

Subcapsular Renal Hematoma: Three Case Reports and Literature Reviews

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Abstract

Subcapsular renal hematoma (ScRH), albeit not a common entity in clinical practice, is a life-threatening condition when it is stopped naturally by the tamponade effect of the renal capsule. Renal tumors, renal vascular diseases, trauma and iatrogenic reasons are held responsible in the etiology. The affected patients present to emergency departments with the symptoms and signs comprising sudden onset flank pain, abdominal tenderness and hematuria. We presented in this paper three case reports related to ScRHs; the first with spontaneous ScRH; the second with the ScRH induced by anticoagulation therapy; and, the third with traumatic ScRH. We implemented conservative treatment in all of the patients. Moreover, we aimed, along with the current literature, to commence a discussion on the etiological reasons, the clinical presentation and the treatment approaches with regard to ScRH.

Introduction

Subcapsular renal hematoma (ScRH) is not a common clinical entity. Spontaneous etiology (e.g. renal tumors, renal vascular diseases, anticoagulation, etc) and traumatic etiology (urological interventions, blunt trauma to the abdomen, cardiac catheterization) are held responsible [1]. A constellation of symptoms, also known as Lenk's triad, comprising sudden onset flank pain, symptoms suggestive of internal bleeding (hypotension, tachycardia, filiform pulse and shock) and tenderness to palpation is frequently seen in the patients [2]. In this paper, three cases with ScRH of distinct etiologies were discussed in the light of current literature.

Case 1

A 63-year-old male patient was admitted to the hospital with the complaint of sudden onset left flank pain. The patient's medical history revealed presence of diabetes mellitus (DM) and hypertension (HT). On presentation, the patient's general clinical status was moderate; he was conscious; and, the skin was cold and pale. The blood pressure was 190/110 mmHg, the pulse rate was 110 beats/min and the body temperature was 37.5°C. Tenderness and defense were present especially in the left upper and lower quadrants. The laboratory results for blood glucose level, urea level, creatinin level, hemoglobin(Hb) level, hematocrit (Htc) value and platelet count (PLT) were 346 mg/dl, 46 mg/dl, 1.19 mg/dl, 14.9 g/dl, 42.5%, 189.000/mm³, respectively. The results of the other blood tests were within normal range. In the urine analysis, the color was clear; the blood level was 250 mg/l; protein level was 150 mg/dl; and glucose level was 1000 mg/dl. Abdominal ultrasonography (USG) revealed an isoechoic crescentic-shaped fluid collection of dense content surrounding the kidney. A hematoma of 90×75 mm dimension (red arrows) located in left perirenal area which demonstrated active contrast extravasation and a hypodense lesion related to cortical laceration (blue arrow) at the level of extravasations on the borderline between the lower and the middle zone of left kidney were diagnosed on contrast-enhanced abdominal computed tomography (CT) (Figure 1).

Case 2

A 76-year-old male patient underwent a coronary angiography due to unstable angina pectoris at another center. He was commenced antiaggregant therapy (Clopidogrel 8×75 mg) preoperatively and heparin infusion postoperatively. A right-sided flank pain developed at the postoperative second hour during follow-up. Upon detection of right-sided perirenal hematoma by USG, the patient was transferred to our emergency department. In poor general clinical condition, the patient was confused, with cold and pale skin. The physical examination revealed tenderness to palpation in the right upper and

lower abdominal quadrants and hematuria in the urinary catheter. The blood pressure and the pulse rate were 80/50 mmHg and 122 beats/min, respectively. In the blood analysis, Hb level, Htc value and PLT count were 8 g/dl, 19% and 369.000/mm³, respectively. Prothrombin time (PTR), INR and activated partial thromboplastin time (aPTT) were 15.9 sec, 1.31 U/ml and 65 sec, respectively. The results of other blood tests were within normal limits. Intravenous (IV) fluid infusions, erythrocyte suspension and fresh frozen plasma transfusions were administered to the patient. On abdominal USG, an isoechoic dense fluid collection of a diameter of approximately 7 cm surrounding the kidney and an active extravasation in the area matching middle pole of the kidney were detected. This extravasation was limited by the renal capsule. Contrast-enhanced abdominal CT revealed a hematoma reaching 7 cm in diameter in its thickest section in the subcapsular area of the right kidney, with millimetric hyperdense areas inside ascribed to active bleeding. Cysts existed in the left kidney (Figure 2).

