

# Single-docking robot-assisted radical antegrade modular pancreatectomy with partial left nephrectomy in a patient with synchronous pancreatic neuroendocrine neoplasm and clear cell renal cell carcinoma

Miha Petric<sup>1,2</sup>, Manca Bregar<sup>2</sup>, Jan Grosek<sup>1,2</sup>, Aleš Tomažič<sup>1,2</sup>, Simon Hawlina<sup>2,3</sup>

<sup>1</sup>Department of Abdominal Surgery, University Medical Centre Ljubljana, Ljubljana, Slovenia, <sup>2</sup>Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia, <sup>3</sup>Department of Urology, University Medical Centre Ljubljana, Ljubljana, Slovenia

## Abstract

The synchronous occurrence of pancreatic neuroendocrine neoplasm (PNEN) and clear cell renal cell carcinoma (ccRCC) in one patient is extremely rare. Synchronous resection of both tumours is preferred over a two-stage procedure if possible. The robotic da Vinci Xi platform allows for multi-quadrant surgery with oncological outcomes comparable to those of laparoscopic or open surgery. We present the case report of an 80-year-old male who underwent synchronous resection of a PNEN in the tail of the pancreas and ccRCC in the left kidney. To the best of our knowledge, this is the first case report on this topic.

**Keywords:** Clear cell renal cell carcinoma, neuroendocrine neoplasm of the pancreas, partial nephrectomy, RAMPS, robot-assisted surgery

**Address for correspondence:** Dr. Simon Hawlina, Department of Urology, University Medical Centre Ljubljana, Zaloška Cesta 7, Ljubljana 1000, Slovenia.

E-mail: [simon.hawlina@kclj.si](mailto:simon.hawlina@kclj.si)

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## INTRODUCTION

The synchronous occurrence of pancreatic neuroendocrine neoplasm (PNEN) and clear cell renal cell carcinoma (ccRCC) in one patient is extremely rare.<sup>[1]</sup> Minimally invasive synchronous resections are associated with benefits for patients compared with open or two-stage procedures.<sup>[2]</sup> Robotic da Vinci Xi platform, with its superior vision and tremor mitigation, allows surgeons to perform highly accurate and precise multi-quadrant surgical procedures with greater ergonomics.<sup>[3]</sup> Due to the rare occurrence of this clinical scenario, data on the use of robotic platforms over laparoscopy are still inconclusive and associated with technical difficulties

and challenges. In this article, we describe the first case of synchronous robot-assisted radical antegrade modular pancreatectomy (RAMPS) with partial left nephrectomy (robot-assisted partial nephrectomy [RAPN]) for synchronous PNEN and ccRCC of the left kidney.

## CASE REPORT

An 80-year-old male with arterial hypertension, benign prostatic hyperplasia, post-cholecystectomy and spinal surgery was admitted to our department for surgical treatment of a synchronous 2.2-cm primary hypodense

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neoplasm of the pancreatic body and a 2-cm solid tumour of the left kidney observed on computed tomography [Figure 1].

The patient was placed in the French position under general anaesthesia. A da Vinci Xi robotic platform was used. We followed the operative protocol described by the UT Southwestern Group for the RAMPS procedure.<sup>[4]</sup> We used four 8-mm robotic trocars and two assistance ports (AirSeal<sup>®</sup> port and one 12-mm assistance port). Trocar position #1 was modified slightly [Figure 2] to facilitate access to the left kidney during the second stage of the procedure.

Hem-o-lok<sup>®</sup> clips were used to close vessels. The soft and steatotic pancreas was transected at the crossing of the vena portae with a reinforced linear stapler. In the second phase of the surgery, mobilisation of the left kidney was performed. Our detailed technique of transabdominal RAPN has been previously described.<sup>[5]</sup> The left renal artery and veins were isolated for vascular clamping. The next step was the endoscopic clamping of the main renal artery using a vascular clamp. Cold scissors were used to make a sharp incision of the kidney parenchyma below the tumour. We performed enucleoresection of the tumour, aiming for maximal preservation of renal function. The excised renal parenchyma was then sutured in two layers using the Hem-o-lok<sup>®</sup> sliding technique to compress the kidney parenchyma. The vascular clamp was released after a total warm ischaemia time (WIT) of 16 min. A drain was placed in the left upper quadrant, and the specimens were removed through a Pfannenstiel incision. The duration of the surgical procedure was 208 min, with an estimated blood loss of 200 mL.

