

RENAL ONCOCYTOMA TREATED BY SURGICAL ENUCLEATION: A CASE REPORT

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We experienced a case of renal oncocytoma, in a 46-year-old woman. At a health examination, ultrasonography revealed a right renal tumor, and she was admitted to our hospital for evaluation. From the ultrasonogram, computerized tomography (CT) and angiography, we suspected a renal oncocytoma, but renal cell carcinoma was not completely ruled out. Since the location of the tumor seemed suitable for a local resection, we scheduled a surgical enucleation, but we intended to switch to a radical nephrectomy if examination of a frozen-section suggested renal cancer. Because the frozen findings were suggestive of an oncocytoma without malignancy, the surgical enucleation procedure was completed as scheduled. Pathological findings of the resected specimens were characterized by granular eosinophilic cytoplasm, and rounded nuclei without nuclear pleomorphism or mitotic figures.

Electron microscopic studies revealed an increased number of mitochondria. The patient was accordingly diagnosed as having renal oncocytoma. We also reviewed the literature to elaborate procedures for a preoperative diagnosis and therapy for renal oncocytoma.

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Key words: Renal oncocytoma, Surgical enucleation

INTRODUCTION

Since the latter half of the 1970s, the entity of renal oncocytoma has been recognized as a benign tumor with morphological features similar to those of renal cell carcinoma. As awareness of the entity grows, it has become more frequently documented, resulting in a more definite differentiation from renal cell carcinoma with respect to clinical and histopathological features. However, virtually all of the suspected cases are treated with radical nephrectomy because of a preoperative diagnosis of renal cell carcinoma. Herein, we report the preoperative diagnosis and therapy of one case of renal oncocytoma recently managed by surgical enucleation.

CASE REPORT

The patient was a 46-year-old woman. At a health examination in August 1994, abdominal ultrasonography demonstrated a right renal tumor, and she was admitted to our hospital for further studies.

Past history: Surgical operation for Fallot's tetralogy in 1970.

Family history: Non-contributory.

Present status: No abnormalities except for cardiac murmur were observed.

Blood biochemistry, urinalysis and urinary cytology: No abnormalities were found.

KUB IVP: No abnormal findings were observed.

Abdominal ultrasonography: A solid mass measuring 2.8×2.6 cm with relatively circumscribed

contours and internally homogeneous echogenicity was visualized in the right kidney.

Precontrast computed tomography revealed a tumor of about 2.5 cm in diameter which featured isodensity and was located in the upper pole of the right kidney (Fig. 1A).

Contrast-enhanced CT revealed a homogeneous solid mass with lower density than that of normal renal parenchyma (Fig. 1B).

Selective right renal angiography was conducted but vascularity was not significant. A nephrogram showed homogeneous tissue but was unclear in the area of the tumor lesion. To clearly visualize the tumor area, the patient assumed a left oblique posture, was given epinephrine (4 µg) and then underwent pharminoangiography. This showed the peripheral vessels surrounding the tumor but no typical spoke-wheel configuration of vessels (Fig. 2)

No abnormalities were observed on chest roentgenograms, chest CT, head CT or bone scintigrams.

Evidence from the above examinations demonstrated the non-malignant nature of this tumor, suggesting renal oncocytoma as the most probable diagnosis, although the possibility of a renal cell tumor was not completely ruled out. The specific location of the tumor and its size, allowed either a partial nephrectomy or surgical enucleation. We operated on this patient on February 28, 1995.

SURGICAL FINDINGS

With frozen-section findings suggestive of onco-

cytoma without malignant features, surgical enucleation was completed.

The resected specimen measured $3.0 \times 2.8 \times 2.8$ cm and weighed 14 g. On gross pathological examination, it had smooth contours and a homogeneous color, uniformly tan-brown. Neither necrosis nor hemorrhage was evident on the cross-section, which resembled a fresh section of the liver.

Microscopic examination disclosed that the tumor cells had abundant eosinophilic granular cytoplasm with round nuclei, little nuclear heterogeneity and no mitotic figures (Fig. 3).

Electron microscopy revealed that the tumor lesion consisted of cells containing numerous mitochondria with no evidence of nuclear pleomorphism and few organelles, which are characteristic features of oncocytoma (Fig. 4).