Case 3

A 68-year-old male patient presented with the complaint of presence of blood in urine. The patient's medical history revealed falling off a horse 2 days ago. No history about prior drug use existed. On admission, the general clinical condition was good; he was conscious; the blood pressure was 110/70 mmHg; and, the pulse rate was 88 beats/

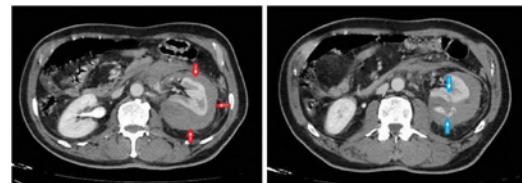


Figure 1: CT sections of the patient. The view of hematoma surrounding left kidney on the left section (red arrows). The views of cortical laceration and extravasation on the right section (blue arrows).

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min. In the blood tests, Hg level, Htc value and PLT count were 13.8 g/dl, 42.8% and 425.000/mm³, respectively. Results from other blood tests were within normal range. Tenderness to palpation in the left lower abdominal quadrant was detected in physical examination. A hematoma of heterogeneous appearance located in the upper pole of the left kidney reaching 6 cm in diameter and minimal amount of left-sided perirenal fluid accumulation were identified in abdominal USG. Contrast-enhanced abdominal CT revealed an organized hematoma approximately 7 cm in diameter which was located in the upper pole of the left kidney, cyst walls having an appearance thinner than the renal parenchyma within the hematoma and a renal parenchymal cyst in the middle pole (Figure 3).

Uncontrolled hypertension was identified as the underlying etiology in the Case 1 with spontaneous ScRH. The blood pressure then was taken under control, whereas ScRH was considered to be induced by high degree of aPTT achieved by heparin infusion following coronary angiography in Case 2. The anticoagulant therapy was ceased, followed by erythrocyte suspension and fresh frozen plasma transfusions in an attempt to bring aPTT back into normal range. *Embolization have no way of making in our hospital.* All three cases were implemented conservative treatment comprising pain control, proper hydration, Htc monitoring, prophylactic antibiotherapy and bed rest. No fall in Htc was observed during the follow-up and hemodynamics in patients pursued a stable course. Control USG and abdominal CT demonstrated resorption of hematoma. All three patients were discharged from the hospital with full recovery.

Discussion

The supracapsular area of a kidney represents a potential space for fluid accumulation which is likely to reach such an extent to compress the adjacent renal parenchyma [3]. First reported by Bonet [4], spontaneous ScRH was then defined by Wunderlich [5].

ScRHs are in direct association with renal trauma and they are among the rare complications known to arise after extracorporeal shock-wave lithotripsy (ESWL) and angiography [6]. However, renal

tumors, vascular diseases like systemic lupus erythematosus (SLE) and polyarteritis nodosa (PAN), anticoagulant therapy, chronic hemodialysis, infections, cystic diseases and hydronephrosis can be counted among the reasons for spontaneous ScRH [7].

In 1975, McDougal et al. reported tumoral bleeding and vascular diseases to be the most frequently encountered etiologies in 57.7% and 17.7% of 78 patients, respectively [8]. Cinman et al. reported in 1985 that tumoral bleeding and vascular diseases were the most common etiologies in 63% and 26% of 27 patients, respectively [9]. Zhang et al. reported in a meta-analysis made in 2002 that tumoral bleeding and vascular diseases were the most common etiologies in 61% and 17% of 165 patients with spontaneous ScRH, respectively [10]. Mabeesh and Matzkin [11] and Ferrando et al. [12] reported cases with spontaneous ScRH following anticoagulant therapy in 2001 and 2002, respectively. In 2007, Fang et al. reported a case of ScRH complicating cardiac catheterization [13]. We considered uncontrolled hypertension, uncontrolled anticoagulant therapy in addition to presence of renal cyst and traumatic cyst rupture as the etiologies in Case 1, Case 2 and Case 3, respectively, which was compatible with the current literature.

