

## Case Report

# Laparoscopic renal denervation for intractable ADPKD-related pain

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### Introduction

Severe back, flank, and abdominal pain are known consequences of cyst enlargement in patients with autosomal dominant polycystic kidney disease (ADPKD). Bilateral open, and now laparoscopic, marsupialization of multiple cysts can relieve pain for a greater period than percutaneous aspiration [1,2]. However, relief is often temporary and repeat procedures have been less helpful. Nephrectomy or renal embolization can offer permanent relief, but no good option exists for those with intractable pain in the face of normal renal function. We applied a bilateral laparoscopic approach to renal denervation in such a patient, with at least short-term success.

### Case

A 41-year-old man with chronic, severe back and flank pain due to ADPKD, as well as chronic lower back pain treated with methadone, presented to our transplant clinic. Spiral CT showed significant preservation of renal mass, single renal arteries, and countless small, intra-parenchymal cysts in both kidneys. He had normal renal function, and a transabdominal bilateral cyst reduction procedure had been performed 4 years earlier. The patient enjoyed approximately 1 year of relief, during which he was able to work. Recurrent pain led to full disability, and repeated attempts at ultrasound-guided percutaneous aspiration achieved only partial and temporary relief. As an alternative to bilateral nephrectomy, we offered a laparoscopic bilateral renal denervation.

Using a modification of our approach to laparoscopic live-donor nephrectomy, we exposed the left renal pedicle, and isolated the periaortic nerve fibres. Circumferential division of these nerves with a

harmonic scalpel followed. The dissection was carried across the anterior surface of the aorta, dividing the fibres of the renal and intermesenteric plexi. Following this course, the right renal artery was exposed and periaortic nervous tissue divided. The patient was discharged on postoperative day 4. On return to the clinic he was free of upper back, flank, and abdominal discomfort, and ranked his low-back pain as a '2' on a 1–10 scale. Renal function and blood pressure remained normal.

### Discussion

The perception of renal pain is carried in afferent A $\delta$  and C fibres from the kidney, coursing through the periaortic nerves, ascending by way of the renal and intermesenteric plexi to the lowest splanchnic nerve, and passing *via* the dorsal roots of T<sub>11</sub> through L<sub>1</sub> to the spinothalamic tracts [3,4]. Because of their number and 3-dimensional arrangement, the periaortic and periaortic nerves do not lend themselves well to percutaneous approaches. While the greater and lesser splanchnic nerves can be divided thoracoscopically, the lowest splanchnic nerve is not easily approached either thoracoscopically or laparoscopically. Visceral organ denervation is a routine consequence of transplantation, and leads to an insensate kidney with no alteration in renal function.

Since the regeneration of nerves to allogenic transplanted and autotransplanted kidneys is possible, we can draw no conclusions regarding the duration of benefit from this procedure. Nevertheless, this presents an option for the control of refractory pain in those with ADPKD and preserved renal function.

### References

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