International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Non-Functioning Paraganglioma of the Urinary Bladder: A Case Report and Review of the Literature

Dr Prakhyath M, Dr Vivek S R, Dr Sreenivas J

Institute of Nephro Urology

Abstract: ***Paragangliomas are extra-adrenal tumors of the autonomic nervous system. It may be functional, secreting catecholamines, or nonfunctional. Non- functioning Paragangliomas of the urinary bladder are rare. The current report presents a case of a 51-year-old female with urinary bladder paraganglioma. The patient presented with no classical signs and symptoms, and these were only appreciated following histological examination of a transurethral resection specimen that elucidated the correct diagnosis. In the present report, the clinical features, diagnosis, management and pathological observations of paraganglioma of the urinary bladder are discussed. Herein, we also briefly review the relevant literature.***

Keywords: Paraganglioma, TURBT, MIBG, PET, IHC

1. Introduction

Paraganglioma is a neoplasm that develops from the chromaffin tissue of the sympathetic nervous system situated outside the adrenal medulla (1). It is also referred to as extra-adrenal pheochromocytoma. Paragangliomas of the urinary bladder account for <1% of all bladder tumors and 6% of all extra-adrenal pheochromocytomas (2). The majority exhibit functional properties related to the release of catecholamines and thus may manifest with episodic bouts of hypertension, tachycardia, palpitations, diaphoresis, or tremors. Unique to bladder wall paragangliomas is the occurrence of hypotension and syncope related to micturition or sexual activity.

2. Case history

A 51-year-old female patient, presented with complaints of hematuria and on further evaluation was found to have bladder growth. The patient had no previous medical problems, and had no specific family, past medical or drug history. The patient had no history of hypertension. Routine hematological examination and biochemical tests were within normal limits and physical examination showed no evidence of hypertensive disease. Ultrasonography revealed an abnormal mass on the posterior wall of the urinary bladder and computed tomography (CT) of the abdomen showed a solitary tumor protruding into the bladder (Fig 1). This was confirmed by cystoscopy demonstrating a protruding tumor on the posterior wall of the bladder with normal mucosa, measuring 5.0x4.0 cm. No sign of any metastatic disease was found on CT scan. On the basis of the first diagnosis of bladder tumor, a transurethral resection was performed and the procedure was uneventful with no hypertension or occurrence of massive bleeding.

In the laboratory, the specimen was received in buffered formalin solution. The specimen was in multiple fragmented bits, gray tan in color. Microscopic evaluation showed a tumor disposed in nesting/zellballen pattern, formed by prominent intratumoral fibrovascular network, and sustentacular cells wrapping the nests of tumor cells (Fig 2A). Individual cells were polygonal, with abundant granular eosinophilic to basophilic cytoplasm, uniform round to oval nuclei, regular nuclear outline, evenly dispersed granular chromatin, and inconspicuous nucleoli. Immunohistochemistry was positive for synaptophysin and chromogranin. (Fig 2B and C). The postoperative VMA level was 6.5 mg/24 h of urine.

3. Discussion

Paragangliomas occur most commonly along the sympathetic chain. The underlying mechanism of bladder paraganglioma remains unclear. Previous studies have shown that bladder paraganglioma occurs more frequently in females than males (female/male ratio is 3:1), primarily during the second and third decades of life The majority (83%) of paragangliomas of the urinary bladder are hormonally active (3) The majority exhibit functional properties related to the release of catecholamines and thus may manifest with episodic bouts of hypertension, tachycardia, palpitations, diaphoresis, or tremors. Unique to bladder wall paragangliomas is the occurrence of hypotension and syncope related to micturition or sexual activity. Despite the functional properties of these tumors, bladder wall paragangliomas often present with nonspecific symptoms such as painless hematuria or may be recognized incidentally on cross-sectional imaging as a bladder wall thickening (4) In this context, bladder instrumentation or transurethral manipulation of these tumors without appropriate preoperative alpha-adrenergic blockage, particularly in asymptomatic patients, may result in a dangerous intraoperative catecholamine surge. As such, a preoperative workup involving measurement of catecholamines and vanillylmandelic acid in a 24-h urine sample, serum epinephrine and others plasma metanephrines and functional imaging of the bladder lesion is necessary if these tumors are suspected(5). Clinically, the patient provided no history that would suggest a diagnosis of paraganglioma. Therefore, endocrine screening for paraganglioma was not considered in the management of this patient.

