# Feasibility of nephron-sparing surgery in giant oncocytoma

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## Abstract

Oncocytomas represent 3 to 7% of renal masses and behave as benign tumours. Nephron-sparing procedures are preferred for biopsy confirmed lesions; however, giant oncocytomas have been generally treated by radical nephrectomy. We report the first case of partial nephrectomy in a 45-year-old man who presented with a 20-cm oncocytoma. At the 1 year follow-up, he had a normal functioning kidney. Despite the difficulty of this procedure, partial nephrectomy for very large benign tumours can be considered in appropriately selected young patients.

#### Introduction

Renal oncocytomas are tumours originating from the distal renal tubule. They represent 3% to 7% of kidney masses and usually behave in a benign manner.<sup>1,2</sup> These tumours have a growth rate similar to renal cell carcinoma (RCC) and can become relatively large.<sup>2</sup> Nephron-sparing surgery is preferred for such tumours; however, patients with giant oncocytomas have been classically treated by radical nephrectomy. We describe the first case of partial nephrectomy in a patient with a giant oncocytoma.

#### **Case report**

A 45-year-old patient presented with left flank pain. His medical history was notable for sickle cell disease. Physical examination revealed a thin man with a large palpable left flank mass. Ultrasound identified a 20-cm left renal tumour. Magnetic resonance imaging (MRI) characteristics of this mass include a hyperintense central radial scar on T2 weighted imaging. The scar showed partial enhancement on T1 weighted imaging in the delayed phase after gadolinium IV injection, while the surrounding tissue enhanced homogeneously in the arterial phase. No fatty tissue or hemorrhage was present in the lesion; there was also no vascular invasion and no suspicious retroperitoneal lymph nodes. This MRI feature was suggestive of oncocytoma (Fig. 1).

Histopathological and molecular biology analysis following ultrasound guided biopsy confirmed the diagnosis. After discussion at our multidisciplinary meeting, we decided to perform nephron-sparing surgery. Following placement of a double J stent, we performed a partial nephrectomy via a midline transperitoneal open approach. Dissection of the hilum revealed a single renal artery and a large renal vein, which had a similar diameter to that of the inferior vena cava (Fig. 1, part B). Hilar clamping was performed and the tumour was completely excised. After early unclamping of the vessels, we were able to control the parenchymal bleeding and repair the renal cavities. The total operative time was 4 hours, and the warm ischemia time was 15 minutes. The excision of the lesion was challenging due to the absence of macroscopic delineation between the tumour and the normal renal parenchyma. The final histopathological analysis confirmed the diagnosis of the lesion as an oncocytoma (Fig. 2), with clear margins.

The follow-up period was complicated by a urinary fistula requiring prolonged drainage (Clavien Grade IIIb). The patient was discharged on postoperative day 12. At the 1-year follow-up, the creatinine/glomerular filtration rate was normal and the triple-phase computed tomography (CT) scan showed a normal functioning kidney with no evidence of recurrence (Fig. 3).

#### Discussion

Oncocytoma are benign renal tumours which can occasionally become very large and can require surgery.<sup>2</sup> In cases of large oncocytoma, the CT or MRI is used to detect a clearly delineated central or eccentric fibrous scar with an intense



*Fig. 1.* T1 magnetic resonance imaging scan after Gadolinum injection. A: Cortical phase showing the giant oncocytoma of the left kidney with the hypointense central scar and homogeneous pericicatricial tissue. B: Normal renal parenchyma with renal artery (long arrow) and renal vein (short arrow)

homogeneous enhancement of the surrounding tissue and with an absence of necrosis in the nephrographic phase. However, a central scar can also be present in chromophobe carcinoma in 23% of cases.<sup>3</sup> In clear cell carcinoma a central necrosis mixed with fibrosis can mimic a central scar. However, the frequency of such an appearance in patients with a large carcinoma was only 1% to 4% when the 2 criteria (star-shaped hypodensity and homogeneous surrounding tissue) were present.<sup>4</sup>

In recent studies no specific CT or MRI features were reliable in distinguishing oncocytoma from chromophobe carcinoma, but only small lesions were included. In these cases only 10% had a central scar, while the remaining patients had homogeneous lesions after contrast enhancement that could not be distinguished from chromophobe carcinoma.<sup>5,6</sup>

It is only with large lesions that imaging can suggest oncocytoma; if conservative surgical management is planned, then it is essential to obtain a histopathological diagnosis. For that purpose, percutaneous biopsy is becoming increasingly accurate.<sup>7</sup> However, making the differential diagnosis between oncocytoma and chromophobe RCC on a small sample can be challenging, and advances in molecular markers could help solve this issue.<sup>8</sup> In our case, the histological pattern on biopsy was typical of oncocytoma, which was confirmed by molecular biology. The diagnosis was further supported by the indolent growth of the tumour, both locally and distally, with the absence of metastasis. While the standard of care for small kidney oncocytomas is partial nephrectomy, this has not been attempted for large tumours despite the fact that they are generally well-encapsulated and rarely invasive or associated with metastases.<sup>9</sup> The reason might be the complexity of such procedures and the risk of surgical complications, as partial nephrectomy in these hypervascularized giant tumours can be technically challenging (dissection planes can be difficult to identify and kidney preservation may not always be possible). Complex kidney reconstruction and hemostasis are also necessary and might require long ischemia times that can be detrimen-



Fig. 2. Macroscopic aspect of the tumour with central scar.

tal to renal function. Postoperative complications of partial nephrectomy, such as urinary fistula and bleeding, can be more frequent in this setting. Despite these challenges, we performed the partial nephrectomy using our early unclamping technique previously described for laparoscopic partial nephrectomy.<sup>10</sup> This allowed a shorter warm ischemia time and efficient kidney reconstruction.

Urinary leakage occurred in our patient, and was resolved with prolonged ureteral stent drainage. The 1-year follow-up CT scan demonstrated a normal functioning kidney.



*Fig. 3.* A computed tomography intravenous pyelogram at 1-year follow-up showed a normal functioning kidney.

### Conclusion

Open partial nephrectomy for giant renal oncocytoma is technically feasible. Preoperative histopathological and molecular biology confirmation of the benign nature of the tumour is essential. However, patients should be informed about the higher risk of complications and possible conversion to radical nephrectomy.

**Competing interests:** Dr. El Hajj, Dr. Thanigasalam, Dr. Boulay, Dr. Molinié, Dr. Escudier and Dr. Baumert all declare no competing financial or personal interests.

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