Dear Philippe:

Given that what we have to do is describe the findings, I hope to do well. I may not describe all that is possible to see in the pictures, but I think the videos are more demonstrative:

− Images 1-4: in transverse and sagittal scans there is a large-diameter vessel that directly reaches the heart. In image 1 may appear to reach the left atrium (the cavity next to the descending aorta) while viewing picture 4 I would think that it goes is to the right atrium (which is most common). A triphasic flow profile similar to that usually seen in the DV can be demonstrated in the umbilical vein

− Images 5-8: in transverse and sagittal scans of the abdomen, possibly the superior mesenteric artery continues directly to the umbilical cord as an aberrant ‘umbilical artery’. Its flow velocity waveform is normal, corresponding to the umbilical artery. The proximal branch of the abdominal aorta (the celiac artery) gives rise to hepatic artery, above the single umbilical artery

− Images 9-11: several sections of free loop of umbilical cord show two vessels, an artery and a dilated umbilical vein. The other two images show one (or both?) fetal kidneys and fetal face in 3D ultrasound

− Videos 1 and 2 (are the same): in a sagittal section of the chest and abdomen, at the position of the superior mesenteric artery (SMA), a large artery was noted continuing anteriorly to the umbilical cord. In the lower abdomen, it is possible see one of the fetal kidneys and in front of it, the usual route of the abdominal aorta. The course of the umbilical vein is normal, but you cannot see the ductus venosus, noting a significant flow from the umbilical vein that goes directly to the heart

− Video 3: the same findings in a transverse plane of the abdomen.

At 5 weeks’ development the embryo is connected to the placenta by the primitive umbilical cord, the body stalk, which contains the umbilical arteries and veins and allantoid. Adjacent to this stalk is the yolk sac which consists of the vitelline duct and the vitelline arteries and veins. Although early in gestation the vitelline vessels are more numerous and provide the dominant source of circulation for the embryo, these vessels quickly concede the primary circulation to the developing allantoic vessels. Failure or interruption of both umbilical arteries is supposed to be fatal. Nonetheless, absence of both umbilical arteries may be compensated by persistence of the vitelline artery.

This has been classified by Blackburn and Cooley as type II single umbilical artery (SUA). There are two umbilical vessels (the left umbilical vein is present), but the umbilical artery is of vitelline origin, rather than as is usual, from the allantoic system. Instead of originating from the common iliac artery, the umbilical artery originates in the superior mesenteric artery. Therefore, once inside the fetal abdomen, the SUA could be seen to ascend superiorly. This type of SUA is almost invariably associated with severe fetal malformations, including sirenomelia, caudal regression, and anal agenesis, although normal development has been reported (Prenat Diagn 2002; 22: 1040–1043).
Two different routes for umbilical venous return have been described in fetuses with absence of ductus venosus (ADV): extrahepatic umbilical venous drainage bypassing the liver (the umbilical vein directly connects to the iliac vein, the inferior vena cava, the renal vein, the right atrium or, exceptionally, the left atrium or the coronary sinus) and intrahepatic umbilical venous drainage without liver bypass (the umbilical vein connects to the portal sinus in its usual way without giving rise to the DV).

The available data indicate a high proportion of associated malformations in fetuses with ADV, including chromosomal aberrations, and a marked tendency towards the development of in utero heart failure. Additional concerns are the possibility of postnatal hepatic dysfunction or cardiac failure. The site and type of connection probably relate to volume overload, the severity of cardiomegaly, and other signs of intrauterine congestive heart failure. This is more likely when the venous drainage occurs directly into or close to the heart or inferior vena cava. Fetuses with ADV and umbilical vein connected to the portal circulation may represent a subgroup with a more favorable outcome.

I do not know if I've described the most significant findings, I hope so. Given previously described, I think it is a congenital absence of ductus venosus with arrival of the umbilical vein to the heart accompanied by a type II single umbilical artery, ie, persistent vitelline artery.

Last year we had a case of ADV type 6, I will send a few pictures (we have many more). The fetus does not present any problem in utero and he is well after birth.

I appreciate the opportunity to learn to give me the cases of the week, that I get to review in depth, but ... I also like to guess the correct answer. I hope this time can be.

Kind regards,

Javier