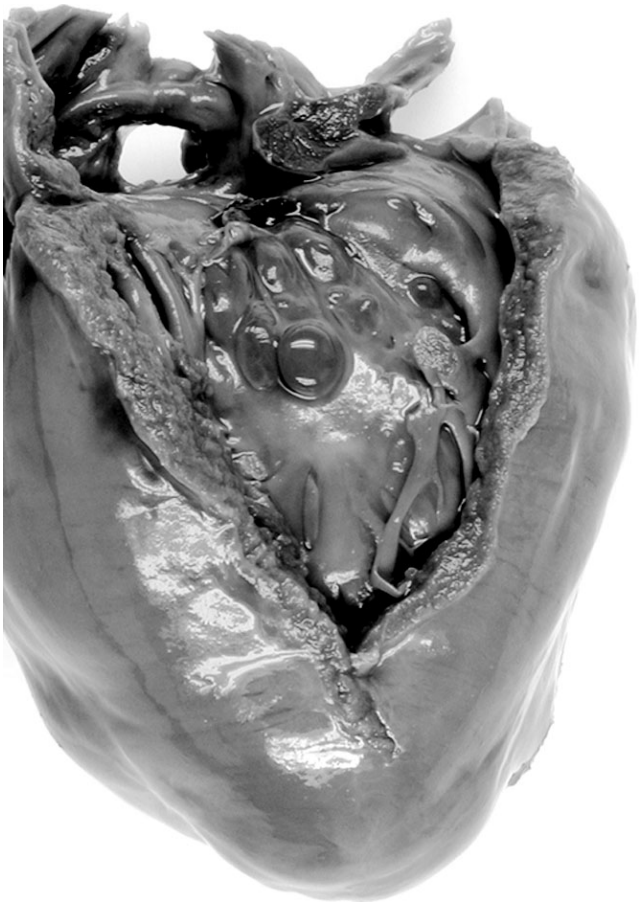

Figure 3 Gross pathological specimen at postmortem examination showing the ventricular tumor.

the tumor made it probable that the cause of fetal death was cardiac arrhythmia rather than obstruction of the outflow tract.

Fetal cardiac tumors are rare. The most common type is rhabdomyoma[1]. Its typical appearance on ultrasound examination is of multiple hyperechogenic, well circumscribed, homogeneous masses in the ventricular wall or interventricular septum[2]. Fibromas are the second most common tumor. These are usually found as solitary masses and are seen on ultrasound examination as hyperechoic lesions often associated with calcification and cystic degeneration[3]. Fibromas often involve the interventricular septum and cause death by ventricular arrhythmia owing to local compression of the conduction system[4].

In general, the management of fetal cardiac tumors is conservative. The approach is to optimize neonatal outcome while avoiding iatrogenic premature delivery. Certain lesions may be amenable to surgical resection following delivery. In cases where the tumor is intracardiac, therapeutic options are limited and the prognosis is poor[5].

Fetal MRI has been used increasingly to confirm equivocal ultrasound findings. It is seldom employed to assess the heart[6–8] and some authors believe that MRI is not useful[9]. In the case described here, fetal MRI was of value as it demonstrated a single, well circumscribed lesion in the interventricular septum. This appearance was consistent with the diagnosis of a tumor and helped exclude cardiomyopathy or hypertrophy secondary to a distal obstructing lesion.

Although making the correct antenatal diagnosis did not alter the outcome, this case does demonstrate the evolving role of MRI. However, real-time ultrasound examination will remain invaluable in assessing cardiac function. It is likely that in future both MRI and ultrasound modalities will be used in combination to make a diagnosis and delineate prognosis.

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Antenatal diagnosis of bilateral intrathoracic kidneys

A 32-year-old woman, gravida 2, para 1, was referred to our center after ultrasound examination at 26 weeks of

gestation showed the fetus to have isolated bilateral club feet. Detailed ultrasound examination revealed evidence of micrognathia, ventricular septal defect, single umbilical artery, bilateral clenched hands, talipes deformity in the right foot and polyhydramnios. Fetal biometry corresponded to a gestational age of 24–25 weeks. Both renal fossae were empty. The bladder was visualized and normal filling and emptying was demonstrated. Further examination revealed intrathoracic kidneys (Figure 1). This diagnosis was confirmed when color Doppler ultrasound examination of the aorta showed coursing of the renal arteries in a cephalad direction (Figure 2). Both lungs appeared normal, as did the position of the heart. The rest of the abdominal organs showed no anatomical distortion. In view of the multisystem abnormalities with growth delay, karyotyping was offered to the couple, which was declined. The patient opted for termination of pregnancy. Hysterotomy with sterilization was performed and the fetus was sent for autopsy. Additional findings at autopsy were a small preaxial skin tag on the left hand. There was a defect in the posterior part of the diaphragm, through which the kidneys herniated into the posterior mediastinum (Figure 3).

