

Anatomical study of a case of thoraco-omphalopagus in the porcine species

OBJECTIVES

The aim of this study is to describe a case of conjoined twins and compare it with the results obtained from the bibliography so as to see if the findings coincide with the particularities assumed in these cases. In addition, a special reference will be made to the cardiovascular system due to its importance for the survival of both individuals.

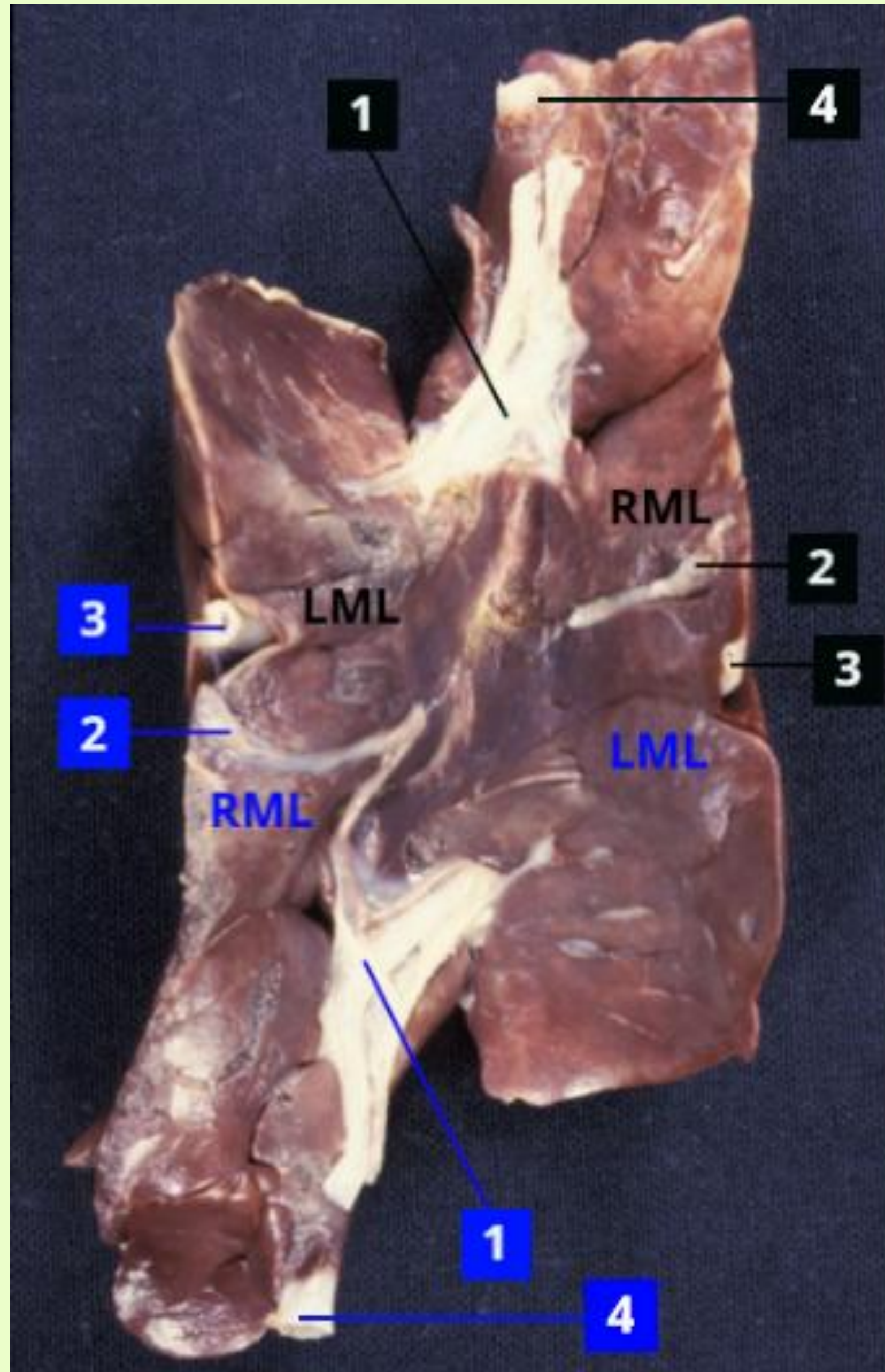


Figure 1: **Visceral view of the shared liver with duplicated structures.** [1] portal vein and hepatic artery in hepatic hilus; [2] biliary gallbladder; [3] round ligament and umbilical vein; [4] caudal vena cava. RML: right medial lobe; LML: left medial lobe (black: twin A, blue: twin B).

