Delayed manifestation of traumatic rupture of the diaphragm: intrathoracic herniation of the kidney

Clinical History:

The patient presented with a two-week history of dyspnoea and abdominal pain. He had a history of abdominal trauma related to a traffic accident that occurred one year previously.

Imaging Findings:

The patient presented with a two-week history of dyspnoea and abdominal pain. On physical examination breath sounds were reduced in the mid and lower zones of the left hemithorax and there was left upper quadrant tenderness on palpation. The patient had a history of abdominal trauma related to a traffic accident that occurred one year previously. Clinical and radiological examination at the time of the accident were reported to be normal. The posteroanterior (PA) chest radiograph revealed an opacity in the left lower lung (Fig. 1a). The left lateral radiograph showed a homogeneous supradiaphragmatic soft tissue mass (Fig. 1b). CT examination of the chest revealed a herniated functional left kidney in the posterior portion of the lung (Fig. 2).

A left thoracotomy was performed. The herniated left kidney was surgically reduced with primary repair of the diaphragm.

Discussion:

Intrathoracic kidney is a very rare condition with a prevalence of less than 1 in 10,000 cases [1,2]. Only 0.25% of cases are associated with a diaphragmatic hernia [1]. Traumatic ruptures of diaphragm usually occur on the left side with the stomach, spleen and large bowel being the organs that most frequently herniate into the thorax. Intrathoracic kidneys are usually congenital and asymptomatic; most are incidentally diagnosed on chest radiographs and confirmed with excretory urography. The involved kidney is usually deformed, but generally has normal function. Frequently presented anatomical features are renal rotational anomalies, long ureter and high vascular origin [1]. Traumatic rupture of the diaphragm is an uncommon injury in patients with blunt trauma. Despite advances in imaging technologies, traumatic rupture of the diaphragm is missed in 30-50% of cases with multiple injuries at initial presentation. The apparent cause of delayed or progressive visceral herniation towards thorax is negative intrathoracic pressure [3]. Patients with a large traumatic diaphragmatic hernia may remain asymptomatic for a long time.
but suddenly decompensate [3]. Most cases of acute presentation of diaphragmatic hernia tend to occur on the left side whereas late cases occur on the right side, with the liver being most commonly involved [3].

Herniation of a kidney into the thorax associated with a traumatic defect of the diaphragm is extremely rare and, as in this case, usually presents with non-urinary symptoms. In this case radiographic findings on PA and lateral chest radiographs were considered to show a soft tissue mass located posteriorly in the lower zone of the left lung or a posterior mediastinal mass. However, CT revealed an intrathoracic left kidney herniated into the thorax through the diaphragmatic defect.

In conclusion, intrathoracic kidney due to traumatic rupture of the diaphragm is a very rare condition. If an opacity is seen in chest radiographs, especially in patients with a history of trauma, herniation of intra-abdominal organs such as the kidney should be considered. The diagnosis should be confirmed with CT or MRI examination prior to management.

**Differential Diagnosis List:** Intrathoracic kidney as a late manifestation of traumatic rupture of diaphragm

**Final Diagnosis:** Intrathoracic kidney as a late manifestation of traumatic rupture of diaphragm

**References:**

Figure 1

Description: PA chest radiograph shows an opacity in the left lower lung. Origin:
Description: Left lateral chest radiograph shows a homogeneous mass in the retrocardiac area. Origin:
Figure 2

Description: Contrast-enhanced CT scan of the chest demonstrating a herniated functional left kidney in the left hemi-thorax. Origin: