

Bilateral Hemorrhagic Adrenal Metastases in Non-Small Cell Lung Cancer: Uncommon Case report in Korea

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Abstract

The adrenal gland is one of the common sites for metastasis from lung cancer. However, the development of adrenal hemorrhage from lung cancer metastasis is rare. We herein describe a first case of massive, spontaneous bilateral adrenal hemorrhage secondary to metastatic lung cancer, initially presented with severe flank pain in Korea. (*J Med Life Sci* 2016;6(1):58–61)

Key Words : Adrenal metastasis; Bilateral adrenal hemorrhage; Non-small cell lung cancer

INTRODUCTION

The adrenal gland is a common site for metastasis from a variety of tumors including breast, lung and renal cell carcinomas, melanoma, and lymphoma^{1,2)}. Adrenal metastases at the time of initial diagnosis occur in less than 10% patients with non-small cell lung cancer (NSCLC)^{2,3)}. Most cases are unilateral and small asymptomatic lesions, incidentally found by CT-scan of the upper abdomen during a staging evaluation. Bilateral adrenal involvement in the setting of lung cancer is not uncommon. However, bilateral adrenal metastases are observed in less than 3% at the initial presentation of NSCLC^{2,4)}. Large symptomatic adrenal metastases at the time of diagnosis are extremely rare²⁾. And intratumoral hemorrhage is a rare but serious complication of adrenal metastases⁴⁾. Here, we report a case of NSCLC, which showed large bilateral adrenal metastases complicated with intratumoral hemorrhage at the time of initial diagnosis.

CASE REPORT

A 71-year old male with no significant past medical history was referred to our hospital for further evaluation of

a lung mass located in the right lower lobe, incidentally detected on abdominal and pelvic computed tomography (CT) performed at other medical institution. He was admitted to the hospital complaining of right flank pain persisting for 1 week without any trauma history. He experienced non-productive cough and sputum occasionally. On examination at our center, the patient was afebrile and vital signs were normal. General physical examination was unremarkable. Chest X-ray and chest CT scans were performed for diagnostic evaluation. Initial chest PA revealed a mass-like opacity in the right retrocardiac area. Subsequent CT scans disclosed a 5.3cm size, malignant-looking mass in the right lower lobe and several small nodules in left upper and lower lobes (Fig. 1). These findings are suggestive of lung cancer with lung-to-lung metastases. Percutaneous biopsy confirmed the diagnosis of adenocarcinoma.



Figure 1. Chest CT scan shows that about 5.2cm sized malignant-looking mass in the right lower lobe.

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The abdominal images covered on the chest CT scan revealed large bilateral adrenal masses with high attenuation on precontrast scan (40–50HU) and surrounding fluid collection especially in the right side (Fig. 2).

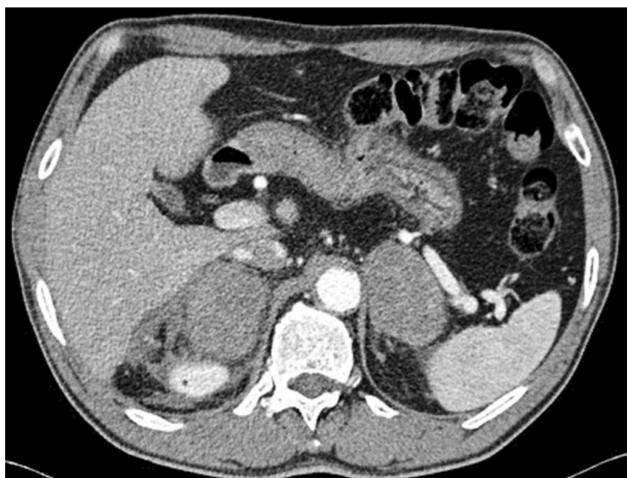


Figure 2. In the upper abdomen covered on the contrast-enhanced chest CT scan, high attenuated bilateral adrenal masses are noted with surrounding fluid collection and fatty infiltrations especially at the right side.

Magnetic resonance imaging (MRI) was performed and showed the right adrenal mass with partly high signal intensity (SI) area in both T1 and T2 weighted sequences representing hematoma of late subacute stage. This hemorrhagic event may cause the right flank pain. And left adrenal mass was also noted heterogeneous signal intensity in both T1 and T2 weighted sequences with disseminated high and low SI foci (Fig. 3). PET/CT showed intense FDG uptake in the right lung mass and bilateral adrenal masses. There was focal non-FDG-avid area within the right adrenal gland, matching the late subacute hematoma (Fig. 4). These radiological features were suggestive of bilateral hemorrhagic adrenal metastases with probably multi-stage hemorrhage from lung cancer.

The patient was started chemotherapy using alimta but experienced disease progression. Eight months after diagnosis, he finally died.

