Urology Case Reports 43 (2022) 102063

Contents lists available at ScienceDirect

Urology Case Reports

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

Bladder paraganglioma – Case report on a rare but important differential

Ivan Thia

Fiona Stanley Hospital, Royal Perth Hospital, Sir Charles Gairdner Hospital, Australia

A B S T R A C T

A paraganglioma is a rare extra-adrenal neuroendocrine tumour that can occur at various sites in the body along the paravertebral axis or within organs. These are very rare tumours, accounting for <0.05% of bladder tumours. A bladder paraganglioma is even more rare, consisting <1% of all paragangliomas. Presentation is variable, given that only 1–3% secrete enough catecholamines to be clinically significant. Paragangliomas can mimic other bladder tumours during investigation for haematuria or lower urinary tract symptoms. The following case describes an incidental bladder paraganglioma discovered during routine flexible cystoscopy in a young female with non-visible haematuria and its subsequent management.

1. Introduction

A paraganglioma is a rare extra-adrenal neuroendocrine tumour that can occur at various sites in the body along the paravertebral axis or within organs. These are very rare tumours, accounting for <0.05% of bladder tumours.[1] A bladder paraganglioma is even more rare, consisting <1% of all paragangliomas.[1] Presentation is variable, given that only 1–3% secrete enough catecholamines to be clinically significant, but can cause unexplained hypertension, headaches, palpitations, sweating and hot flushes, as well as micturition or bladder distension syncope.[1] Paragangliomas can mimic other bladder tumours during investigation for haematuria or lower urinary tract symptoms and cause issues during surgical resection if not identified pre-operatively. The following case describes an incidental bladder paraganglioma discovered during routine flexible cystoscopy in a young female with non-visible haematuria.

2. Case study

A 52-year-old female was referred to the Urology department for investigation and management of an incidental bladder lesion identified on pelvic ultrasound for a complaint of per-vaginal bleeding. Her symptoms were non-specific, mainly a sensation of incomplete bladder emptying. Past medical history was only significant for lifelong smoking (25-pack-year history). The ultrasound and subsequent computed tomography with contrast demonstrated a 20mm posterior bladder wall well-circumscribed mass suspicious for bladder cancer (Fig. 1)[2] confirmed on flexible cystoscopy. There was no incriminating evidence on history or investigation to suggest an underlying paraganglioma.

This patient underwent a transurethral resection of bladder tumour (TURBT). During the procedure, it was noted that she had labile hypertension requiring intra-operative alpha blocker control, leading to suspicion of the final diagnosis of bladder paraganglioma, confirmed on histopathology (Fig. 2). Post-procedure magnetic resonance imaging of her bladder confirms full resection of lesion (Fig. 3). An endocrinology consult was obtained, and given normal serum levels of normetanephrine 484pmol/L (<750pmol/L), free met adrenaline 264pmol/L (<300pmol/L) and methoxytyramine 51pmol/L (<100pmol/L), recommendation was for surveillance with blood tests and cystoscopy rather than repeat resection or partial cystectomy.

3. Discussion

Bladder paraganglioma are very rare and difficult to diagnose prior to surgical resection, hence a high index of suspicion is required in suspected cases. These tumours, once discovered, follow an unpredictable course, with up to 50% of cases subsequently developing extravesical invasion or metastasis.[3] Genetic predisposition is identified in up to 50% of cases, such as deletion of SDHB gene or mutation of von Hippel Lindau (VHL) gene on chromosome 3.[4] It is associated with many familial syndromes such as multiple endocrine neoplasia (MEN) type II, neurofibromatosis type I, and hereditary phaeochromocytoma-paraganglioma syndromes.[4] They tend to be discovered in patients between 20 and 40 years of age without sex predominance. Bladder paragangliomas tend to occur along the bladder trigone, and secreting tumours trigger recurring symptoms during bladder stress, such as bladder distension or micturition due to excessive catecholamine release. They appear as smooth, well-circumscribed tumours originating with the bladder wall with normal overlying urothelium, rather than the typical pedunculated or sessile intravesical appearance of urothelial

E-mail address: ivan_thia@hotmail.com.

https://doi.org/10.1016/j.eucr.2022.102063
Received 22 February 2022; Received in revised form 20 March 2022; Accepted 23 March 2022
Available online 1 April 2022

