Kardiolog med stort hjärta

Mark Dirven, leg veterinär, Dipl ECVIM-CA (kardiologi)

Som en praktiskt lagd diplomate har Mark Dirven länge varit en uppskattad föreläsare. Det var i den rollen han kom i kontakt med Anicura i Sverige vilket ledde till en tjänst på Djursjukhuset Albano.

Det han uppskattar mest är att han kan kombinera sina patienter med forskning och utbildning och kunna samarbeta och diskutera fall med andra kardiologer.

Mark Dirven studerade till veterinär på veterinärmedicinska fakulteten på universitetet i Utrecht och tog examen 2004. Han började arbeta på en smådjursklinik som även tog emot en del exotiska husdjur och hans inriktning blev snabbt intermedicin och ultraljud. Det blev många kurser och kombinationen intermedicin och ultraljud ledde honom osökt till kardiologin. Mark kände att han ville specialisera sig men eftersom det inte finns någon motsvarighet till steg-I- eller steg-II-utbildning i Nederländerna så började han fundera på en residency.

Efter många diskussioner och förhandlande med universitetet fick han påbörja ett alternativt program på deltid med 40 procents tjänstgöring på den privata klinik som han arbetade på och 60 procents tjänstgöring på universitetet. Efter fem år tog han examen på första försöket vilket är ytterst ovanligt.

Han ser många fördelar med att ha kombinerat utbildningstjänsten med arbete på en privat klinik. Det gjorde att han fick se fler fall och det gav honom mer erfarenhet av arbete på ”en vanlig klinik”. Hans mer praktiska infallsvinkel uppskattas inte minst av de som går på hans föreläsningar. Mark anser också att det var en fördel att arbeta några år innan han påbörjade sin vidareutbildning jämfört med att bli resident som nyutexaminerad.

Som färdig diplomate föreläste han en hel del i Sverige och då mest inom Anicura då han arbetade för en Anicuraklinik i Nederländerna. Han träffade Anna Tidholm och blev erbjuden att börja arbeta på Albano.

– Jag sms:ade min flickvän som är djursjukskötare med inriktning kardiologi och sa att vi kanske skulle flytta till Sverige. Fick väldigt snabbt svar att hon höll på att packa sin väska och att katten redan satt i transportburen, skrattar Mark.

Det är stor skillnad att arbeta i Nederländerna och i Sverige, menar han. Som specialist i Nederländerna måste du ägna all din tid åt att ha patientlistor.

–Här på Albano kan jag kombinera mina patienter med forskning och utbildning. Det är också fantastiskt att få jobba med andra kardiologer, samarbeta och diskutera fall, och även kunna ha en resident på en klinik i privat regi.

Förutom utredningar av komplicerade kardiologifall och avancerade ultraljudsundersökningar utför även Mark ingrepp som ballongsprängningar av pulmonalisstenoser och annan interventionell kirurgi som PDA-operationer. •

FALLRAPPORTER

FORTSÄTTER PÅ NÄSTA UPPSLAG

Från Hjärtcentrum på Anicura Djursjukhuset Albano har vi fått flera intressanta fallstudier för att illustrera hur viktigt det är att remittera fall vidare där man hör någon störning på hjärtat, även om djuret inte visar några symptom. Fallrapporterna spänner över allt från screening av en valp med blåsljud till hund som får en pacemaker inopererad.

FALLRAPPORT

Hypertrofisk kardiomyopati

MARK DIRVEN

Phoenix, 9 year old female spayed European shorthair.

Phoenix in a 9 years old female castrated European Shorthaired that is presented for dental cleaning. Phoenix is asymptomatic and has no relevant medical history besides the problems with his teeth.

Upon pre-anaesthetic physical examination Phoenix is bright and alert. Respiratory rate is 48 breaths per minute. The breathing pattern is normal. Femoral pulse quality is normal. Heart rate is 210 beats per minute. A soft left parasternal systolic heart murmur is audible.

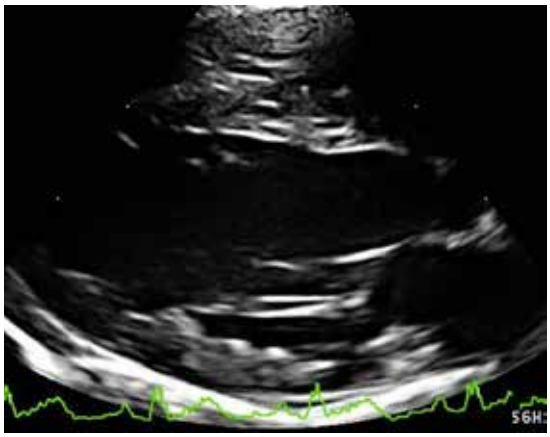
Heart murmurs are common in asymptomatic adult cats. A heart murmur is to be expected in at least 1 in 3 apparently healthy adult cast. Similarly subclinical hypertrophic cardiomyopathy (HCM) is prevalent in asymptomatic adult cats as well with estimates of approximately 1 in 5 apparently healthy cats having HCM but not showing any symptoms of this disease. Although both heart murmurs and HCM are prevalent in cats, many cats with heart murmurs do not have HCM or other heart disease and some cats with HCM do not have heart murmurs. Many cats with heart murmurs do not have any type of heart disease and some cats with heart disease may not have heart murmurs.

In contrast to small breed dogs, physical examination is not particularly helpful in determining the presence of heart disease in cast with and without heart murmurs. The presence of a heart murmur in an adult asymptomatic cat may or may not be related to heart disease. The intensity of the heart murmur is not particularly helpful as loud murmurs may not be related to structural heart disease. Many heart murmurs in cats will have their point of maximum intensity in the left or right parasternal area but this holds true for both murmurs related to heart disease and those not related to heart disease. Both heart rate and respiratory rate are variable in healthy cats and both may be elevated just as a result of stress. Additionally cats in left sided congestive heart failure may present with high, normal or even low heart rates. Therefore Phoenix' heart murmur may or may not be related to heart disease. The presence of subclinical heart disease may impact anaesthetic risk and management. Both anaesthetic risk and prognosis are difficult to give at this point in time.

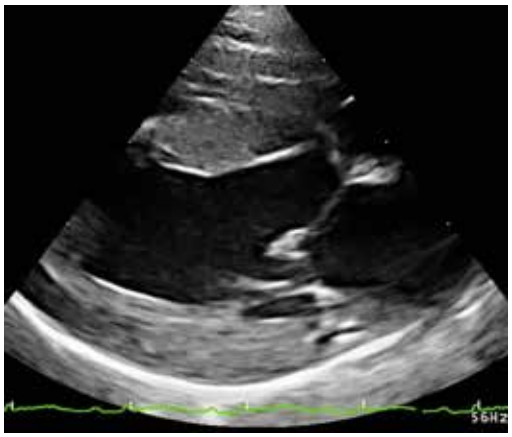
Echocardiography is the test of choice to find the cause of the heart murmur, to check for the presence of a structural heart disease and abnormalities impacting anaesthetic risk and prognosis. As Phoenix is 9 years old evaluation of systemic blood pressure and thyroid function is helpful to determine their role in the presence of the heart murmur and/or structural heart disease.

At Albano's Heart patients like Phoenix will undergo physical examination and echocardiography. As Albano's team comprises dedicated cardiology technicians to assist with the echocardiographic examination, sedation is hardly ever needed. They are also the ones to perform blood pressure measurement and evaluation of thyroid function. Results are known immediately and will be discussed with the owner during the same visit. Relevant information regarding treatment, prognosis and monitoring will be communicated to the owner. Subsequently a written summary of relevant findings will be sent to the referring veterinarian including advice on anaesthetic risk and management.

Phoenix is diagnosed subclinical hyper-



Right parasternal 5 chamber view from an adult cat with a normal heart. Note the ratio between left ventricular wall and left ventricular lumen. The left atrium is not enlarged. shorthair.



Right parasternal 5 chamber view from Phoenix. Note the decreased ratio between left ventricular wall and left ventricular lumen. Symmetric concentric left ventricular hypertrophy is present. The left atrium is not enlarged. As hyperthyroidism and systemic arterial hypertension were ruled out, HCM remains as the most likely cause of the concentric left ventricular hypertrophy.

trophic cardiomyopathy. Although prognosis is variable, many cats with subclinical HCM may live for years and years without (ever) getting heart failure symptoms. No treatment has been shown to be beneficial in this stage of the disease. The owner is instructed to monitor sleeping respiratory rate.. Although anaesthetic risk is increased several anaesthetic regimens are tolerated well. The referring veterinarian receives information regarding anaesthetic management. A follow up appointment in six months' time is advised to monitor possible disease progression. •

FALLRAPPORT

Valp med blåsljud

MARK DIRVEN

Spike, 6 week old male West Highland Weaten terrier.

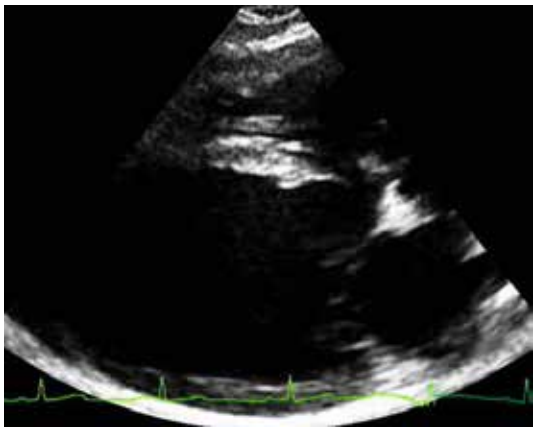
Spike is a 6 week old male West Highland White Terrier puppy presented for a health check prior to his first vaccination. Spike is the smallest puppy in the litter, nevertheless he is very lively and growing well. Spike is still housed with his siblings and mother at the breeder who is presenting the puppy for health check and vaccination.