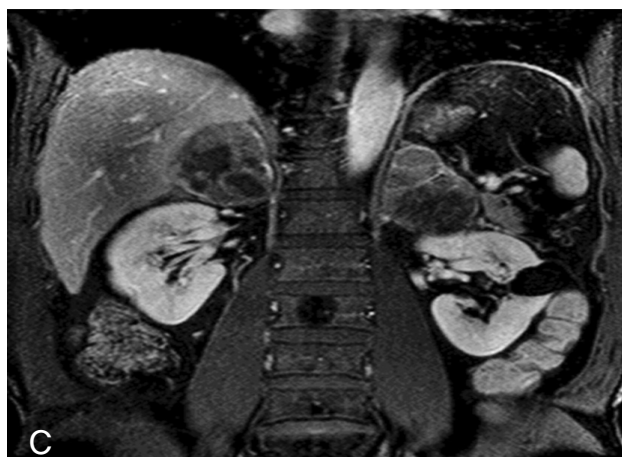
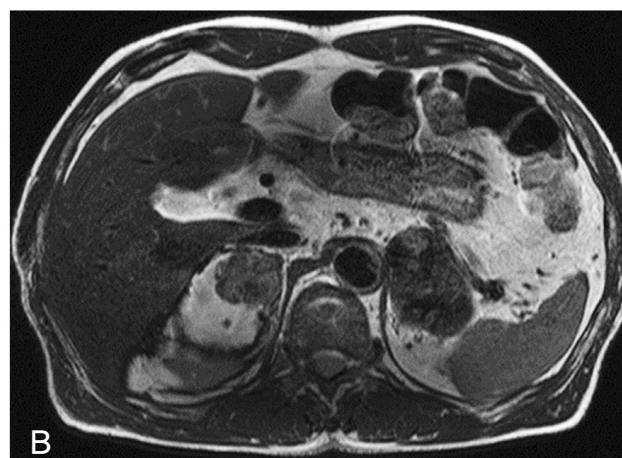
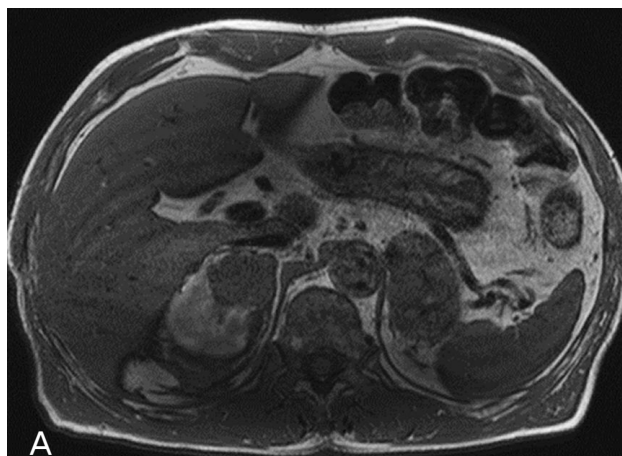


Figure 3. MR imaging shows that heterogeneous signal intensity of both adrenal glands in T1 (A) and T2 (B)-weighted images and heterogeneous enhancement in contrast-enhanced T1-weighted image (C). Especially in the right adrenal gland, partly high signal intensity area is noted in both T1- and T2-weighted images, representing late subacute hemorrhage.

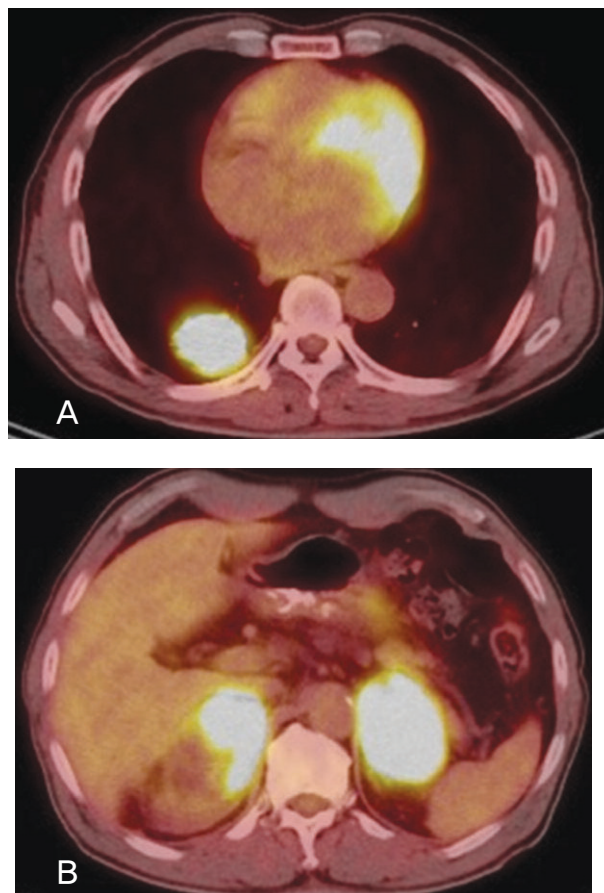


Figure 4. On PET/CT images, intense FDG uptake (maximum SUV, 12.6) is seen in the left lower lobe mass (A). And intense hypermetabolic mass lesions (maximum SUV, 14.3) are also noted in bilateral adrenal glands with partial non-FDG-avid area (B).