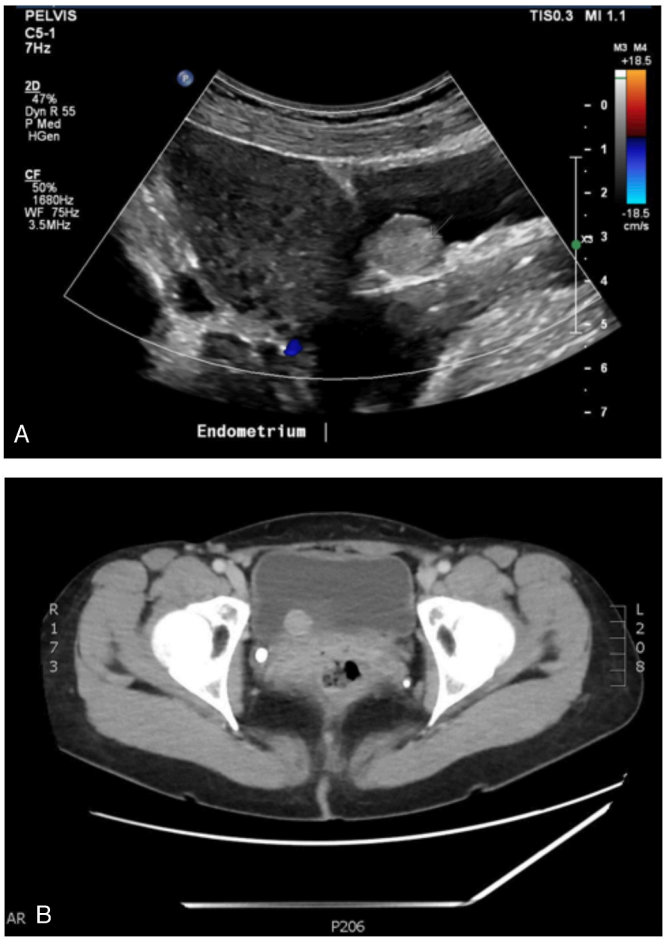

Fig. 1. -A. Ultrasound pelvis demonstrating small, well circumscribed intravesical bladder lesion. Fig. 1-B. Same lesion confirmed on CT imaging. Fig. 1-C. Same lesion appearance on flexible cystoscopy.

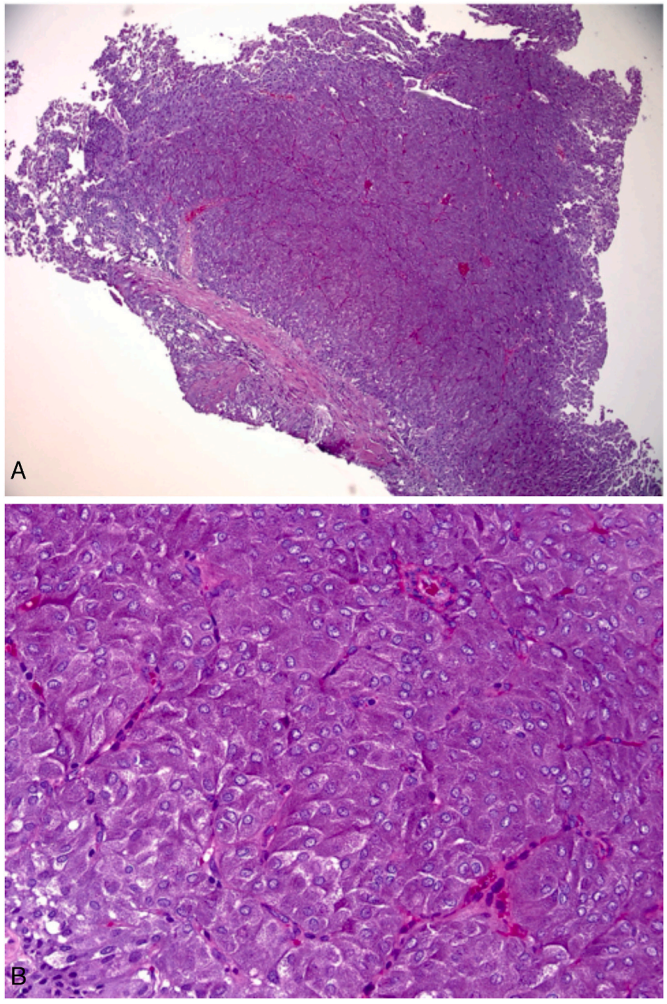

Fig. 2. -A. Bladder tissue involved by tumour with solid architecture at low power. Fig. 2-B. Same tissue demonstrating abnormal cells arranged in nests with abundant granular cytoplasm typical of chromaffin cells. Stains strongly with synaptophysin, chromogranin and CD56.

carcinoma. These symptoms are classic for phaeochromocytomas and other paragangliomas. However, up to 25% of these tumours can have an indolent course and patients do not have typical clinic findings.[5] These patients present with symptoms mimicking bladder tumours such as bladder storage or voiding symptoms and haematuria.

Current gold standard management of bladder paragangliomas include complete surgical resection of the tumour. This may be in the form of transurethral resection (TUR), or a partial cystectomy depending on depth and size of tumour involved. Pre-medication with antihypertensives prior to surgical resection is required, as these tumours can cause labile hypertension and heavy bleeding when disturbed. TUR approach is suitable for smaller, non-functional tumours less than 3cm in size without radiological evidence of muscularis invasion.[4] Larger, functional tumours tend to be better managed with a partial cystectomy as this approach allows for a more controlled resection, with less tumour disruption, increased rates of complete resection and lower intra-operative morbidity. Simultaneous endoscopic cystoscopy with open or laparoscopic partial cystectomy could help better delineate tumour margins with cystoscopic tattooing, as with other tumour or large bladder diverticulum resections.[5] These patients will also benefit from lifelong follow up with surveillance cystoscopies as 15–20% of paragangliomas are malignant and recur or metastasize.[5]

4. Conclusion

A number of rare malignant bladder tumours apart from urothelial carcinoma can occur, and a high index of suspicion is required to

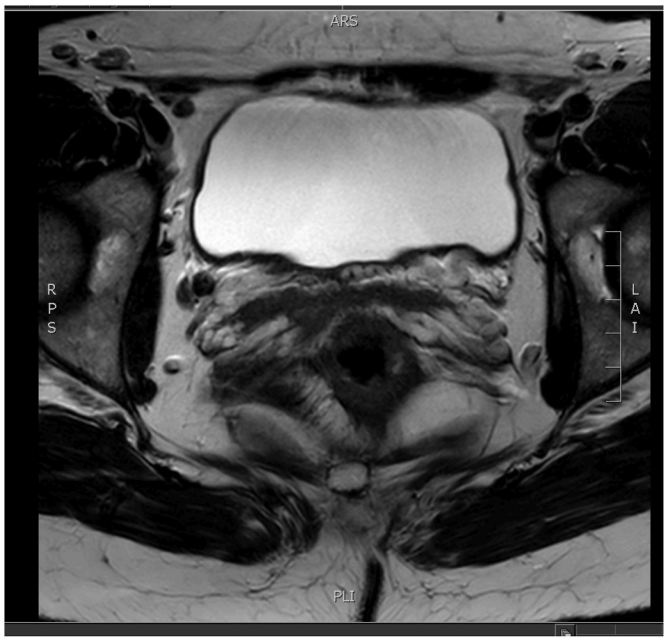

Fig. 3. MRI demonstrating complete resection of previous tumour with no deeper invasion present.

identify and manage appropriately. Bladder paragangliomas are rare, but incorrect diagnoses can lead to intra-operative complications. Suspected cases should be investigated with serum or urine catecholamines and metanephrine, as well as genetic testing due to its association with other hereditary syndromes.

References

1. Hajji F, Benazzouz A, Hammoune N, Ma Azami, Ghoundale O. Functional bladder paraganglioma as an incidental finding during infertility workup. *Cureus*. 2021;13 (10), e18815 [cited 13 Feb 22] https://www.cureus.com/articles/74323-functional-bladder-paraganglioma-as-an-incidental-finding-during-infertility-workup. Available from.
2. Beysens M, Lapauw B, Gykiere PJ, Dekeyzer S, Lumen N, et al. Minimally invasive approach of bladder paraganglioma: case report and review of literature. *Austin J Clin Case Rep*. 2014;1(7):1034 [cited 13 Feb 22] https://www.researchgate.net/publication/294141105_Minimally_invasive_approach_of_bladder_paraganglioma_case_report_and_review_of_literature. Available from.
3. Beilan JA, Lawton A, Hajdenberg J, Rosser CJ. Phaeochromocytoma of the bladder: a systematic review of the contemporary literature. *BMC Urol*. 2013;13(22) [cited 13 Feb 22], Available from: Pubmed.
4. Henderson SJ, Kearns PJ, Tong CMC. Patients with urinary bladder paragangliomas: a compiled case series from a literature review for clinical management. e25-9 *Urology*. 2015;85 [cited 13 Feb 22], Available from: Pubmed.
5. Neumann PH, Young Jr WF, Eng C. Phaeochromocytoma and paraganglioma. *N Engl J Med*. 2019;381:552–565 [cited 13 Feb 22], Available from: Pubmed.