

CLOSURE OF PATENT DUCTUS ARTERIOSUS – INFORMATION SHEET FOR VETS

What you need to do prior to referral...

- It is prudent to obtain chest radiographs to screen for cardiomegaly which is common with PDAs. If there is significant cardiomegaly present and marked left ventricular dilation on echocardiography, we currently recommend medication with pimobendan.
- If pulmonary oedema is present on chest radiography, then diuretics are required prior to anaesthesia.
- Please also provide your owner with our 'Information Sheet for owners'.
- Please check the dog or cat for any infections especially pyoderma or skin parasites, especially over the femoral artery sites - if present these should be treated before surgery can proceed.

What we will perform...

- Detailed echocardiography to screen for more subtle or concurrent heart conditions, assess heart function and measure the ostium and ampulla of the duct in preparation for surgery.

Indications

Closure of a PDA is indicated in virtually all cases as the mortality rate in untreated cases is estimated to be 50% per year.

The most common outcome for dogs in which a PDA is not closed is the development of cardiomegaly and left sided congestive heart failure. Closure can still be performed in these cases provided the left ventricular contractility is still good and there is not excessive cardiomegaly. The development of pulmonary hypertension and thus a reverse shunting (ie. right-to-left) PDA is uncommon - but this is a possible contraindication to closure, unless it can be reversed with medications just prior to surgery. Those dogs that do develop pulmonary hypertension usually do so by 6 months of age.

Weight limits

Upper limit:

At present there is no upper limit in the size of dog or size of duct that we have yet encountered that we cannot close.

Lower limit:

We have no problem catheterising the femoral artery of dogs as small as 3.0kg.

We can catheterise the femoral artery in dogs as small as 2.2kg, but dogs between 2.2 and 3.0kg are very difficult and thus owners need to be advised of the increased risk of complications. We will therefore only attempt dogs <3kg if the dog is confirmed to be in congestive heart failure or at high

risk; otherwise we would prefer them to be medicated with pimobendan and diuretics until they reach 3.5kg – if possible. Use of a puppy growth chart on the internet can be helpful to predict when this might be.

Outcome

The Cardiology Service at Paragon Veterinary Referrals is one of the few specialist centres in the UK to regularly perform interventional closure of PDAs (transcatheter embolisation). This is a difficult intervention and better results will be achieved with an experienced veterinary cardiologist. Direct surgical closure is still available, however this is associated with a mortality rate of 3 - 8% (depending upon the surgeon) and an extended recovery time from the thoracotomy. Interventional closure has a very low mortality and morbidity rate and dogs can return home the following day with no after-effects or pain. In addition owners do tend to prefer 'keyhole' surgery. The prognosis for PDA closure is ~10-11 years; i.e. a full life for most dogs.

Closure device

There are an increasing number of embolisation devices for closure of PDAs and this continues to be an area undergoing advances in paediatric cardiology, and we are keeping abreast of these developments. Amplatzer Canine Duct Occluders (ACDO) are currently the main devices used dogs, however we still keep a stock of other devices for tiny dogs and cats.

Complications

There can be sometimes bruising around the femoral incision and some dogs are mildly lame after surgery. Haematuria has been reported, but seems to be rare and we have not seen a case. Loss of the ACDO into the pulmonary artery circulation is rare. Residual flow is virtually non-existent with ACDOs. Device infections are also exceedingly rare but possible as with other sterile implants

Follow-up

- Sutures from the femoral area are due for removal ~10 days post-surgery.
- If dogs have been on medication, usually diuretics can be weaned off, but other cardiac medications such as pimobendan should be continued until follow-up echocardiography.
- A follow-up scan is often recommended between 4-6 months by the referring cardiologist prior to stopping any medication and to screen for cardiac remodelling
- In more severe cases, further rechecks and echocardiography may need to be performed.