



Letters to the Editor

Horizontal stomach: a new sonographic clue to the antenatal diagnosis of right-sided congenital diaphragmatic hernia

We report on two cases of isolated right-sided congenital diaphragmatic hernia (CDH) in which the condition was first suspected due to ultrasound visualization of a horizontal orientation of the fetal stomach in the abdomen.

In the first case, a 38-year-old woman, gravida 2 para 1, attended the ultrasound department of Valduce Hospital, Como at 13 weeks' gestation for a first-trimester scan. Fetal nuchal translucency thickness and anatomy appeared normal; however, an abnormal horizontal orientation of the fetal stomach was noted (Figure 1). At 20 weeks' gestation, a massive protrusion of the liver into the fetal chest was documented, leading to the diagnosis of isolated right-sided CDH. Moderate lung hypoplasia was demonstrated (observed to expected lung-to-head ratio was 41%, according to the longest diameter method)¹. Antenatal findings were confirmed after birth and neonatal death occurred soon after delivery.

In the second case, a 32-year-old woman, gravida 2 para 1, was referred to Bologna University Hospital at 24 weeks' gestation after amniocentesis revealed a mosaic karyotype (46,XY[8]/46,XX[3]/45,X[2]). On ultrasound, hypospadias was suspected and a horizontal orientation of the fetal stomach was also noted (Figure 2) in an otherwise normal male fetus. At the follow-up scan performed at 29 weeks, an upward displacement of the fetal liver was detected, leading to the diagnosis of right-sided CDH (Videoclip S1). Antenatal findings were confirmed after birth. Surgical correction was attempted, but the neonate died a few days after surgery.

Right-sided CDH has a poor prognosis and a low prenatal detection rate^{2–4}. The latter seems to be explained by a number of factors, including the similar sonographic appearance of the liver and lung, the lack of associated dextrocardia and, more importantly, the absence of intrathoracic herniation of the stomach, an important sonographic marker for left-sided CDH^{2,5}. Contrary to the perinatal outcome of left-sided CDH, the lack of intrathoracic stomach and bowel herniation typically seen in right-sided CDH does not confer a better prognosis⁵.

As observed in our two cases, the horizontal orientation of the stomach in the abdomen may represent an indirect sonographic sign that could raise the suspicion of this condition. In both cases, the horizontal stomach was detected prior to the right-sided CDH itself, and based on this finding a further reassessment of fetal anatomy was scheduled at a later stage in gestation, resulting in unambiguous detection of the hernia. Horizontal orientation of the stomach in the early stages of this

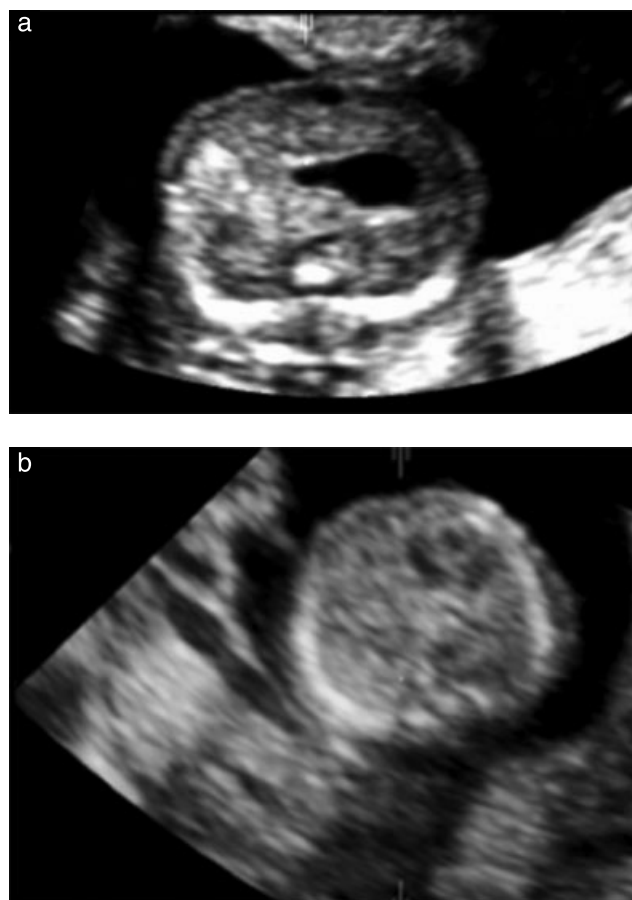


Figure 1 Ultrasound images from Case 1 at 13 weeks' gestation, showing: (a) horizontal orientation of the stomach and (b) chest cross-sectional view.



Figure 2 Ultrasound image from Case 2 showing horizontal orientation of the fetal stomach at 24 weeks.

condition is biologically plausible and may be a result of the medial stretching of the hepatogastric ligaments (lesser omentum) caused by the rising of viscera through

the diaphragm and consequent shifting of all anatomically connected structures. An interval of a few weeks between sonographic visualization of the horizontal stomach and the appearance of right-sided CDH in the fetus is not surprising, as clear visualization of the condition requires the intrathoracic herniation of a significant proportion of the liver, and in some cases this may not become apparent until the second half or later phase of gestation.

These cases highlight the role of the horizontal stomach as an early sonographic indicator of CDH that could alert the caregiver to the need for fetal reassessment in order to exclude or confirm the presence of right-sided CDH.

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SUPPORTING INFORMATION ON THE INTERNET

The following supporting information may be found in the online version of this article:



Videoclip S1 Case 2. Transverse sweep of a 29-week fetus with right-sided congenital diaphragmatic hernia showing horizontal position of the stomach in the abdomen.