

Successful Treatment of Primary Aldosteronism With Partial Adrenalectomy, Facilitated By The Use of ¹¹C-Metomidate PET/CT

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Background

Primary aldosteronism (PA) is estimated to be responsible for 5-10% of all cases of hypertension (HTN)¹. The current gold standard test for determining lateralisation in PA is adrenal vein sampling (AVS). ¹¹C-Metomidate PET/CT (MTO-PET) has recently emerged as a potential non-invasive alternative to AVS². As ¹¹C-Metomidate is concentrated within 'hyper-functioning' nodules, MTO-PET potentially not only identifies the side, but the exact site of aldosterone hypersecretion, thus raising the possibility of more targeted surgical intervention.

Case Report

A 45-year-old man was noted to have HTN and hypokalaemia following a myocardial infarction. He required four anti-hypertensive agents to achieve BP control. His plasma aldosterone was elevated with a suppressed plasma renin (off interfering medications), and aldosterone did not adequately decrease following saline suppression, confirming the diagnosis of PA. Adrenal CT and MRI did not convincingly demonstrate a lesion. He underwent AVS, but the result was inconclusive (right adrenal vein not cannulated). MTO-PET revealed focally increased tracer uptake in a sub-centimetre nodule in the left adrenal gland.

Investigations

ARR screening:

Renin	<2	mU/L
Aldosterone	932	pmol/L

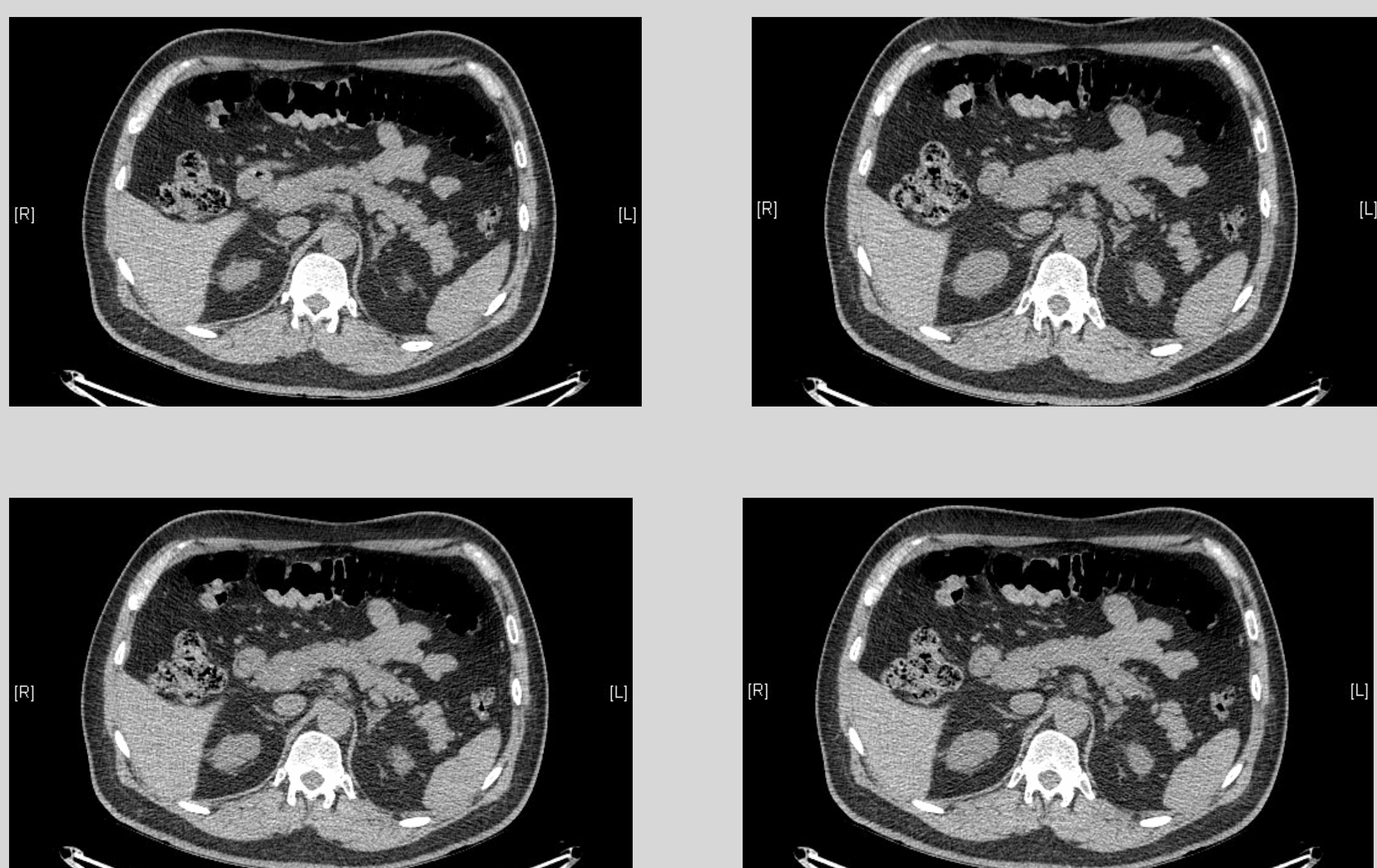
Saline infusion test:

Time	Aldosterone	Renin	Cortisol
0h	934	<0.2	586
+4h	584	<0.2	213

Adrenal Vein Sampling:

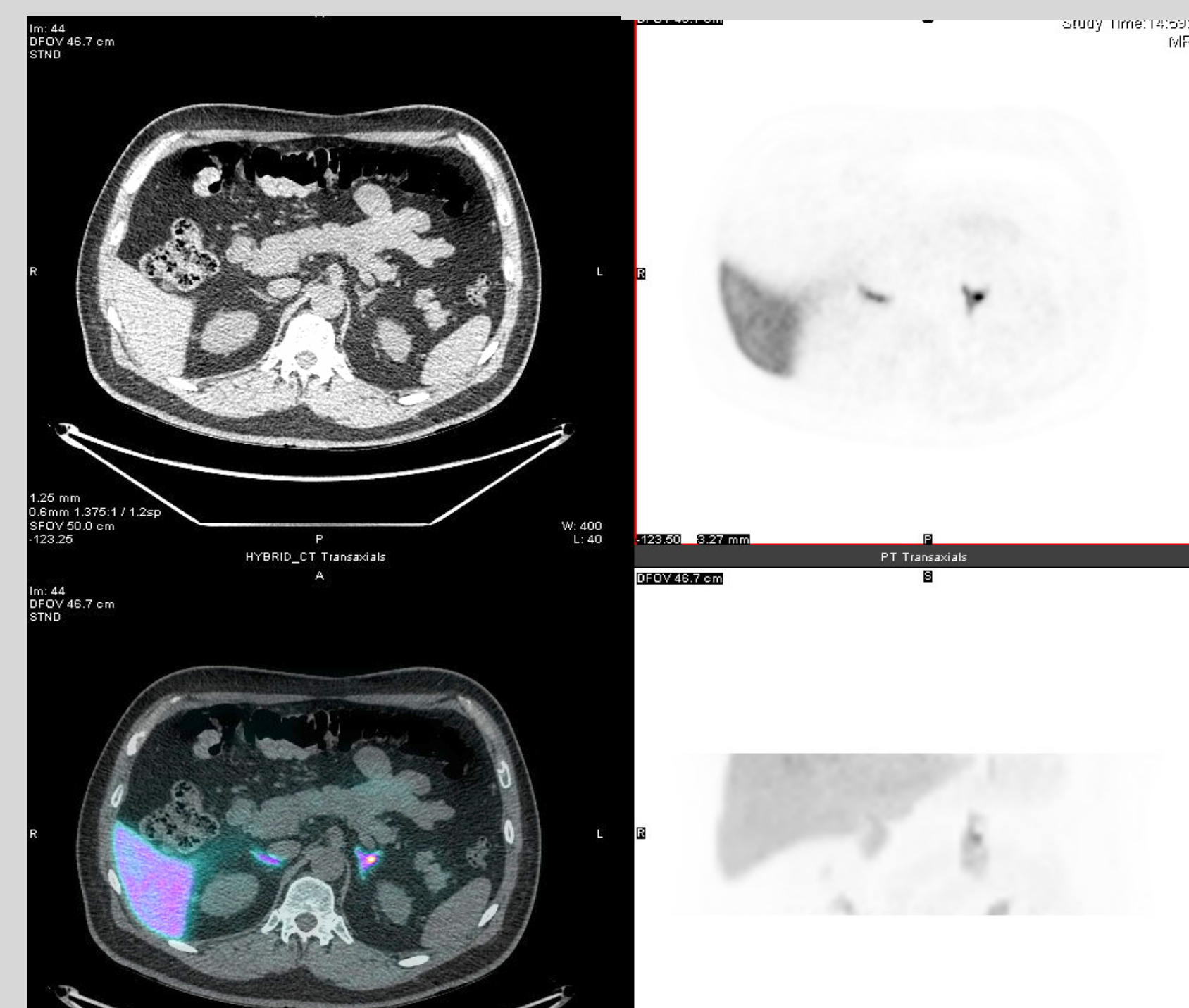
Site	Cortisol	Aldosterone	Aldo:Cort
Periphery	522	1028	1.97
Left Adrenal	816	37763	46.27
Right Adrenal	487	969	1.99

