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Percutaneous closure of patent ductus arteriosus with the Vet-PDA Occluder ® device in dogs

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Introduction

The development of safe devices and protocols for the resolution of patent ductus arteriosus (PDA) is of the utmost importance in veterinary practice. The great diversity of sizes and morphologies of the PDA, moreover, the variety of body conditions in the canine species, make it difficult to determine the most appropriate occlusion device. The Vet-PDA Occluder® (Evomed and B. Braun) device consists of a series of nitinol coils, conical in shape, occluding vascular communication when released. The use of homologous devices (Nit-Occlud® PDA), has previously demonstrated its utility for the adequate resolution of PDA in human medicine. The aim of this study is to describe for the first time the use of the Vet-PDA Occluder® device in the successful resolution of PDA in 5 dogs.

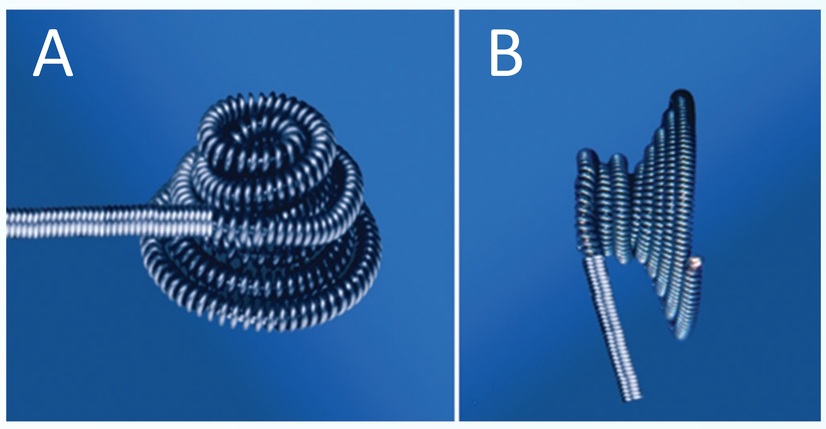

Figure 1. Vet-PDA Occluder® device (A and B). Nitinol-based spiral-shape device for small and medium-sized patent ductus arteriosus. Tight and compact windings are thought to enhance efficient occlusion and no thrombogenic fabrics are incorporated.

Methodology

The selected animals had <6 months of age, weighing <2 kg. The mean diameters of the ductal ampulla were 3.3±0.7 mm, and those of the ductal ostium were 1.8±0.2 mm. PDA morphology was previously classified as type IIB in 4/5 of the animals and type I in 1/5. No animal presented signs of congestive heart failure, and the same anesthetic protocol was applied in all cases.

