Clinical History:

A female patient was referred for a CT examination after a serious motor vehicle accident. Besides hepatic and splenic trauma lesions and perihepatic and perisplenic haematomas, both kidneys showed enhancement of the renal medulla, while the cortex did not enhance in any phase after i.v. contrast medium injection.

Imaging Findings:

A 46-year-old female who was injured in a motor vehicle accident was brought to the ER unit. The patient was in shock with arterial pressure 70/45 mm Hg and heart beat rate of 130 bpm. When the patient was haemodynamically stable, she was referred for a CT examination for evaluation of possible internal organs injuries. CT examination was performed pre- and 70 seconds post- i.v. contrast administration and revealed hepatic and splenic contusions and lacerations, perihepatic and perisplenic haematomas, as well as bilateral enhancement of renal medulla with luck of enhancement of the renal cortex, signs suggestive of acute renal cortical necrosis (ARCN). Post-mortem histology confirmed the imaging signs.

Discussion:

Acute renal cortical necrosis is frequently associated with obstetric complications, severe trauma with shock, certain toxins (snake venom, drugs) acute pancreatitis, renal transplant complication and bacterial endotoxinemia. The pathophysiology of ARCN may be related to ischemia due to constriction of small intracortical blood vessels. The occlusion of afferent arterioles and interlobular arteries in the cortical vasculature may result from either prolonged vasospasm with secondary thrombosis, primary vascular damage with thrombosis or some combination of both. ARCN is thought to have specific diagnostic features on contrast enhanced CT examination. Non-enhancement of the renal cortex, well enhanced renal medulla, lack of excretion contrast medium into the collecting system and cortical rim of enhanced subcapsular area are the findings resulting in radiological diagnosis of acute renal cortical necrosis (Figure 2,3). Additional findings are associated with the primary cause of ARCN. Subcapsular solid organ hematoma, splenic , hepatic and renal laceration or contusion, may be the causal findings in CT scans (Figure 1,2,3). Extravasation of contrast medium in delayed scans in the peritoneum, indicate active hemorrhage. A shattered kidney appears as multiple separate and discrete renal fragments.

The sonographic findings of ARCN have been described as hypoechoic cortical tissue adjacent to the renal capsule. However, the sonographic appearance is variable and may be deceptively normal. Magnetic resonance imaging findings (especially T2- and gadolinium enhanced T1 weighted images) are quite similar to those of contrast enhanced CT examination, while most patients with such condition are usually critically ill, therefore difficult to be closely monitored during the procedure. The prognosis of acute renal cortical necrosis is mainly dependent on the underlying disease. Septic shock, severe trauma with shock, almost invariably have fatal outcome, regardless of their effect on renal failure. Other conditions
have better prognosis and the renal function usually improves in treatment by dialysis.

**Differential Diagnosis List:** Acute renal cortical necrosis

**Final Diagnosis:** Acute renal cortical necrosis

**References:**


Figure 1

Description: Axial contrast enhanced CT scan revealed hepatic and splenic contusions and perisplenic hematoma. Origin:
Description: Axial contrast enhanced CT scan demonstrated bilateral renal medullary enhancement and lack of cortical enhancement. Origin:
Description: Peripheral rim enhancement of subcapsular area in bilateral renal cortex (arrowheads).
Origin: