

Fig. 4 (a) Macroscopic finding reveals yellow-tan polypoid mass. (b,c) Microscopic findings reveal typical histological appearance of paraganglioma (hematoxylin and eosin stain).

providing the advantage of reducing the risk of a positive surgical margin and ureter or ureteral orifice injury. In addition, using the needle electrode, we first excised circumferentially around the lesion with sufficient margin and resected the drainage vein of the tumor without violating the tumor. Manipulation of the tumor before resection of the drainage vein can induce excessive hormone release, resulting in cardiovascular instability. Therefore, this procedure has the advantage of reducing the risk of the elevation of blood pressure during the operation.

Recently, LECS is reported to be a more feasible and safer minimally invasive treatment for submucosal tumors such as glomus tumors and gastrointestinal stromal tumors; LECS is one of the standard options for the resection of these tumors.^{11,12} To our knowledge, this is the first report on the resection of paraganglioma of the bladder by combination of en bloc TUR and laparoscopic partial cystectomy; this combination is minimally invasive and safe. Our novel approach using LECS can be considered as one of the options for the treatment of paraganglioma of the bladder.

Conflict of interest

The authors declare no conflict of interest.

Editorial Comment

Editorial Comment to Combination of en bloc transurethral resection with laparoscopic partial cystectomy for paraganglioma of the bladder

Pheochromocytoma of the urinary bladder is a rare disease. However, urologists occasionally encounter patients with this

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disease, as evidenced by many published case reports. A review of the literature revealed 54% patients with pheochromocytoma had hypertension, 48% had headache, and 47% had hematuria as presenting symptom. Furthermore, micturition attack was reported in 53% of patients.¹ In the absence of clear guidelines, urologists encountering this disease often find it difficult to choose the appropriate treatment option. Transurethral tumor resection, open partial cystectomy, laparoscopic partial cystectomy, and radical cystectomy with

urinary tract reconstruction might be the available treatment options for localized pheochromocytoma of the urinary bladder. Acute hemorrhage and paroxysmal hypertension are intraoperative risks associated with transurethral tumor resection. The risk of positive surgical margins is also concerning with transurethral tumor resection and laparoscopic partial cystectomy. Although open surgery is a highly invasive option, it is associated with less risk of hemorrhage, paroxysmal hypertension, and positive surgical margins. Urabe *et al.* reported the first case of paraganglioma of the bladder resected by a minimally invasive and safe procedure: a combination of en bloc transurethral resection and laparoscopic partial cystectomy.² This treatment strategy is very impressive because it could possibly help overcome the demerits of other treatment options. Metastasis or recurrence was identified in almost 10% of bladder paraganglioma patients in a previous study.³ In the case of recurrence or metastasis, radiation therapy or chemotherapy is administered, although these options are not curative. Therefore, reduction of positive surgical margins during surgery is critical to avoid recurrence.

The diagnosis of paraganglioma of the bladder is confirmed on the basis of a combination of specific symptoms and hormonal assay and imaging findings. However, metaiodobenzylguanidine scintigraphy is the most useful investigation for the diagnosis of paraganglioma. Traditionally, on magnetic resonance imaging, T1-weighted images show low intensity and T2-weighted images show high intensity. However, a previous study reported a different pattern of magnetic resonance imaging findings.⁴ Urabe *et al.* reported a case wherein magnetic resonance imaging showed a high T1-weighted image intensity and a low T2-weighted image intensity. Hence, we can conclude that, as in adrenal

pheochromocytoma, metaiodobenzylguanidine scintigraphy is necessary for the diagnosis of bladder paraganglioma. The number of cases of this disease that we encounter is very small. However, it is pertinent for urologists to be able to treat this disease with sufficient expertise. Therefore, in regular medical practice, it is necessary to keep in mind the possibility of pheochromocytoma of the bladder in patients presenting with specific symptoms.

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Conflict of interest

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