ENDOCRINE IMAGE

# Robotic-assisted Resection of a Retrocaval Paraganglioma

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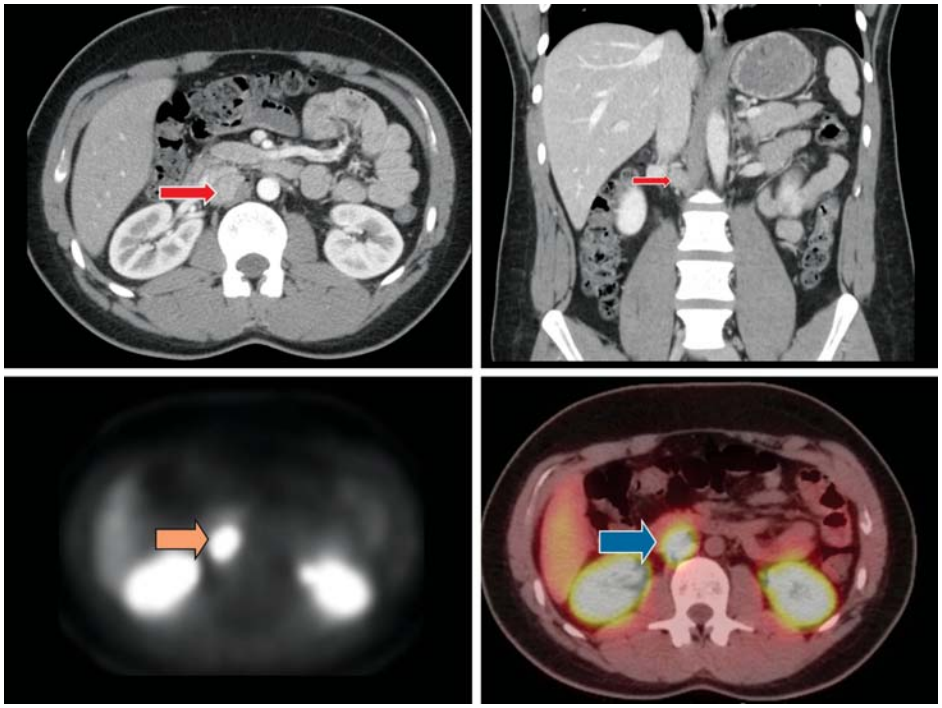

**Fig. 1**: Abdominal CT (at the top) and 18F Dopa-PET (bottom) showing a 27 mm paraganglioma located behind the vena cava at the level of confluence of renal veins

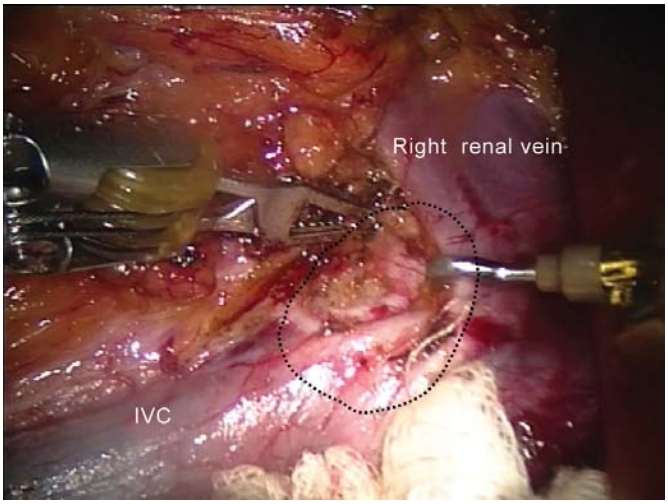


**Fig. 2:** Preoperative view at the beginning of robotic-assisted laparoscopic paraganglionoma dissection

A 24-year-old male was referred for malaise, easy fatigability, and excessive sweating. His past surgical and medical history was negative except that his 37-year-old father died suddenly in his car of unknown cause. Further work-up showed that urinary catecholamine was 4 times above upper normal values. Abdominal CT showed a 27 mm retrocaval paraganglioma at the level of right renal vein. FDG-PET and 18F Dopa-PET scans confirmed a unifocal retrocaval paraganglioma with no other localization (Fig. 1).

After 3 weeks preparation using a calcium channel blocker (nicardipine 50 mg per day), the patient was scheduled for paraganglioma resection. He was placed in strict left lateral decubitus position. Under general anesthesia, one 12 mm port was placed at 3 cm above umbilicus for the optic and two 8 mm ports on anterior axillary line for right and left robotic arms (Da Vinci system). One 5 mm ports was placed for the first assistant. A complete dissection of hepatic flexure of the colon was performed with kocherization of the second part of the duodenum up to the right renal vein level. The tumor was seen behind the vena cava (Fig. 2). Dissection around the tumor was performed using hook with monopolar and bipolar diathermy alternatively. The tumor was progressively extracted from behind on the right side of vena cava and below the right renal vein. Complete excision without tumor fraction was performed with no vascular injury. Operative time was 90 minutes. Patient started on oral diet at day one and was discharged on 4th postoperative day. Pathology showed a paraganglioma with Ki 67 < 5%. At 24 months follow-up, postoperative cathecholamines were within normal ranges. DNA blood analysis revealed a SDHB exon 3 mutation (c.394 T > C p.L87S).

Retrocaval paraganglioma resection is technically challenging because of tumor accessibility and vena cava close relation. This case report emphasizes that laparoscopic resection of a retrocaval paraganglioma is feasible and safe. We believe that robotic approach, placing a computer between patients and surgeon is a technical evolution from standard laparoscopy. Consequently, this robotic approach is particularly appropriate to resect paragangliomas in demanding localization. This case also illustrates that all patients with abdominal paragangliomas have to be managed by a specialized and multidisciplinary team. In this group, surgeons should evaluate the possibility of laparoscopic resection in all patients even in demanding localizations. These surgeons need extensive experience in minimally invasive techniques, as well as in endocrine surgery.