

➤ Ductus arteriosus and foramen ovale in the bottlenose dolphin (*Tursiops truncatus*)

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Introduction:

- ductus arteriosus is a blood vessel connecting the pulmonary artery to the aortic arch
- foramen ovale is fetal cardiac shunt between left and right atrium
- objective: to determine the timing of postnatal closure of ductus arteriosus and foramen ovale in bottlenose dolphins and to assume the possible causes

Materials and Methods:

- 49 hearts of bottlenose dolphins were studied by gross dissection
- the hearts originated from bottlenose dolphins found death from October 1991 till April 2011 in the Croatian part of the Adriatic Sea
- data on body length, body mass and age were listed from necropsy protocols

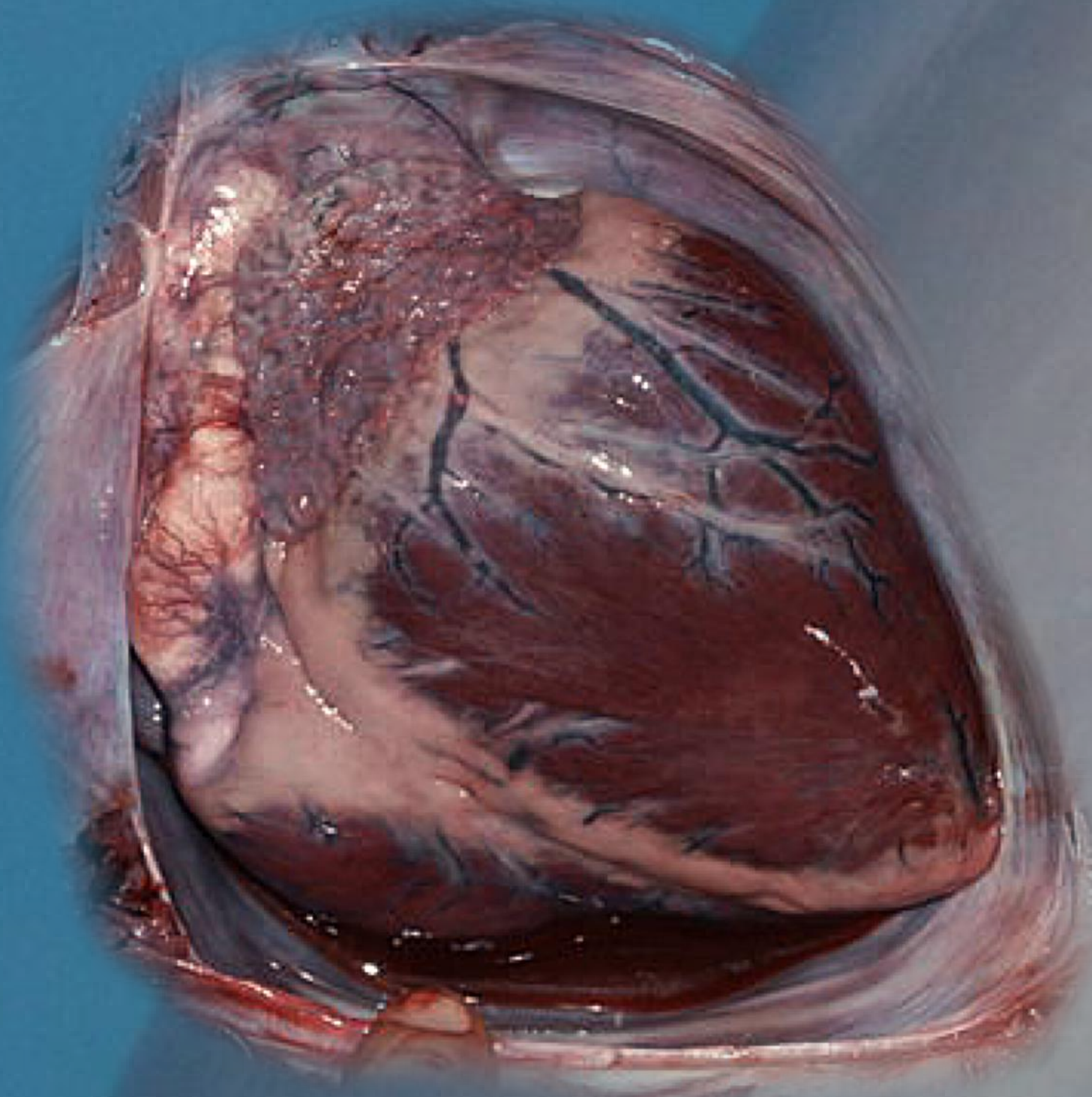


Fig 1. Heart in situ surrounded by pericardium

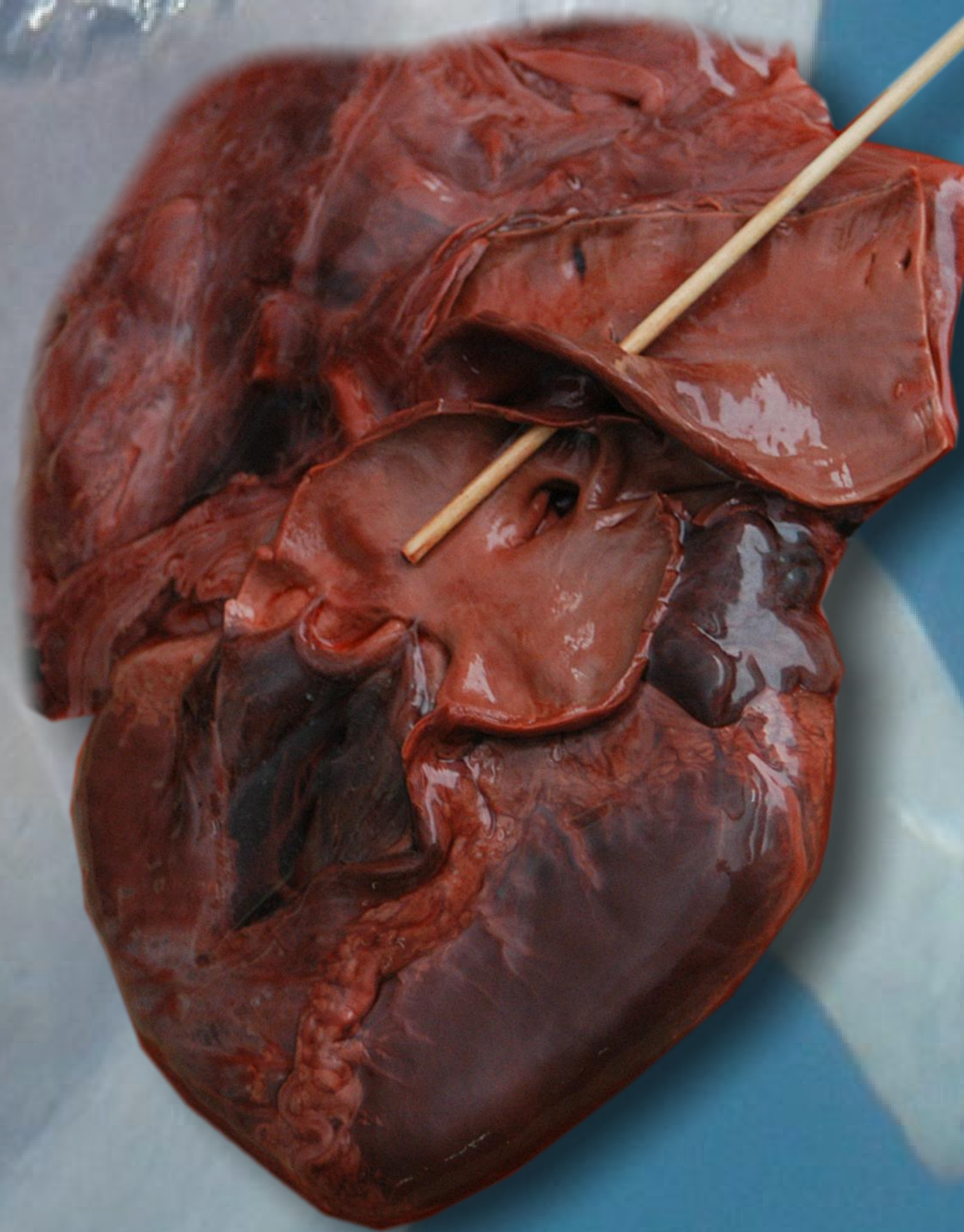


Fig 2. Open ductus arteriosus

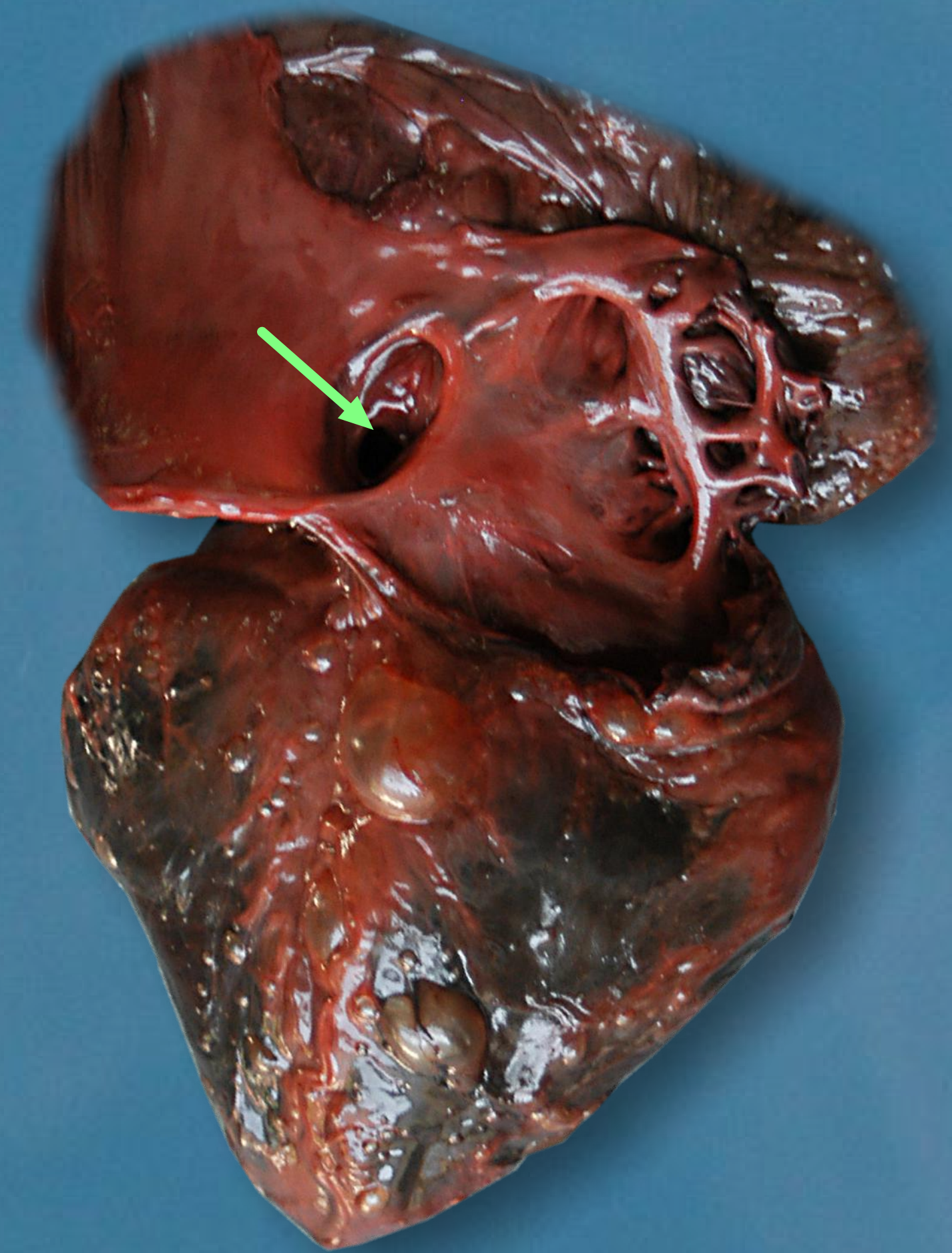


Fig 3. Open foramen ovale

Results and discussion:

