Adrenal Incidentalomas with Review of Literature

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Abstract

Adrenal incidentaloma is a mass lesion greater than 1 cm in diameter, serendipitously discovered by radiologic examination. The reported incidence of adrenal incidentalomas is between 4-6%. Majority of reported adrenal incidentalomas are adenomas (hormonally active/inactive), pheochromocytoma, adrenal carcinoma and metastatic carcinomas. We report three rare adrenal incidentalomas with brief review of literature. The three adrenal incidentalomas proved to be adrenal myelolipoma, adrenal pseudocyst and adrenal teratoma on histopathology. Pre-operative hormonal assessment and postoperative histopathological examination is required in all cases of adrenal incidentalomas to rule out malignancy.

Keywords: Adrenal gland; Incidentaloma; Myelolipoma; Pseudocyst; Teratoma

Introduction

Adrenal incidentaloma is a mass lesion greater than 1 cm in diameter, serendipitously discovered by radiologic examination [1]. The entity is the result of technological advances in imaging such as computed tomography (CT), magnetic resonance imaging (MRI) and their widespread use in clinical practice. Numerous autopsy studies have also added to the literature on adrenal incidentaloma. The reported incidence of adrenal incidentaloma is between 4% to 6% [1]. We report three rare non-functioning lesions of adrenal gland which were discovered incidentally on performing imaging studies for other with brief review of literature.

Case Reports

Case 1

A 52-year-old male presented with incisional hernia in midline abdomen. CT scan of abdomen showed a left adrenal mass measuring 10 x 7 cm (Figure 1a). Right adrenalectomy was performed. Grossly, adrenal gland had gray-brown to tan-brown surface. Cut surface showed yellow and tan-brown surface (Figure 1b). Microscopic examination showed tumor composed of mature adipose tissue containing islands of hematopoietic tissue. Hematopoietic component showed trilineage hematopoiesis (Figure 1c). Compressed adrenal tissue was seen towards the periphery. A diagnosis of adrenal myelolipoma was given.

Case 2

A 32-year-old female presented with right upper abdominal pain. Ultrasonography (USG) of abdomen showed cholelithiasis and left adrenal mass measuring 4 x 2.5 cm. CT scan showed the adrenal mass to be homogeneous and hypodense. An attempt was made to excise the adrenal mass, however, the cystic mass ruptured in attempt to remove it. Grossly, multiple tan-brown soft tissue pieces were received. Microscopic examination showed a fibrous cyst devoid of any lining (Figure 1d) with areas of dystrophic calcification, hemorrhage, thick walled blood vessels and islands of adrenal cortical tissue. A diagnosis of adrenal pseudocyst was given.

Figure 1: (a) CT scan of abdomen showing a left adrenal mass measuring 10 x 7 cm (b) Cut surface of adrenal gland showing yellow and tan-brown surface (c) Microscopic examination showing myelolipoma composed of mature adipose tissue containing islands of hematopoietic tissue with compressed adrenal tissue at the periphery (H&E, x40) (d) Microscopic examination of adrenal pseudocyst showing a fibrous cyst devoid of any lining (H&E, x40).
Case 3
A 24-year-old female presented with features of acute appendicitis—
pain initially in the umbilical region followed by pain in right lower
abdomen. USG showed an adrenal mass. CT scan with contrast
showed a right adrenal mass measuring 19 x 16 x 9 cm. The mass was
multiloculated, containing fat and calcification, suggestive of a adrenal
teratoma (Figure 2a). Patient underwent left adrenalectomy and
appendicectomy. Grossly, the adrenal mass was multiloculated with
smooth tan and shiny surfaces (Figure 2b). Microscopic examination
showed cystic spaces lined by keratinizing squamous epithelium along
with sebaceous glands, hair, and pancreatic tissue. There were multiple
cystic spaces lined by mucous and respiratory epithelium as well as a
complete intestinal wall-like structure (Figure 2c and 2d).

