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CLINICAL IMAGE

Stellate scar sign of renal cell carcinoma

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Stellate scar sign is defined as the centrally-placed, well-defined, stellate area of low density on computed tomography (CT) appearance of solid tumors. This kind of radiating enhancement from the center of the tumor, which is also referred as "a spoke-wheel-like enhancement" or central scar sign, usually has been recognized as a specific finding of renal oncocytoma. We describe a patient who developed clear cell renal cell carcinoma (RCC) displaying typical stellate scar sign on CT scans, which was confirmed by gross pathologic appearance.

A 62-year-old Chinese man presented with incidentally detected renal tumor with once ignored gross hematuria half a year ago. Ultrasonography found a 5.6 cm hypoecho mass; CT scans displayed a nearly circular circumscribed mass in the middle of the left kidney, with inhomogeneous enhancement during corticomedullary and nephrographic phases, being an excellent likeness with a spoke wheel (Fig. 1). His medical history was not significant except that he had been a heavy smoker for more than 40 years. Laparoscopic nephrectomy of the left kidney surgery was performed for a presumed RCC and the patient recovered uneventfully in postoperative period. The central stellate scar on CT corresponded to fibrous connective tissue on the gross pathological examination; and the color of viable tumor tissue on cross-section is yellow cast of classical clear cell RCC, but not mahogany color of typical renal oncocytoma (Fig. 2). Histological examination arrived at the diagnosis of clear cell RCC.

Why a central scar develops in the solid tumor? One explanation which is well recognized is that the tumor mass could outgrow its blood supply as it enlarges, thus leading to concomitant ischemia; eventually, the ischemic tumor could be replaced by a fibrotic scar. Because the blood supply comes from the periphery to the central portion of the mass, the fibrotic scar is more likely to develop in the central region of the mass [1]. According to this proposal, stellate scar sign has nothing to do with pathology. Here we present a case with a pathologically confirmed clear cell RCC displaying typical stellate scar sign on CT scans and gross pathological examination. The case strongly supports

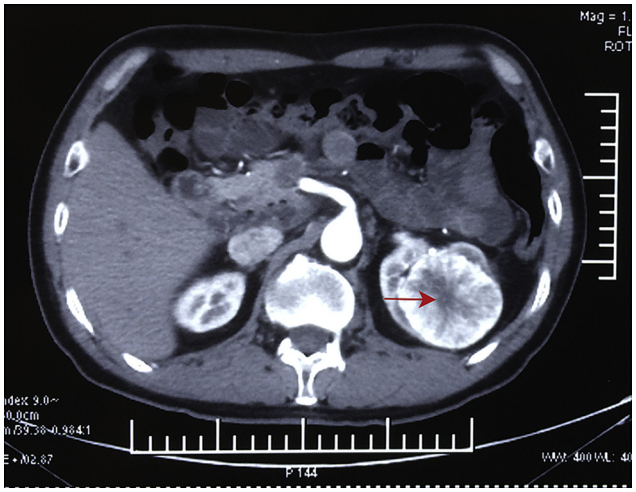

Figure 1 The computerized tomography (CT) appearance of the tumor showing central low density spoke-wheel-like shape (arrow) during corticomedullary phase.

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Figure 2 The gross pathologic appearance of the tumor on cross section: central stellate scar formed by fibrous connective tissue in otherwise yellow cast and homogenous tumor tissue.

the standpoint that a stellate scar sign on CT scan is not specific for renal oncocytoma and that its existence could not exclude a diagnosis of RCC [2]. Extra efforts are needed to achieve the goal of radiological differentiation of oncocytoma from RCC [3].

One possible way to differentiate RCC from renal oncocytoma is renal tumor biopsy (RTB). However, with its potential unfavorable complications and relatively high nondiagnostic biopsy rate [4], RTB is not the standard practice in clinical. What is more, there is a possibility that RCC could co-exist with oncocytoma in rare cases [5], thus the benign biopsy tissue would create a clinical dilemma because it could not rule out a malignant tumor. Thus RTB has not been commonly accepted by either doctors or patients.

Conflicts of interest

The authors declare no conflict of interest.

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