Thoracic ectopic kidneys with partial or complete renal protrusion above the level of the diaphragm into the posterior mediastinum is the rarest form of this disorder,

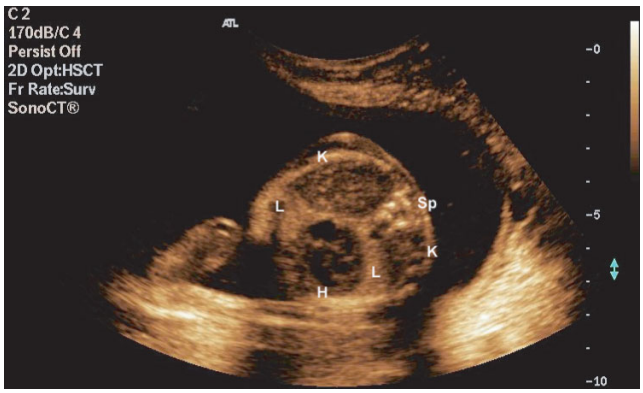

Figure 1 Transverse ultrasound image of the thorax with the kidneys (K) posterior to the lungs (L) and heart (H). Sp, spine.

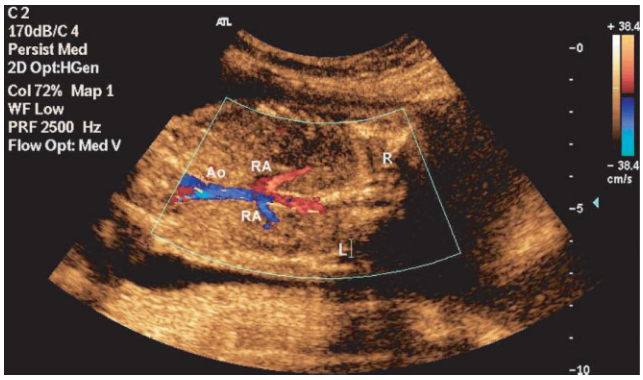

Figure 2 Coronal view of the fetus showing color Doppler ultrasound imaging of the aorta (Ao) with the renal arteries (RA) coursing in a cephalad direction, confirming the high-placed kidneys. L, left; R, right.

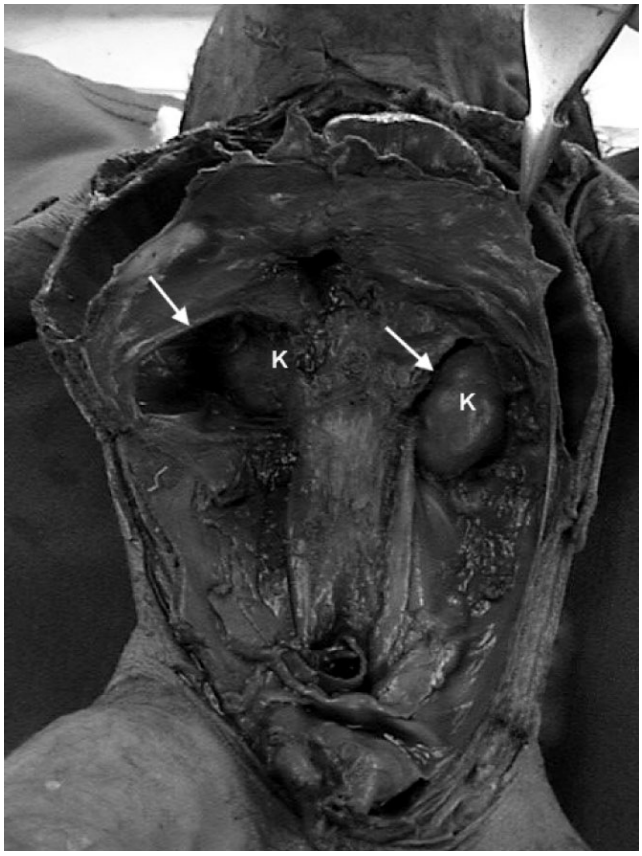

Figure 3 Posterior view at autopsy showing the defect in the diaphragm (arrows) with kidneys (K) in the thorax.

with an incidence of less than 1 in every 10 000 cases[1]. It arises from an abnormal caudal to cranial ascent of the kidney during development. Initially, the kidneys lie close together in the pelvis, anterior to the sacrum and with the hila facing anteriorly. They gradually ascend into the abdomen and are seen separate from each other and inferior to the adrenals by the ninth gestational week. As they ascend, they gradually rotate, with the hila starting to be seen anteromedially. Common positional abnormalities are pelvic kidneys (close to the bladder) and low kidneys (in the iliac fossa). Rarely, over-ascent leads to the kidneys being identified above their normal position; however, this is usually subdiaphragmatic. High renal positioning may lead to focal eventration overlying the kidney, mimicking a supradiaphragmatic renal position[2,3].

Intrathoracic kidneys are discovered incidentally in adults on routine chest radiography, presenting as a well-demarcated mass at the base of the lung[4]. Differentiating them from other posterior mediastinal masses obviates the need for further clinical studies, treatment, and unnecessary surgery[5,6].

Herniation of the intraperitoneal organs, such as the liver, stomach and intestines, is common in primary congenital diaphragmatic hernia. The incidence of intrathoracic kidney in congenital diaphragmatic hernia is only 0.25%[7]. In isolated intrathoracic kidneys, the primary abnormality is renal over-ascent leading to

secondary abnormalities, such as focal eventration or diaphragmatic hernia. If the kidneys are not seen in the normal position in the presence of a normal bladder and amniotic fluid volume, thoracic kidneys should be suspected. Color Doppler ultrasound imaging helps in the easy identification of the kidneys, as the renal arteries can be seen coursing in a cephalad direction.

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