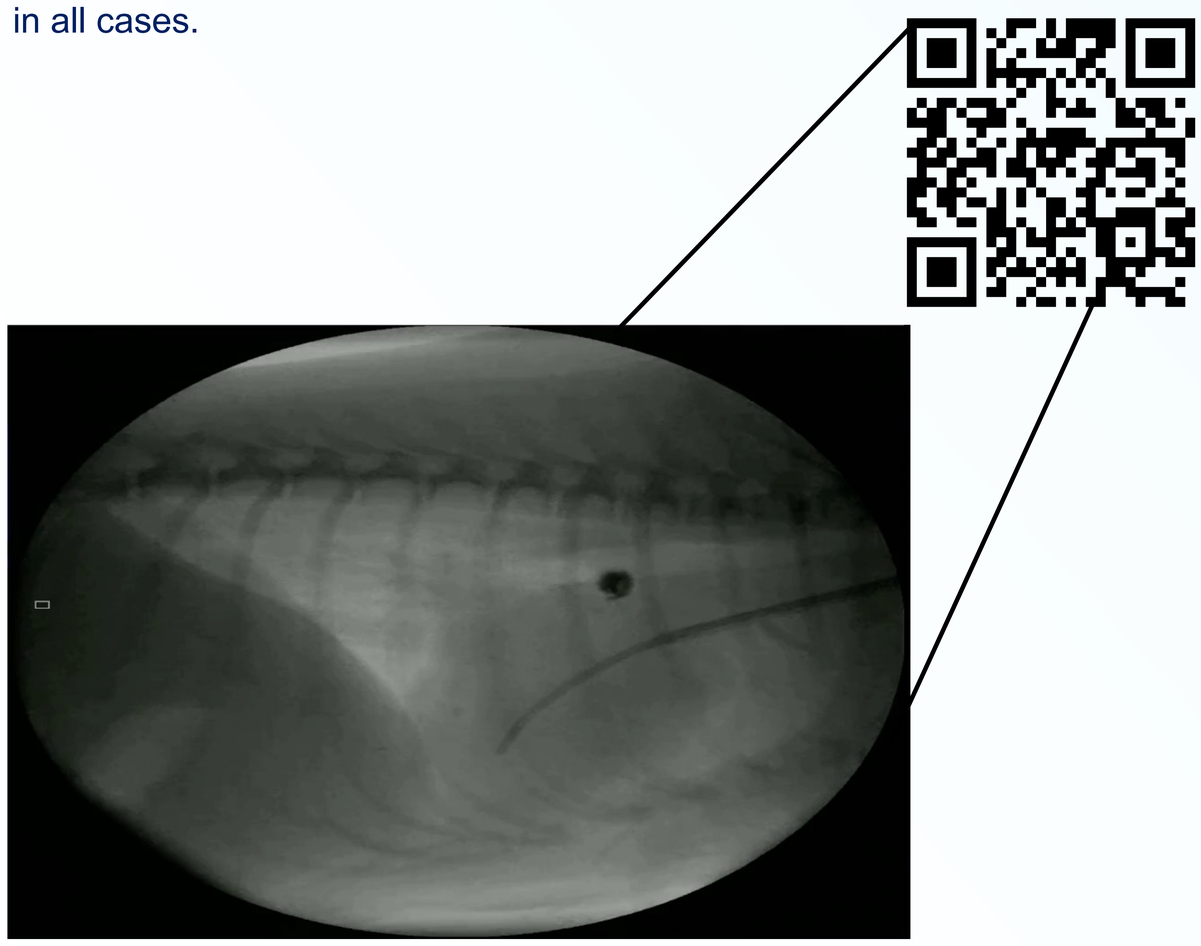

Figure 2. Representation of a fluoroscopy study of subtraction in a canine patient undergoing successful endovascular surgery for resolution of a patent ductus arteriosus using a Vet-PDA Occluder® device.

Results

The conducted protocol consisted in obtaining percutaneous vascular access to the right jugular vein (5-6 Fr) by using a modified Seldinger technique and passing a guidewire and multipurpose catheter in a retrograde manner through the PDA, which allowed for manual measurement of the canal by angiography. Device sizing was based on the distal coil diameter, no more than 2 mm greater than the ampulla, and the proximal coil diameter, no more than 3-4 mm greater than the ostium diameter. The occlusion device and delivery system were loaded onto a dedicated guide catheter (4-5 Fr) and, under fluoroscopy, the device was placed by performing continuous loops within the ductal ampulla and on the pulmonary side of the duct. The safe position of the device was determined by gentle manipulation and transthoracic echocardiography. Pulmonary artery angiography was performed, and no presence of residual flow was reported. The endovascular material was removed, and hemostasis was achieved by applying digital pressure for ten minutes. No significant complications were reported during the surgical intervention and the time range for its performance was 34-64 minutes.

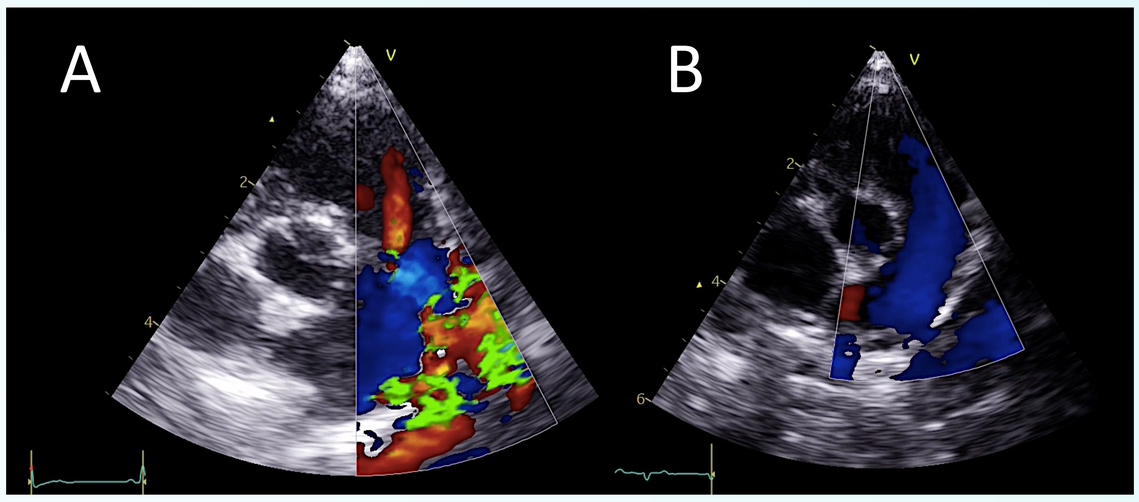

Figure 3. Echocardiographic study performed before (A) and after (B) the percutaneous resolution of a patent ductus arteriosus in a canine patient using a Vet-PDA Occluder® device.

Conclusion

The Vet-PDA Occluder® device has proven effective for ductal occlusion in all studied animals, and the protocol performed has been a safe surgical alternative in this group of small patients.

Acknowledgements

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