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Case Report

Bleeding after renal biopsy resulting from a persisting left cardinal vein

Mario Meola[1], Massimiliano Barsotti[2], Ester Morelli[2], Adamasco Cupisti[2] and Giuliano Barsotti[2]

[1]Scuola Superiore 'S. Anna', Pisa and [2]Dipartimento di Medicina Interna, Università di Pisa, Pisa, Italy

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Introduction

Ultrasound guidance has made the percutaneous renal biopsy (PRB) a relatively safe technique in skilled hands [1]. However, this procedure is not totally free of risk [2–5]. Sonography is used to locate the kidney pole or, more properly, to continuously guide the needle toward the kidney pole [3,6,7]. Two main procedures are described to perform PRB using ultrasound guidance, the first consisting in the introduction of the needle by a fixed support at 45° or coaxial probe, while in the second, the needle is introduced free-handedly and the progression of the needle tip is followed toward the kidney pole on continuous sonography scans [3]. An area of about 3 cm^2 of the posterolateral region of lower pole of the native kidney (or anterolateral region of the upper pole of transplanted kidney) represents the anatomical and relatively safe target of PRB, to avoid accidental laceration of caliceal or vascular structures. The number and severity of complications following PRB have become minimal today, and consist mainly of haematuria or clinically silent perirenal haematoma.

We describe a case of severe post-biopsy bleeding caused by accidental puncture of a renal vascular abnormality undetectable by B-mode sonography and diagnosed only after kidney biopsy. This suggests the clinical usefulness of the colour-coded Doppler examination before kidney biopsy procedure to prevent complications related to unusual vascular abnormalities.

Case

A 21-year-old female was admitted for a relapsing nephrotic syndrome.

Past history: at 16 years of age, onset of nephrotic syndrome due to focal segmental glomerulosclerosis, unresponsive to steroids and immunosuppressive therapy. Then symptomatic and dietary treatment was commenced [8]. Some months later a complete remission of the disease occurred until 1 month before the admission.

At physical examination ankle oedema was detected. Blood pressure was 110/70 mmHg, body weight 48 kg and mass body index 18.1 kg/m^2. Biochemistry showed serum creatinine 1.1 mg/dl, creatinine clearance 65 ml/min, proteinuria 9 g/24 h; serum total cholesterol 410 mg/dl, triglycerides 350 mg/dl, total protein 4.4 g/dl, albumin 1.8 mg/dl; WBC count 8800, RBC 5.030.000, haemoglobin 14.8 g/dl, haematocrit 43.9%. Prothrombin time, PTT, bleeding time, and tourniquet test were within the normal ranges.

Sonography scanning showed large kidneys with reduced echo density. The maximum diameter was 115 mm and corticomedullary thickness 21 mm. Perirenal adipose capsule, lumbar wall muscles and subcutaneous fat tissue were not well visualized.

Renal biopsy was performed free-handedly with an automated device and continuous ultrasound guidance without any apparent trouble (one attempt, one sample of 15 mm length, adequate for histological analysis). A few minutes after biopsy, the patient complained of lumbar and hypogastric pain, cold sweat and hypotension. Systolic blood pressure decreased to 80 mmHg. Peritoneal signs developed during the following 2 h. Abdominal X-ray excluded subdiaphragmatic air, but sonography showed the presence of fluid in the pouch of Douglas and a hyperechoic thickening of the left perirenal anterior region, indicating the formation of clinically significant perirenal haematoma. Haematocrit decreased and two blood transfusions were needed. Twenty-four hours after biopsy, sonography confirmed the presence of fluid in the pouch of Douglas and the presence of a perirenal haematoma of about 60–70 ml in the anterior perirenal region. Colour-coded Doppler evaluation showed a small longitudinal vessel in front of the haematoma (Figure 1). Duplex analysis showed a slow but continuous flow modulated by breathing (Figure 2). This vessel was demonstrable in the supramesocolic region of the inferior vena cava after a retroaortic pathway (retroperitoneal left cardinal vein).

No surgical procedure was needed.

Correspondence and offprint requests to: Mario Meola MD, Clinica Medica I, Department of Internal Medicine, University of Pisa, Via Roma 67, I-56100 Pisa, Italy.

