

# Life-Threatening Complications Following Percutaneous Ultrasound-Guided Renal Biopsy: a Rare Case Report

**CASE REPORT**

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## Abstract

Percutaneous ultrasound-guided renal biopsy has been a basic tool for the diagnosis of kidney disease, but minor and major complications cannot be completely avoided. Major complications including gross hematuria, renal hematoma and arteriovenous fistula, usually develop within 24 hours after renal biopsy.

We presented an educational case of female with major bleeding complications after percutaneous ultrasound-guided renal biopsy. The patient developed hypovolemic shock after renal biopsy complicated with perirenal hematoma and hemothorax. The case highlighted an educational issue for clinical physicians.

### Keywords

Hemothorax; Renal Biopsy; Complications.

## Introduction

The first renal biopsy in the world was carried out more than a century ago, beginning in the 1950s, which helps to develop nephrology into the powerful subspecialty of internal medicine [1]. In the past 25 years, percutaneous ultrasound-guided renal biopsy has been used to obtain adequate tissue yield with a specialized biopsy gun. However, percutaneous ultrasound-guided renal biopsy is not without risk. On average, complication rates are seen from 7.4% to 19.5% [2]. In general, the occurrence time of these bleeding complications is within 24 hours after percutaneous ultrasound-guided

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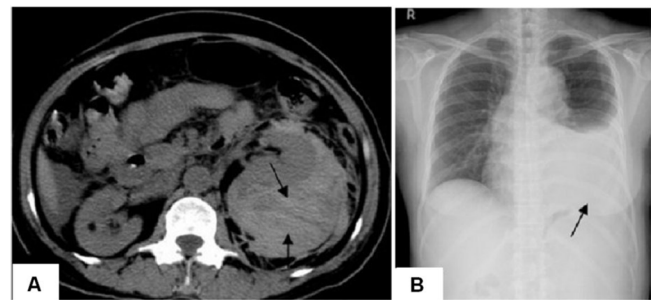
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renal biopsy. We presented a case, who suffered from life-threatening complications after percutaneous ultrasound-guided renal biopsy. Early recognition of these complications and the provision of prompt therapy are imperative.

## Case report

A 48-year-old female was admitted to the intensive care unit (ICU) with hypertensive crisis, acute pulmonary edema, anemia, and acute kidney injury. After a series of examinations, the diagnosis of malignant hypertension associated with *thrombotic thrombocytopenic purpura* (TTP) was made. After 6 sessions of plasmapheresis therapy, the patient's condition got improvement. On day 7, her condition was relative stable with a blood pressure of around 140/80 mmHg. Laboratory results showed: blood urea nitrogen: 48 mg/dL, creatinine: 5.2 mg/dL, hemoglobin: 11.4 g/dL, platelet: 153,000 /uL, prothrombin time/activated partial thromboplastin time: within normal limit. Abdominal sonography revealed normal kidney size without hydronephrosis. She underwent percutaneous ultrasound-guided renal biopsy in the ICU then. On day 8, she was transferred to an ordinary ward and serum hemoglobin value was 11.3 g/dL. On day 9, the patient developed sudden onset of left flank pain with shock. At that time, serum hemoglobin value was down to 4.8 g/dL. We arranged emergent abdominal computerized tomography (CT) and it demonstrated a large left perirenal hematoma (**Figure 1A**). The patient was sent to ICU again and she received a transfusion of 12 units packed red blood cells in the following days. Following chest X-ray suggested massive pleural effusion in the left side. (**Figure 1B**) The pigtail catheter was inserted for drainage of pleural effusion. Analysis of pleural effusion was done. No organisms were identified on Gram's stain or culture, nor were malignant cells identified by cytology. The color of fluid was blood-like and hematocrit ratio between pleural

**Figure 1:** A) Transverse non-contrast CT image of kidneys demonstrates a large left perirenal hematoma. Left retroperitoneal hemorrhage and perihepatic ascites are also noted. B) Chest X ray reveals left side costophrenic angle blunting, and a decrease volume of left lung.



effusion and blood was 51%. Finally, the diagnosis of hemothorax was made. Seven days later, she was discharged without any sequel.

## Discussion

The technique of renal biopsy gets significant improvement over the past two decades as a result of the development of automated-gun biopsy devices. However, minor and major complications cannot be completely avoided in clinical practice. Serum creatinine > 1.2 mg/dL, hypertension (diastolic blood pressure > 90 to 110mmHg), bleeding tendency, amyloidosis, and female are risk factors for bleeding complications after renal biopsy [3-7]. Therefore, close observation any complications such as gross hematuria, flank pain or hypotension and follow-up serum hemoglobin levels should be considered in high risk patients. In addition, there are some learning points from our patient.

We concerns whether hemothorax is related to perirenal hematoma in this patient. The common causes of blood-stained pleural effusion are malignancy, chest trauma, pulmonary embolism, and pneumonia [8]. Few reports demonstrated hemorrhagic pleural effusion following percutaneous li-

ver biopsy or renal biopsy with bleeding. To our knowledge, this is the second case to be reported complication of hemothorax post percutaneous ultrasound-guided renal biopsy [9, 10]. Why does hemothorax develop after a biopsy procedure? The most plausible explanation, as Chahal PS et al suggestion, is that a full expiration was not achieved and the biopsy needle injured a diaphragmatic vessel [10]. Following inspiration created a negative intrathoracic pressure, allowing the transient bleeding to preferentially drain into the thoracic cavity while resealing the penetration site [9, 10]. This should be the main reason of hemothorax in our patient. Therefore, careful monitor should be emphasized specially in patients with high risk and undergoing any unsmooth procedure.

## Conclusion

These case reminds the importance that physicians should be alert to the possibility of life-threatening complications after percutaneous ultrasound-guided renal biopsy. Early recognition and the prompt treatment are very crucial.

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