Declarations

Written informed consent to participate in this study and for the publication of this report was obtained from the patient for ethics approval.

Consent for publication

Written informed consent was obtained from the patient. A copy of the written consent form is available for review from the Editor-in-Chief of this journal.

Availability of data and material

Due to ethical restrictions, the raw data underlying this paper are available upon request to the corresponding author.

References

1 Beilan JA, Lawton A, Hajdenberg J, Rosser CJ. Pheochromocytoma of the urinary bladder: a systematic review of the contemporary literature. *BMC Urol.* 2013; **13**: 22.

2 Iwamoto G, Kawahara T, Tanabe M *et al.* Paraganglioma in the bladder: a case report. *J. Med. Case Rep.* 2017; **11**: 306.

3 Priyadarshi V, Pal DK. Paraganglioma of urinary bladder. *Urol. Ann.* 2015; **7**: 402–4.

4 Yasui M, Kawahara T, Takamoto D, Izumi K, Uemura H, Miyamoto H. Distribution of androgen receptor expression in the urinary bladder. *Int. J. Urol.* 2019; **26**: 305–6.

5 Zhai H, Ma X, Nie W *et al.* Paraganglioma of the urinary bladder: a series of 22 cases in a single center. *Clin. Genitourin. Cancer* 2017; **15**: e765–71.

6 Al-Zahrani AA. Recurrent urinary bladder paraganglioma. *Adv. Urol.* 2010; **2010**: 1–3.

7 Ohtaka M, Kawahara T, Ishiguro Y *et al.* Expression of receptor activator of nuclear factor kappa B ligand in bladder cancer. *Int. J. Urol.* 2018; **25**: 901–2.

Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table S1. Previous published reports in Japan containing information on tumor sites.

Editorial Comment

Editorial Comment to Functional paraganglioma of the bladder: Both radiographic-negative and laboratory-negative case

Cases of pheochromocytoma of the urinary bladder are quite rare, accounting for 0.05% of bladder tumors and less than 1% of all pheochromocytomas.[1] Pheochromocytomas are clinically important, and functional tumors have been reported by Zhai *et al.*[2] to account for over 63.6% of cases of paraganglioma in the bladder. Clinicians must be vigilant for signs of severe hypertension subsequent to the surgical procedure, which can result in fatal outcomes such as intracranial hemorrhage. Therefore, a preoperative diagnosis is essential to avoid such undesirable outcomes.

Low-intensity T1-weighted and high-intensity T2-weighted magnetic resonance imaging (MRI) are important diagnostic tools for pheochromocytomas. Additionally, iodine 131 metaiodobenzylguanidine (MIBG) scintigraphy can be used to definitively diagnose the tumor. Other than these imaging modalities, laboratory tests for measuring the concentration of catecholamine or its metabolic products in addition to blood tests or acid urinary collection are helpful diagnostic tools for determining whether the tumor is functional or nonfunctional.

Sugimura *et al.*[3] reported functional paraganglioma of the bladder, which was negative in both radiographic and laboratory examinations. They also noticed that the tumor they were about to incise had some hormonal activity because of the rapid elevation in blood pressure during the transurethral resection of bladder tumor (TURBT). Ceasing the endoscopic procedure was a wise decision. Even though the preoperative MRI scan indicated paraganglioma, the MRI findings were not specific.[4] In contrast to MRI, MIBG scintigraphy has high specificity.[5] If MIBG scintigraphy and laboratory tests were performed before TURBT and those examinations showed positive results, partial cystectomy could have been selected as the initial treatment. However, in this case, those examinations showed negative results.

Overall, in spite of negative findings of MIBG scintigraphy and laboratory tests, functional paraganglioma cannot be completely ruled out. Therefore, urologists must pay careful attention to perioperative vital signs during TURBT for atypical intravesical tumors, and the procedure must be stopped when a major change in the patients' condition is observed during the operation.

Tadashi Tabei M.D.
Department of Urology, Yokosuka Kyosai Hospital, Yokosuka, Kanagawa, Japan
tadashiokclub@yahoo.co.jp

DOI: 10.1002/iju5.12079

Conflict of interest

The author declares no conflict of interest.

References

1 Beilan JA, Lawton A, Hajdenberg J, Rosser CJ. Pheochromocytoma of the urinary bladder: a systematic review of the contemporary literature. *BMC Urol.* 2013; **13**: 22.

2 Zhai H, Ma X, Nie W *et al.* Paraganglioma of the urinary bladder: a series of 22 cases in a single center. *Clin. Genitourin. Cancer* 2017; **15**: e765–71.

3 Sugimura R, Kawahara T, Noguchi G *et al.* Functional paraganglioma of the bladder: both radiographic-negative and laboratory-negative case. *IJU Case Rep.* 2019; **2**: 174–7.

4 Maurea S, Cuocolo A, Reynolds JC, Neumann RD, Salvatore M. Diagnostic imaging in patients with paragangliomas. Computed tomography, magnetic resonance and MIBG scintigraphy comparison. *Q. J. Nucl. Med.* 1996; **40**: 365–71.

5 Wong-You-Cheong JJ, Woodward PJ, Manning MA, Sesterhenn IA. From the archives of the AFIP: neoplasms of the urinary bladder: radiologic-pathologic correlation. *Radiographics* 2006; **26**: 553–80.