Case Report

Adrenal Gland Incidentalomas: Case reports

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DOI: 10.21276/APALM.3269

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Submitted: 06-Jul-2023
Final Revision: 23-Aug-2023
Acceptance: 01-Sep-2023
Publication: 01-Nov-2023

Abstract

Adrenal lesions are serendipitously discovered in upto 5% of cross-sectional examinations performed for other purposes and are hence labeled incidentalomas. Here is the presentation of two cases, one of which is myelolipoma, second common cause of adrenal tumor and other is a rare bronchogenic cyst.

Keywords:

Adrenal, incidentalomas, myelolipoma, bronchogenic cyst

Introduction

Adrenal lesions are serendipitously discovered in up to 5% of cross-sectional examinations performed for other purposes and are hence labeled incidentalomas. Adrenal lesions can be classified as benign or malignant or functioning or nonfunctioning. Adrenal lesion is defined as functioning if it overproduces one or more hormones or their metabolites, whereas a nonfunctional is evident as an increased volume of the adrenal gland without hormonal overproduction. Most common adrenal lesions in the general population are nonfunctioning benign tumors, found in approximately 5% of all abdominal computed tomographic examinations. Once an adrenal mass is identified, a comprehensive adrenal hormone evaluation helps to define the adrenal function and the eventual type of hormonal hypersecretion.[1]

The differential diagnosis of the adrenal mass comprises: adenoma, myelolipoma, cyst, lipoma, pheochromocytoma, adrenal

cancer, metastatic cancer, hyperplasia, and tuberculosis.[2]

Case Report

Case 1: 67 years/ female, presented with right sided dull aching abdominal pain, not associated with food intake, since 2 months. On CT abdomen (Figure 1), right adrenal gland was bulky and enlarged and revealed a 5.5 x 5.5 cms sized well defined fat density lesion with craniocaudal extent of 7 cms. Scattered soft tissue density lesion was seen within this lesion. No evidence of calcification/ significant post contrast enhancement was seen. Both kidneys were unremarkable. Findings were in favour of adrenal myelipoma over fat rich adrenal adenoma. Blood adrenaline (<8 pg/ml) & noradrenaline (<20 pg/ml) were within normal limits. Adrenalectomy was performed. Grossly (Figure 2) a nodular mass with attached fatty tissue (weighing 94 grams) at one end measured 8.5x5.5x4.8cms Cut section showed a yellow solid fatty nodule with hemorrhage and few cystic spaces measuring 6.5 x 5.5x4.5 cms. Thin compressed adrenal gland at periphery measured 3.5x0.8x0.5cms.On microscopy, circumscribed tumor comprising sheets of adipocytes with hemorrhage, fibrin, fat necrosis, cystic change, interspersed trilineage hematopoietic elements (Figure 3), including megakaryocytes along with foci of fibrosis. Focal osseous metaplasia (Figure 4) was seen. Hence the final impression was adrenal myelolipoma.

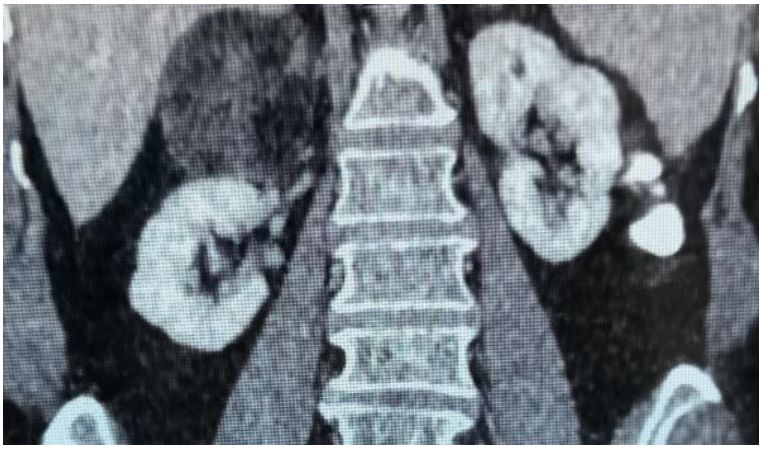

Figure 1: CT abdomen: Bulky and enlarged right adrenal gland revealed well defined fat density lesion

