

Gallium-67-citrate scintigraphy of primary renal lymphoma

Mitsuru TANIGUCHI, Koutarou HIGASHI, Manabu OHGUCHI,
Tetsuro OKIMURA and Itaru YAMAMOTO

Department of Radiology, Kanazawa Medical University

We present a case of primary renal lymphoma, which is a rare entity and poses diagnostic challenge. Ultrasound and CT scan demonstrated a nonspecific solid tumor in the left kidney. ^{67}Ga -citrate scintigraphy demonstrated an intense uptake in the tumor, which led to a correct diagnosis, so that we could spare unnecessary laparotomy and possible nephrectomy.

Key words: kidney, neoplasms, lymphoma, gallium-67 imaging

INTRODUCTION

SECONDARY RENAL INVOLVEMENT from systemic lymphoma is a common occurrence, with previous reports demonstrating approximately a 50% incidence at autopsy;¹ it occurs more commonly with non-Hodgkin lymphoma and less often with Hodgkin lymphoma.² Primary renal lymphoma, with no evidence of involvement elsewhere, is extremely rare,³⁻⁶ since the kidney does not normally contain lymphoid tissue. Whether primary or secondary, early diagnosis and treatment are essential for a cure, but these may be difficult due to nonspecific findings on ultrasound or CT scan.

In this report, we present our experience with ^{67}Ga scintigraphy in a patient with primary renal lymphoma, and emphasize the contribution of ^{67}Ga scintigraphy to the initial diagnosis of it.

CASE REPORT

A 79-year-old man was referred to the urology section for a several day history of left lumbago. There were no palpable adenopathies or tumors. Urinalysis revealed pH 5.0, 50 to 100 red blood cells per high power field, and abnormal cells (class V). Blood examination revealed mild anemia, and increase in LDH (794 IU/liter, normal:

180-460), BUN (22 mg/dl, normal: 8-20) and creatinine (1.7 mg/dl, normal: 0.6-1.2).

An abdominal ultrasound demonstrated enlargement of the left kidney with a large, ill-defined, weakly echogenic tumor. On an abdominal CT scan, the lesion was demonstrated as an ill-defined, inhomogeneous, low-density tumor, infiltrating and replacing the renal parenchyma (Fig. 1). No discernible sites of lymphomatous lesion other than the kidney were demonstrated by ultrasound, CT scan, MR imaging and bone marrow aspiration. On an angiography, the left renal tumor was hypovascular.

A ^{67}Ga -citrate scintigraphy was performed 48 hours after the intravenous administration of 111 MBq of ^{67}Ga -citrate. Whole body images were acquired on a large field-of-view gamma camera (SNC-510R, Shimadzu, Kyoto, Japan) with a medium energy collimator. A solitary area of intense uptake was demonstrated in the left kidney (Fig. 2).

Subsequently we performed an ultrasound-guided percutaneous needle biopsy of the left renal tumor. The histological examination revealed non-Hodgkin lymphoma (B-cell, diffuse, large cell type) (Fig. 3). Although laparotomy with possible nephrectomy had been arranged by the urologists at first, it was omitted after the ^{67}Ga scintigraphy and the biopsy, and the patient was then transferred to the section of hematology for chemotherapy.

DISCUSSION

There was once much debate as to whether primary renal lymphoma exists as a separate clinical entity, because of the absence of lymphoid tissue in the normal kidney, but a few well-documented cases can be found in the litera-

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For reprint contact: Mitsuru Taniguchi, M.D., Department of Radiology, Kanazawa Medical University, Daigaku 1-1, Uchinada, Kahoku-gun, Ishikawa 920-0293, JAPAN.

E-mail: tngc@po2.nsknet.or.jp

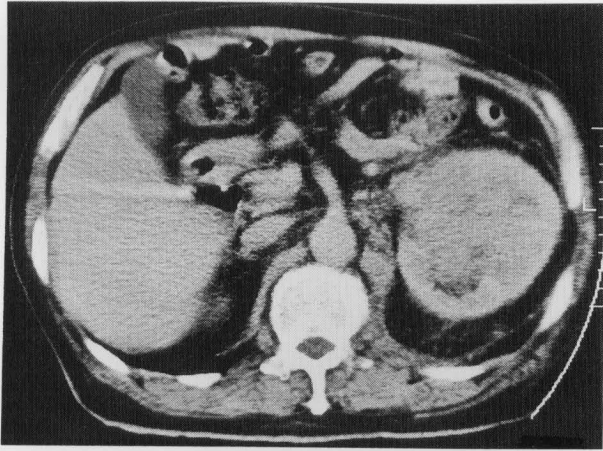


Fig. 1 A post contrast CT scan demonstrates a large, inhomogeneous, low-density mass replacing the left kidney.