DISCUSSION

The adrenal gland is highly vascular and particularly susceptible to hemorrhage⁴⁻⁶. Most adrenal hemorrhages are bilateral and are associated with cardiovascular diseases such as acute myocardial infarction and congestive heart failure, systemic anticoagulant therapy, pregnancy or postpartum state, postoperative state, or sepsis. On the other hand, unilateral adrenal hemorrhage is relatively uncommon. It has been documented in associated with pheochromocytoma and a variety of primary benign and malignant adrenal tumor such as carcinoma, adenoma, cyst, or apoplexy⁷⁻⁹.

Adrenal metastasis has been reported at autopsy in upto

42% of patients with advanced non-small cell lung cancer and 20% to 45% of all cancer patients^{2,7,8}. Adrenal metastasis from lung cancer is usually asymptomatic in spite of high incidence. Massive adrenal hemorrhage secondary to metastasis of lung cancer is extremely rare. To the best of our knowledge, there were 11 reports (16 patients) in the English literature of adrenal hemorrhage secondary to lung cancer. Like our patient, about half of the patients were not known to have lung cancer before their presentation with adrenal hemorrhage⁶. Presenting symptoms and signs are nonspecific, and include abdominal pain, back or flank pain, chest pain, nausea and vomiting, fever, hypotension/shock, and tachycardia⁶. The major concern of adrenal hemorrhage in metastatic adrenal tumor is that it can be potentially life-threatening event. Intratumoral hemorrhage should be promptly managed using chemotherapy or adrenalectomy⁷.

Adrenal hemorrhage is usually first diagnosed via CT or MRI. CT has been reported to be a sensitive and specific imaging technique for diagnosing adrenal hemorrhage and findings can vary from a heterogeneous mixed-density mass with extensive hyperdense perirenal changes to massive retroperitoneal hemorrhage⁵. MRI has been reported to be more accurate than other imaging modalities for diagnosing adrenal hematoma, with high signal intensity on T1-weighted image⁴.

It can also be difficult to differentiate metastatic adrenal involvement from an adrenal adenoma but diagnostic accuracy for metastases increases with the presence of bilateral involvement and the simultaneous detection of the primary tumor. And modern imaging techniques, especially MR imaging can be helpful in differentiating metastases from adenoma as adenoma presents a low intensity signals on T2 sequences compared to hepatic parenchyma. In contrast, the adrenal metastasis presents higher intensity T2 sequence signals than that of the adenoma, relative to hepatic parenchyma³.

Bilateral adrenal metastases can be found in some of patients with non-small cell lung cancer. Early identification of these lesions is necessary, because adrenalectomy may increase survival in selected patients³. Spontaneous bilateral adrenal hemorrhage secondary to lung cancer metastasis is a rare event. However, it should be included in the differential diagnosis of lung cancer patients presenting with acute onset flank pain. Transcatheter embolization, open surgical resection and conservative management with or without chemotherapy can be used as treatment options.

REFERENCES

- 1) Brunt LM, Moley JF. Adrenal incidentaloma. *World journal of surgery* 2001;25:905-13
- 2) Singh N, Madan K, Aggarwal AN, Das A. Symptomatic large bilateral adrenal metastases at presentation in small-cell lung cancer: A case report and review of the literature. *Journal of thoracic disease* 2013;5:E83
- 3) Allard P, Yankaskas BC, Fletcher RH, Parker LA, Halvorsen RA, Jr. Sensitivity and specificity of computed tomography for the detection of adrenal metastatic lesions among 91 autopsied lung cancer patients. *Cancer* 1990;66:457-62
- 4) Marti JL, Millet J, Sosa JA, Roman SA, Carling T, Udelsman R. Spontaneous adrenal hemorrhage with associated masses: Etiology and management in 6 cases and a review of 133 reported cases. *World journal of surgery* 2012;36:75-82
- 5) Simon DR, Palese MA. Clinical update on the management of adrenal hemorrhage. *Curr Urol Rep.* 2009;10(1):78-83
- 6) Vella A, Nippoldt TB, Morris JC. Adrenal hemorrhage: A 25 year experience at the Mayo Clinic. *Mayo Clin Proc* 2001;76:161-68
- 7) Mohammad K, Sadikot RT. Adrenal insufficiency as a presenting manifestation of nonsmall cell lung cancer. *South Med J.* 2009;102(6):665-7
- 8) Abrams HL, Spiro R, Goldstein N. Metastases in carcinoma: analysis of 1000 autopsied cases. *Cancer* 1950;3:74-85
- 9) Kinoshita A, Nakano M, Suyama N, Takatani H, Kanda T, Fujimoto S et al. Massive adrenal hemorrhage secondary to metastasis of lung cancer. *Internal medicine* 1997;36:815-18