

BALLOON CATHETER DILATION– INFORMATION SHEET FOR VETS

A balloon catheter dilation is most commonly performed for a **valvular pulmonic stenosis**, but this technique is also used for other defects such as a cor triatriatum dexter and aortic stenosis.

What you need to do prior to referral....

It is preferable if dogs are medicated with beta blockers for 2 weeks prior to referral and these should normally be continued until a follow-up scan some months later.

- We recommend atenolol: starting at 0.5mg/kg bid for the first week, then increasing to 1mg/kg bid thereafter. An even higher dose (2mg/kg bid) is recommended for very severe cases with marked dynamic outflow tract obstruction.
- Please ensure the dog or cat is free of any infections especially pyoderma involving the neck, otitis or skin parasites - if present these should be treated before surgery can proceed.

What we will perform prior to surgery

- Detailed echocardiography to screen for more subtle or concurrent heart defects (eg. persistent left cranial vena cava, ASD, aberrant coronary arteries) as well as fully assessing the type and severity of the stenosis and measuring the pulmonary artery diameter.

Indications

Balloon dilation is indicated when there are clinical signs of forward heart failure (often on exertion) attributable to the pulmonic stenosis.

In the absence of obvious clinical signs the following are also indications:

- Valvular PS with clinical signs, regardless of pressure gradient.
- Pressure gradient >70-80mmHg...
 - + predominantly cusp fusion
 - + dynamic right ventricular outflow tract obstruction
 - + moderate right ventricular hypertrophy
- The trans-stenotic pressure gradient > 80mmHg without clinical signs

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Outcome

The Cardiology Service at Paragon Veterinary Referrals is one of the few specialist centres in the UK to regularly perform this procedure. This is one of the more difficult interventions and better results will be achieved with experienced veterinary cardiologists.

The success rate varies in relation to the pathology of the stenosis, ie. valve fusion, dysplasia or hypoplasia. However as a guideline in our experience >85% of cases will show a significant clinical improvement with a 40 - 60% drop in the pressure gradient through the stenosis. The procedure is not without risk, however the mortality rate is low (<1% based on clinical audit data). Subvalvular stenosis, such as seen in Bulldogs, does not respond as well.

Balloon catheter dilation has been shown to improve both the prognosis and associated clinical signs. For pulmonic stenosis it has also been shown to reduce overall risk of mortality versus dogs that do not have surgery.

Complications

- Aberrant coronary arteries can be present, particular in brachycephalic breeds such as Bulldogs, that would be a contraindication to balloon dilatation (see later). Where this is suspected, coronary angiograms can also be performed at the time of cardiac catheterisation. Its presence precludes proceeding to balloon dilatation.
- A patent foramen ovale is not uncommon; if this is reverse shunting (ie. right to left) an echo-contrast study can reveal this and the PCV also measured. A reverse shunting defect increases the anaesthetic complications, although is a risk that has to be taken.
- Arrhythmias are not uncommon with severe pulmonic stenosis, in particularly during the passage of relatively large catheters through the heart during surgery. Pre-medication with beta blockers prior to surgery, in our experience, appears to reduce the incidence of arrhythmias and anaesthetic complications.

Follow-up

- Sutures from the left jugular area are due for removal 10 days post-surgery.
- Beta blockers should be continued until a follow-up scan is performed.
- A follow-up scan 6 to 12 months later by the cardiologist should be performed after surgery to measure the degree of success of the procedure and re-assess cardiac morphology. Beta blockers should be continued until that time, but can often be weaned off if the pressure gradient is low and there is no dynamic outflow tract obstruction.
- The defect should be regularly monitored by echocardiography at least every couple of years.