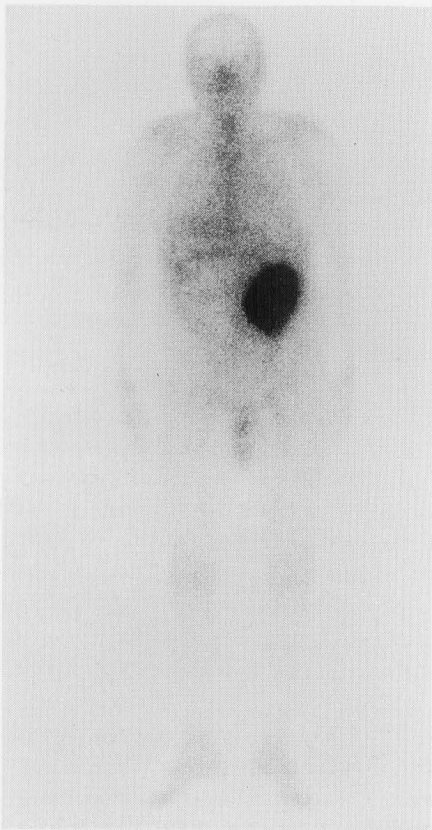


Fig. 2 An anterior whole-body ^{67}Ga scintigraphy demonstrates an intense uptake which may correspond to the left renal large mass disclosed on CT scan.

ture,³⁻⁶ and now it is commonly accepted that lymphoma can be primary in the kidney though extremely rare. Puente Duany N. has postulated that lymphoid cells are drawn to the kidney by a preexisting inflammatory process such as pyelonephritis and once they are there the untimely oncogenic event may take place.⁷

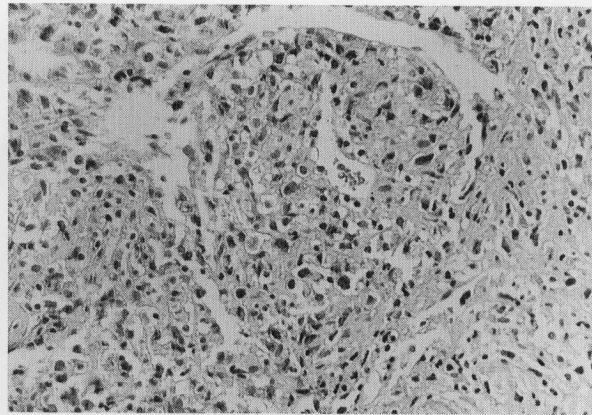


Fig. 3 Microscopic examination reveals lymphomatous cells of large cell type without formation of the follicles (HE stain, original magnification $\times 280$). Shadowy glomerulus and tubules are visible.

Recognition of renal lymphoma in the initial diagnosis of a renal tumor has obvious clinical importance because lymphoma and other tumors (such as renal cell carcinoma or transitional cell carcinoma) are treated very differently; the former is generally treated with chemotherapy or radiation, the latter with surgical resection as much as possible. The majority of renal tumors can be identified and characterized by both ultrasound and CT scan, but some lesions fail to meet the established criteria of the specific diagnosis; one of these "indeterminate" renal tumors is lymphoma.⁸

Secondary renal lymphoma has been documented as multiple nodules, invasion from retroperitoneal disease or a solitary tumor, whose predominant appearance on ultrasound and CT scan is characteristic, but certainly nonspecific.⁹⁻¹¹ In spite of this, secondary renal lymphoma is readily suggested and is not difficult to differentiate for the following reasons: firstly, the patient usually has histologically-proven lymphoma in another site or a history of the disease, secondly, it is often accompanied with retroperitoneal adenopathy or splenomegaly, thirdly, after chemotherapy it may resolve along with a lymphomatous lesion in another site.

On the other hand, the diagnosis of primary renal lymphoma is quite difficult because of the absence of the abovementioned features. Most of the primary cases, as documented in our case, have been presented with a solitary solid renal tumor requiring exploration, and often undergone nephrectomy because of unawareness of lymphoma.³⁻⁵

^{67}Ga -citrate scintigraphy has been proved to play an important role in the staging and the detection of recurrence of lymphoma.¹²⁻¹⁵ As for the initial diagnosis of lymphoma, in general ^{67}Ga has little role prior to biopsy^{12,15} because ^{67}Ga is not a specific agent for lymphoma and accumulates also in other tumors and inflamed tissues.^{15,16} But in our case the intense ^{67}Ga uptake in the renal tumor

led to consideration of lymphoma. The reasons are as follows: firstly, solid renal tumors other than lymphoma have scarcely accumulated ^{67}Ga , except for metastatic melanoma,^{16,17} wherein, however, an accompanying primary skin lesion would have already been identified, secondly, the majority of inflammatory renal diseases, especially in the acute phase, would be suspected on the basis of history, urinalysis and blood examination. And both of the conditions were excluded in this case.

In this case, we diagnosed renal lymphoma by means of the ultrasound-guided percutaneous needle biopsy and could avoid unnecessary laparotomy and possible nephrectomy. In general, whether a needle biopsy of a renal tumor is performed prior to laparotomy or not mostly depends on the preference of the referring physician. But a needle biopsy should be recommended by the radiologist to investigate the possibility of lymphoma when an indeterminate renal tumor reveals an intense ^{67}Ga uptake.

An additional advantage of ^{67}Ga is the provision of total body information. Diagnostically, this is useful especially when the renal lesion presents as the earliest manifestation of systemic lymphoma both because one may detect widespread involvement of lymph nodes or other organs which arouses strong suspicion of lymphoma and because one may find another lesion which is less invasive or more suitable for needle biopsy than the kidney.

In conclusion, it is worthwhile to perform ^{67}Ga scintigraphy prior to biopsy or laparotomy to investigate the possibility of renal lymphoma when other imaging methods such as ultrasound and CT scan demonstrate a non-specific renal tumor.

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