Based on these findings, this case was diagnosed as right renal oncocytoma.

In the postoperative DIP, morphological changes in the calix were partly observed but its function remained favorable.

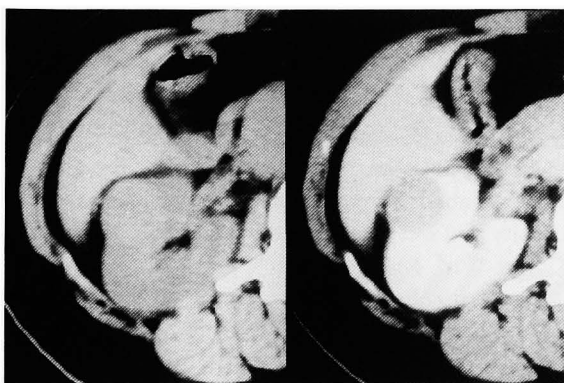


Fig. 1A. Precontrast CT scan showing an exophytic tumor in right kidney. B. Postcontrast CT scan. The tumor shows a homogeneous mass with a lower density than that of normal renal tissue.

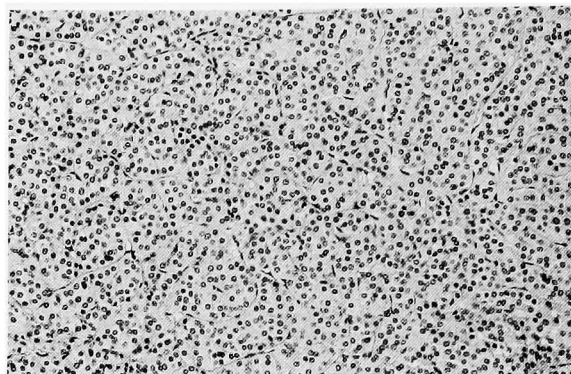


Fig. 3. Histological appearance of the tumor. Large eosinophilic cells with granular cytoplasm and small regular nuclei are seen.

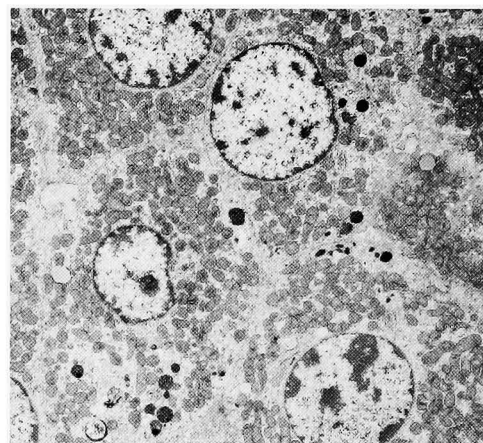


Fig. 4. Electron micrograph of the tumor demonstrates abundant mitochondria in the cytoplasm.



Fig. 2. Selective right renal angiogram. A. Arterial phase. Typical tumor vessels are absent. B. Homogeneous capillaries, Nephrogram phase. C. Pharmacoangiography, showing peripheral vessels surrounding the tumor but no typical spoke-wheel configuration of vessels.

DISCUSSION

In 1942, Zippel presented the first report of renal oncocytoma¹⁾. In 1976, Klein and Valensi retrospectively investigated resected specimens from 13 cases, and proposed the concept of renal oncocytoma.

None of these 13 cases involved metastasis or recurrence, underscoring the need for clinical and histopathological differentiation renal cell carcinoma²⁾. Thereafter, this concept has been accepted and relevant reports have gradually accumulated. In Japan, the first report was presented by Sakurai et al. in 1979³⁾ and, to our knowledge, 76 cases including ours have been reported.

In the following discussion, we present the preoperative diagnosis and therapy for this disease. Preoperative diagnosis of renal oncocytoma invariably entails differentiation from renal cell carcinoma.

While recognizing the difficulty of preoperatively differentiating renal oncocytoma from renal cell carcinoma, Ambos⁴⁾ concluded that angiography is the only way to suggest the specific diagnosis preoperatively, by referring to the following angiographic features as the most characteristic findings:

1. "Spoke-wheel" configuration of vessels
2. Homogeneous capillary, nephrogram phase (similar in density to renal nephrogram)
3. Sharp, smooth margin with capsule ("lucent rim")
4. No "wild" clearly neoplastic vessels nor marked heterogeneous capillary-nephrogram phase nor poorly defined margination

Barth et al. described that the typical spoke-wheel configuration of vessels was evident in larger tumors but could not be observed in tumors less than 5 cm in diameter. While inconclusive at this stage, they also suggested that when a small tumor showed vascular proliferation without typical tumor vessels and the so-called spoke-wheel configuration could not be observed, it could be diagnosed as oncocytoma⁵⁾.

