Diagnostic tools for incidental pheochromocytoma and paraganlioma

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INTRODUCTION

Pheochromocytoma and paraganglioma (PHEO/PGL) are the cause of secondary hypertension, glucose intolerance, arteriosclerosis, which are associated with increase of mortality. Furthermore, 10-17% of them are malignant[(1)].
Therefore, diagnosis PHEO/PGL at the early stage is important.

METHODS

We searched the medical records in our hospital from January 2001 to December 2015 for Japanese patients with the diagnosis of PHEO/PGL.
Fifty-seven cases were identified.

Eight cases were excluded because of following reasons:
Refusing surgery or inoperable due to lung cancer (n=2)
No endocrinological examination before surgery (n=5)
Pathological diagnosis was ganglioneuroma (n=1)

Forty-nine cases were included in our cohort (pheochromocytoma n=37, paraganglioma n=12).
Six patients had genetic background (Mutliple Endocrine Neoplasia (MEN) 2A (n=1), MEN2B (n=1), Von Hippel–Lindau disease (n=2), Neurofibromatosis type 1 (n=2)), while other patients (n=43) were thought to be sporadic.
We conducted 24-hour fractionated metanephrines (24h-UMN)* and ^{123}I-metaiodobenzylguanidine scintigraphy (MIBG) in all cases, and clonidine suppression test (CST) in 35 of 49cases (71%).**

*The measurement of plasma free metanephrines is not available in Japan, therefore we measure urinary fractionated metanephrines. The cut-off values of 24h-UMN were 0.4 mg/day for metanephrine, and 0.9 mg/day for normetanephrine, respectively.

**CST is defined positive when the sum of plasma adrenaline and noradrenaline is 500 pg/ml or more, or decrease of plasma noradrenaline is 50% or less. The plasma catecholamine were obtained three hours after the administration of clonidine (0.3mg)[(2), (3)].

RESULTS

Incidentally discovered PHEO/PGL were 44 of 49cases (90%), which was more frequent than previous reports.

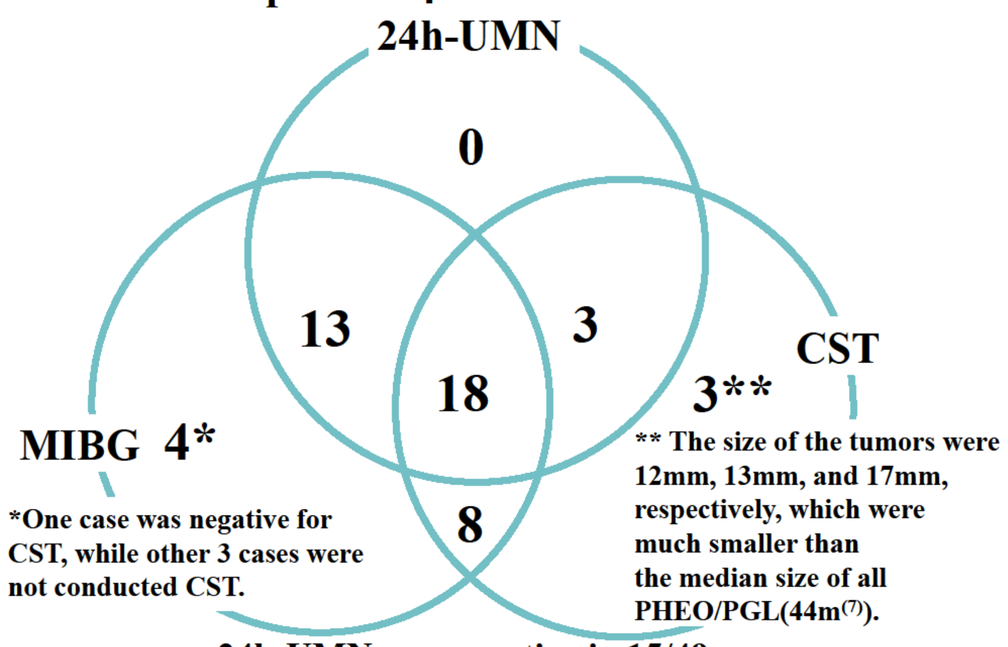
Authors	Incidentally discovered PHEO/PGL	Study period
Amar et al.[(4)]	12/48(25%)	1996-2003
Yu et al.[(5)]	8/30(27%)	1997-2007
Kopetschke et al.[(6)]	59/201(29%)	1973-2007

The imaging modalities served as an opportunity of discovery

Modality	Number of patients
Chest CT	4
Abdominal CT	19
Abdominal MRI	3
Abdominal ultrasonography	18

Eleven of 44 patients (25%) were pointed out incidentaloma in their medical checkups.

Number of patients positive for each examination



*One case was negative for CST, while other 3 cases were not conducted CST.

** The size of the tumors were 12mm, 13mm, and 17mm, respectively, which were much smaller than the median size of all PHEO/PGL(44m[(7)]).

24h-UMN was negative in 15/49 cases.
Among these cases, CST was positive in 11/12 cases, MIBG was positive in 11/15cases.
This result suggests the usefulness of CST and MIBG in patients without elevation of 24h-UMN.

Duration of follow-up in our cohort

No event* was found in our cohort.
(median follow-up: 5 years, ranged 3 months – 15 years)
The recent report showed the risk of new events in the first 5 years was 10%[(7)].
*Event included these conditions: new tumors, local recurrences, metastatic recurrences.

CONCLUSIONS

MIBG, 24h-UMN, CST → **Incidental PEHO/PGL** → **Diagnosis at the early stage** ← **Early surgical intervention** → **Good prognosis**

Early diagnosis and surgical intervention may result in good prognosis of incidental PHEO/PGL which are possibly malignant.

References

(1) Lenders et al *J Clin Endocrinol Metab.* 2014 Jun;99(6):1915-42.
(2) Sjoberg et al. *Arch Intern Med.* 1992 Jun;152(6):1193-7.
(3) Grossman et al. *Hypertension.* 1991 Jun;17(6 Pt 1):733-41.
(4) Amar et al. *J Clin Endocrinol Metab.* 2005 Apr;90(4):2110-6.
(5) Yu et al. *Am J Med.* 2009 Jan;122(1):85-95.
(6) Kopetschke et al. *Eur J Endocrinol.* 2009 Aug;161(2):355-61.
(7) Plouin et al. *Eur J Endocrinol.* 2016 May;174(5):G1-G10.