Interventional cardiology is a subspecialty of veterinary cardiology, whose main aim is to introduce a catheter into the heart chambers through the blood vessels. All these procedures are image-guided and have many advantages that the rest of thoracic surgical interventions have not: lower risk, as they do not require thoracotomy; and faster recovery after surgery with less pain suffered.

Vascular access and imaging techniques

Access to the vascular system may be made by the modified Seldinger technique (a single-wall puncture technique) or via arterotomy or phlebotomy.

The use of imaging techniques is needed, such as fluoroscopy, transhoracic echocardiography (TEE) or transoesophageal echocardiography (TOE), and angiography (contrast administration).

Aortic valvuloplasty

Aortic stenosis is another usual congenital cardiac defect in dogs, but less common in cats. It can be subvalvular, valvular and supraavalvular. Subvalvular aortic stenosis (SA+) is the most.

Contraindication: subvalvular aortic stenosis.

Indication: severe aortic stenosis and SAS.

Procedure: balloon dilatation is introduced into the aortic root and is inflated for 5 to 10 seconds through a valvuloplasty guide wire.

Pulmonary valvuloplasty

Pulmonic stenosis (PS) is also a common congenital cardiac defect in dogs (uncommon in cats), that produces an obstruction in the right-side ventricle outflow tract. It can be subvalvular, supraavalvular and valvular. The last one is the most common presentation and it is divided in type A (flanged valve) and type B (dysplastic valve). In some breeds such as English bulldog and boxer it can be caused by an abnormal right coronary artery type C.

Contraindication: pulmonic stenosis caused by an abnormal right coronary artery type C.

Procedure: balloon dilatation is introduced under the pulmonic stenosis until pulmonary trunk. The procedure is repeated with the balloon catheter.

Balloon valvuloplasty of pulmonic stenosis (PS)

Once, the catheter balloon is inflated with dilated contrast for 5 seconds, and the process is repeated twice or three times, with an interval of 3 and 5 minutes (Fig. 4).

Complications seldom appear: ventricular arrhythmias and tricuspid insufficiency.

Conclusions

Interventional cardiology is increasingly being considered as the first option of treatment for the most common congenital heart diseases in dogs – PDA, PS, and SAS.

- Arterial or venous access is required in order to perform a cardiac catheterization, and the choice of the access depends on defect location and indications of the procedure. As for the blood vessel, it is chosen according to the size of the patient – vessel diameter.

- Success of the intervention depends mainly on the correct measurement of the defects by using TTE, TEE and angiography.

- These interventions present many advantages with respect to medical and invasive surgery, but balloon valvuloplasty of SAS has not clear advantages of survival. In addition, interventional cardiology is not always the first option of treatment for severe defects of PDA, and the presence of abnormal coronary artery of type C, and severe septal defect disease.

The most common congenital cardiac defect in cats has no treatment option by cardiac catheterization.