In the post-operative period, we found no derangement in renal function. According to the Clavien–Dindo classification,<sup>[6]</sup> patients develop Grade 2 complications due to post-operative pancreatic biochemical leak.<sup>[7]</sup> The

patient was discharged from the hospital on day 9 after surgery. At the last outpatient visit, 3 months after surgery, the patient had no significant complaints and was able to resume normal daily activities.

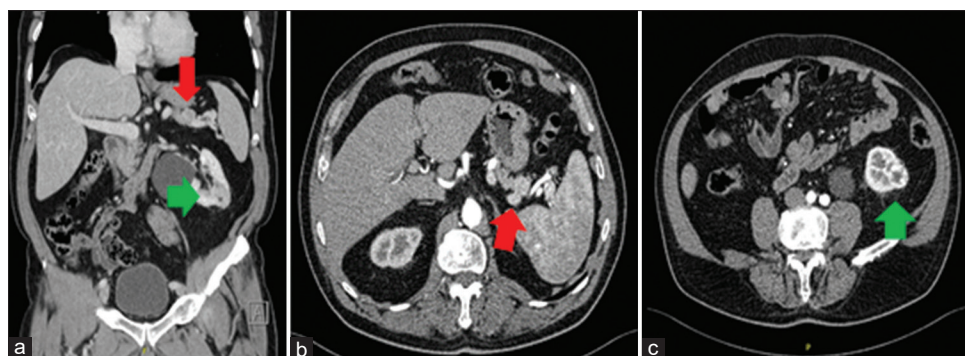
Histopathological analysis revealed a 17-mm, Grade 1, stage pT1N0 PNEN with eight negative-removed lymph nodes. The tumour in the left kidney was diagnosed as 23-mm, Grade 2, stage pT1a ccRCC, without vascular or perinephric fat invasion. Both tumours were radically resected.

## DISCUSSION

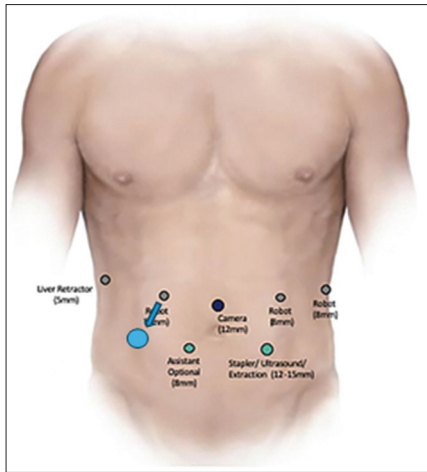
The EAU and ENETS guidelines recommend a minimally invasive approach with PN for T1 or T2 ccRCC and left hemipancreatectomy for PNEN > 2 cm in the body or tail of the pancreas.<sup>[8,9]</sup> A robotic minimally invasive approach to left-sided pancreatic tumours is safe, oncological, comparable to laparoscopic modalities and superior in complex clinical scenarios.<sup>[10]</sup> In patients with PNEN, the robotic approach is safe and comparable to the open or laparoscopic techniques.<sup>[11]</sup> Compared to laparoscopic modalities, robotic platforms are associated with a shorter WIT and provide benefits for the treatment of complex tumours.<sup>[12]</sup> Owing to the rarity of these clinical scenarios, pre-operative planning can be faced with challenges in trocar and robotic hand positioning. With gaining surgical experience and slight modifications of the established SOP (RAMPS<sup>[4]</sup> and RAPN<sup>[5]</sup>), single-docking robotic surgical procedures can be performed safely. To the authors' best knowledge, there are no reports in the literature regarding open or laparoscopic synchronous RAMPS and RAPN.

## CONCLUSION

Here, we report the first successful synchronous single-docking robot-assisted RAMPS and RAPN for the treatment of PNEN and ccRCC of the left kidney. The



**Figure 1:** Patient computed tomography scan (a-c) with pancreatic neuroendocrine neoplasm (red arrow) in the pancreatic tail and clear cell renal cell carcinoma (green arrow) in lower pole of left kidney



**Figure 2:** Placement of robotic trocars according to UT Southwestern SOP (2) and trocar #1 position modification (blue arrow)

robotic da Vinci Xi platform enables safe and efficient multi-quadrant surgery. This report can be used as a template for future clinical scenarios.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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