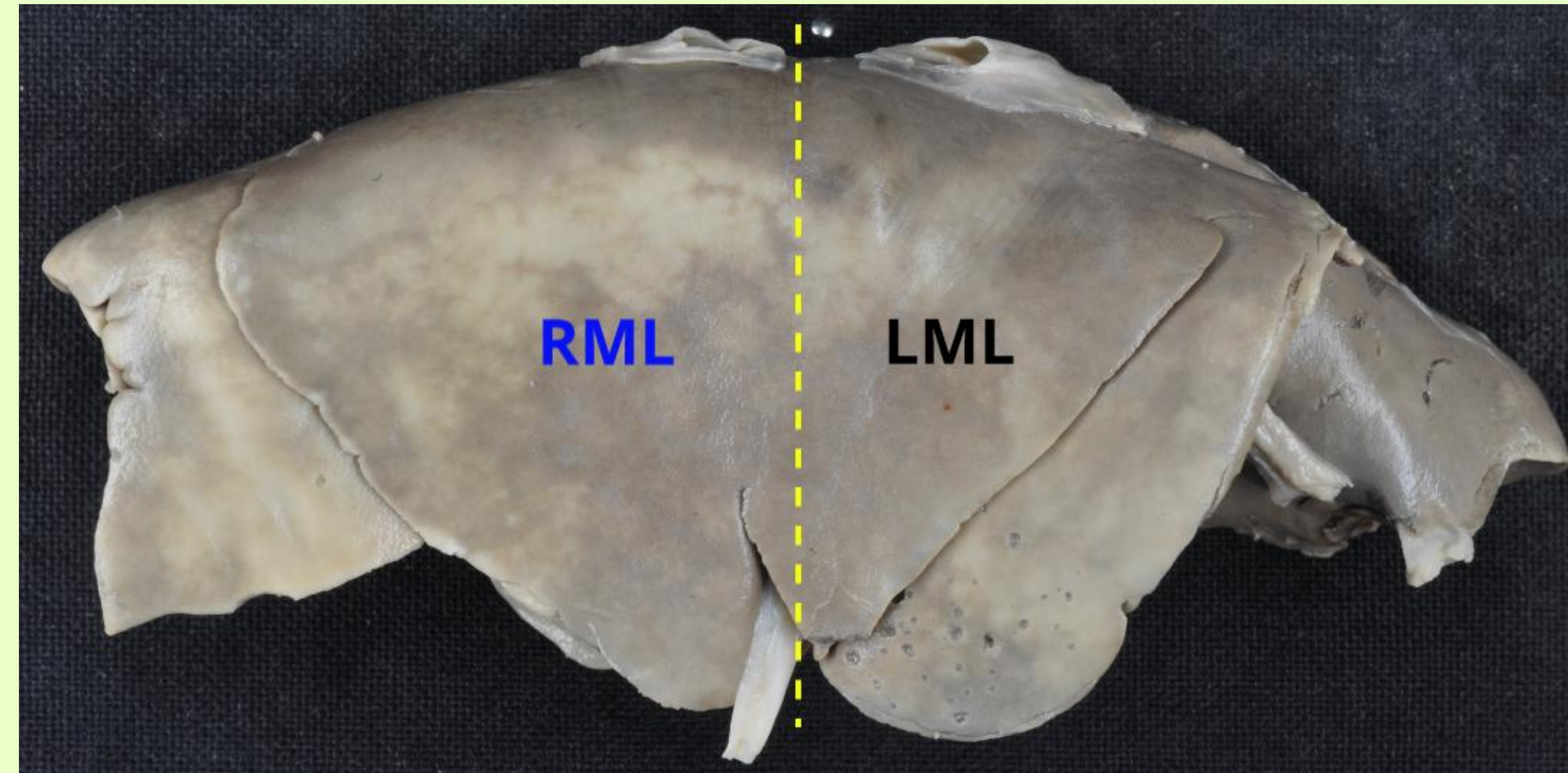


Figure 2: **Visualization of the diaphragmatic face of the shared liver from a lateral view.** The imaginary fusion line of the liver is indicated with a discontinuous line. RML: right medial lobe; LML: left medial lobe (black: twin A, blue: twin B).

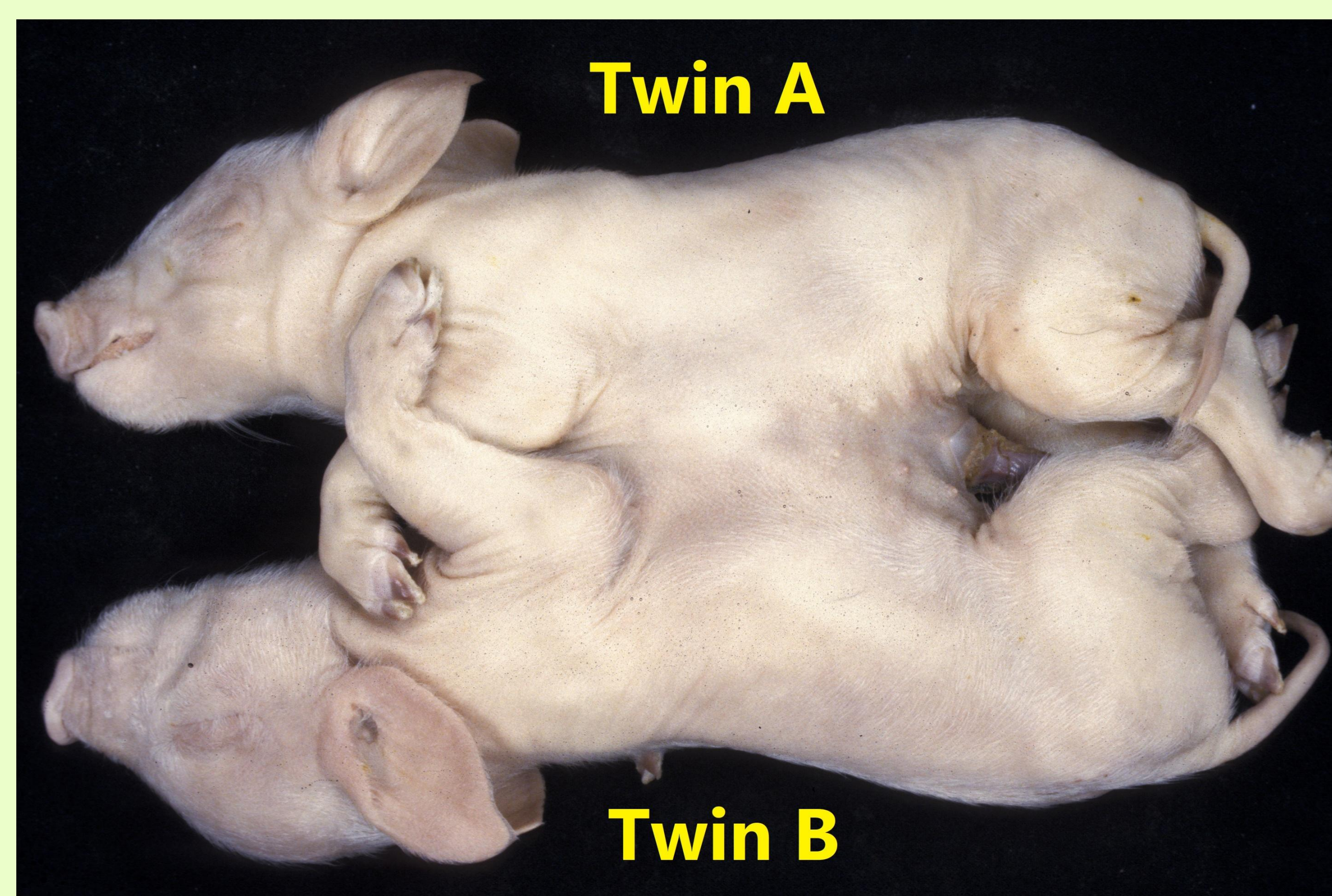


Figure 4: **External lateral view of the thoraco-omphalopagus.**

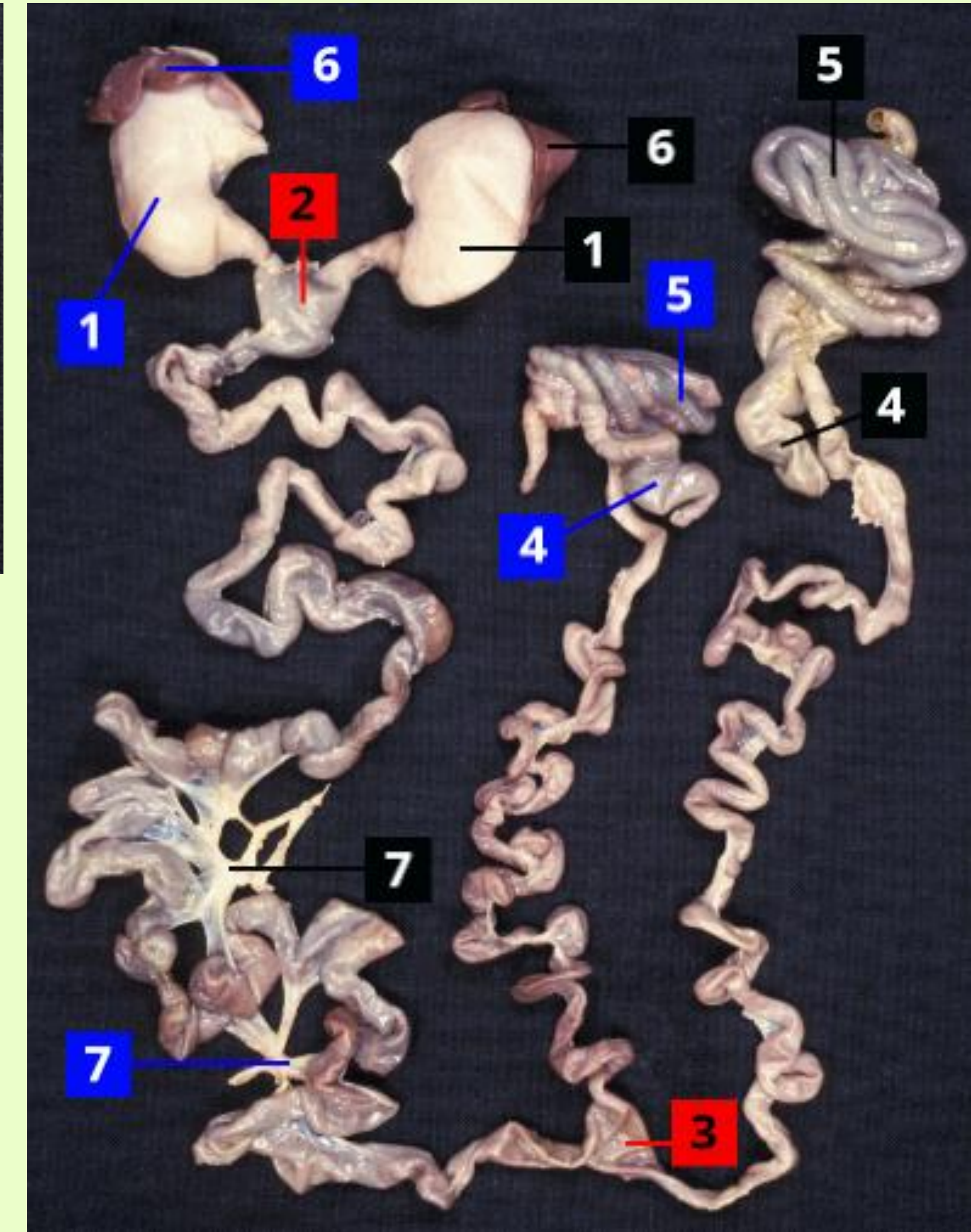


Figure 3: **Digestive tract.** [1] stomach; [2] cranial union at the descendent duodenum; [3] caudal union at the jejunum; [4] caecum; [5] ascending colon; [6] spleen; [7] cranial mesenteric artery (black: twin A, blue: twin B).

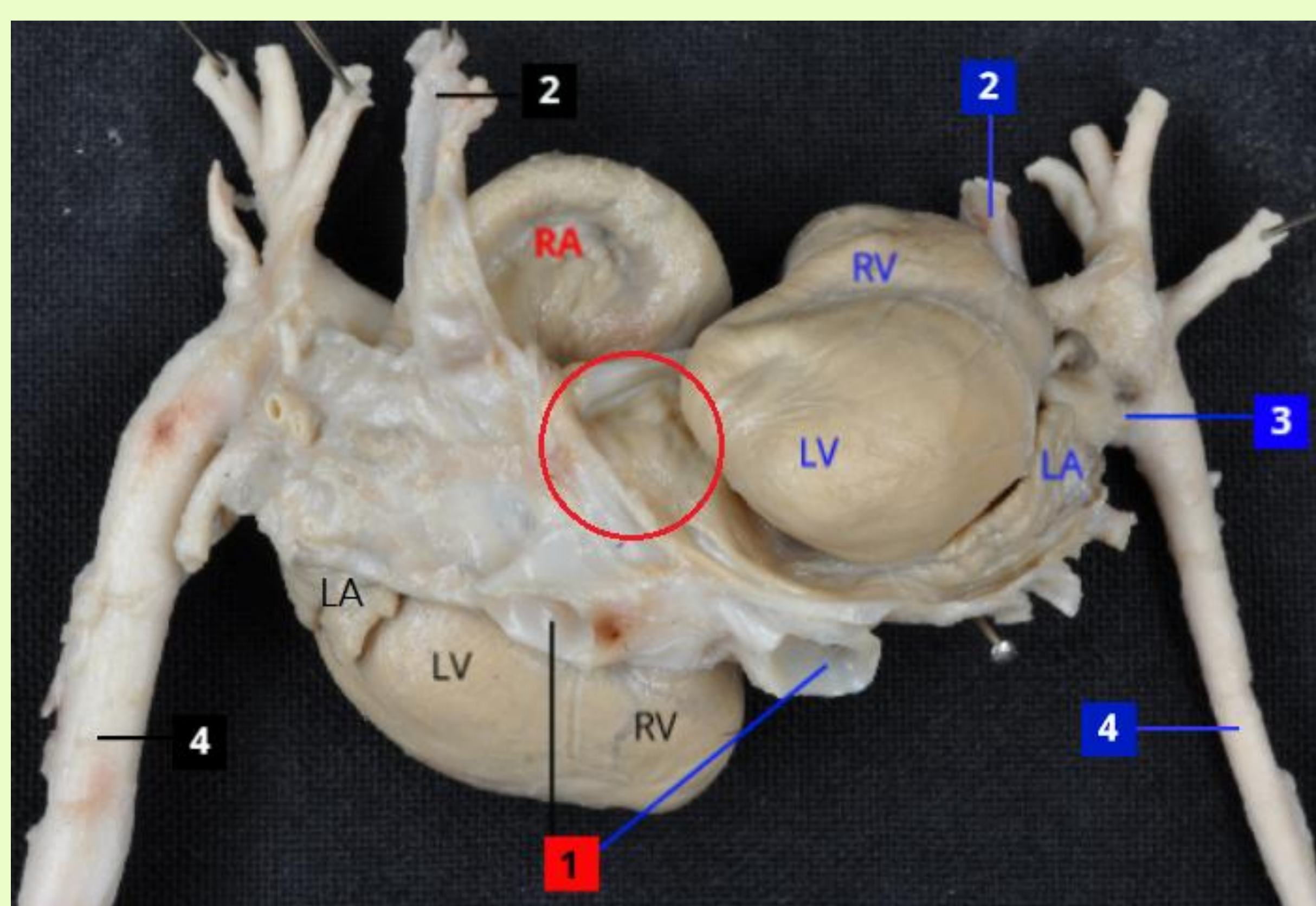


Figure 5: **Connected hearts and main vessels.** Right lateral view of heart A (black) and left lateral view of heart B (blue). [1] caudal vena cava; [2] cranial vena cava; [3] ductus arteriosus; [4] thoracic aorta. RV: right ventricle; LV: left ventricle; RA: right auricle; LA: left auricle. Circle: right atrium (shared).

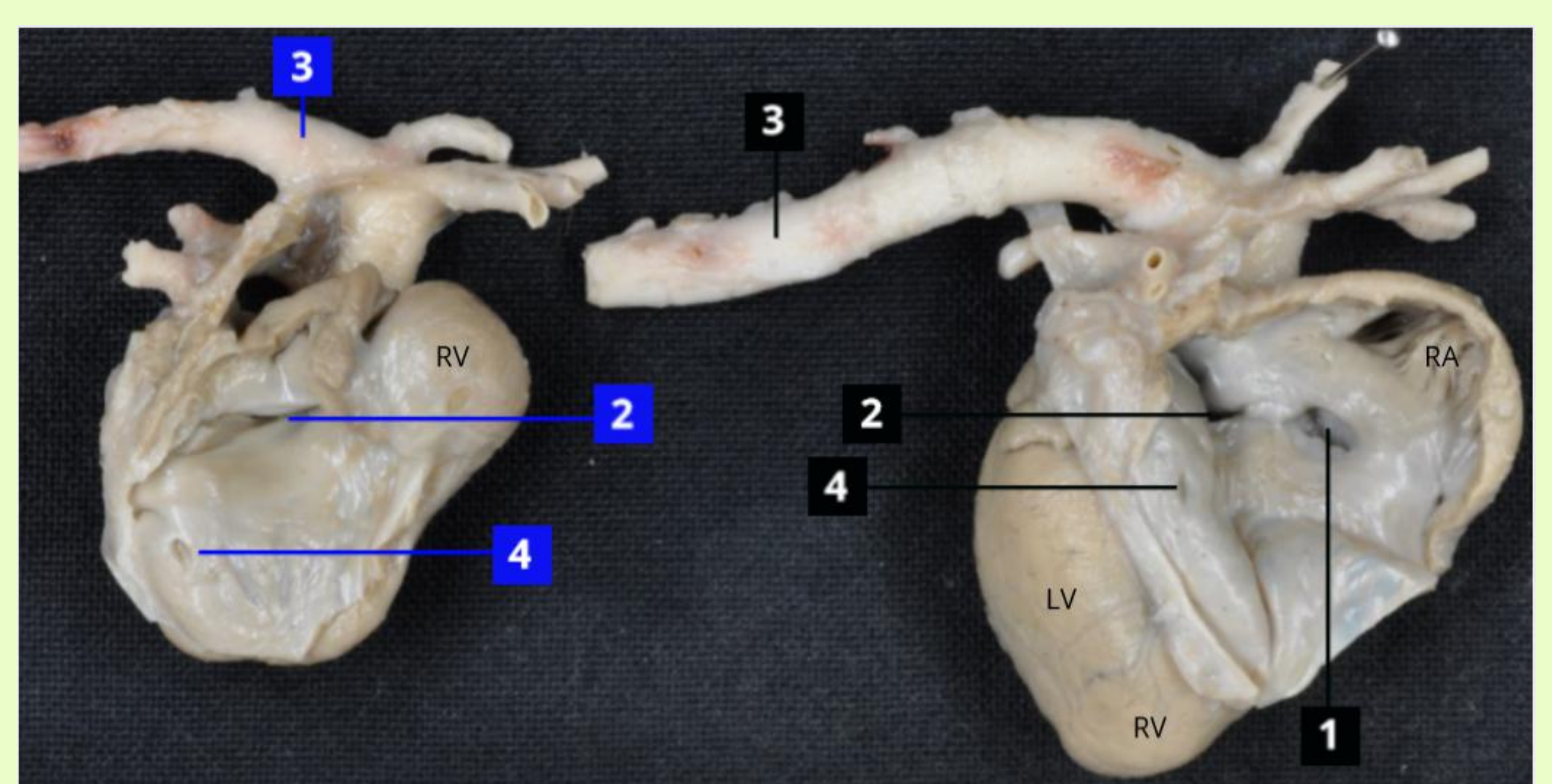


Figure 6: **Separated hearts.** Right lateral view of both hearts: the separation allows us to observe the inside of the right atrium. [1] atrioventricular foramen; [2] interatrial foramen; [3] thoracic aorta; [4] coronary sinus. RV: right ventricle; LV: left ventricle; RA: right auricle (black: twin A, blue: twin B).

CONCLUSIONS

- Case classified as **thoraco-omphalopagus**.
- Two complete separated vertebral columns suggests an **initial fission of a single embrionary disk** that resulted in two independent notochords. In addition, shared structures such as the right atrium of the heart, the liver and the small gut seem to indicate a **posterior ventral fusion of both disks**.
- Isosexuality supports the hypothesis of **monozygotic twins**, but doesn't rule out a dizygotic origin of twinning.