Urology Case Reports 2 (2014) 189–190

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Oncology

Episodic Hypertension With an Adrenal Mass: A Red Herring☆

Carter J. Neugarten*, Nikolai A. Sopko, Debasish Sundi, Jen-Jane Liu, Trinity J. Bivalacqua

The James Buchanan Brady Urological Institute, The Johns Hopkins University School of Medicine, Baltimore, MD

ARTICLE INFO

Article history:
Received 1 August 2014
Accepted 21 August 2014
Available online 18 September 2014

Keywords:
Bladder paraganglioma
Pheochromocytoma
Malignancy
Adrenal mass

ABSTRACT

A 66-year-old man with symptomatic hypertensive episodes was found to have a 9-mm adrenal mass and elevated metanephrine levels. He was scheduled for an adrenalectomy for suspected pheochromocytoma. Subsequent workup revealed a large bladder mass which was found to be a paraganglioma. There is no consensus on what should be considered the standard management of primary bladder paraganglioma, including surgical technique, assessment of malignancy, and appropriate follow-up, owing to the rarity of the diagnosis.

Introduction

Paragangliomas are rare growths of chromaffin tissue derived from neural crest cells, histologically identical to pheochromocytoma but located at extra-adrenal sites.[1] Only 6% of paragangliomas are located in the bladder, and only 0.06% of all bladder neoplasms are paragangliomas.[2] Bladder paragangliomas are three times more common in females than males and primarily present in the second and third decades of life.[3] Here we discuss the case of an unusual presentation of a bladder paraganglioma.

Case presentation

A 66-year-old man with a 15-year history of hypertension presented to an ambulatory clinic with a chief complaint of episodic hypertension with systolic pressures up to 250 mm Hg. These episodes began with a sense of fecal urgency and urinary tingling once or twice per day. He then developed bulging of his veins and sensations of tingling, flushing, and pressure throughout his body.

He underwent workup for pheochromocytoma, and was found to have elevated metanephrine and normetanephrine levels. Oral phenoxybenzamine treatment was initiated, which decreased the severity and frequency of his hypertensive episodes. Adrenal computed tomography at that time revealed a 9-mm left-sided adrenal nodule (Fig. 1). This nodule appeared consistent with an adrenal adenoma, given its small size and radiodensity of 2 Hounsfield units (HU; nearly all lesions under 10 HUs on noncontrast imaging are adenomas). However, because of his symptoms and elevated metanephrine levels, the adrenal nodule was assumed to be a pheochromocytoma and he was scheduled for adrenalectomy. However, subsequent confirmatory metaiodobenzylguanidine (MIBG) scintigraphy was negative and as the imaging suggested that the nodule was an adrenal adenoma, he did not undergo the procedure. He also did not undergo metabolic workup for hyperaldosteronism or hypercortisolism, as his metanephrines were elevated and this is only mandatory in patients with masses >1 cm.

Subsequently, computed tomography angiography of the abdomen and pelvis was performed. This demonstrated a 2.6-cm heterogeneously enhancing bladder mass suspicious for a paraganglioma (Fig. 2). The patient underwent transurethral resection of the tumor, but complete resection was not possible due to the lesion's size, location, and branched arterial vascularization. Pathology revealed a paraganglioma involving the muscularis propria.

One month later, he underwent partial cystectomy and bilateral pelvic lymphadenectomy. Frozen sections for margins were negative, and the final pathology report revealed a 2.5-cm paraganglioma (Fig. 3). The 26 sampled nodes were negative for tumor, and his phenoxybenzamine blockade was discontinued. At his most recent follow-up 16 weeks after surgery, the patient has had complete resolution of his hypertensive episodes, has normal urine metanephrine and normetanehprine levels, and is only taking his 2 baseline antihypertensives.

* Corresponding author. Tel.: 443-287-0385; fax: 410-614-3695.
E-mail address: cartern@jhmi.edu (C.J. Neugarten).

2214-4420/$ – see front matter © 2014 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.eucr.2014.08.004

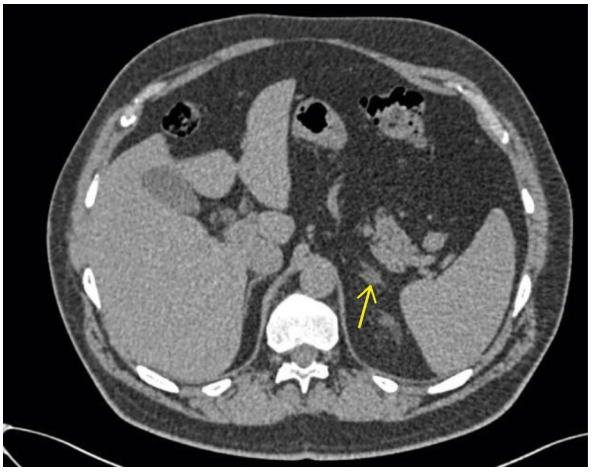

Figure 1. Original adrenal computed tomography image revealing a 9-mm adrenal adenoma measuring 2 Hounsfield units (arrow). As the bladder was not visualized on this scan, this was initially thought to be a pheochromocytoma.

Discussion

Bladder paragangliomas are rarely encountered in clinical practice, and this case highlights the challenges in diagnosis and treatment. Options for surgical management of these tumors include transurethreal resection, partial cystectomy, and total cystectomy, but there is controversy over which modality is preferred.[1] This case underlines the difficulty in choosing a surgical approach, as the exact location, extent, and ability to achieve a complete resection endoscopically is not always apparent from imaging. Furthermore, because these tumors can be highly vascularized and can lead to hypertensive episodes when manipulated, resection can be challenging and dangerous.[1] Removal, both transurethral and surgical, can be complicated by excessive bleeding and hypertension, even leading to hemorrhagic stroke.

