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Original Article

Results of surgery versus conservative follow up of adrenal incidentaloma

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Abstract

Aim: The incidence of adrenal incidentaloma has increased recently due to increased magnetic resonance imaging (MRI), computed tomography scans (CT) and ultrasonography (USG). In our study, we aimed to demonstrate our radiologic, hormonal and clinical follow up of adrenal incidentaloma

Material and methods: We retrospectively reviewed 276 patients with adrenal incidentaloma and excluded 73 of them. We collected the data of demographic findings, size, hormonal activity of the mass and malignancy.

Results: Between 2007-2016 we diagnosed 203 adrenal incidentaloma patients in our clinic. The mean size of the tumors was 22,7±10,8mm. 157 (77,3%) of them were non-functional. We diagnosed 21 (10,3%) tumors with autonomous cortisol secretion, 9 (4,4%) cushing syndrome, 5 (2,5%) pheochromocytoma, 9 (4,4%) primary aldosteronism, 2 (1%) adrenocortical carcinoma. We suggested surgery to patients with 15 functional, 13 non-functional incidentaloma and 2 incidentaloma with suspicious malignancy. 21 cases preferred to undergo adrenalectomy and 12 of them had retroperitoneal laparoscopic adrenalectomy. During their routine follow up there was not any change in size of the tumors (p:0,12).

Conclusion: The incidence of non-functional adrenal incidentolama (%77,3) was similar to the literature (4-5-6). There was not any change in size of the tumors during 3,9 year follow up of the patients. Although we had limited number of patients, we showed that radiologic evolvement contributes to differentiation of benign and malign lesions. By this way, we could follow patients more conservatively.

Keywords: Adrenal İncidentaloma; Pheochromocytoma; Adrenocortical Carcinoma.

INTRODUCTION

The incidence of adrenal incidentaloma (AI) is increased recently due to increased imaging studies performed for reasons unrelated to adrenal pathology (1). Although most adrenal incidentalomas are non-functioning benign adenomas, their increasing prevalence presents diagnostic, therapeutic and surgical challenges. Adrenal incidentaloma is used for the discovered adrenal mass in imaging studies that are performed for reasons other than adrenal pathology. The prevelance of AI in autopsy series is in between 1.4-15% and increases with age. Usually AI is smaller than 1cm and seen in older population. Pathophysiologically AI is assumed to develop due to compensatory regeneration following ischemia in atherosclerotic, diabetic and hypertensive patients (2). Although most adrenal incidentalomas are non-functioning, small portion of AI cause serious hormonal changes and 1/4000 AI is reported to be malignant (3).

All patients with AI should be evaluated for the hormonal activity of the lesion and differential diagnosis of benign and malign lesion. This evaluation will help for treatment strategy. If the patient has sypmtoms and findings of hormonal hyperfunction and these are proved by biochemical tests, than surgery should be the choice of the therapy. However, medical therapy may be more appropriate in some of the situations. Besides differential diagnosis of benign and malign lesions, is important for further treatment and follow up. The likelihood of an AI being an adrenal carcinoma is directly proportional to its size (1,4,5). Laparoscopic adrenalectomy can be relatively contraindicated in cases with invasive adrenocortical cancer (6,7). Mortality due to adrenal surgery is reported to be lower than 2%. In this study, we aimed to demonstrate our radiologic, hormonal and clinical follow up of adrenal incidentaloma.

MATERIALS and METHODS

Our incidentaloma cases are evaluated according to American Association of Clinical Endocrinologists and American Association of Endocrine Surgeons medical guidelines for the management of adrenal incidentalomas

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that is reported in 2009 (1). Between 2007-2016 we diagnosed 276 adrenal incidentaloma patients by imaging studies (MRI, CT, USG) and we retrospectively evaluated all of them and excluded 73 patients (26 patients with lesions other than adrenal tumors, 47 patients that refuser further evaluation). We collected the data of demographic findings, size, hormonal activity of mass and malignancy. For differential diagnosis we performed tests for hypersecretion; 1 mg overnight dexamethasone suppresion test, 24hr urinary catecholamines and/or plasma metaneprines, aldosterone-renin ratio.