Upon physical examination Spike is bright and alert. Respiratory rate is 36 breaths per minute. The breathing pattern is normal. Femoral pulse quality is normal. Heart rate is 120 beats per minute and heart rhythm is regular. A low intensity left basal systolic heart murmur is present.
Every now and then a puppy like Spike will come into the consulting room. Screening puppies (and kittens) for heart murmurs is a very important part of the physical examination. A heart murmur in a puppy may be related to congenital heart disease. On the other hand the absence of a heart murmur renders congenital heart disease unlikely (though not impossible). The difficulty is that not all heart murmurs in juvenile dogs and cats are related to congenital heart disease. In many cases the heart will be completely normal and the heart murmur can be subsequently classified to be an innocent heart murmur. Innocent heart murmurs have their point of maximum intensity in the area of the left hemithorax at the base of the heart. They are low intensity murmurs, have a short duration and sometimes have a musical quality. Both point of maximal intensity, murmur intensity and murmur timing are variable in murmurs related to congenital heart disease. Overlap exists in murmur characteristics of innocent murmurs and murmurs related to congenital heart disease.
As a result Spike's heart murmur could just be an innocent murmur or could be related to congenital heart disease. In this case physical examination alone will not differentiate between the two.

Spike is intended to go to a new family in a couple of weeks but of course they are expecting a healthy puppy and not one with (a suspicion) of congenital heart disease.
Echocardiography is the test of choice to find a cause of the heart murmur and to check for the presence of a congenital heart defects.

The cardiologists working in Albano's Heart centre have extensive experience in diagnosis and treatment of congenital heart disease in dogs and cats. Patients like Spike will undergo physical examination and echocardiography. As Albano's team comprises dedicated cardiology technicians to assist with the echocardiographic examination, sedation is hardly ever needed and echocardiography can be performed in very young and small puppies and kittens. Results are known immediately and will be discussed with the owner during the same visit. Relevant information regarding treatment, prognosis and monitoring will be communicated to the owner. Subsequently a written summary of relevant findings will be sent to the referring veterinarian including advice on anaesthetic risk and management.

Spike is diagnosed with an innocent heart murmur. Congenital heart disease is ruled out. Treatment is not necessary. Spikes prognosis is excellent. A written statement is created for the breeder. It says that Spike is examined by a cardiologist and has an innocent heart murmur and is free of congenital heart disease. As a result the new owners are happy to have spike and are not worried any longer. •



Right parasternal 4 chamber view from Spike. Measurements of heart size and function were well within normal limits. Furthermore Doppler echocardiography did not reveal any evidence of leaks, shunts, outflow tract obstructions or pathological valve regurgitations. The murmur turns out to be an innocent heart murmur.

FALLRAPPORT

Persisterande Ductus Arteriosus

EINAR JOHARD

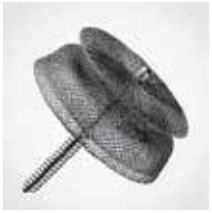
An 11.5-kg 13 months old Schapendoes dog was referred to the Anicura Albano Animal Hospital for evaluation of a heart murmur. The heart murmur had been noticed already at a young age but had not previously been investigated. The pet owner did not report cough, exercise intolerance or other clinical signs of disease. On the day of presentation clinical examination revealed a grade 5/6 continuous heart murmur with maximum intensity dorsal to the left heart base, but no other abnormalities.

Transthoracic echocardiography revealed a left to right shunting Persistent Ductus Arterious, PDA with a moderate dilatation of the left ventricle (left ventricular internal diameter in end-diastole, LVIDd 5,62cm and systole LVIDs 3,5cm), left ventricular systolic performance evaluated by fractional shortening (FS) was normal (37.5%). Minor pulmonic and mitral insufficiencies were also noticed. Left atrial dimension in short and long axis views were normal. Electrocardiography obtained during echocardiography showed normal sinus rhythm with a heart rate of 110 beats per minute.

Possible differential diagnosis for a PDA are; combined abnormalities producing systolic and diastolic heart murmurs, such as a ventricular septal defect and aortic insufficiency due to an unsupported aortic valve cusp, aorticopulmonary window, arteriovenous fistula, bronchial artery flow in chronic heart worm cor pulmonale and tortuous collateral arteries in aortic coarctation or interruption.