Preoperative investigations are extremely important in confirming the diagnosis. Contrast CT and magnetic resonance imaging may be of great use in localizing the tumor I131-methyliodobenzylguanidine (MIBG) is an analog of norepinephrine and is absorbed by the paraganglioma tissue. I131-MIBG has been used in diagnosing and localizing extra-adrenal paraganglioma with a specificity close to 100% and a sensitivity approaching 90%. Positron emission tomography (PET) offers even higher accuracy than MIBG scans in the localization of paragangliomas due to the higher spatial resolution of PET scanning. The tumors in cystoscopy appear as globular submucosal masses protruding into the bladder with an intact surface, continuous mucosa and rich blood supply.

The majority of paragangliomas are sporadic in nature, but ~10% of these tumors may be associated with genetic disorders, such as familial paraganglioma, neurofibromatosis type 1, von Hippel-Lindau, Carney triad and multiple endocrine neoplasia type 2 . Therefore, it has been suggested that all patients with extra-adrenal or multifocal pheochromocytoma, or a family history, must undergo genetic testing.

The tumors show histological features similar to adrenal pheochromocytomas and the cells usually grow in a characteristic nested Zellballen pattern. Immunohistochemical staining is required for a definitive diagnosis. Chromogranin, synaptophysin and NSE may aid the identification of neural tissue and neuroendocrine cells.

It is very critical to distinguish paraganglioma from urothelial carcinoma because of potential differences in therapy as well as prognosis. Biopsy under cystoscopy is not recommended since it has a low positive rate, risk of bleeding and may provoke a hypertensive crisis.TURBT/partial cystectomy with complete removal of tumor is treatment of choice in PG, even if the muscles are invasive. Chemotherapy and radiotherapy may be required in rare metastatic settings.

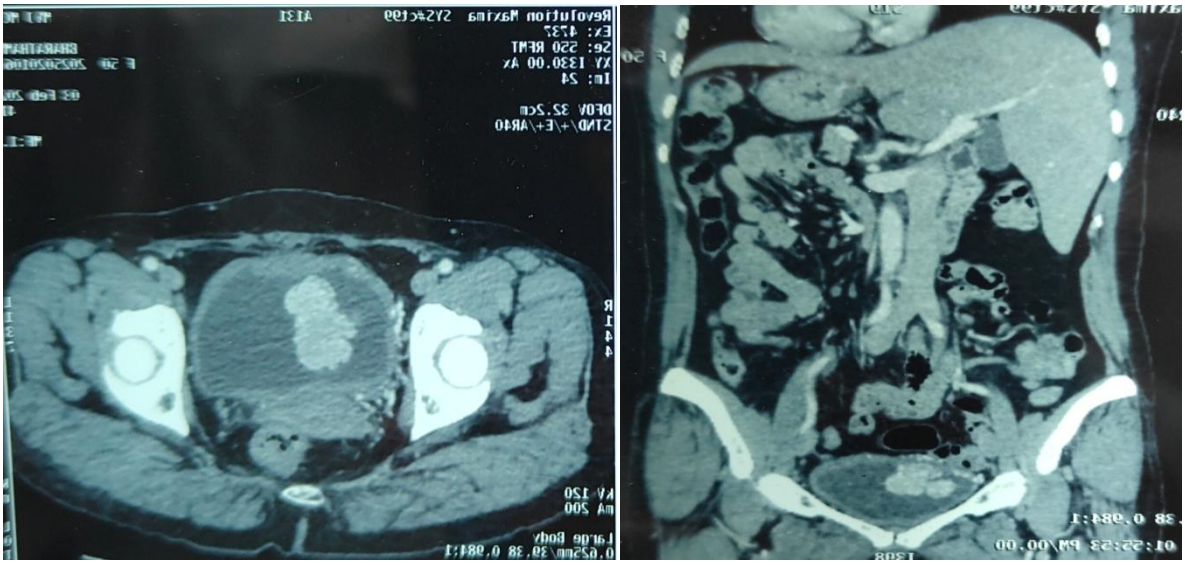
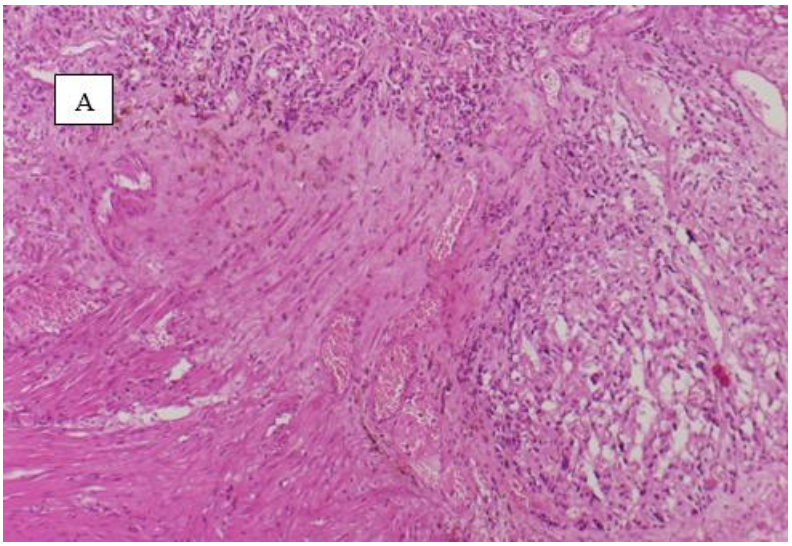


Figure 1: Axial and coronal views from computed tomography scan revealing the position of the tumor protruding into the bladder with an intact surface.



