Leiomyoma of the Kidney Parenchyma Mimicking Renal Cell Carcinoma

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Kidney leiomyoma is a rare benign neoplasm which usually arises from smooth muscle cells of the renal capsule, renal cortical vessels, and pelvicaliceal system. We describe a 57-year-old female with a left renal mass which was identified by screening ultrasonography. Hand-assisted laparoscopic radical nephrectomy was performed under the suspicion of renal cell carcinoma. Microscopic examination revealed renal leiomyoma. There was no evidence of recurrence was detected during follow-up. (Korean J Urol Oncol 2011;9:130-132)

Key Words: Kidney neoplasm, Leiomyoma

Kidney leiomyomas are extremely rare and mostly asymptomatic. The first case of solitary leiomyoma of the kidney was reported by Schluter in 1890. The preoperative diagnosis of renal leiomyoma is very difficult and only definite method to distinguish between a leiomyoma and other renal tumor is microscopic evaluation although imaging technology develops. We present a case of leiomyoma occurring in the renal parenchyme, detected incidentally during an abdominal ultrasonography with review of literature.

CASE REPORT

A 57-year-old female was referred to our hospital for evaluation of incidentally detected renal mass by abdominal ultrasonography in general medical examinations. She had no symptoms and there was nothing notable in the patient’s past medical history or family history, and the patient was generally in good health except subtotal gastrectomy and gastrojejunostomy (primary closure) due to stomach ulcer perforation in 10 years ago.

There were no specific abnormal findings in the physical examinations. The results of a complete blood count, electrolyte battery, liver function, renal function, and urine tests were all within normal limits except for mild anemia. Computed tomography (CT) of the kidney revealed a 5.5cm-sized and well-defined mass in the left upper pole of kidney and simple cyst on both kidneys (largest 3.2cm sized). Solid mass had a hypo-vascular and homogeneous enhancement (Fig. 1). The clinical and radiological diagnosis was papillary renal cell carcinoma and left radical nephrectomy was performed. Hand-assisted laparoscopic radical nephrectomy was done. There was no enlargement of the lymph nodes or adhesions, therefore, we resected only samples of para-caval lymph nodes for biopsy.

Grossly, the left kidney contained a 5x4cm-sized tumor. The tumor was white and hard, located in the renal parenchyme abutting renal capsule. The renal capsule and renal pelvis appeared not to be involved and the tumor was thought not to arise from the renal capsule. Microscopically, the kidney tumor
Fig. 1. Computed tomography showing a homogeneous enhanced and 5x4cm-sized mass in the left upper pole kidney.

was formed by interlacing bundles of smooth muscle cells with the usual cellular form and some slit-like spaces between the smooth muscle cells. The mass adjacent on the renal capsule but did not extend into the peri-nephric fat and remaining renal parenchyme. Neither significant atypical nuclear nor mitotic activities were found. No inflammation and necrotic areas were recognized (Fig. 2). Immunohistochemical study showed tumor cells positive for actin and desmin, and negative for CD34, HMB45, S-100 protein and MIB-1. Pathological diagnosis was renal parenchymal leiomyoma. The patient tolerated the procedure well and had an unremarkable postoperative recovery course. At the present time, 18 months after surgery, there have been no signs of recurrence or symptoms.

**DISCUSSION**

Kidney leiomyoma is an extremely rare and benign spindle cell tumors that is found in approximately 5% of autopsy specimens. The majority of renal leiomyomas occurs in the renal capsule, confined to the capsule alone or may extend into the parenchyma, the renal pelvis, or hilum. Leiomyoma of renal parenchyma is extraordinary rare. The present kidney tumor was located in the renal parenchyma and capsular involvement appeared absent. The pathogenesis of renal parenchymal leiomyoma is obscure because of the rarity of the tumor. It is presumed that blood vessel smooth muscles or renal totipotential stem cells were the origin of renal parenchymal leiomyoma.

Clinically, kidney leiomyomas tend to be asymptomatic. The most frequent symptoms are presence of a palpable mass (57%), pain (53%), and microscopic hematuria (20%). Imaging studies alone cannot establish the exact diagnosis in cases of kidney leiomyomas. On ultrasound, the leiomyoma usually presents as a solid mass (73%), but cystic changes are not uncommon. Computed tomography is more sensitive than ultrasound and show that kidney leiomyomas is hypovascular and well circumscribed with homogeneous enhancement on contrast administration. These findings give rise to confusion between kidney leiomyoma and papillary renal cell carcinoma. Very large size tumors can become heterogeneous in both attenuation and enhancement caused by hemorrhage, cystic, or mixoid degeneration. We did not perform the magnetic resonance (MR) imaging. However, MR imaging can help clinician select the diagnoses from CT finding. Low signal intensity of a leiomyoma, as seen on T1- and T2-weighted images, is due to T1 and T2 relaxation times of smooth muscle. The signal intensity of a leiomyoma varies according to the degree of degeneration or cellular component. Low signal intensity on both T1- and T2-weighted MR images is not, however, a characteristic finding of renal leiomyoma; it can be seen in cases of fibroma, milk of calcium cysts, renal cell carcinoma secondary to iron within the tumor, and other calcified renal lesions. The diagnosis of kidney leiomyoma can only be made after surgical excision and microscopic evaluation. All of the reported cases were treated with radical nephrectomy. Nevertheless, some authors state that a conservative intervention can be performed in selected cases if the tumor displays characteristics already described under radiology and does not infiltrate structures of
the vascular pedicle.5

Pathologically renal leiomyomas are solid, whitish, well demarcated and fibrous masses that can show cystic and hemorrhagic areas in large tumors. The presence of necrosis and the invasion of adjacent structures is a common finding in leiomyosarcomas.10 Microscopically, they are fusocellular tumors whose cells, with a cigar shaped nucleus and an eosinophilic cytoplasm, are arranged in interlacing fascicles. There is no nuclear atypia and the mitotic index is usually very low. The main differential diagnosis should be established with other fusocellular tumors in the retroperitoneum such as neurofibromas, schwannomas and even gastrointestinal stromal tumors.3,10 Immunohistochemical markers can be very helpful. Leiomyomas are immunostained with antibodies against smooth muscle antigens like specific smooth-muscle actin and desmin, however, not against S-100 protein, a nerve sheath tumor marker and cytokeratins. In our case, immunohistochemically tumor cells showed positive immunostaining with smooth muscle actin, desmin and vimentin. However, there was no reactivity for CD34, HMB45, S-100 protein and MIB-1 as expected in leiomyomas but not in other tumors.5

REFERENCES