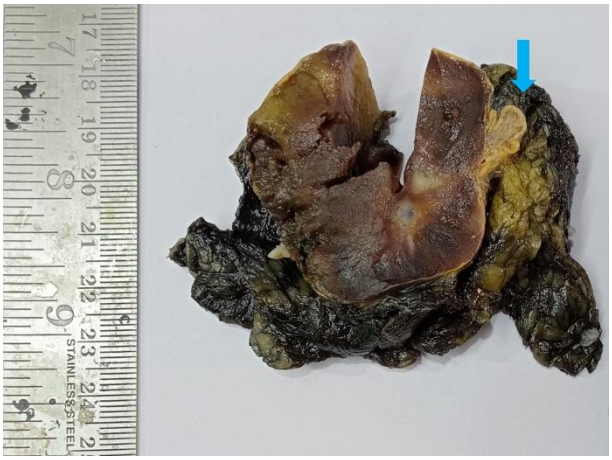

Figure 2: Gross: Yellow solid fatty nodule with hemorrhage and few cystic spaces along with thin compressed adrenal gland at periphery (blue arrow).

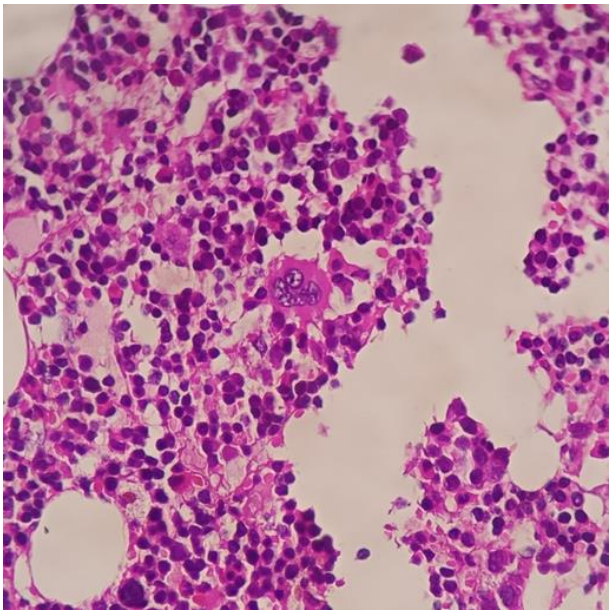

Figure 3: Microscopy: Adipocytes with interspersed trilineage hematopoietic elements, including megakaryocytes (HE X100).

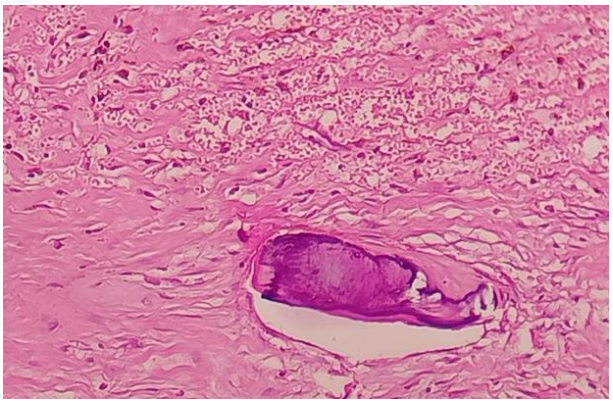

Figure 4: Microscopy: Focal osseous metaplasia (HEx100)

Case 2: 24 years/ female, presented with left abdominal pain, not relieved on medications. CT scan revealed a complex cyst in left suprarenal region measuring 52 x 34 mm, with no solid component within. Adrenalectomy was performed. Grossly 7x4.5x 3cms fibrofatty tissue (weighing 30 gms) was received. Cut surface revealed 3x2x1 cms adrenal gland, periphery of which showed a multilocular cyst measuring 5x3x2 cms filled with mucoid material (Figure 5). No solid component was seen. Cyst wall was grey brown with wall thickness of 0.2 cm. On microscopy, periadrenal cyst revealed locules lined by preserved to denuded respiratory type of epitheium, with fibrous cyst wall showing seromucinous glands, cartilage (Figure 6), reactive lymphoid follicles, moderate to dense lymphocytes, plasma cells, histiocytes, few eosinophils, occasional neutrophils, giant cells reaction and foci of calcification. Skin adnexal structures/ any other elements to suggest teratoma, were not seen. Adrenal gland (Figure 7) was unremarkable. Hence, the final impression given was, benign inflamed periadrenal bronchogenic cyst.

