



Giant Hydronephrosis: A Potential Risk Factor for Pulmonary Thromboembolism. A Case Report

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Abstract

We reported a patient with right giant hydronephrosis developed pulmonary thromboembolism the day after left percutaneous nephrolithotomy. The patient was a 50-year-old woman presented with left-sided flank pain. Computed tomography scan showed a huge cystic right kidney secondary to upper ureteric calculi occupying almost three-fourth of the abdominal cavity. The left kidney also showed moderate hydronephrosis with left upper ureteric calculi. Left percutaneous nephrolithotomy and right double-J catheterization were performed. However, the patient suddenly experienced syncope after off-bed activity the day after surgery. Urgent computed tomography scan showed thrombosis in the right main pulmonary artery. The patient had a good recovery with anticoagulant therapy and underwent right nephrectomy finally. This case will strengthen the awareness of giant hydronephrosis as a potential high risk factor for thromboembolism. We recommend pre-operation color Doppler ultrasound and urgent treatment for the giant hydronephrosis.

Keywords: Giant; Hydronephrosis; Pulmonary thromboembolism; Risk factor

Introduction

Pulmonary Thromboembolism (PTE) is defined as the blockage of the pulmonary artery by a thrombus, usually caused by Deep Vein Thrombosis (DVT) in lower limbs. It could be a serious complication after surgery, especially orthopedic surgeries, which require prolonged bed rest [1]. Generally speaking, Percutaneous Nephrolithotomy (PCNL) carries only a low risk of PTE [2]. Zeng et al. [3] reported an experience with more than 10,000 PCNL without a case of PTE. Recently, we treated a patient with right giant hydronephrosis who developed PTE the day after left PCNL.

Case Presentation

A 50-year-old Chinese woman was referred to our hospital because of left-sided flank pain. Her medical history was unremarkable, and no significant sign was revealed during physical examination except for abdominal distension. Computed Tomography (CT) scan showed a huge cystic right kidney occupying almost three-fourth of the abdominal cavity, displacing the small intestine, colon and left kidney. The inferior vena cava was compressed (Figure 1) because of the right upper ureteric calculi, which extended to the left side (Figure 2A). The left kidney also showed moderate hydronephrosis with left upper ureteric calculi (Figure 2B). The Glomerular Filtration Rate (GFR) was 5.4 ml/min for right kidney and 85.2 ml/min for left kidney. The serum creatinine was within normal range as were other systemic examinations and laboratory results. Since the patient mainly suffered from left-sided flank pain and in order to maximally protect renal function, she underwent right double-J catheterization in lithotomy position and left PCNL in prone position (Figure 3). Prophylactic anticoagulant was not given and the operation was successfully completed in ≤ 40 minutes, without obvious bleeding.

However, the next day after the operation, the patient suddenly experienced syncope after off-bed activity, and she regained consciousness a few minutes later. Urgent CT scan showed thrombosis in the right main pulmonary artery (Figure 4A) and the serum D-dimer level was ≥ 5 mg/L, so a diagnosis of PTE was established. The patient received oxygen and heparin anticoagulants, but did not require respirator. Ten days later, her general condition improved and another CT scan showed that the thrombosis had disappeared (Figure 4B). Four months after PCNL, her serum creatinine remained normal and the GFR was 5.0 ml/min for right kidney and 85.2 ml/min for left kidney, so laparoscopic right nephrectomy was performed.

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Figure 1: Computed tomography showed the compression of inferior vena cava (the white arrow) by the right giant hydronephrosis.

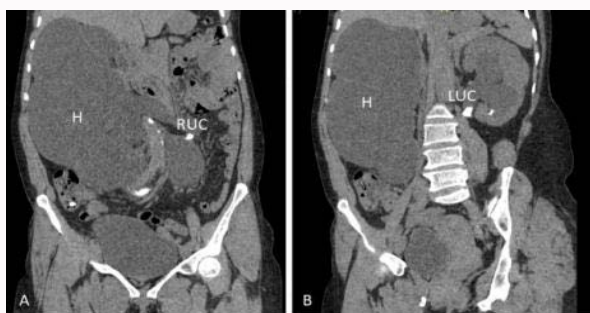


Figure 2: Computed tomography scan showed the (A) right giant hydronephrosis secondary to right upper ureteric calculi, and (B) left moderate hydronephrosis secondary to left upper ureteric calculi. Abbreviation: H: Hydronephrosis; RUC: Right Upper Ureteric Calculi; LUC: Left Upper Ureteric Calculi.



Figure 3: X-ray showed the disappeared left upper ureteric calculi and bilateral double-J (A: before operation; B: after operation).

Discussion

According to the National Institute of Health and Clinical Excellence (NICE) guidelines in the United Kingdom, the following patients may have risk factors for venous thromboembolism: patients with active cancer or cancer treatment, age more than 60 years, dehydration, critical care admission, known thrombophilias, significant medical comorbidities (ex.: heart disease; metabolic; endocrine or respiratory pathologies; acute infectious disease; inflammatory conditions), hormone replacement therapy or oestrogen-containing contraceptive therapy, personal history or first-degree relative with a history of venous thromboembolism, varicose veins with phlebitis, women who are pregnant or have given birth within the previous 6 weeks [1]. Although surgery itself may be a risk factor, PTE can also occur several days after operation due to

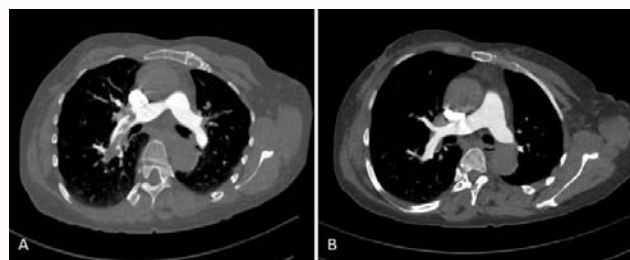


Figure 4: Computed tomography scan showed thrombosis in the right main pulmonary arteries (A: before anticoagulants; B: after anticoagulants).

prolonged bed rest. Our patient did not have any above high risk factors, and the only suspicious factor was the giant hydronephrosis.

Giant hydronephrosis is defined as the presence of over 1 liters of urine within the adult renal collecting system. Congenital ureteropelvic junction obstruction is the most common cause followed by stone disease, trauma and tumor. Flank pain or asymptomatic progressive abdominal distension is the usual complaint. Nephrectomy is the commonest treatment because of the irreversible renal insufficiency. Giant hydronephrosis may cause infection, malignant degeneration and rupture of the kidney. Compression of the surrounding structures is another main concern, including vein, intestine and contralateral ureter. Aliotta et al. [4] once reported a case of left iliofemoral vein thrombosis with extension to the inferior vena cava associated with giant hydronephrosis. Vascular endothelial injury, slow blood flow and hypercoagulable state are three factors causing DVT. Our patient had ≥ 4 liters of fluid in the collecting system, which may have compressed the vessels, reduced the blood flow and finally caused thrombosis. We did not perform color Doppler ultrasound before the operation in this case. Although without direct evidence, it was reasonable to deduce giant hydronephrosis as a potential high risk factor for PTE.

This case will strengthen the awareness of giant hydronephrosis as a potential high risk factor for thromboembolism. We recommend pre-operation color Doppler ultrasound and urgent treatment for the giant hydronephrosis by percutaneous nephrostomy or nephrectomy.

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