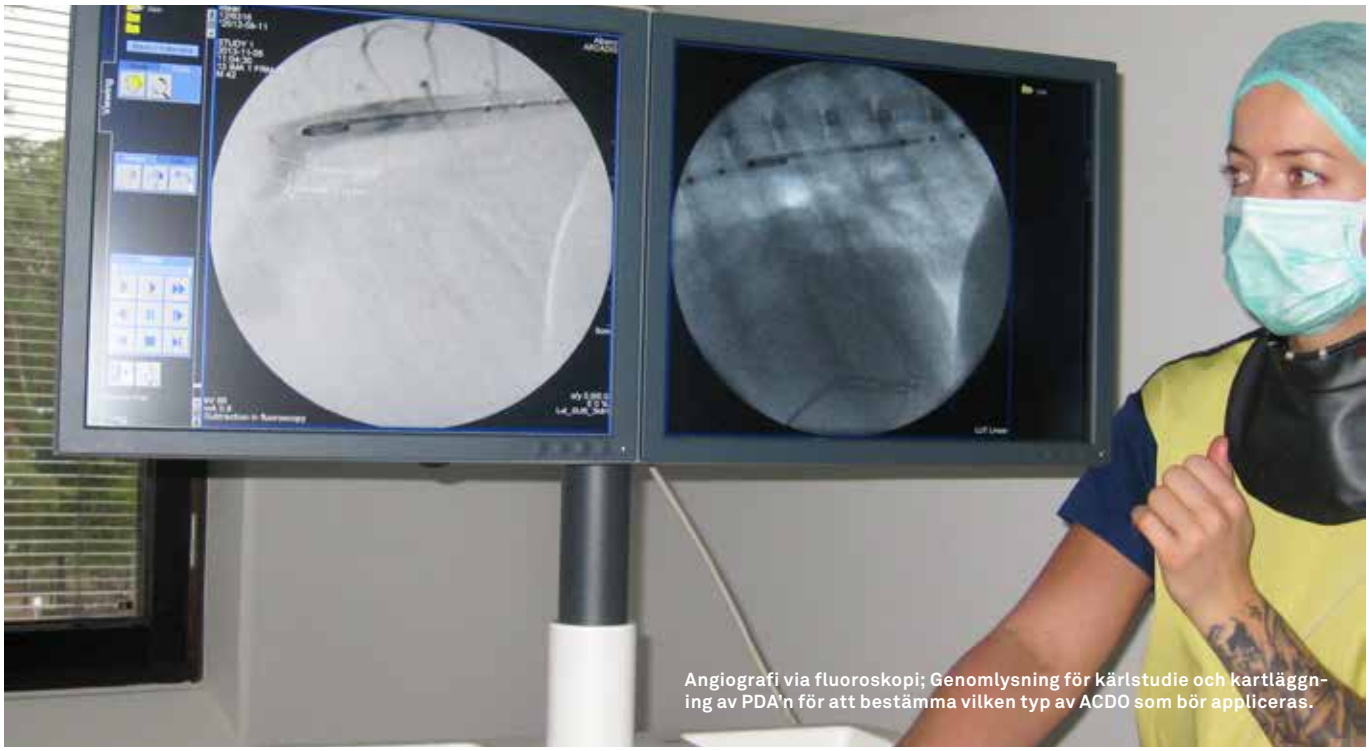
As this dog was being considered for correction of the PDA via the novel Amplatz™ Canine Duct Occluder (ACDO)-technique, special emphasis was placed on the appearance of the PDA, which was measured to have a length of approximately 1,2cm, a waist of 0,6cm and a minimal ductal diameter of 0,4 cm. The waist of the PDA is simply the middle width of the ductus and is important as this is where the ACDO-device anchors its proximal part. The minimal ductal diameter is the narrowest part where the ductus connects to the Pulmonary Artery (PA) and this is where the ACDO-device anchors its distal part.

The dog was scheduled for correction of the PDA, using the, in Sweden novel technique ACDO, a nithinol mesh device with a short waist that separates a flat distal disc from a cupped proximal disc. The device is designed to conform to the morphology of most different kinds of the canine patent ductus arteriosus, according to the Buchanan classification (1,8).



ACDO - Amplatz Canine Duct Occluder, en paraplyliknande "plugg" gjord i nitinol mesh och som åstadkommer en gradvis ockludering av kärlet.

Exponering av *arteria femoralis* där kärlkatetern anläggs. Denna approach kan göras perkutant eller via "cut down" och friläggning av kärlet.



Angiografi via fluoroskopi; Genomlysning för kärlstudie och kartläggning av PDA'n för att bestämma vilken typ av ACDO som bör appliceras.

On the day of surgery, the dog's partial thromboplastin time (PT) and activated partial thromboplastin time (aPTT) were within normal ranges. The dog was premedicated with methadone (0,19mg/kg SC) and general anesthesia was induced with diazepam (0,38mg/kg IV) and propofol (4,6mg/kg IV) and maintained with an inhaled mixture of 2 % isoflurane and oxygen. The dog was placed in right lateral recumbency, the right femoral artery was surgically isolated and cannulated with a 7 French vascular access sheath large enough to allow for passage of angiographic and guiding catheters. The dog was placed under fluoroscopy for the whole procedure. A 5 French vessel sizing non-selective pigtail angiographic catheter with radiopaque reference markers near its tip, was advanced into the aorta immediately cranial to the junction between the aorta and PDA. Angiography was performed by injecting 1mL/kg iodinated contrast solution into the angiographic catheter. The PDA was determined to be a PDA type II, according to the Buchanan classification (8). The minimal ductal diameter, (MDD) of the PDA was determined using the angiography and a suitable size ACDO-device was selected by multiplying the MDD with a factor of 1,29-2,0. Following selection of ACDO-size, a straight flexible tipped guiding catheter was placed across the PDA from the aorta into the main pulmonary artery. Proper attachment between the ACDO-device and delivery cable was then assessed, and the hoop dispenser and device loader used were flushed with heparinized saline. The tip of the device loader was inserted through the hemostasis valve into the hub of the guiding catheter and the ACDO was advanced from the loader into the guiding catheter with the delivery cable. The ACDO was then advanced through the guiding catheter until the flat distal disc was deployed within the main pulmonary artery. The partially deployed ACDO was then retracted until firm resistance was felt as the distal disc engaged the pulmonic ostium of the PDA (Figure 2). The position of the distal disc was maintained via constant tension on the delivery cable while the guiding catheter was retracted further to deploy the ACDO waist and proximal disc across the pulmonic ostium and within the ductal ampulla. The ACDO was observed to assume its natural cupped shape, back-and-forth maneuvering of the delivery cable and manual injection of contrast solution showed proper placement and no residual leakage over the ductus. The delivery cable was then detached by rotating it counter clockwise using a pin vise. An aortic angiogram was then repeated to evaluate any residual leakage across the PDA and then all catheters and vascular introducers were removed, and the femoral artery was ligated using absorbable ligatures (Polydioxanone). The surgical site was closed using absorbable monofilamentous suture material (Monocryl). The dog was observed closely during anesthetic recovery and the immediate post-procedure time and was then kept overnight at the hospital for analgesic and antibiotic treatment (methadone 0,19mg/kg 12h and cefalotine 20mg/kg IV q12h).

Echocardiography 24 hours after surgery showed no residual leakage across the PDA. The LVIDd, LVIDs and FS remained the same as before surgery thus far. The dog was discharged one day after surgery, confined to leash-walks for 14 days and received antibiotic treatment for 7 days (cephalexin 15mg/kg q12h). The owner reported an uncomplicated and full post-operative recovery. At follow up 1-month post-surgery the dog was doing well. Follow up echocardiography revealed no residual leakage across the PDA using Color Flow Doppler. The LVIDd had decreased to 4,7cm and LVIDs 3,0cm but remained moderately dilated. At follow up 6 months post-surgery the dog was doing clinically well, although a new echocardiography was not done due to financial restraints. •

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FALLRAPPORT

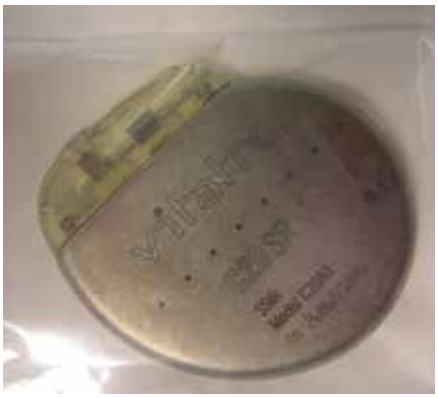
Pacemaker

EINAR JOHARD

A10 year old intact female Miniature Schnauzer was presented to the Anicura Albano Animal Hospital in June 2010 for evaluation of syncope and unwillingness to exercise. Syncope had progressed in frequency and was at the time of presentation occurring several times a day. The dog had previously been diagnosed with myxomatous mitral valve degeneration, MMVD, but was not receiving any treatment. Physical examination disclosed a left-sided systolic heart murmur but no other significant findings. Blood-samples for hematology and biochemistry, as well as urine-samples for microscopic testing and specific gravity revealed no abnormalities. Neurological examination was without significant findings. Echocardiography revealed a mitral insufficiency of 4,9m/s with a mild dilatation of the left ventricle and left atrium with a left atrium to aortic root ration (LA/Ao) of 1,6. Electrocardiogram recorded simultaneously revealed frequent periods of sinus-arrest followed by possibly compensatory tachycardia. An atropine response-test was not done. A Holter-electrocardiogram was performed and revealed frequent periods of sinus-arrest, between 3-10 seconds of arrest with a mean of 7 seconds throughout the 24 hour-period and infrequent ventricular ectopic beats, 20-25 beats/24 hours. The maximum heart rate recorded was 144 beats per minute and the minimum heart rate obtained was 28 beats per minute. The diagnosis proposed was Sick Sinus Syndrome, SSS, or bradycardia-tachycardia syndrome as it is also termed. Possible differential diagnosis for SSS may possibly include premature ventricular beats in bigeminy which may cause apparent slow pulse rate in the physical examination, blocked premature atrial contractions (APCs) that are concealed in the preceding T wave, concealed premature junctional extrasystoles and possibly equipment problems causing intermittent recording of monitor leads. Implantation of a transvenous endocardial artificial pacemaker (AP) was scheduled for two months later. The delay was due to extrinsic circumstances.

The dog was pre-medicated with atropine (0,05 mg/kg S.C.), buprenorphine (0,01 mg/kg S.C.) cefalotine (30 mg/kg I.V.) and was then anesthetized with midazolam (2 mg/kg I.V.), propofol (8 mg/kg I.V.) and sevoflurane (inhalation). The dog was placed in left lateral recumbency and a venous introducer was placed in the right jugular vein. A transvenous bipolar lead was placed in the right ventricle and screwed in place with 5 counter-clockwise turns, whereby appropriate contact with the endocardium was achieved (Figure 1). A single chamber Ventricular Ventricular Inhibited Rate response (VVIR-V)-pacemakera (Figure 2) was inserted subcutaneously at the height of the right shoulder, sutured in place and the proximal lead of the bipolar lead was attached to the pacemaker and screwed in place, however the accompanying screwdriver-device malfunctioned and the lead was therefore left loosely in place to be adjusted the next day. Both the lead and pacemaker were sutured in place using a non-resorbable synthetic suture, polypropylene 3-0. The wound was closed using subcutaneous and intracutaneous sutures of monofilament synthetic absorbable suture, poliglecaprone 3-0. The pacemaker was then programmed using a programmer designed for this purpose, to adjust the stimulation algorithm and settings for

Pacemaker med kateter.



Pacemaker.

Transkutan programmering av pacemakern.

optimal therapy.b Adjustments could be made using a programming wand placed over the pacemaker while information was sent and received via wireless communication (Figure 3). The dog was then awoken uneventfully and remained in the ward overnight.
The next day anesthesia was performed again, using the same anesthesia protocol, the pacemaker was exposed through the previous wound and the lead was now attached firmly in place using a functioning screwdriver-device. The dog again recovered uneventfully, remained for another night in the hospital and was discharged two days later on leash-rest until the follow up after two weeks.

At the follow up examination the owners reported that the dog was doing very well and was able to both play and move around without episodes of syncope

Three weeks after the implantation of the pacemaker a follow up visit for calibration of the pacemaker was made, where the rate control set-point was increased slightly to 80 bpm, the pulse width was kept the same to + 40 BPM. With these settings the survival time of the pacemaker battery was estimated to be 5-7 years, which was expected to exceed the survival time of the patient. Another follow up for the pacemaker was not deemed to be necessary, unless complications occurred. The owners were recommended to re-check the dog's MMVD annually though.

Seven months after being discharged from the hospital after pacemaker-implantation the dog was brought back by the owners because of signs of congestive heart failure, CHF. Echocardiography revealed a moderate left atrial enlargement and mild pulmonary hypertension. Thoracic radiographs showed signs of pulmonary edema. She was again admitted for stationary care and was treated with furosemide, pimobendan, benazepril and oxygen. The dog responded clinically to treatment. Follow up radiographs two days after initial treatment showed an improvement of the pulmonary edema, although not fully resolved. The dog was discharged on continued medication and a follow up was scheduled for 4 weeks later. At the follow up the dog was not responding well to treatment and the owners decided on euthanasia. •

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FALLRAPPORT

Holter

ANNA TIDHOLM

En irländsk setter, hanhund, 7 år inkommer till kliniken pga trötthet sen en tid. Matte (som är mycket observant) uppfattar att hundens hjärta rusar emellanåt.

Vid klinisk undersökning hörs ett lindrigt systoliskt blåsljud över mitralisområdet men hjärtfrekvensen är normal vid undersökningstillfället. Lungor auskulteras normala och vid vidare undersökning finner man heller inget onormalt.

Ekokardiografi visar ett lindrigt läckage över mitralisklaffen med en hastighet som indikerar normala tryckförhållanden mellan vänster förmak och kammare och inget annat onormalt identifieras. Under undersökningen ses intermittent förmakstachycardi med en frekvens på ca 200/min.

Behandling med diltiazem och digoxin initieras och hunden fungerar bra på denna medicinering under en tid men återkommer några månader senare då förmaksflimmer utvecklats.

Irländsk setter, hanhund, 7 år.

Anna Tidholm undersöker en dvärgschnauzers hjärta med 3D-ultraljud.

Hjärtfrekvensen är nu konstant ca 200/min och under de följande veckorna utprovas olika behandlingsstrategier för att minska kammarfrekvensen. I följande ordning ges sotalol, metoprolol och atenolol i stigande doser utan att kammarfrekvensen påverkas nämnvärt. Under behandlingen med atenolol utvecklar hunden svimningsattacker som varar upp till 60 sekunder. En generell uppfattning bland veterinära kardiologer är att arytmi-orsakade medvetandeförluster sällan varar längre än 30 sekunder om djuret återfår medvetandet. En 7-dagars EKG-registrering så kallad "7-dygnsHolter" var lyckligtvis uppkopplad på hunden under denna svimning, varvid en 59 s lång asystole kunde konstateras. Denna incident ledde till att atenolol-behandlingen avslutades omgående, trots att denna medicinering sänkte medelhjärtfrekvensen bäst. För närvarande behandlas hunden med amiodarone. Denna incident visar värdet av dygnsregistrering med Holter och i detta fall också värdet av registreringar som är längre än den vanliga 1-dygnsregistreringen. Under ett dygn registreras ca 100.000 P-QRS-T-komplex hos en normal hund och att manuellt analysera 7- dygnsregistreringar tar lång tid. Med hjälp av nyare analysprogram, där undersökaren diagnosticerar ett antal komplex med olika utseende och på så sätt "rättar" den maskinella tolkningen, möjliggör dock analys av ett sådant stort antal komplex. •

FALLRAPPORT

Pulmonalisstenos

ANNA BODEGÅRD-WESTLING

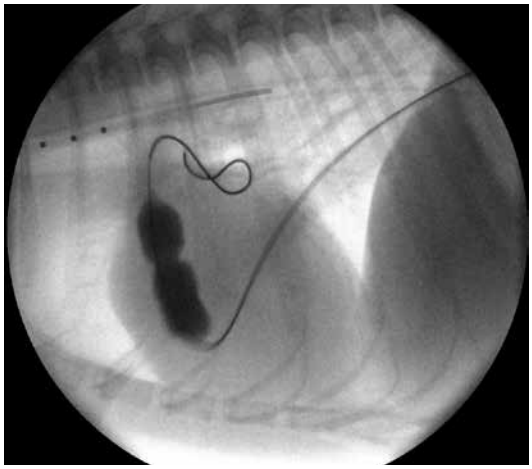
Borderterrier, tik, ett år.

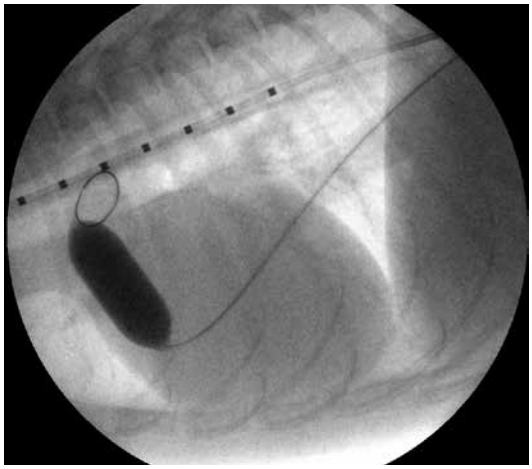
En ettårig borderterriertik inkom med ett vänstersidigt systolisk blåsljud grad IV/VI. Övrig klinisk undersökning var utan anmärkning. Patienten beskrevs som välmående men att hon alltid varit ”lite lat” som djurägarna uttryckte det. En ekokardiografisk undersökning av patienten visade en högersidig myokardhypertrofi samt en grav förträngning i lungartärens klaffplan. Patienten diagnosticerades med en grav pulmonalisstenos och bedömdes vara en lämplig kandidat för ballongdilatation.

Via höger ljumske utfördes en angiografi samt ballongdilatation av det förträngda området. Midjan på stenosen försvann därmed och tryckgradienten i området reducerades från 180 mmHG till 55 mmHG. Patienten kunde gå hem 2 dagar efter ingreppet. Hon var då välmående. Hemgångsråden informerade om koppelrastning i 7 dagar samt att hon därefter kunde leva som vanligt.

Vid återbesök efter 3 mån beskriver djurägarna att deras hund uppvisar en markant ökad aktivitetsnivå. Uppföljande EKO visar en kvarstående kraftigt reducerad tryckgradient över det stenotiska området.

Pulmonalisstenos förekommer i tre olika typer; valvulär, sub- eller supravalvulär. Den valvulära formen är vanligast. Denna karaktäriseras av fusionerade klaffblad. Vid en grav förträngning är ballongdilatation i denna patientgrupp att rekommendera. Olika faktorer, som ex förekomst av andra medfödda hjärtfel, dysplastiska pulmonalisklaffar eller coronarkärlsanomalier påverkar beslutet om lämpligheten i att utföra ingreppet samt förväntad framgång av ballongsprängningen. På Albano Djursjukhus har vi under åren 2015-2019 genomfört 23 ballongsprängningar. En hund var i grav högersidig hjärtsvikt och avled under ingreppet, en hade en samtidig förekomst av annat hjärtfel (cor triatriatum dexter) och ingen förbättring erhölls. Övriga 21 hundar har i olika grader erhållit tydliga mätbara förbättringar. •





Genomlysning (thorax höger lateral) som visar uppblåsning av ballongen. Ballongen har initialt en tydlig midja som visar var stenosen är belägen.

FALLRAPPORT

Klaffsjukdom

MARK DIRVEN

Smokey, cross breed, male, 10 year old.

Smokey is a 10 year old male neutered cross breed (12 kg) presenting for a routine annual health check. Smokey is doing fine and is in good health according to the owners. Smokey has been known to have a heart murmur that was detected for the first time two years ago.

Upon physical examination Smokey is bright and alert. Respiratory rate is 28 breaths per minute. The breathing pattern is normal. Femoral pulse quality is normal. Heart rate is 96 beats per minute and respiratory sinus arrhythmia is present. A loud left apical systolic heart murmur is audible.

Asymptomatic senior small breed dogs are a common sight in everyday clinical practice. Physical examination is both helpful and valuable in this type of patient. An acquired left apical systolic murmur in an asymptomatic senior small breed dog is typically caused by mitral valve regurgitation related to myxomatous valve degeneration (MMVD). Smokey has a loud murmur. A loud murmur usually reflects severe regurgitation and severe regurgitation is commonly associated with left ventricular and left atrial enlargement. With progressive left atrial enlargement the risk of left sided congestive heart failure increases. However, a respiratory rate 30 breaths per seconds suggests the dog is not in left sided congestive heart failure. Sinus arrhythmia reflects high parasympathic tone and helps us to rule out left sided congestive heart failure.

So based on physical examination, we can inform the owner that Smokey's heart murmur is related to an acquired heart disease which is extremely common in older dogs and that could not have been prevented. Furthermore we can inform the owner that Smokey's heart is probably enlarged and that he may be at increased risk for congestive heart failure. Fortunately we can be quite certain that Smokey is not in left sided congestive heart failure yet. Prognosis is difficult to give at this point in time and may vary from months to years.

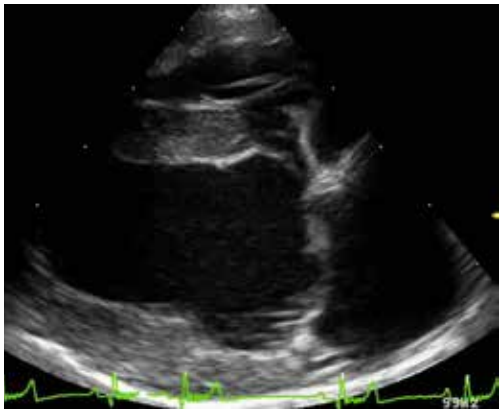
So, is there anything else we can do for Smokey and his owners ?

Actually there is! In the recent EPIC trial1 it was shown that administration of pimobendan to dogs with MMVD and echocardiographic and radiographic evidence of cardiomegaly results in prolongation of preclinical period by approximately 15 months and is safe and well tolerated. represents substantial clinical benefit. In contrast, so far no treatment has proven to benefit dogs with MMVD without cardiomegaly.

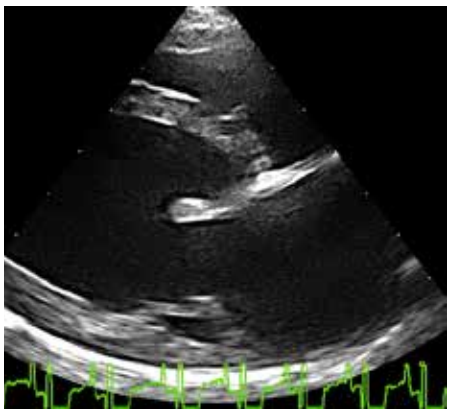
From our physical examination we already know the dog has MMVD. However, additional tests are necessary to evaluate if Smokey will benefit from treatment with pimobendan. Thoracic radiography will provide information on heart size and additional information on the airways. Echocardiography will provide a more precise measurement of heart size and function.

The team of cardiologists working in Albano's Heart centre have extensive experience in diagnosis and treatment of MMVD in dogs. Actually, some of the dogs participating in the EPIC trial were included and monitored by Albano's cardiologists. Dogs like Smokey will undergo physical examination and echocardiography (+/- thoracic radiography). The results are known immediately and will be discussed with the owner during the same visit. Relevant information regarding the need for treatment, prognosis and monitoring will be discussed with the owner. Subsequently a written summary of relevant findings will be sent to the referring veterinarian.

Smokey meets the inclusion criteria of the EPIC study and treatment is started to prolong the asymptomatic phase of MMVD. The owner is instructed to monitor sleeping respiratory rate. Once sleeping respiratory rate repeatedly exceeds 30 breaths per minute the owners should bring Smokey back to the clinic to examine the presence of left sided congestive heart failure .



Right parasternal 4 chamber view from a dog with MMVD. Note the severe thickening of the mitral valve leaflets. Measurement of left ventricular and left atrial size showed that cardiomegaly was not present, the dog did not meet the inclusion criteria of the EPIC study and treatment was not yet indicated.



Right parasternal 4 chamber view from Smokey. Note the severe enlargement of both left ventricle and left atrium. Measurement of left ventricular and left atrial size showed severe cardiomegaly present.