Hypertensive crises are triggered by micturition in 50%-70% cases.[3] However, our patient's hypertensive crises were unique in that they were preceded by fecal urgency in concert with urinary urgency. This phenomenon may have been associated with bladder spasms, leading to catecholamine release. He is also the only patient to our knowledge to have had an incidental adrenal mass that complicated his diagnosis. This underscores the importance of ruling out extra-adrenal disease before proceeding with adrenalectomy in suspected pheochromocytoma, particularly if imaging findings are not conclusive for pheochromocytoma. We recommend complete abdominopelvic axial imaging (as opposed to adrenal protocol only) in such a scenario. MIBG scintigraphy can also be used to confirm the diagnosis, but small adrenal masses such as our patient's are unlikely to register positive on MIBG, even if the mass is a pheochromocytoma. Recently, MIBG is largely being replaced by F-fluoro-deoxy-2-glucose hybrid positron emission tomographic in patients suspected of having catecholamine-producing lesions.[4]

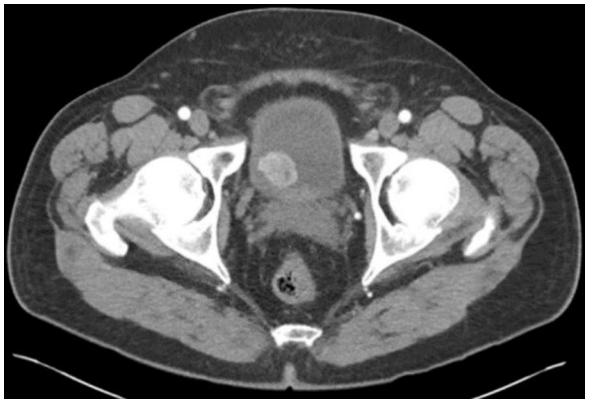

Figure 2. Computed tomography angiography revealing a heterogeneous bladder paraganglioma.

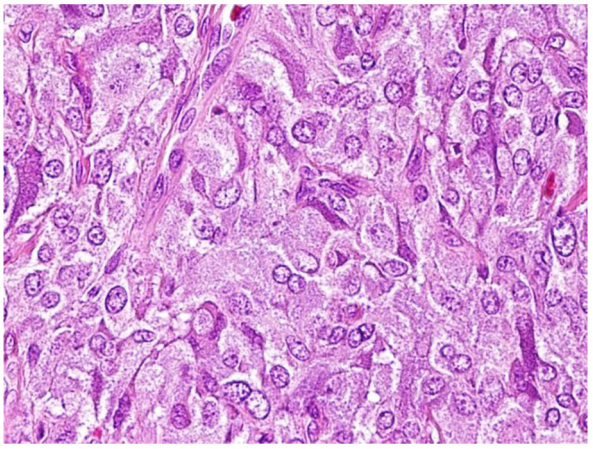

Figure 3. Histologic appearance of our patient's paraganglioma (original magnification ×400). Tumor cells appear in a zellballen (clusters of chief cells) pattern and are embedded in a fibrous highly vascular network.

As many as 50% of paragangliomas are hereditary. If any family members of a patient with a history of paraganglioma develop severe hypertension that is not easily managed with medications, then genetic testing for familial paraganglioma, neurofibromatosis type 1, von Hippel-Lindau disease, and multiple endocrine neoplasia type 2 should be considered. Lipid-rich pheochromocytomas have been reported but are extremely rare. While most paragangliomas are benign, the only reliable indicator of malignancy is the development of metastasis, which occurs in up to 15% of tumors. Invasive growth, recurrence, young age, and micturition attacks are also associated with a poor prognosis.

Conclusion

Because paragangliomas can recur, long-term follow-up is mandatory. However, there is no consensus on the duration and frequency of such follow-up.[1] It should include both monitoring of hypertension and plasma or urine metanephrine levels. Some advocate a conservative approach, including testing metanephrine levels 10 days after operation and then annually for life.[5] As long as the patient remains asymptomatic and normotensive, screening regimens can be discussed with the patient, and an informed decision on the regimen can be made.

References

1. Pastor-Guzmán JM, López-García S, Giménez-Bachs JM, et al. Paraganglioma of the bladder: controversy regarding treatment. *Urol Int*. 2004;73:270–275.
2. Grignon DJ, Ro JY, Mackay B, et al. Paraganglioma of the urinary bladder: immunohistochemical, ultrastructural, and DNA flow cytometric studies. *Hum Pathol*. 1991;22:1162–1169.
3. Lai Y, Chen D, Yu Z, et al. Non-functioning paraganglioma of the urinary bladder: a case report and review of the literature. *Oncol Lett*. 2014;7:891–893.
4. Timmers HJ, Chen CC, Carrasquillo JA, et al. Staging and functional characterization of pheochromocytoma and paraganglioma by 18F-fluorodeoxyglucose (18F-FDG) positron emission tomography. *J Natl Cancer Inst*. 2012;104:700–708.
5. Plouin PF, Gimenez-Roqueplo AP. Initial work-up and long-term follow-up in patients with phaeochromocytomas and paragangliomas. *Best Pract Res Clin Endocrinol Metab*. 2006;20:421–434.