Umbilical lines in a sick, extremely low birth weight infant: clinical quandary of X-ray images

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DESCRIPTION

A female infant weighing 530 g was born at 24 weeks of gestation. Antenatal ultrasounds were unremarkable. She was intubated and given surfactant at birth. Umbilical venous (UV) and arterial (UA) catheters were inserted through the identified separate vascular orifices. Postinsertion X-ray showed one catheter entering the left liver lobe and the other entering the right atrium (figure 1). The deeper inserted catheter was withdrawn but subsequently migrated into the hepatic vein (figure 2). Neither catheter showed a descent to the pelvis before ascending, as would have been observed in the UA; it is speculated that they were in the UV, indicating the persistence of right umbilical vein (PRUV). The catheter entering the hepatic vein was removed and a new catheter was inserted through the third vascular orifice of the umbilicus. Ultrasound imaging of the UV catheter showed the UV tip in the left portal vein, instead of being in

Figure 2 After the initial radiograph, shown in figure 1, the more superiorly placed UVC was withdrawn slightly. Its tip was then seen to point towards the right (long arrow), possibly within the hepatic vein. UVC, umbilical venous catheter.

Figure 1 A UV catheter with its distal end coiled in the right atrium (arrow). A second UV catheter is seen more inferiorly, with its tip situated in the umbilical vein.

the ductus venosus, and it was repositioned. Final X-ray showed the UV catheter in the ductus, and the UA catheter proceeding inferiorly and curving cephalad to enter the aorta (figure 3). Later attempts to delineate the path of PRUV, using ultrasound, were unsuccessful, due to the rapid collapse being a vein. Echocardiography and cranial ultrasounds were unremarkable.

This is the first report of a quandary related to PRUV and UV line. A single umbilical artery, the most common PRUV-associated anomaly, was present in this case.¹ PRUV can be either intrahepatic or extrahepatic. Absence of major organ anomalies in this case suggests an intrahepatic type, which drains into the ductus venosus.^{2,3}

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Figure 3 A third radiograph was obtained after the malpositioned UVC was removed and an UAC was put in place. The UAC takes an inferior turn into the pelvis on entering the umbilicus to enter the common iliac artery (short arrow). It then turns superiorly to end with its tip situated within the aorta at the level of the T8 vertebral body (long arrow). UAC, umbilical arterial catheter.

Learning points

- ▶ The right umbilical vein disappears around 7 weeks of gestation, hence if it persists in the fetal ultrasound scan, screen for cardiac, skeletal, cerebral, urological and gastrointestinal anomalies.¹
- ▶ X-ray images showing two catheters in the right half of the abdomen after insertion through two separate vascular orifices in the umbilicus, raise suspicion of persistence of right umbilical vein.
- ▶ When in doubt, ultrasound during line placement can delineate the path of the catheters, confirming their position in the vascular system.

REFERENCES

- 1 Leal DB, Maggiolini M, Bianchi A. Prenatal diagnosis and postnatal follow-up of patients with persistent right umbilical vein. *Donald School J Ultrasound Obstet Gynecol* 2012;6:104–8.
- 2 Wolman I, Gull I, Fait G, *et al*. Persistent right umbilical vein: incidence and significance. *Ultrasound Obstet Gynecol* 2002;19:562–4.
- 3 Blazer S, Zimmer EZ, Bronshtein M. Persistent right umbilical vein in the fetus: a benign anatomic variant. *Obstet Gynecol* 2000;95:433–6.

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