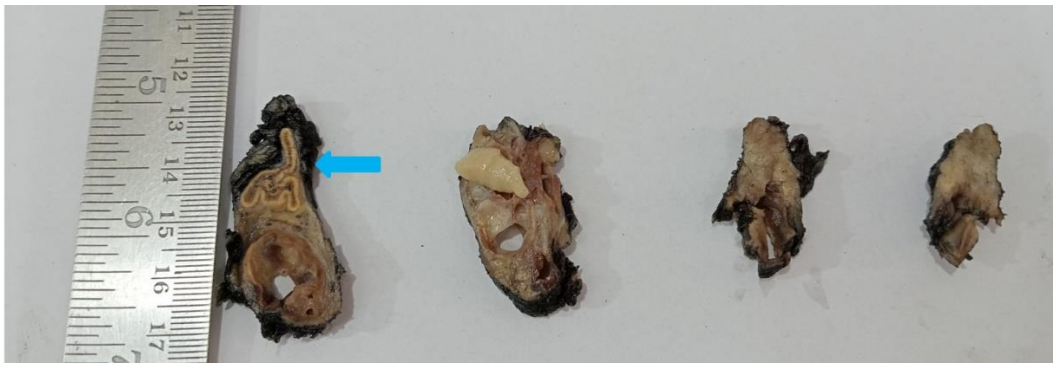

Figure 5: Gross: Periadrenal cyst (Blue arrow adrenal)

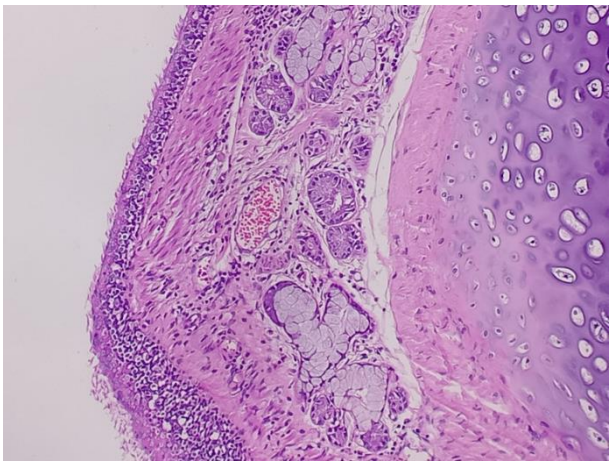

Figure 6: Microscopy: Cyst lined by respiratory type of epitheium, with wall showing seromucinous glands and cartilage (HEx100)

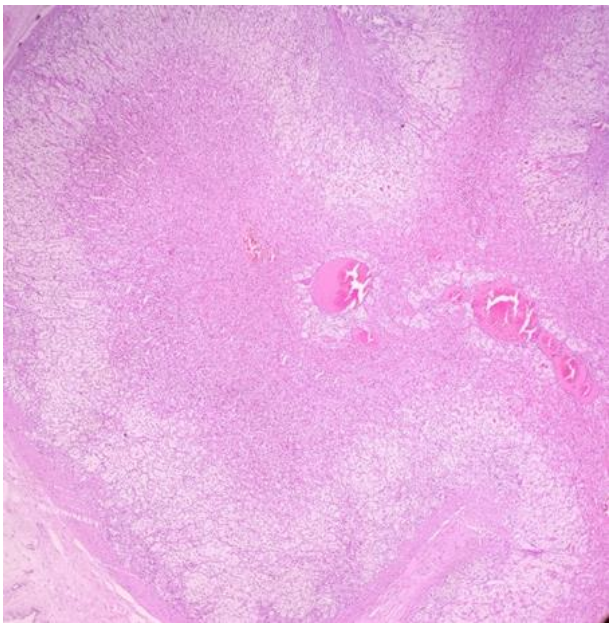

Figure 7: Adrenal gland around periadrenal bronchogenic cyst

Discussion

Adrenal tumors are commonly discovered incidentally on abdominal imaging performed for reasons other than adrenal mass. Incidence of adrenal tumors increased 10-fold in the past 2 decades, with most diagnosed in older adults. In any patient with a newly discovered adrenal mass, determining whether the adrenal mass is malignant and whether it is hormonally active is equally important to guide the best management.[3]

