting adrenal masses has been reported in 94 to 100 % cases in literature.[16] CT scan may be recommended as the initial modality of choice in localizing adrenal neoplasms.[17] In all patients in our study adrenalectomy was performed through open transabdominal approach by roof top incision. Mean size of tumor removed in our series was 8.52±2.77cm. One patient (6.66%) had intraoperative colonic injury during the procedure for huge left adrenal tumor which later turned out adrenocortical cancer. There are reports of intraoperative viscous injury during surgery for huge adrenal tumors in literature[18,19]. Incidence of periopertaive complication in our study was wound infection (7%), pleural effusion (7%). Reported incidence of wound problems is 9% and pulmonary problems is 8% by Bonjer et al.[20] There was no operative mortality which emphasizes the need for extensive periopertaive care at specialized centers for adrenal surgery. Two patients (13%) died in year 1, one had liver metastases and one developed local recurrence and lung metastasis.

In follow up of 3 months hypertension was cured in 67% of these cases. In a study done by Saleh hypertension was cured in 57.1% of the patients. In another study done Spleinza hypertension cured in 46% of cases[21]. This disparity may be explained by small sample size of our series.

CONCLUSION

The adrenal tumors are one the rare and challenging surgical problems. The accurate diagnosis and localization can usually be done by screening for adrenal hormones or their metabolites in urine and CT scan. Adrenal surgery can be safely performed at centers who have experience of such surgical procedures.

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