RESULTS

We evaluated 203 adrenal insidentaloma cases that are diagnosed in 2007-2016 in our clinic. 139 women (68,5%), 64 men (31,5%) had AI with the mean age of 55,8 years. 95 AI (46,8%) were localised in the right adrenal, 76 AI (37,4%) were in the left and 32 AI (15,8%) were bilateral. The mean size of AI was 22,7±10,8 mm. We diagnosed 21 (10,3%) tumors with autonomous cortisol secretion, 9 (4,4%) cushing syndrome, 5 (2,5%) pheochromocytoma, 9 (4,4%) primary aldosteronism, 2 (1%) adrenocortical carcinoma. 157 (77,3%) of them were non-functional (Table1). The size of AI and plasma cortisol levels following 1mg overnight dexamethasone suppresion test had significant corelation (p<0.001 r=0.399). In patients that use oral contraseptives, plasma cortisol levels following 1mg overnight dexamethasone suppresion test (3,32µg/dl-0,97µg/dl p<0.001) and the mean size of AI was much more higher (33,1mm-21mm p<0.001). We suggested surgery to patients with 15 functional, 13 non-functional incidentaloma and 2 incidentaloma with suspicious malignancy. 21 cases preferred to undergo adrenalectomy (6 patients refused operation and 3 patients could not go under surgery due to co-morbidity). 12 of them had retroperitoneal laparoscopic adrenalectomy, 9 patients had open surgery due to size of the lesion, malignancy, co-morbid disease. We diagnosed 2 adrenocortical carcinoma, 5 pheochromocytoma, 14 adrenocortical adenoma. One of these patients had surgery due to increased size of the lesion and the pathology was reported as adrenocortical adenoma. One patient had wound enfection (8.3%) and managed with wound care. We had no mortality after surgery. None of the patients required replacement therapy after surgery and had no adrenal insufficieny in their follw up. Patients that did not go under surgery were followed by CT and MRI with 3-6 months periods. During their routine follow up there was not any change in hormonal activity or size of the tumors (p:0,12) (Table2). The size of adrenocortical carcinoma, and pheochromocytoma cases were significantly bigger than the other adenoma cases(p<0.001) (table 3). The size of primary aldosteronoma cases were significantly smaller than the other functional adenoma cases (p<0.001) (Table 3).

Table 1. Demographic findings of patients with incidentaloma

Age (mean, year)	55,8
Gender	
female (number,%)	139 (68,5)
male (number,%)	64(31,5)
BMI (kg/m2)	28,78±5,7
Location	
Right (number, %)	76 (37,4)
Left (number,%)	95(46,8)
Bilateral (number,,%)	32(15,8)
Size of the lesion (mm)	22,7±10,8
Hormonal state	
Non-functional (number,%)	157(77,3)
autonomous cortisol secretion (number,%)	21 (10,3)
pheochromocytoma (number,%)	5(2.5)
cushing syndrome (number,%)	9 (4,4)
primary aldosteronism (number,%)	9(4,4)
Adrenocortical carcinoma (number,%)	2 (1)
Follow up (year)	3,96±2,54
Excluded patients	
Myolipoma (number)	4
cyst (number)	6
Metastasis (number)	2
Surrenal thickening (number)	5
Bilateral hematoma (number)	1
Gastric diverticula (number)	1
USG positive, CT/MRI negative (number)	7
Unfollowed (number)	47

Table 2. Size follow up of adrenal incidentaloma in imaging studies

Follow up	1	2	3	4	5	p
	n=203	n=121	n=86	n=53	n=35	
size (mm±SD)	21,24±6,66	21,74±6,86	22,12±6,72	22,35±6,9	22,38±6,85	0.12

Table 3: Size of the functional adrenal incientaloma

	Non-functional	Oral contraceptive	Cushing syndrome	pheochromocytoma	Primary Aldosteronism	ACC n=2	ACC n=2
	n=0157	n=21	n=9	n=5	n=9		
size (mm±SD)	19,8±6,73	33,1±8,32	31,7±10,19	48±16,04	15,6±5,54	71,5±16,2	0,01

DISCUSSION

The incidence of non-functional adrenal incidentolama (%77,3) was similar to the literature (4-5-6). There was not any change in size of the tumors during 3,9 year follow up of the patients. It is reported in many studies that adrenal masses are detected in 0,6-1,4% of abdominal CT that are performed for different reasons (8). In many reports AI patients are in their six decades (1). The mean age (55,8 years) of our AI patients and the mean size of the AI (22,7±10,8 mm) in our study are similar with literature. Adenomas are reported to be 60% of AI (1), we diagnosed adenomas in 66,6% of AI. All patients with AI should be evaluated for the hormonal activity of the lesion and differential diagnosis of benign and malign lesion. This evaluation will help for treatment strategy. The survival after adrenocortical carcinoma is related with the size of the lesion. In large tumors 5 year survival is 16%. However, in smaller lesions with stage 1 and 2 carcinoma 5 year survival is 42%. The most effective treatment is early diagnosis and early curative resection of the lesion (9).

In our series, we diagnosed 2 adrenocortical carcinoma with a mean tumor size of 71 mm. Both of these patients had open adrenalectmoy and they are still alive with 52 and 13 months follow ups under mitotane therapy. We accepted the size cut-off of 4 cm as the indication for adrenal surgery. As it is reported in many studies that this size has 93% sensitivity in differential diagnosis of benign or malign lesions (1).

Although we had limited number of patients, we showed that radiologic evolvement contributes to differentiate benign and malign lesions. Also this thesis is supported in many studies that follow 6 cm adrenal lesions without surgery. In the light of the data, we started to follow patients more conservatively. According to our algorithm surgery should be applied in all functional tumors or tumors more than 6 cm in size. If the CT scans showed images with lower fat tissue, non-functional AI smaller than 3 cm can be followed up with 6 months period. If the CT scans showed images with higher fat tissue, non-functional AI smaller than 3cm can be followed up with more longer periods. Functional adrenal lesions smaller than 3 cm should be removed surgically. Patients under 50 years with 3-6 cm AI should undergo surgery. However, patients older than 50 years with 3-6 cm AI can be followed without surgery.

Conservative therapy protocols with regular radiological and biochemical evaluation can be safely applied in those patients with low risk. It is difficult to provide suggestions on the duration of follow-up, so there should be more controlled studies in this subject.

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