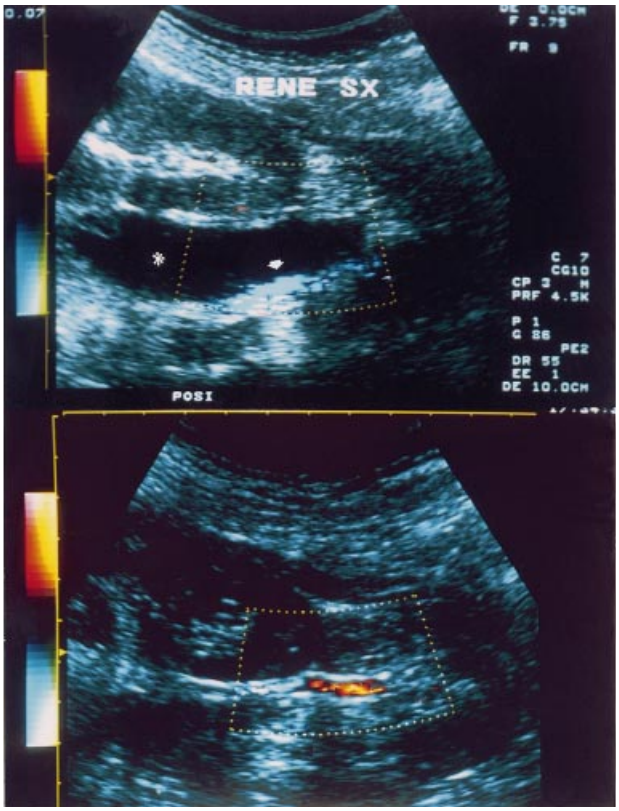

Fig. 1. (**Upper**): Colour-Doppler mapping on longitudinal posterior scan. Evidence of perirenal haematoma (asterisk) and of the anomalous vessel in front of it (arrow). (**Lower**): Colour-Doppler after resolution of the haematoma. The anomalous vessel is closely located near the lower pole of the kidney.

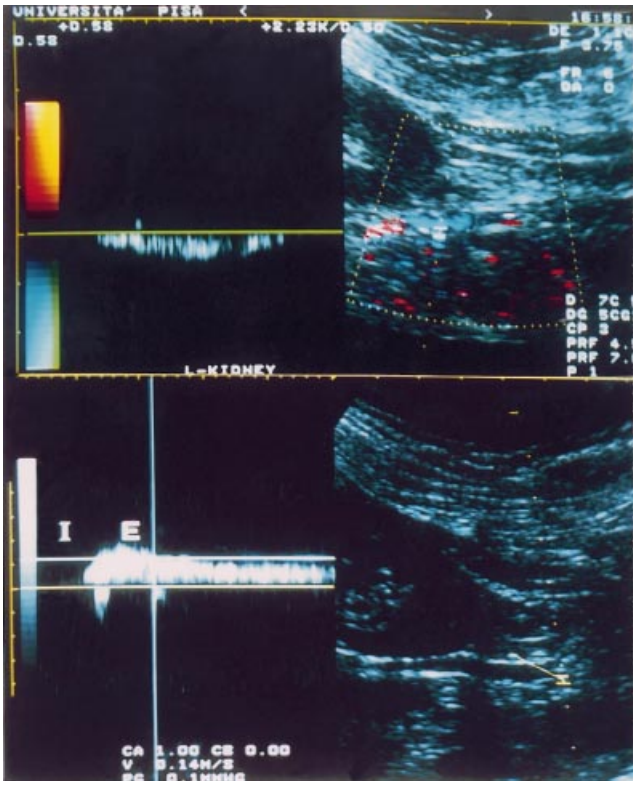

Fig. 2. (**Upper**): The duplex analysis shows the slow but continuous flow of the vessel. (**Lower**): This venous flow is modulated by breathing in (I) and breathing out (E). .

Comment

The present case shows that haematoma can occur even if the execution of renal biopsy is technical correct. In our case, severe bleeding was caused by accidental puncture of an abnormal venous vessel undetectable by B-mode standard scan. It was only subsequently revealed using the colour-coded Doppler sonography.

In the adult, the presence of this vessel is infrequent. Anatomical studies in animals and humans showed that the persistence of right posterior cardinal vein, left supracardinal vein, or both right and left posterior cardinal veins are the most common types of anatomical variants, while the persistence of isolated left posterior cardinal vein occurs far less frequently [9].

This case suggests that the evaluation of the renal or perirenal vessels should be included in the evaluation of native kidney before a renal biopsy is performed. Colour-coded Doppler demonstration of vascular abnormalities should reduce the risk of bleeding complications.

In conclusion, colour-coded Doppler evaluation of perirenal vasculature is useful to reveal rare abnormalities, as the presence of a left cardinal vein or other abnormal lumbar vessels.

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