CT Adrenal:

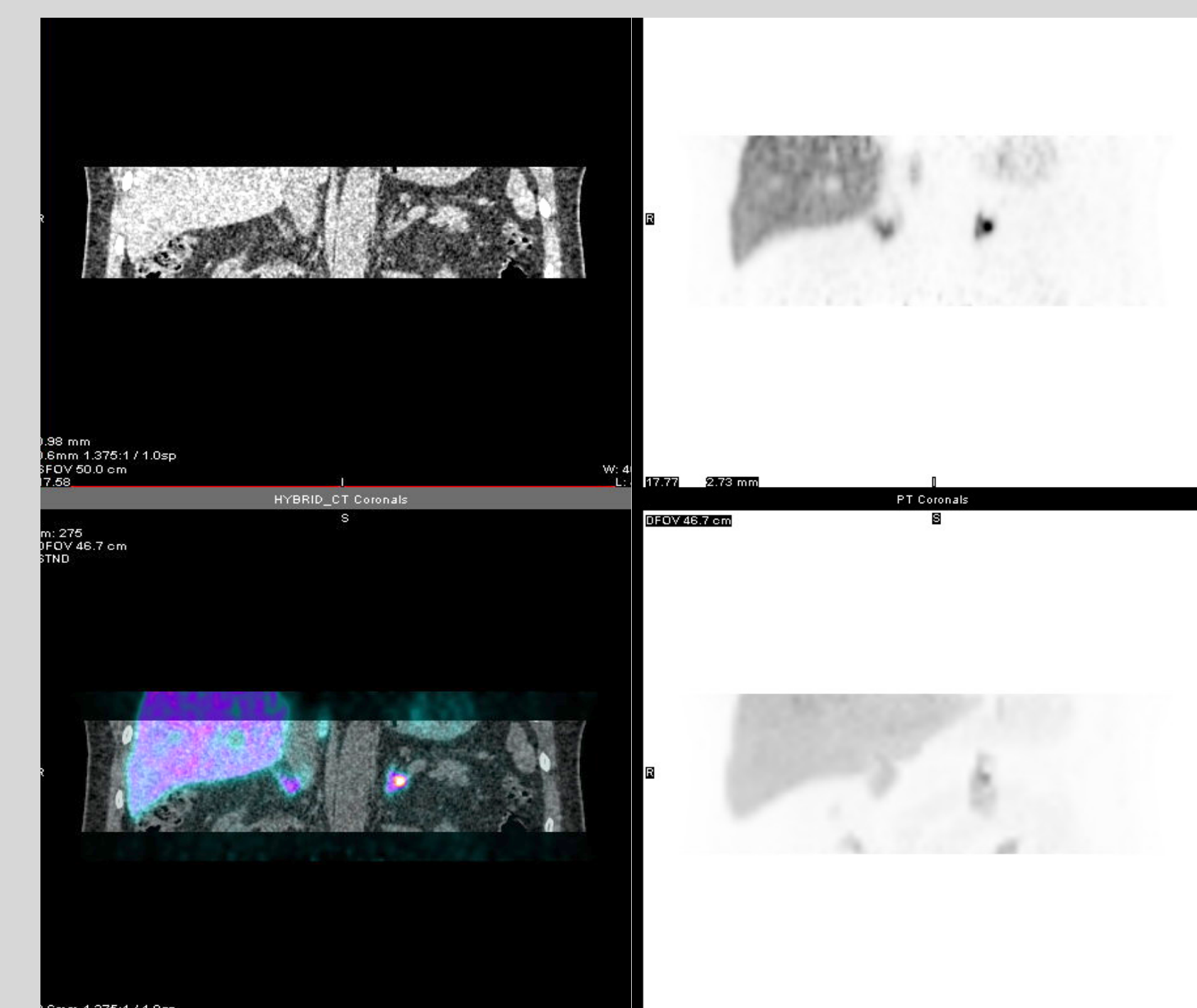


¹¹C-Metomidate PET/CT:

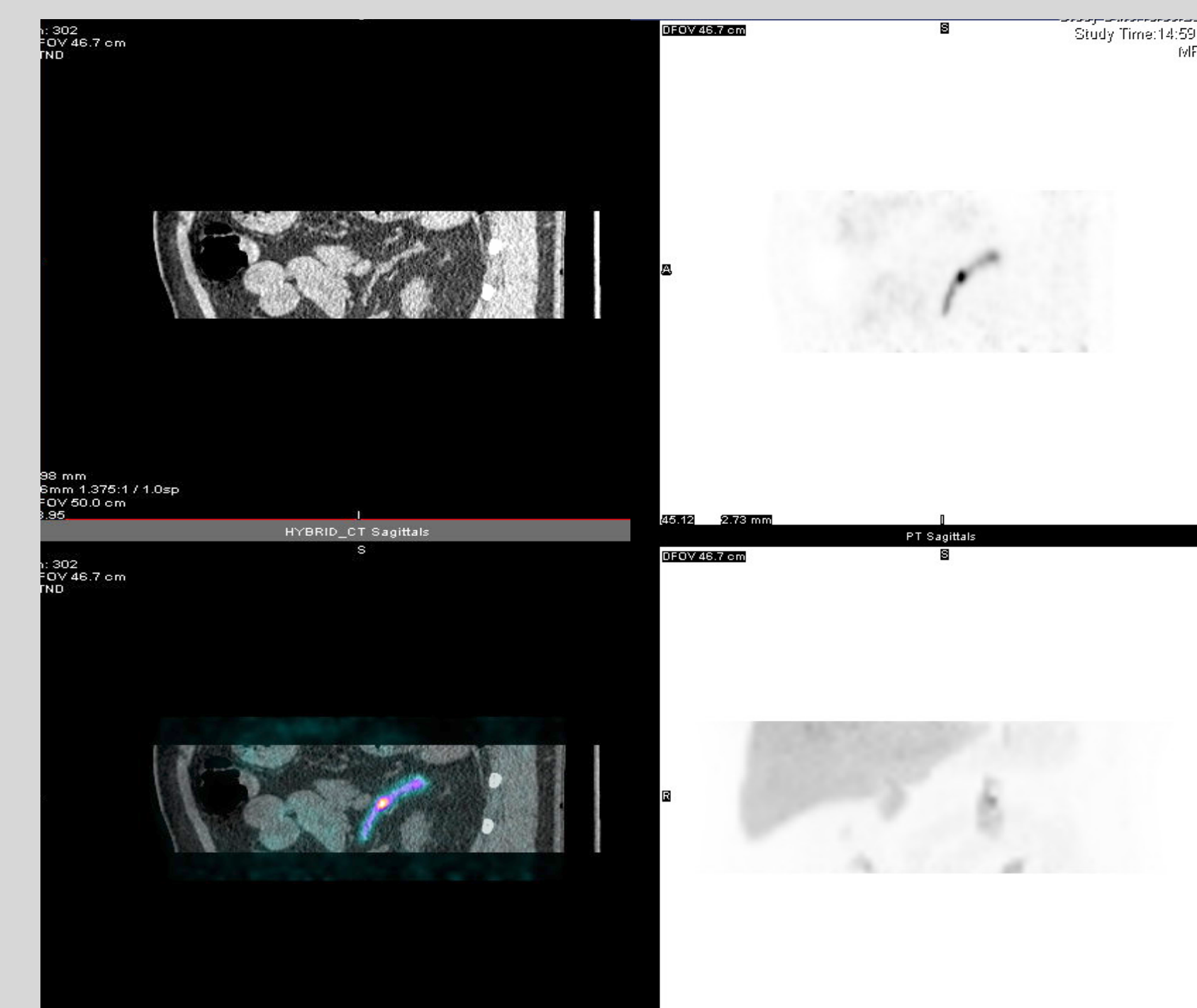
Axial



Coronal



Sagittal



Treatment and outcome

The patient underwent a posterior retroperitoneoscopic procedure, during which the nodule and lateral limb of the left adrenal were selectively removed, leaving the rest of the gland in situ. Histology confirmed the presence of a small Conn's adenoma. The patient is normotensive post-surgery (BP 110/74 mmHg), on no antihypertensive medications, with normal biochemistry.

	Pre-op	Day 2	Month 3	
Renin	<2	63.8	30.9	mU/L
Aldosterone	932	<102	352	pmol/L

Conclusion

This case highlights the ability of MTO-PET to not only lateralise, but actually localise the site of aldosterone hypersecretion, and thereby guide selective removal of a Conn's adenoma with sparing of the adjacent normal adrenal gland.

References:

- Funder et al. *JCEM*. 2008
- Burton et al. *JCEM*. 2012