



Case Report

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A Case-Study Report of an Indiscernible Adrenal Myelolipoma - Clinical and Histologic Features



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Abstract

Adrenal myelolipomas are rare benign tumors with estimated autopsy prevalence of 0.08-0.4%. They are identified in adults, either incidentally or if complicated by haemorrhage. There is no gender predilection. They are usually found to occur alone in one adrenal gland but not both and there may be a right sided predilection. Most lesions are small and asymptomatic and may be discovered incidentally during autopsy or on imaging studies performed for other reasons. Although the tumor itself is non-functioning there is a relatively high incidence (10%) of associated endocrine disorders. Several hypotheses have been proposed as to the cause of myelolipomas but the causative process is still not clearly understood. In recent years, they have been found to be more and more frequent due to sophisticated imaging tests. The case reported below, concerns the incident of an adrenal myelolipoma measuring 6.5x6x1.4cm and weighing 32.8gr, which caused the death of a 61-year-old male. The samples undertook microscopic examination using the Hematoxylin and Eosin (H&E) staining protocol, which revealed the presence of this rare tumor in the male's adrenal gland

Keywords: Adrenal myelolipoma; Adrenal gland; Benign tumor

Abbreviations: ACTH: Adreno Cortico Tropic Hormone; CT: Computed Tomography scanning; MRI: Magnetic Resonance Imaging; CECT: Contrast Enhanced Computed Tomography

Introduction

Adrenal myelolipomas are rare, non-functional, benign tumor-like lesions of the adrenal gland. They are usually found to occur alone in one adrenal gland but not both and there may be a right sided predilection. Histological examination demonstrates variable amounts of mature adipocytes (with distended lipid vacuoles) similar to bone marrow and hematopoietic cells (including cells from myeloid, erythroid and megakaryocytic cell lines) [1,2]. The fatty component is often the predominant feature and therefore the most characteristic feature on imaging. The lesions can infrequently contain bone or show partial replacement by haemorrhage or fibrosis. Adrenal myelolipomas are usually identified in adults, either incidentally or if complicated by haemorrhage [3]. There is no gender predilection. The tumor affects men and women equally and is most commonly found between the fifth and seventh decades of life with a mean age of 62 years. Adrenal myelolipomas can vary widely in size [4].

They are often smaller than 4cm in diameter, with the largest reported adrenal myelolipoma measuring 31x24.5x11.5cm and weighing 6kg. Most of them are small, asymptomatic and may be discovered incidentally when the region is imaged for other reasons. Larger ones (typically over 4cm in size) can present with an acute retroperitoneal haemorrhage and still others (especially when very large, causing pressure of surrounding organs or tissues) with vague mass related symptoms. Symptoms include pain in the abdomen or flank, blood in the urine, a palpable lump or high blood pressure. Some studies suggest surgical intervention if the tumor is symptomatic, growing or larger than 6cm. ultimately, the optimal treatment for myelolipoma depends on size and symptoms of the mass, and the patient's needs [5]. Although the tumor itself is non-functioning there is a relatively high incidence (10%) of associated endocrine disorders such as the Cushing syndrome, the congenital adrenal hyperplasia (21-hydroxylase deficiency) and the Conn syndrome (primary

hyperaldosteronism). In these disorders, adrenal myelolipomas may contain significant amounts of adrenal cortical tissue and may become very large with continued stimulation by adrenocorticotrophic hormone (ACTH), which may lead to autonomous steroid hormones production [6].

Materials & Methods

We received an adrenal gland measuring 6.5x6x1.4cm and weighing 32.8gr with its fat and a brown to red tissue fragment measuring 7.5x2.5x2.7cm and weighing 40.4gr. The tissue sections were stained with Hematoxylin and Eosin (H&E) staining technique. The procedure was:

- a) Deparaffinize the section: flame the slide on burner and place in the xylene. Repeat the treatment.
- b) Hydration: hydrate the tissue section by passing through decreasing concentration of alcohol baths and water. (100%, 90%, 80%, 70%)
- c) Stain in hematoxylin for 4 minutes.
- d) Wash in running tap water until sections "blue" for 5 minutes or less.
- e) Differentiate in 1% acid alcohol (1% HCl in 70% alcohol) for 1 second.
- f) Wash in running tap water.
- g) Stain in Eosin for 2 minutes.
- h) Dehydrate in increasing concentration of alcohols and clear in xylene.
- i) Mount in mounting media.

After the staining procedure the sections observed under microscope and the results conducted [6].