Good history taking is an important first step in treating the patients with the diagnosis of ScRH. ScRH can emerge as a triad known in the literature as 'Lenk's triad' which encompasses sudden onset flank pain, tenderness to palpation and findings suggestive of internal bleeding (hypotension, tachycardia, filiform pulse and shock), whereas it was reported in the literature to emerge with some other clinical findings [2], which can mimic findings of acute abdomen caused by other disease states such as acute appendicitis and aortic dissection [14]. Should decrease in hemoglobin and hematocrit and increase in lactate dehydrogenase (LDH) levels accompany the sudden onset flank pain, ScRH should be suspected [15]. All three cases had sudden onset flank pain, tenderness to palpation and hematuria in common. However, shock-related findings related to the bleeding prevailed in Case 2.

Although not sufficient as sole diagnostic modality, ultrasonography is commonly used in rapid identification of renal disease. A perirenal hematoma can be confused ultrasonographically with a renal tumor or an abscess formation, at which point abdominal CT can be used to confirm the suspected diagnosis. A sizable number of medical studies indicated CT to be more sensitive than USG in making the diagnosis of ScRH [16,17]. In such situations as presence of contrast allergy and pregnancy when CT is considered to be contraindicated, alternative modes of imaging such as magnetic resonance imaging can be implemented. Highly useful in diagnosing vascular pathologies associated with the occurrence of spontaneous ScRH, the angiography is generally reserved for cases in whom emergency embolization is needed [18]. We utilized USG as the first diagnostic modality in each of all three patients, followed by the use of contrast-enhanced abdominal CT in identifying the etiology and evaluating both extent of the bleeding and the contralateral kidney. Approaches such as conservative treatment, total or partial nephrectomy and drainage + embolization can be pursued in the management of ScRH. The main determinants in the treatment are patient's hemodynamic status and the etiology. While surgical management is preferred in unstable patients and in those cases with one-sided tumor-related renal bleedings, conservative treatment is in the foreground in the patients with stable hemodynamics. In a meta-analysis including 165 patients in 2002, Zhang et al. specified bleeding associated with renal tumors as the most frequent etiology (%61) and reported respective ratios of managements by total and partial nephrectomy and conservative treatment to be 73.2% and 9.7% [10]. The conservative treatment comprises bed rest, adequate pain control, IV hydration and prophylactic antibiotherapy. Each of our three

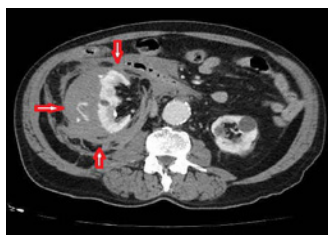


Figure 2: The views from a section of contrast-enhanced abdominal CT compatible with right-sided ScRH, active extravasation and cyst formation in the left kidney.

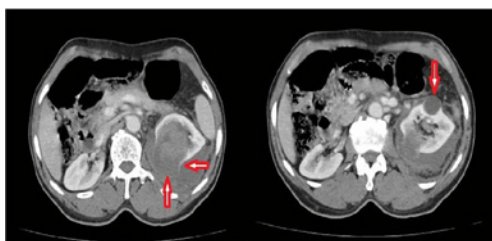


Figure 3: Contrast-enhanced abdominal CT sections of the patient. The views of left-sided ScRH, the cyst and the rupture of the cyst.

patients was treated conservatively because of stable hemodynamic parameters. USG- and CT-guided controls demonstrated resorption of the hematoma.

In conclusion, early and accurate diagnosis of ScRH requires not only a scrutiny both in obtaining medical history and physical examination, but also radiological evaluation. Robust assessment of the hemodynamic parameters and risk factors of the patients and etiology-directed treatment strategy should be implemented.

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