Our patient conformed to numbers 2 and 4 of Ambos' angiographic criteria⁴⁾, but characteristic findings of renal oncocytoma, including spoke-wheel configuration and lucent rim, were not clearly detected. Furthermore, the tumor measured less than 5 cm in diameter and generated no obviously abnormal vessels, indicating the suspected diagnosis of renal oncocytoma, as defined by Barth et al⁵⁾.

However, Ambos reported that these angiographic findings were also evident in 15% of renal cell carcinoma patients, indicating the unreliability of angiography⁴⁾.

Since angiography could not completely eliminate the possibility of renal cell carcinoma in our case, we performed an operation. The frozen-section diagnosis permitted us to make a final decision as to whether surgical enucleation should be replaced by radical nephrectomy.

Renal oncocytoma is reported to have a malignant potential^{6,7)} although most cases are benign in nature⁸⁻¹⁰⁾; therefore, residual concerns about partial nephrectomy and surgical enucleation have been raised by many investigators. However, if cases of

renal cell carcinoma are properly selected, these procedure can yield a favorable prognosis^{11,12)}. Thus, radical nephrectomy if performed on all cases of renal oncocytoma may cause excessive surgical invasion.

A preoperative biopsy is preferred in some cases to differentiate oncocytoma from renal cancer¹³⁾ but an adequate amount of tissue specimens could not be obtained. Furthermore, it seems inappropriate to diagnose renal oncocytoma based on the biopsy of one portion of the tumor because renal cell carcinoma has a variable histology and may contain areas with oncocytic features⁴⁾. Little is known about the factors affecting the prognosis of oncocytoma. However, the above findings support our use of a preservative nephrectomy in patients in whom malignancy is ruled out by frozen-section diagnosis and the criteria for enucleation of renal cancer and partial nephrectomy are satisfied.

Therapies employed for 76 Japanese cases included nephrectomy in 67 cases (88.2%), partial nephrectomy in 4 (5.3%), enucleation in 2 (2.6%), and follow-up observation in 2 (2.6%). As a preoperative diagnosis, renal-cell cancer or suspected renal-cell cancer predominated, while renal oncocytoma or suspected oncocytoma was recorded in only 11 (14.5%). These results clearly indicated the difficulty of preoperative diagnosis, which affected the subsequent therapeutic procedures. With further advances in preoperative diagnosis, clarification of the major factors affecting the prognosis of oncocytoma, and more reports regarding long-term prognosis, therapeutic approaches will be modified in the future.

We intend to continue to carefully monitor the present case while paying particular attention to the malignant potential.

CONCLUSION

We managed one case of renal oncocytoma with surgical enucleation.

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和文抄録

腫瘍核出術を施行した腎オンコサイトーマの1例

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腫瘍核出術を施行した腎オンコサイトーマの1例を報告する。症例は、46歳、女性、健診時の超音波検査で右腎腫瘍を指摘され受診。CT、血管撮影にて、腫瘍は、腎オンコサイトーマが疑われた。腫瘍の部位が核出術可能であり、この予定で手術に望み、術中迅速病理診断で最終治療方針を決定し、もし腎癌の場合は根治的腎摘を施行することとし手術を施行した。迅速病理の結果は、オンコサイトーマの可能性大で悪性像はみられないとの診断であったため予定通り核出術にて手術は終了した。摘出標本の病理組織は、好酸性

顆粒状の細胞質を持ち、核は類円形で核異型は乏しく核分裂像も見られなかった。電顕像では、多数のミトコンドリアが認められた。以上より、腎オンコサイトーマと診断した。本疾患は一般的に予後良好とされているにもかかわらず本邦においては、腎摘されたものがほとんどである。術前診断の難しさからであろう。本例は核出術の第3例目の症例である。本腫瘍の、術前診断および治療法につき文献的考察を行った。

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