Open ductus arteriosus (Fig. 2) was observed in 9 animals:

- the youngest was an immature fetus with a body length of 99 cm;
- the largest male was 160 cm in length, the largest female was 220 cm in length, 5 years old

Open foramen ovale (Fig. 3) was observed in 19 animals:

- the largest male and female were both 210 cm in length, 4 years old

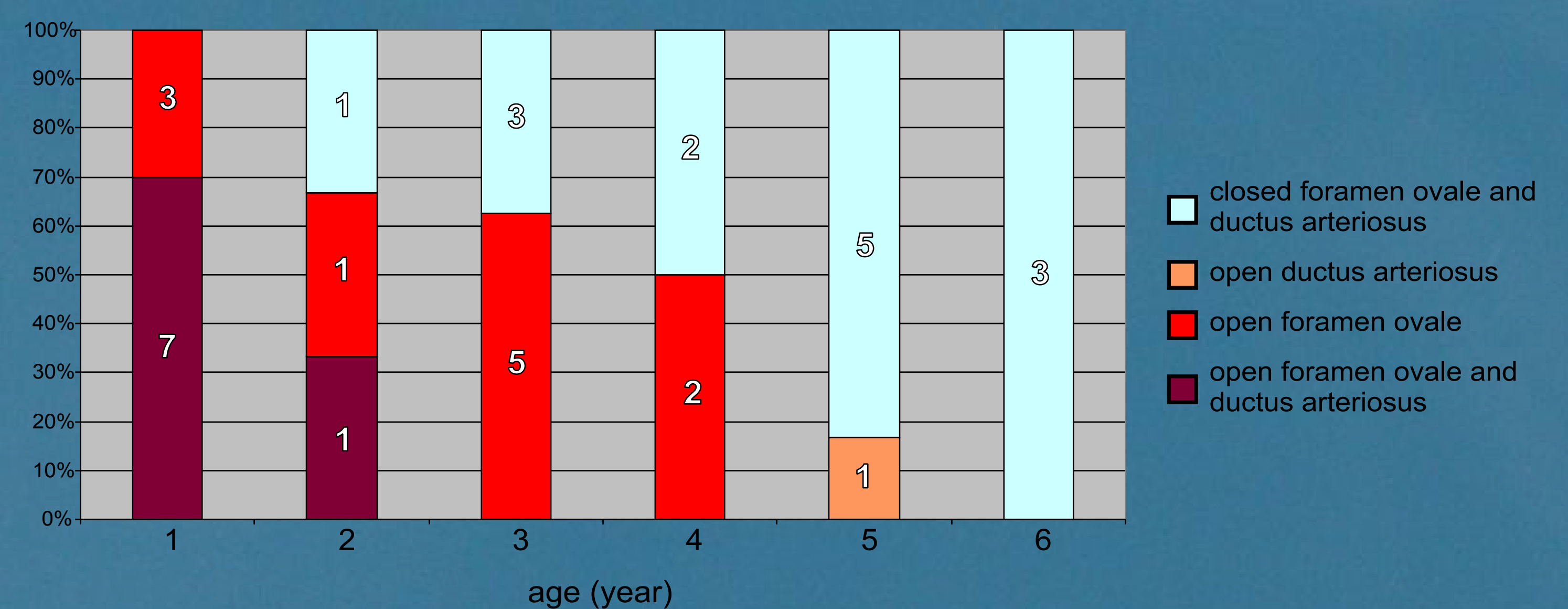


Fig 4. Prevalence of persistent fetal structures of the heart with age of bottlenose dolphins

Conclusions:

- ductus arteriosus and foramen ovale are open at birth
- the closure of fetal structures of the heart correlates with total body length and age of bottlenose dolphins and appears earlier in males than in females
- fetal structures of the heart retain longer in bottlenose dolphins than in humans
- we presume that the persistence of fetal structures in the bottlenose dolphin heart is the result of a lower evolutionary pressure on marine versus land mammals