A Complex Case of Pseudopheochromocytoma in a Patient with Type 1 Neurofibromatosis

Jessica Ferdinands[1], Kevin Rajakariar[2], Spiros Fourlanos[3,4], Amy Harding[4], Robert Millar[5,6], Michael Sutherland[3], Hendrik Zimmet[1,2,3]

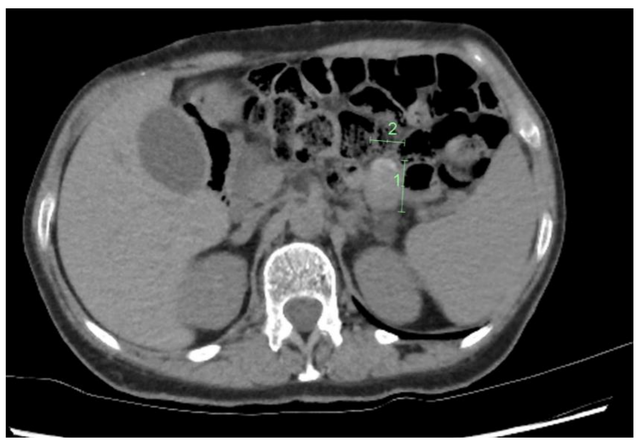
[1]Department of Medicine, Central Clinical School, Monash University, Melbourne, Australia
[2]Cardiac Sciences Clinical Institute, Epworth Healthcare, Melbourne, Australia
[3]Internal Medicine Clinical Institute, Epworth Healthcare, Melbourne, Australia
[4]Diabetes and Endocrinology Service, Royal Melbourne Hospital, Melbourne, Australia
[5]General Surgery and Gastroenterology Clinical Institute, Epworth Healthcare, Melbourne, Australia
[6]General Surgery Service, Royal Melbourne Hospital, Melbourne, Australia

Introduction

- Neurofibromatosis Type 1 (NF1) is an autosomal dominant condition which occurs in 1:3000 live births.
- In their lifetime, it is estimated that 5-7% of patients with NF1 will develop a pheochromocytoma/paraganglioma (PCC/PGL).[1]
- While typically associated with hypertension, these rare tumours can present with orthostatic or paroxysmal hypotension.[2]
- We report a case of possible biochemically detected PCC/PGL in a patient with NF1 with recurrent orthostatic hypotension following spinal surgery.

Normetanephrine level progression

Laboratory test	Initial level	One week later	Post-Nortriptyline washout	Reference range
Plasma normetanephrine	1680 pmol/L	3130 pmol/L	990 pmol/L	<1140 pmol/L
Urinary normetanephrine	-	3.9 umol/d	1.9 umol/d	<2.3umol/d



Computed Tomography Abdomen imaging showing 3cm heterogenous lesion (28 x 19mm) near the pancreatic tail (measurements in green)

Results

- A 69-year-old female with a history of NF1 was admitted for elective cervical spine surgery and experienced intraoperative hypotension.
- Postoperatively she was noted to have orthostatic hypotension and tachycardia, but was euvolaemic on examination.
- Furthermore, she had a concerning five-year history of headaches managed on 50mg nortriptyline daily and described episodic chest pain, diaphoresis and palpitations.
- Her family history was significant for a sister with NF1 and pheochromocytoma.
- Screening for PCC/PGL demonstrated an initial plasma normetanephrine level of 1680 pmol/L (normal <1140 pmol/L) and one week later increased to 3130 pmol/L. This correlated with her urinary normetanephrine which was 3.9 umol/d (normal <2.3umol/d).
- Known to elevate normetanephrine levels, the patient's nortriptyline was weaned over a four-week period, however repeat plasma and urinary catecholamine levels remained borderline elevated.
- Computed tomography of her chest, abdomen and pelvis identified one extra-adrenal lesion near the pancreatic tail at the duodenojejunal flexure, but was not seen on Gallium-68 DOTATATE or MIBG imaging.
- Subsequent removal and biopsy of the lesion revealed a gastrointestinal stromal tumour.
- She is currently alpha blocked with prazosin, with additional ivabradine to help manage her sinus tachycardia.
- Since discharge, repeat plasma and urinary catecholamines have been unremarkable.

Conclusions

- While infrequent, PCC/PGL may present with hypotension rather than hypertension.
- Clinicians need to remain vigilant of its association with hereditary familial syndromes due to the associated morbidity and mortality when left untreated.[3]
- Physicians also need to be cognizant of medications which cause false-positive elevations of plasma normetanephrine levels, to prevent unintentional treatment.

References

1. Malindretos, P.M., Sarafidis, P.A., Geropoulou, E.Z., Kapoulas, S., Paramythiotis, D.D. and Lasaridis, A.N., 2008. Sustained hypotension complicating an extra-adrenal pheochromocytoma. American Journal of Hypertension, 21(7), pp.840-842.
2. Cecchi, R., Frati, P., Capri, O. and Cipolloni, L., 2013. A rare case of sudden death due to hypotension during cesarean section in a woman suffering from pheochromocytoma and neurofibromatosis. Journal of Forensic Sciences, 58(6), pp.1636-1639.
3. Petr, E.J. and Else, T., 2018. Pheochromocytoma and Paraganglioma in Neurofibromatosis type 1: frequent surgeries and cardiovascular crises indicate the need for screening. Clinical Diabetes and Endocrinology, 4(1), p.15.