Diagnosis and treatment of pheochromocytoma in urinary bladder

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Abstract: Objective: To study the diagnosis and treatment of pheochromocytoma in urinary bladder. Methods: Six cases of bladder pheochromocytoma were studied. Four cases showed hypertension, 3 of which were paroxysmal hypertension during urination. Catecholamine (CA) was increased in a case, and vanillymandelic acid (VMA) was increased in 2 cases. Bladder submucosal mass was detected by B-ultrasound in 5 cases (5/5), computerized tomography (CT) in 3 cases (3/3), cystoscopy in 5 cases (5/6). Four cases took \( \alpha \)-receptor blocker for 2 weeks, 1 case took \( \beta \)-receptor blocker to decrease heart rate. All patients were treated with surgical operation including 4 partial cystectomies, 2 excavations. Results: Three cases had manifestations including headache, excessive perspiration and hypertension during cystoscopy. Four cases were confirmed before operation. Two cases showed hypertension during operation. All patients were pathologically diagnosed as pheochromocytoma postoperatively. In five cases followed up, blood pressure returned to normal. No patient had relapse and malignancy. Conclusions: Typical hypertension during urination comprised the main symptoms. We should highly suspect bladder pheochromocytoma if a submucosal mass was discovered with B-ultrasound, CT, \(^{131}\text{I-MIBG} \) (methylidobenzylguanidine) and cystoscopy. The determination of CA in urine is valuable for qualitative diagnosis. The preoperative management of controlling blood pressure and expansion of the blood volume are very important. Surgical operation is a good method for effective treatment. Postoperative long-time followed up is necessary.

Key words: Urinary bladder, Pheochromocytoma, Diagnosis, Therapeutics

INTRODUCTION

Pheochromocytoma is a neoplasm, which develops from cells of the chromaffin tissues that are derived from the ectodermic neural system and mostly situated within the adrenal medulla. Only approximate 15% pheochromocytoma develops from extra-adrenal chromaffin tissue, in which pheochromocytoma of the bladder is rare and accounts for less than 0.06% of all bladder neoplasm and less than 1% of all pheochromocytoma. We treated 226 cases of pheochromocytoma from Jan. 1988 to Dec. 2006, in which extra-adrenal pheochromocytoma are 31 cases, including 6 cases of bladder pheochromocytoma. We report and analyze clinical manifestation, diagnosis and treatment in 6 cases of bladder pheochromocytoma.

MATERIALS AND METHODS

Clinical patients
There were 6 cases (male 1, female 5). The average age was 36 (range 19 to 53) and the courses of disease ranged from 4 d to 1.5 years. Four cases had a history of paroxysmal hypertension, 3 cases suffered from headaches and dizziness during urination, the highest blood pressure was 190/105 mmHg. Two cases’ blood pressure decreased after urination, 1 case’s blood pressure decreased after taking hypotensive drugs, 1 case presented hypertension during bimanual examination, 1 case was associated with gross hematuria, 2 cases were associated with microscopic hematuria and 1 case had difficulty of urination. Two cases were found during physical examination, 5 cases were detected by B-ultrasound, 3 cases
in trigone, 1 case in neck, 1 case in right lateral wall, and the tumors appeared as a submucosal mass, which turned into bladder like hemispheroid, with clear outline, smooth surface, continuous mucosa, and abundant blood. Three cases were detected by computerized tomography (CT) and the tumors appeared as a round mass covered by intact urothelium with smooth capsules. Six cases were detected by cystoscopy, of which 5 cases appeared as globular submucosa mass protruding prominently into bladder, 3 cases appeared as abundant blood in the mucosa surface, 2 cases appeared as normal mucosa. During cystoscopy, 3 cases showed increasing blood pressure, headache, dizziness, palpitation, with highest blood pressure being 195/110 mmHg, 2 cases’ symptoms were relieved and their blood pressure decreased gradually after the cystoscopy, 1 case’s blood pressure decreased after taking phenoxybenzamine. All of the six cases were not detected by biopsy. Catecholamine (CA) was increased in a case and vanillymandelic acid (VMA) was increased in 2 of three patients who underwent the test.

Therapies

Four cases were treated with preoperative phenoxybenzamine (30~45 mg/d) for two weeks. Of the 4 cases, 1 case’s blood pressure did not decrease prominently, whose pressure was controlled between 140~160 and 70~90 mmHg after taking captopril; 1 case presented tachycardia, with heart rate controlled under 90 min⁻¹ after taking propranolol. The other 2 cases did not receive the preparation because they were not confirmed.

All of the 6 cases underwent surgical operation. Partial cystectomy was performed in 4 cases (1 case’s blood pressure fluctuated during the transurethral resection of the tumor, then partial cystectomy was performed) (Fig.1), while excavation was performed on the other 2 cases (Fig.2).

RESULTS

In 4 cases that had a history of paroxysmal hypertension in preoperation, their blood pressure did not fluctuate during postoperative urination, their blood pressure did not fluctuate during postoperative urination. Two cases’ blood pressure fluctuated during operation, but was controlled after management, and they were pathologically diagnosed as pheochromocytoma postoperatively, 5 cases were followed up, who did not have relapse or malignancy.

DISCUSSIONS

Urinary bladder pheochromocytoma is similar to adrenal pheochromocytoma, most of which can secrete catecholamines. They usually present two symptoms of the pheochromocytoma and bladder tumors, which are continuous or paroxysmal, and are especially associated with urination and hematuria (Walsh et al., 1998). In recent years, as we know more and more about the disease, misdiagnosis decreased apparently, although asymptomatic bladder pheochromocytoma is almost impossible to diagnose preoperatively. Main symptoms: during filling of bladder, the cases present tachycardia, paleness, headache, sweating and hypertension; during of urination, the symptoms are most prominent; after urination, the symptoms are gradually relieved. The