Case 1895

Congenital intrathoracic ectopic kidney
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Section: Chest imaging
Imaging Technique: CT
Case Type: Clinical Cases
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Patient: 20 years, male

Clinical History:

Complaints of non-specific respiratory tract infection such as cough and mild fever. Plain radiographs of the chest revealed a paravertebral soft tissue opacity with regular borders encasing the left heart contour. There was mild leukocytosis (15,500 WBCs/mm$^3$).

Imaging Findings:

The patient presented with complaints of non-specific respiratory tract infection such as cough and mild fever. Plain radiographs of the chest revealed a paravertebral soft tissue opacity with regular borders encasing the left heart contour (Fig. 1). The medical history was unremarkable and there was no previous trauma. Laboratory tests and renal function tests showed no abnormality apart from mild leukocytosis (15,500 WBCs/mm$^3$). Abdominal ultrasound, excretory urography, and computed tomography of the chest were performed to aid in diagnosis.

Discussion:

Ectopic kidneys are frequently located in the pelvic region, but intrathoracic renal ectopia is extremely rare (1,2). Most cases are in male patients and the diaphragm is usually intact. Ectopic kidneys mostly occur on the left side (61%) but they may also be right sided (36%) or bilateral (2%) (1). Intrathoracic kidneys are usually asymptomatic, in contrast to pelvic kidneys, and are found incidentally on antero-posterior chest radiography.

The embryology of thoracic ectopic kidneys is still unclear. It was first described by Jean Louis Petit in 1970 as the migration of the contents of abdominal and retroperitoneal areas into the thoracic cavity, and was later termed 'evantratio diaphragmatica' by Beclard. It was previously thought that most intrathoracic kidneys were the result of maldevelopment of the pleuro-peritoneal membrane. However, the incidence of intrathoracic kidney with diaphragmatic hernia is low (less than 0.25%).

Spillane and Prather proposed three criteria in the diagnosis of congenital intrathoracic kidney. They were rotation anomaly, long ureter and anomalous high origin of the renal arteries. Medial deviation of the lower poles of the kidneys was described as in pelvic and horseshoe kidneys. The normal origin of the renal arteries, as seen in this case, has been shown previously with selective arteriography in a few cases (2,3).

Four basic types of intrathoracic kidney have been described:

1. True thoracic ectopia with a normally developed dorsal diaphragm;
2. Eventration of the diaphragm;
3. Diaphragmatic hernia, either a congenital diaphragmatic hernia defect or acquired herniation;
4. Traumatic rupture of the diaphragm with renal ectopia (1,2).

The radiographic appearance of a thoracic kidney may be similar to that of posterior mediastinal masses, such as
Bochdalek hernia, sequestration, or neurogenic masses. A smooth rounded mass is seen extending into the chest near the midline on antero-posterior chest radiography and on the posterior aspect of the diaphragm on the lateral view. Sometimes the only radiological finding is elevation of the diaphragm (1). Ultrasound is useful in the diagnosis of juxtadiaphragmatic masses (2). Excretory urography is very useful and it may be necessary for the differential diagnosis (4). Computed tomography (CT) provides not only detection of a posterior mediastinal lesion but also visualisation of its contour, extent and size. The differential diagnosis from other thoracic masses, such as omental hernias through Morgagni's foramen or oesophageal hiatus and mediastinal lipomatosis can be made easily on the basis of low-density fatty components of these structures (1). The typical contrast enhancement of pelvicaliceal structures and the typical appearances of soft tissue density of kidney can be best diagnosed by CT (5). Apart from its abnormal position, a thoracic kidney is functionally normal. The stretched ureter provides good drainage and so there is no tendency to infection or other complications as in low localised ectopic kidneys. Thoracotomy and nephrectomy are almost always not necessary for diagnosis but may be indicated for associated abnormalities of the reproductive system, pelvis, adrenal glands and lungs.

In conclusion, thoracic kidney must be kept in mind whenever a reniform mass lesion with convex upper and lower borders is seen in the posterior sulcus of the thorax in an asymptomatic patient. Excretory urography, ultrasound, and CT best demonstrate the abnormality.

**Differential Diagnosis List:** Congenital intrathoracic ectopic kidney

**Final Diagnosis:** Congenital intrathoracic ectopic kidney

**References:**


Description: On lateral chest radiography, a posterior mediastinal mass is seen. Origin:
Description: On excretory urography, the right kidney is functional and in the normal location. The left kidney has an intrathoracic location and has a rotation anomaly in the vertical and transverse planes. The renal pelvis and pelvicaliceal structures are normal. Origin:
Description: Contrast-enhanced CT shows the left intrathoracic kidney with normal function. Origin:
Description: Selective intra-arterial renal DSA shows the normal origin of the left single renal artery and the left kidney in the supradiaphragmatic region. Origin: