Pheochromocytoma Characterizing Both Fever and Acute Renal Failure

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Introduction

Pheochromocytoma is a rare catecholamine-producing tumor with the primary presentations, both of intermittent fever and nonoliguric acute renal failure. Only several articles were retrieved with the rare presentation of fever. However, no case characterized by both of fever and acute renal failure has been retrieved.

Case Report

A 66-year-old man sought medical help for intermittent fever. The onset was often sudden with the normal temperature rising to 40°C. The high fever always sustained for several hours and then declined to normal. A review of the past medical history revealed a hypertension over 3 years. His blood pressure (BP) was under good control by orally taking 5 mg amlodipine daily. On initial examination, he had an elevated BP of 230/120 mmHg, temperature of 38.5°C. Physical examination showed a heart rate of 103–125 beats/min in sinus rhythm. The remainder of physical examination yielded no abnormalities. On admission, urine dipstick showed a reaction for protein 3+. Laboratory data revealed both an elevated C-reactive protein (CRP) level of 26.3 (normal range [NR] 0–3) mg/L and a marked leukocytosis (leukocyte count 21.24 [NR 4–10] × 10^9/L, 86% [NR 40–75%]). Besides, a serum creatinine (Scr) level elevated to 198.1 (NR 59–104) μmol/L and blood urea nitrogen (BUN) to 9.4 (NR 2.9–8.2) mmol/L.

Subsequently, the patient was referred to our department. Although procalcitonin was normal (NR <0.1 ng/ml), an infectious disease consultant suggested that an infection was coming. The antibiotics of intravenous piperacillin-tazobactam and levofloxacin were then started. However, he had intermittent fever with the same intensity. A marked increasing BP in a previously stable state was noted. Thus, a single dose of labetalol hydrochloride was administered intravenously. After a few minutes, he became hypotensive with a BP dropped to 80/60 mmHg and even unrecorded later. In view of hypotension, labetalol was discontinued. High-dose of intravenous fluid was required to maintain mean arterial pressure. When hypotension was corrected, his BP remained high. A subsequent morning Scr level was elevated to 325.6 μmol/L and BUN raised to 11.03 mmol/L. The level of serum cystatin C was enhanced to 1.66 (NR 0.55–1.14) mg/L. Repeated urine specimen revealed a reaction for protein 3+ and a few of hyaline casts. However, the urine output was normal (2000 ml/day). Based on the clinical presentations above, pheochromocytoma was highly suspect. However, urine (24 h) vanillylmandelic acid level was 14.3 (NR 9.6–49.5) μmol/24 h. Subsequently, abdominal computed tomography confirmed a solid heterogeneous mass in the left adrenal gland [Figure 1]. As the diagnosis of pheochromocytoma was considered, the more traditionally used prazosin was commenced. In the ward, the Scr level rose to a peak of 474 μmol/L. Following the usage of prazosin, the levels of Scr and BUN surprisingly began to fall and returned to baseline after 2 days [Table 1]. Subsequently, laparoscopic excision of the left adrenal tumor was undertaken uneventful. The pathological examination confirmed the diagnosis of pheochromocytoma. Postoperatively, the patient became

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Table 1: Data of Scr and BUN

Items	Hospital day 1	Hospital day 2	Hospital day 3	Hospital day 4	Hospital day 5
Scr (μmol/L)	198.1	325.6	474.0	237.0	66.0
BUN (mmol/L)	9.40	11.03	23.78	14.85	4.90

Scr: Serum creatinine; BUN: Blood urea nitrogen.

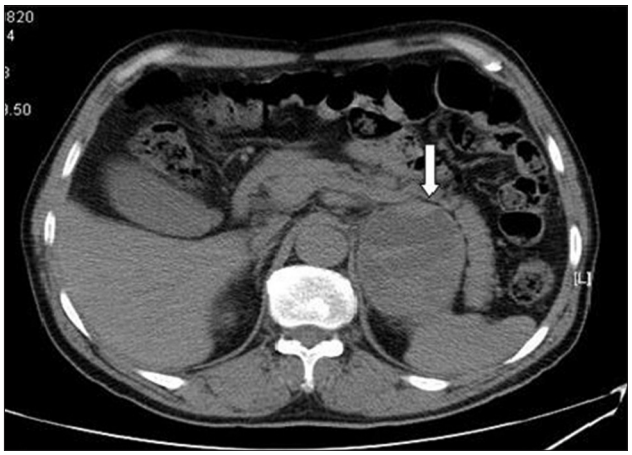

Figure 1: Abdominal computed tomography showed a large tumor about 7.7 cm × 6.4 cm × 8.0 cm (white arrow) at the left adrenal gland.

symptom-free with normal temperature. At present, the patient remained asymptomatic with normal renal function and his BP was under good control.

Discussion

Pheochromocytoma is a catecholamine-producing tumor.[1] Clinical manifestations of pheochromocytoma are highly variable. The diagnosis is clinically challenging with the atypical symptoms. Less frequent clinical manifestation includes fever of unknown origin. High fever with leukocytosis and raised CRP strongly indicated that infection was occurring. The site of infection was considered more likely in the left adrenal gland in this case. In fact, the exact mechanism of fever in patients with pheochromocytoma is unclear. Presumably, it may due to catecholamine overproduction caused by pheochromocytoma that finally led to an increase in inflammatory cytokines. The previous study demonstrated that pheochromocytoma presenting with fever was associated with elevated cytokine of interleukin-6.[2] Ultimately, the patient, in this case, achieved fever remission through the adrenalectomy. It is therefore of utmost importance, to look for an undiscovered pheochromocytoma in a case presenting with fever.

Early diagnosis and prompt management are crucial. The patient in our case was at risk for the appearance of nonoliguric acute renal failure. The prominent signs of renal injury in this patient were the increase in Scr and BUN, persistent proteinuria, and a few of hyaline casts. It is unknown what triggered his acute presentation and subsequent deterioration of renal function. Probably, acute renal failure in pheochromocytoma may be due to hypertensive injury, hypoperfusion, acute tubular necrosis following hypotension, and drugs. Although the exact cause was difficult to determine, the excessive catecholamine, either directly or indirectly, played a part in causing acute renal failure. A massive catecholamine release during the procedure manifested itself as a hypertensive crisis, which produced severe vasoconstriction and thereby provoked ischemia of the patient's kidney. The insults ultimately resulted in the serious clinical condition of nonoliguric acute renal failure. Retrospectively, renal failure is uncommon in benign hypertension. However, our patient progressed from benign to malignant hypertension, renal failure commonly supervened. Second, it was probably that renal failure developed as a consequence of the hypotension. In this case, the hypertension was controlled by administration of labetalol, but an episode of hypotension developed. There may be a decrease in renal blood flow secondary to hypotension. The tendency of the patient was to present prerenal azotemia. Moreover, partial necrosis of renal tubular epithelium may be present. Finally, acute renal failure may develop with the full indicated dose of levofloxacin. Levofloxacin is a third-generation fluorinated quinolone antibiotic and the active levo stereoisomer of loxacin. It has one of the most adverse reaction profiles.[3] Levofloxacin is a dangerous drug in patients with renal dysfunction. In this report, pheochromocytoma crisis with nonoliguric acute renal failure was preoperatively controlled by the treatment of α_1-adrenergic receptor blocking agent.

In clinic, the diagnosis of pheochromocytoma requires a high degree of clinical suspicion. Pheochromocytoma must be considered as a part of the differential diagnosis complicated with both of fever and acute renal failure.

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Conflicts of interest

There are no conflicts of interest.

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