

ARTICLE

Rescue of a patient with pheochromocytoma crisis in left adrenal gland

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Abstract

To summarize the rescue experience of a patient with left adrenal pheochromocytoma crisis in the emergency department. The patient came to the hospital due to palpitation and chest tightness. After early and rapid identification in the emergency department, opening the green channel process, and close cooperation in the rescue process, the conditions which presented with paroxysmal hypertension and chest and back pain during the emergency department were controlled and the patient was successfully transferred to the department for further treatment.

1. BACKGROUND

Pheochromocytoma is a rare neuroendocrine tumor originating from adrenal chromaffin cells, which mainly secretes catecholamines. Pheochromocytoma Crisis attack is caused by fulminant release of catecholamines into the blood by the tumor stimulated by a certain inducement. Its main clinical manifestations are persistent or intermittent hypertension, hypotension, palpitations, headache and other symptoms (pallor, nausea, abdominal pain, chest pain, fatigue, facial flushing, shivering and arrhythmia, etc.), and life-threatening symptoms such as hypertensive crisis, heart failure, and myocardial infarction may occur in severe cases [1], so early identification and treatment are particularly important. A patient with pheochromocytoma crisis was admitted to our hospital in June 2022 and achieved good results after active treatment and care. Cases are reported below.

2. case data

2.1 General Information

A 27-year-old female patient presented to the emergency department on June 28, 2022 due to palpitation discomfort for half a day, accompanied by chest tightness and shortness of

breath, which were paroxysmal and lasted for varying lengths, accompanied by dizziness and headache discomfort, accompanied by nausea and vomiting of gastric contents. She had been suffering from long-term headache for 1 year. At the time of presentation, the patient developed chest and back pain and could not lie supine. PE: T 36.4°C, R 18 times/min, P 103 times/min, BP 179/101 mmHg, SPO₂ 99%, General consciousness, answering the questions correctly, facial distress, slightly pale skin all over the body, cold extremities, clear breath sounds in both lungs on auscultation, no obvious dry or moist rales, regular heart rate, no additional heart sounds or murmurs, mild buttoning pain and tenderness in the left renal area. The patient denied any previous history of hypertension, and was admitted to the cardiology clinic due to "long-term headache for 1 year." Performing cardiac ultrasound revealed a patent foramen ovale left-to-right shunt EF of 60%. ECG: frequent ventricular premature bigeminy; emergency blood routine: white blood cell (WBC) 23.43-109/L; emergency diabetes metabolic panel: lactic acid (LAC) 6.37 mmol/L, Glucose (GLU) 25.00 mmol/L; Four items of acute myocardial injury: troponin I : 0.0750 ng/mL. Thoracoabdominal CT plain scan + enhanced scan: mixed density lesions in the left adrenal region and low-density filling in the left perirenal space, considering neoplastic lesions with rupture and bleeding, and multiple small nodules in the left upper lobe.

2.2 Treatment and Outcome

At admission to the observation room (06:54), BP 202/132 mmHg, trace blood glucose 22.9 mmol/L, intolerable chest pain, and pain score (NRS) 8 points were observed, and ECG monitoring, establishment of venous access, oxygen inhalation, low-dose insulin for blood glucose control, and tramadol for analgesia were immediately given. Considering the patient had obvious clinical manifestations of hypertension, chest and back pain, aortic dissection, acute myocardial infarction and other fatal diseases could not be excluded. Green channel management was immediately opened to improve the nursing level. Two hours later (08:50), the patient still complained of intolerable chest pain with a pain score (NRS) of 9 points. Morphine analgesia was given. After stabilizing vital signs, C T enhanced examination of the chest and abdomen was performed accompanied by medical staff. The examination revealed mixed density lesions in the left adrenal region and low-density shadow filling in the left perirenal space, considering neoplastic lesions with rupture and bleeding. Return to the observation room and ask the patient to rest in bed, avoid agitation, avoid squeezing the left side of the abdomen and left waist, avoid increasing abdominal pressure; closely observe changes in consciousness and vital signs; perform night tonifying, indwelling catheterization, elicit reddish urine, monitor urine volume, urine color, character; 4 hours later (11:15) the patient developed dyspnea, cough pink foamy sputum, pallor, cold extremities, heart rate 120 beats/min, respiratory rate 28 breaths/min, blood pressure 150/110 mmHg, oxygen saturation 80% under flow oxygen inhalation in the nasal catheter, and then decreased to 51%, immediately tracheal intubation, ECG monitoring, mechanical ventilation, anti-infection, anti-heart failure, blood pressure control, heart rate control and other treatments, initiate multidisciplinary consultation, Considering pheochromocytoma crisis, inflammatory storm due to catecholamine hypermetabolism causing myocardial damage, he was admitted to the intensive care unit. On the 7th day, the patient's organ function was significantly improved

, and the patient was transferred to the ward for perioperative management on 2022.7.4, and elective surgery was performed after multidisciplinary consultation.

3. Discussion

3.1 Early Identification and Green Channel Management

The patient visited emergency department due to chest distress and palpitation as the initial manifestation, and was admitted into observation room after perfecting relevant examinations. Half an hour later (7:30), the patient developed intolerable chest and back pain, with pain score (NRS) of 9 points and blood pressure up to 202/132 mmHg. ECG showed frequent ventricular premature bigeminy, and ECG monitoring showed non-sustained ventricular tachycardia (lasting for 30 s). Chest pain is a common symptom in emergency department. Rapid and accurate diagnosis is the key point and difficulty. First, the most dangerous and urgent diseases should be excluded. Once life-threatening chest pain is diagnosed, it should be immediately included in green channel management. Pheochromocytoma presents with the following clinical features: hypertension with the triad of chest pain, palpitations, and sweating. Pheochromocytoma crisis is an endocrine emergency with a very high mortality rate requiring rapid rescue intervention [2] due to the hemodynamic instability of the body that occurs after the sudden massive release of catecholamines, ultimately leading to organ function impairment or loss. The patient could not rule out fatal diseases such as aortic dissection, acute coronary syndrome, pheochromocytoma crisis, and green channel management was immediately initiated and the nursing level was improved. Step-down thinking can take the life safety of patients as the primary problem, divide priorities to help medical staff better cope with the patient's condition, perform emergency preliminary treatment for the patient and maintain the patient's vital signs normally, and give priority to opening the green channel [3]. In this case, the step-down thinking principle commonly used in emergency department is applied, the most fatal and important problems are put first, rapid treatment is implemented, and green channel management is included, priority treatment is given to patients, early identification and diagnosis are performed, the rescue time is strived for patients, and the success rate of rescue is improved.

3.2 Recognition and Care of Catecholamine Cardiomyopathy

It has been shown that the most common form of crisis in pheochromocytoma is hypertensive crisis with catecholamine-induced cardiomyopathy [4-5]. Catecholamine-induced cardiomyopathy is myocardial damage caused by continuous or intermittent release of large amounts of catecholamines from catecholamine-secreting lesions into the blood, and catecholamine toxicity can cause left ventricular hypertrophy and left heart failure, which is a more serious complication of pheochromocytoma. The incidence of catecholamine-induced cardiomyopathy in patients with pheochromocytoma ranges from 32.0% to 65.4% [6]. ECG showed frequent ventricular premature bigeminy, ECG monitoring showed: non-sustained ventricular tachycardia (lasting 30s), HR fluctuated between 140-150 beats/min, troponin I: 0.0750 ng/ml, this case suggested: clear diagnosis of pheochromocytoma should be vigilant catecholamine-induced cardiomyopathy, pulmonary edema is a prominent feature of this disease, heart rate, heart rhythm changes should be closely observed, heart rate and blood

pressure should be controlled; volume management should be done, attention should be paid to control the rate of fluid replacement; oxygenation, troponin, N-terminal pro-brain natriuretic peptide (NT - proBNP), myoglobin and other indicators of myocardial injury changes should be monitored. Catecholamine-induced cardiomyopathy is a serious and rare complication caused by pheochromocytoma . Early definitive diagnosis and targeted treatment can improve the cure rate and prognosis. As a centralized place for the treatment of critically ill patients in hospitals, the emergency department has complex and variable conditions, high personnel mobility, and some patients with insidious conditions are easily ignored. Emergency nurses play an important role in disease observation and early identification of disease deterioration, timely identify the severity of the disease, and timely implement interventions to treat and delay the development of the disease, provide predictive care , can reduce the disability rate and mortality of critically ill patients .

4. SUMMARY

Pheochromocytoma crisis (PCC) is an acute and critical condition with a high mortality rate. In this case, step-down thinking mode was used for early identification and intervention of the severity of the patient 's condition, improving the corresponding nursing level, and improving the success rate of rescue through multidisciplinary consultation, reducing stimulation to avoid inducing hypertensive crisis, identification and emergency care of catecholamine cardiomyopathy crisis .

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