Results

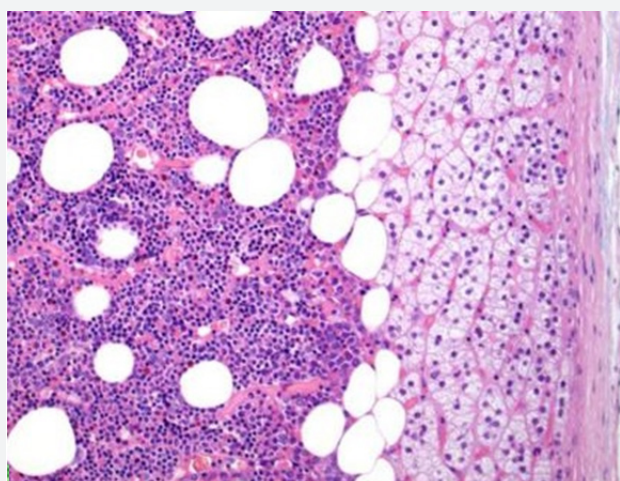


Figure 1: Microscopic examination of an Adrenal Myelolipoma: Section revealed characteristic admixture of mature adipose tissue with normal hematopoietic tissue. (H & E stain, 10 x).

Microscopic examination from the adrenal's tissue fragment showed partial autolysis details, focal fibrosis, presence of inflammatory infiltrations, macrophages, hemosiderin granules and congested vessels with slightly thickened wall (Figure 1). Macroscopic examination in both tissue fragments revealed, in an expanded almost universal extent, the presence of mature adipocytes together with extramedullary hematopoietic details (Figure 2). There were also observed haemorrhagic infiltrations, phagocytes, hemosiderin granules and the local presence of amorphous eosinophilic material. All the findings above indicated the presence of an adrenal myelolipoma.

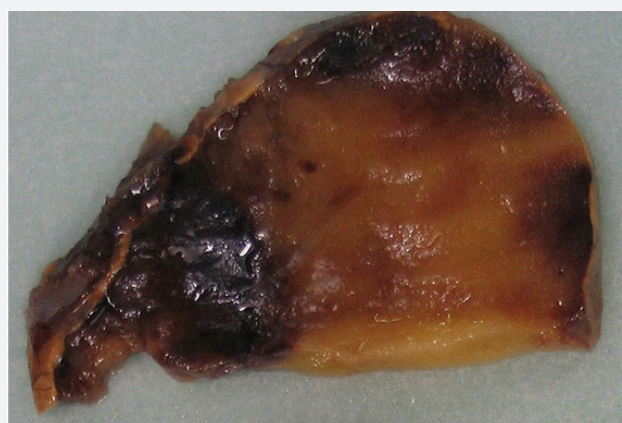


Figure 2: Macroscopic appearance of Adrenal Myelolipoma: On cut section, a solid tumor showing expanded yellowish areas together with hemorrhagic areas.

Discussion

Myelolipomas are small, asymptomatic and non-functional in nature. The benign nature of these lesions has been established. Nevertheless, it remains unclear how this tumor actually develops. Since myelolipomas contain different proportions of fat and myeloid tissue, a definitive diagnosis using computed tomography scanning (CT) or magnetic resonance imaging (MRI) may be difficult, although rarely so, in case of a small amount of fat is present [7-9]. There are three different types of MRI imaging:

- a) T1: typically hyperintense due to fat contents.
- b) T2 (FS): typically shows fat suppression.
- c) T2: generally intermediate to hyper intense but can sometimes vary depending on contents.

The CT appearance is usually characteristic. The typical adrenal myelolipoma appears as an adrenal mass with fat-containing components. The mass is usually relatively well circumscribed; however masses that are mostly fat may be difficult to separate from surrounding retroperitoneal fat [8]. Contrast enhanced computed tomography (CECT) scan is another promising technique for studying adrenal masses. PET imaging with 18-Fluorodeoxyglucose is a useful modality. Benign tumors do not show uptake pattern with metastasis show high

uptake 100% sensitivity and specificity. Whole body PET scan can show extra-adrenal involvement. The most effective imaging modality for evaluation of an adrenal mass is the contrast enhanced computed tomography (CECT). Perinephric fat allows the gland to be clearly displayed and even 1cm size tumors can be detected with 100% sensitivity [10].

Conclusion

To sum up, the case above describes an incident of an adrenal myelolipoma founded after the death of a 61-year-old male. The samples examined microscopically using the characteristic histological H&E staining protocol. Macroscopic and microscopic examination indicated a rare case of myelolipoma located in the adrenal gland.

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