Discussion
The reported incidence of adrenal incidentalomas on imaging
studies done for other purposes is 4% [2] and incidence reported in
autopsy studies is 6% [3]. The prevalence of adrenal incidentaloma
increases with increasing age [2]. Majority of adrenal incidentalomas
are due to adrenal adenomas, congenital adrenal hyperplasia,
pheochromocytoma, adrenal carcinoma and metastatic carcinoma [3].
Majority of adrenal adenomas are non-hypersecreting. The secreting
adenomas secrete cortisol, aldosterone and sex hormones, thus
hormonal evaluation should be done on detecting an adrenal mass [3].
The possibility of malignant disease is the major concern when
evaluating a case of adrenal incidentaloma. A study has shown size of 4
cm or greater to have greater chance of malignancy [4]. Size is also
important because the smaller an adrenocortical carcinoma is at the
time of diagnosis, the lower the tumor stage is and the better the
overall prognosis will be [5]. Metastases are the cause of the adrenal
incidentaloma in approximately half of patients who have a history of
malignant disease [6]. Tumors that commonly metastasize to the
adrenals include carcinomas of the lung, kidney, colon, breast,
exophagus, pancreas, liver, and stomach.

The adrenal incidentalomas that we are reporting are not commonly
encountered. We describe each one of them with brief review of
literature.

Adrenal myelolipoma is one of ‘incidentaloma’ which is a clinically
inapparent adrenal mass discovered during diagnostic testing or
treatment for clinical conditions, not related to the adrenal gland.
Adrenal myelolipoma is female predominant disease, mostly
asymptomatic, symptomatic lesions can present with abdominal pain
and hemorrhage [7]. A fatty adrenal mass is diagnostic of myelolipoma
although other less common adrenal tumors containing fat such as
teratoma, lipoma, and liposarcoma should be considered [8]. Adrenal
myelolipoma can be easily detected on USG, however, CT scan is the
most sensitive test for diagnosing myelolipoma. Differentials include
adrenal adenoma, adrenal metastasis, primary adrenal malignancy
and retroperitoneal lipoma and liposarcoma [7]. Adrenal myelolipoma can
co-exist with other adrenal tumors like adrenocortical adenomas and
adenomatoit tumors of the adrenal gland [9].

Besides other adrenal tumors, myelolipoma has been found to be
associated with endocrine disorders, adrenal dysfunction and
hyperstimulation with adrenocorticotrophic hormone. A case of
adrenal myelolipoma has been described with chromosomal
translocation (3;12) (q25;p11) indicating that it is bona-fide neoplasm
[10].

Adrenal pseudocysts are rare and represent 80% of cystic masses of
adrenal [11]. Two types of cysts are known to occur in adrenal gland—
endothelial cyst and hemorrhagic or pseudocyst. Microscopically, both
cysts are lined by partially calcified wall without an epithelial lining.
Endothelial cyst is filled with serous fluid while hemorrhagic or
pseudocyst is filled with clotted blood or hyalinized thrombus with
attenuated adrenal cortex [12]. The exact pathogenesis of adrenal cysts
is not known, however, vascular anomaly, perhaps of lymphatic nature
in former and blood vessel type in the latter has been suggested [12].
Adrenal pseudocysts present with symptoms associated with large
tumor size, hypertension, infection or shock due to hemorrhage [12].
Pseudocysts may be isolated or associated with a primary adrenal
neoplasm, such as pheochromocytoma, adrenocortical carcinoma,
adrenocortical adenoma, or neuroblastoma [13]. Differential diagnosis
of adrenal pseudocyst includes endothelial cyst, epithelial cyst,
lymphangioma and parasitic (hydatid) cyst.

Adrenal gland as the site of teratoma is extremely rare. Adrenal
teratomas have no specific clinical manifestations. They are often
found incidentally on USG. However, abdominal distension,
adrenal pain, low back pain, intestinal obstruction caused by
compression of the neoplasm can occur in one half of patients [14].
The diagnosis of adrenal teratoma relies predominantly on an imaging
examination. Plain abdominal film shows calcification. USG and CT
scan identify the cystic, solid or complex components of the tumor
[15], MRI is better than USG and CT to demonstrate the anatomical
relationship [15]. The differential diagnosis of retroperitoneal
teratomas include ovarian tumors, renal cysts, adrenal tumors,
retroperitoneal fibromas, sarcomas, hemangiomas, xantogranuloma,
enlarged lymph nodes and perirenal abscesses [14]. A postoperative
pathologic examination has often been required for a definitive
diagnosis.
References