Bilateral Giant Adrenal Myelolipomas: a case report and literature review

PO-CHUN LIN1 FEI-SHII YANG1,2

Department of Radiology1, Mackay Memorial Hospital
Department of Radiological Technology2, Yuanpei University

Adrenal myelolipoma is a rare benign adrenal neoplasm presenting in 0.08%-0.4% of population based on autopsy series. It is of adrenal origin composed of mature adipose tissue and a variable amount of hematopoietic elements (myeloid and erythroid cells). Most patients are asymptomatic, and the lesion is discovered incidentally at autopsy or on imaging studies performed for other reasons. Most tumors are unilateral and small in size (<5cm). The case of symptomatic bilateral giant adrenal myelolipomas is extremely rare. We report a case of bilateral giant adrenal myelolipoma in a 56-year-old male presenting with gradually abdominal distention for 6 months. We present characteristic CT finding in this patient with review of literatures.

Myelolipoma is a relatively rare benign tumor composed of fatty tissue and bone marrow elements. It is frequently arisen from the adrenal glands but may exist as a solitary mass elsewhere. Adrenal myelolipomas are typically small in size (<5cm), nonfunctioning and asymptomatic. They are most often discovered incidentally [1].

We report a case of bilateral giant myelolipoma with presentation of gradually abdominal distention for 6 months.

CASE REPORT

A 56-year-old male presented with gradually abdominal distention for 6 months. He had visited other hospital and received computed tomography (CT) scan which manifested bilateral adrenal gland masses. So he came to our urology department for second opinion.

No significant medical history except benign prostatic hyperplasia was told. Physical examination revealed abdominal distention with mild tenderness. Initial laboratory data including hemogram, biochemical analyses and endocrine function tests showed only mildly decreased RBC count and hematocrit (Hct), otherwise were within normal limit.

Contrast-enhanced abdominal CT was arranged and disclosed well-defined, giant, heterogeneously enhanced masses in bilateral adrenal glands with mostly fat density (-30 to -90 HU), which were characteristic of bilateral adrenal myelolipomas (Fig. 1). The right adrenal mass measured 11×12×19 cm and the left adrenal mass measured 8×11×13 cm. The huge masses caused symptom and had risk of hemorrhage as well as the possibility of malignant change, the patient was therefore underwent resection of bilateral giant adrenal myelolipomas. Grossly, they were yellowish within these hemorrhagic tumors. Microscopically, the masses had composition of mature fat cells and hematopoietic elements (Fig. 2). Diagnosis of bilateral adrenal myelolipomas was confirmed.

Reprint requests to: Dr. Fei-Shih Yang
Department of Radiology, Mackay Memorial Hospital.
No. 92, Sec. 2, Chung Shan N. Road, Taipei 104, Taiwan, R.O.C.
Bilateral giant adrenal myelolipomas

**DISCUSSION**

Adrenal myelolipoma is a rare benign tumor composed of mature adipose tissue and proliferating hematopoietic elements (myeloid and erythroid cells). Gierke first described this disease in 1905, and the term myelolipoma was mentioned by Oberling in 1929. In a 1973 autopsy series, it had been estimated that the prevalence at autopsy was about 0.08%–0.4% [2, 3].

Reviewing the literature, most myelolipomas are solitary when presentation and the size is usually less than 5 cm and didn’t need surgery [1]. According to the PubMed database, there are only 7 case reports worldwide for bilateral giant adrenal myelolipomas [1, 4-9], representing the rarity of this entity.

Myelolipoma predominantly involves the adrenal gland, but extra-adrenal presentations have been reported in presacral area, stomach, liver, lymph nodes, mediastinum and cranium [10]. The etiology remains unclear, hypotheses about the origin include metaplasia of adrenal cortical cells precipitated by chronic stress or degeneration, remains of adrenal cortex or extramedullary hematopoiesis in pathological situations [3, 10].

Most myelolipomas are asymptomatic and discovered incidentally on abdominal imaging (so called “incidentalomas”) for some other indications. When the tumors grow large, they may cause compressive symptoms, tumor necrosis, or hemorrhage and present with abdominal and flank pain, palpable mass, or hematuria [11]. If coexistence with functioning adenoma, myelolipoma may have an association with endocrine dysfunction such as Cushing syndrome, Conn syndrome, adrenogenital syndrome, Addison’s disease [1, 2].

Usually, adrenal myelolipomas are detected by CT. CT is the preferred primary modality for evaluation of the abdomen if there is a suspicious mass lesion because it is fast, readily available, and provides spatial resolution as well as differentiates tissues by different CT Hounsfield unit (HU).

The majority of adrenal myelolipoma is composed of fat tissue, which has a negative HU value. The CT values are usually higher than those of retroperitoneal fat (typically measuring less than –20 HU) owing to associated hematopoietic tissue component in adrenal myelolipomas. The interspersed hematopoietic element

---

**Figure 1.** Contrast-enhanced abdominal CT. Axial view a. and coronal views b. c. show bilateral well-demarcated masses originated from adrenal glands. Most part of the masses are in fat density interspersed with heterogeneously-enhanced hematopoietic tissue (arrows).

**Figure 2.** Histopathology (200x): Microscopically, the section shows features of myelolipoma with mature fat and hematopoietic elements such as megakaryocyte (arrow).
can also be enhanced by contrast leading to an heterogenous appearance. Sometimes, there are high-attenuation regions probably result from hemorrhage or calcifications [12, 13].

At MR imaging, adrenal myelolipoma shows high signal intensity on T1-weighted images because of plenty adipose tissue. Intermediate signal intensity on T2-weighted images may be found due to mixed fat and marrow tissues. This appearance is nonspecific and may be confused with adrenal metastases or primary adrenal cancers. By using of fat suppression MR imaging technique, the diagnosis can be confirmed by demonstrating a loss of signal intensity within the fatty component. Fat-containing malignancies of the adrenal gland are exceedingly rare; thus, adrenal malignancies would not be expected to lose signal on fat-suppressed MR images [12, 13].

If adrenal myelolipoma become larger, the differential diagnosis should include lipoma and liposarcoma. The possibility could be low because these tumors rarely occur in adrenal gland, but sometimes percutaneous biopsy may be necessary to confirm the diagnosis. Adrenal myelolipoma may also mimic angiomyolipoma arising from the upper pole of kidney, but reconstruction images of multislice CT scan can demonstrate its renal origin [2].

Treatment of asymptomatic small adrenal myelolipoma (<5cm) is usually conservative with 6-12 months interval follow-up with ultrasound or CT. If symptomatic, surgery is performed for relief of symptoms. When the tumor size is over 10cm, operation is recommended as potential risk of malignant change and hemorrhagic complication [4, 11].

REFERENCES
兩側巨大腎上腺髓質脂肪瘤：病例報告與文獻回顧

林柏君\textsuperscript{1} 楊斐適\textsuperscript{1,2}

台北馬偕紀念醫院 放射線科\textsuperscript{1}
元培科技大學 放射技術系\textsuperscript{2}

腎上腺髓質脂肪瘤是相對少見的良性腎上腺腫瘤，解剖研究發現約佔人口比例的0.08%-0.4%。此病灶從腎上腺長出，含有成熟的脂肪組織和造血細胞。病人大多沒有症狀，常於解剖或是其他原因作影像檢查時意外發現。大部分的腫瘤是單側且小於5公分，所以兩側巨大腎上腺髓質脂肪瘤屬相當罕見的病灶。我們報告一名56歲男性的病例，症狀是腹脹六個月。文中將描述典型的電腦斷層特徵並作相關文獻的回顧。