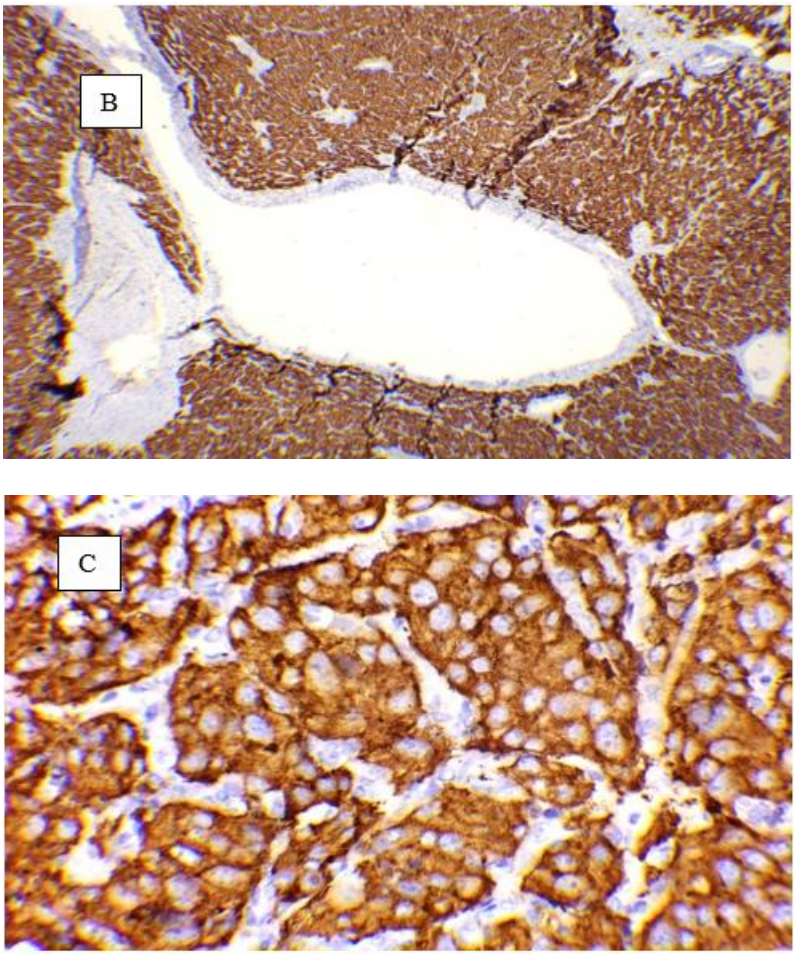


Figure 2: Histopathological evaluation of the paraganglioma. (A) Paraganglioma composed of dual cell populations arranged in a characteristic nested Zellballen pattern (H&E staining; magnification, x400). (B) Chromogranin and (C) Synaptophysin (immunohistochemical stain) confirmed neuroendocrine origin, compatible with paraganglioma (magnification, x400).

References

[1] Elder EE, Elder G and Larsson C: Pheochromocytoma and functional paraganglioma syndrome: no longer the 10% tumor. J Surg Onco l89: 193-201, 2005.
[2] Pastor-Guzman JM, Lopez-Garcia S, Gimenez-Bachs JM, Ruiz-Mondejar R, Canamares-Pabolaza L, Atienzar-Tobarra M, *et al*: Paraganglioma of the bladder: controversy regarding treatment. Urol Int 73: 270-275, 2004.
[3] Lee KY, Oh YW, Noh HJ, Lee YJ, Yong HS, Kang EY, Kim KA and Lee NJ: Extraadrenal paragangliomas of the body: imaging features. AJR Am J Roentgenol 187: 492-504, 2006.
[4] Zimmerman IJ, Biron RE and MacMahan HE: Pheochromocytoma of the urinary bladder. N Engl J Med 249: 25-26, 1953.
[5] Yadav R, Das AK and Kumar R: Malignant non-functional paraganglioma of the bladder presenting with azotemia. Int Urol Nephrol 39: 449-451, 2007.