Adrenal myelolipoma is a benign adrenal neoplasm predominantly composed of mature adipose tissue and intermixed myeloid tissue. They comprise 6-16% of adrenal incidentalomas and are the second most common cause after adrenal adenomas. Rarely myelolipomas are encountered outside the adrenal glands and are termed as extra-adrenal myelolipoma. The pathogenesis of adrenal myelolipoma is either believed to be due to metaplastic change in the mesenchymal cells or as a result of overstimulation by adrenocorticotrophic hormone (ACTH).[4]

One hypothesis suggests that stimuli (necrosis or inflammation) could lead to the metaplasia of the reticuloendothelial cells, which could lead to the formation of adrenal myelolipomas. This hypothesis is supported by the increased incidence of the lesion in the advanced years of life. Another hypothesis claims that adipocytes develop from the mesenchymal stem cells in the endothelium; this results in inflammation leading the adrenal cortex to secrete mediators responsible for the recruitment of hematopoietic progenitors. Lastly, Hans et al. noted in their experiments that injection of anterior pituitary extract in rats leads to the transformation of the adrenal cortex into bone marrow-like tissue. Therefore, it was hypothesized that excess ACTH could be responsible for the pathogenesis of adrenal myelolipomas. This theory is supported by the increased incidence of adrenal myelolipomas in congenital adrenal hyperplasia (CAH), where the levels of ACTH can be very high. Adrenal myelolipoma is often associated with conditions like Cushing disease, obesity, hyperlipidemia, hypertension, and diabetes. Other theories propose that a stressful lifestyle and an unbalanced diet may also play a role in the natural history of the neoplasm.[5,6]

Management of adrenal myelolipoma is decided upon the size of the lesion and the presence of symptoms. Small lesions measuring less than 5 cm and those who are asymptomatic are usually monitored via imaging over a period of one to two years. According to various studies, it is suggested that symptomatic tumors or myelolipomas larger than 7 cm should undergo elective surgical excision. Follow-up is mandatory regardless of which surgical method has been employed. There is no evidence of malignant transformation in the literature.[4]

Bronchogenic cysts are benign cystic congenital aberrations caused by abnormal budding of the tracheobronchial tree between 26 and 40 days of embryogenesis. They are usually found in the thorax, especially in the mediastinum. Rarely, they can occur below the diaphragm, and a retroperitoneal position is exceptionally unusual. In most cases, retroperitoneal bronchogenic cysts occur on the corpus of the pancreas or adrenal gland region.[7]

Thus far, the exact mechanism underlying formation of retroperitoneal bronchogenic cyst is unclear. However, it is generally believed that the occurrence of bronchogenic cyst is related to the tracheobronchial tree and is caused by the separation of pulmonary buds.

If abnormal budding and extrusion of the tracheobronchial tree occur at approximately week 5 of gestation, the connection between lung bud and tracheobronchial tree is lost. In rare cases, the foregut and its derivatives of the trachea and bronchus may migrate to an atypical location, including the neck, intraspinal locations, and below the diaphragm. In the early stage of embryonic development, the thorax and the abdomen are a singular unit, and the pericardial–peritoneal canal links the thoracic and abdominal

cavities. When the canal is later divided by fusion of the pleuroperitoneal membranes, a portion of the tracheobronchial tree could be pinched off and migrate, and the migrated lung buds may develop into retroperitoneal bronchogenic cysts. Microscopically, bronchogenic cysts are predominantly unilocular or oligolocular, lined by pseudostratified ciliated columnar epithelium with bronchial glands, cartilage, smooth muscle, and mucoid material.

Considering that retroperitoneal bronchogenic cysts are frequently located adjacent to or surrounding the adrenal gland, the condition is easy to misdiagnose as an adrenal tumor, an adrenal cyst, a cystic lymphangioma, a teratoma, or adrenal tuberculosis. At present, only histopathological examination can yield a definitive diagnosis of retroperitoneal bronchogenic cyst. Therefore, surgical resection is the only therapeutic strategy to establish definitive histology and to provide symptom resolution.[8]

Conclusion

Adrenal lesions are incidental on radiology and many a times require histological examination for a definite diagnosis. Both the above-described adrenal lesions in our cases were nonfunctioning, but required surgical excision to relieve symptoms and for a definite diagnosis.

Acknowledgements : *Author would like to thank Agilus Diagnostics Dr Phadke Labs*
Funding: None
Competing Interests: None

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