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Editorial

Continuing Veterinary Medical Education (CVME) Programs for PPAM Members

Veterinary clinical science is constantly changing and evolving with new knowledge, practices, and inventions. Thus, a veterinarian's education doesn't culminate once a degree is obtained. Instead, all professional veterinarians need to continue their education throughout their career in order to provide the highest possible level of care and advance one's career. Professional development is a continuous process that applies throughout the lives of professionals. It is no longer possible to do all the learning at the start of your career and spend the rest of your life on what you have learned. The sell by date for professional learning is getting shorter. Our knowledge assets do not remain the same if we do not freshen them from time to time. Knowledge dwindles and dwindles very fast, especially in this modern age of information technology.

CVME is a process by which individuals take control of their own learning and development, by engaging in an ongoing process of reflection and action. It helps the veterinarian to look at one's career from a wider perspective. It reminds the veterinarians that we have a responsibility to develop ourselves.

Organizing the CVME program demonstrates interest, determination and commitment to improvement both at the professional and organizational level, such as the PPAM. CVME unlocks a world of insights, education, and opportunities for veterinary professionals. It relates to their growth, development, and advancement.

CVME is crucial to the prosperity of animal health care providers–it allows a practitioner to learn and discover viable ways to improve the care they deliver and effectively manage a career in the ever-changing landscape. The values of the CVME program help improve veterinary skills to progress overall care, stay up-to-date with the latest advances, address real-world encounters that professionals face day to day. Getting things done in the right way at the right time depends not only on our ability to do something but also on how much we want to do it- the effort we put into it.

Equally important is that our CVME when planned by PPAM must meet rigorous and high standards of application, usefulness and freedom for the present veterinary practitioners. However, these CVME programs must be free of commercial bias.

Daily new solutions are published or advancements are made in clinical cases. These findings and innovations impact how animals with certain disease conditions should be evaluated, treated, and cared for. As doctors, we have a responsibility to our animal patients and pet parents to continue our education and offer the best and latest treatment option based on recent options. CVME improves the health of the pets and the satisfaction of pet parents as it improves animal care, treatment outcomes, and further gives the public the confidence that CVME program are adding value to their pet's lives. It also promotes intra and inter-institutional interactions.

Furthermore, CVME is vital for veterinary professionals in practice and employees who want to advance their careers. Staying on top of professional education and changes in clinical practices demonstrates a proactive personality–a trait that pet parents and employers take note of and see in an extremely positive light.

Professional development is an expressed need and expectation for veterinarians across the various career stages. Students and early-career clinicians expect sufficient training and education to facilitate workplace transitions, as well as continuing educational opportunities throughout their careers for career laddering. For mid-to late-career veterinarians, the importance of lifelong learning is more related to maintaining competency, providing quality patient care and enhancing future career opportunities. Training and education for professionals are directly linked to career satisfaction and healthy work environments.

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CVME program may also be a requirement for certain certifications and licensure in the future. Most regulatory bodies around the world require veterinarians to complete a certain number of continuing education credits each year, as a requirement to maintain their license.

We appeal to all PPAM members to attend and actively participate in all CVME programs organized by PPAM and give PPAM feedback on our CVME program. Effective feedback, both positive and negative, is very helpful. Feedback is valuable information that will be used by PPAM to make important decisions in the future. Feedback from PPAM members can actually motivate PPAM to plan and perform better. Please note that feedback on CVME program is often mistaken for criticism. In fact, it is actually constructive criticism.

An appeal to all PPAM members to attend the CVME program organized by PPAM, so that our members become more capable and equipped to offer the best possible care to our animals.

Feline Cytauxzoonosis: An Emerging Disease in India

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Introduction

Cytauxzoonosis, an emerging tick transmitted disease of domestic cats and wild felids, is caused by *Cytauxzoon felis,* a haemoprotozoal, *Theileria*-like piroplasmid organism. For many years cytauxzoonosis in domestic cats was only reported in North and South America, but in recent years the infection has also been documented among domestic and wild cats in Europe, Africa and certain Asian regions including India and now it is an important emerging disease in domestic cats. The first fatal case of feline cytauxzoonosis in India was reported in 2009 diagnosed on the basis of microscopic detection of intraerythrocytic piroplasms and thereafter in Karnataka and Kerala few cases confirmed by PCR were reported.

Amblyomma americanum, is a highly competent vector for *C. felis* in America and *Dermacentor variabilis* also demonstrated as a vector. But little is known about the tick vector of European and Asian strain of *Cytauxzoon spp.* The transmission of *Cytauxzoon felis* in Asia may be attributed to different tick species depending on the local ecological conditions and geographical area. As these above ticks species have so far not been described in India, *Rhipicephalus sanguineus* or *Haemaphysalis* sp. might be hypothesized as being involved in the transmission of *Cytauxzoon* sp. in the country. Additional research is necessary to clarify their role.

Feline cytauxzoonosis a life-threatening pathological condition is characterized by a rapid course of illness and eventually death, usually within a week. Given the seriousness and its widening geographical reach, it is imperative to increase awareness of the disease among veterinarians, pet owners, and the wider public. Accordingly, this article provides an overview of the parasite and its life cycle, pathogenesis and symptoms, diagnosis, treatment, and prevention strategies concerning infection in domestic cats.

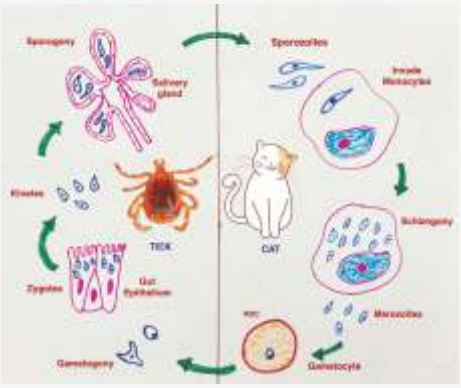
Transmission, Life cycle and Pathogenesis

The transmission of the infection to the cats primarily occurs through the bite of a tick. *Amblyomma americanum* is recognized as the principal vector for this pathogen. It's important to note that cats cannot contract the infection directly from an infected cat or through the ingestion of ticks and *C. felis* do not transmit vertically from mother to offspring.

The parasite's life cycle continues when a tick feeds on blood containing merozoite-infected RBCs from natural reservoir hosts or domestic cats. It has been observed that recovered domestic cats can effectively transmit the pathogen to feeding ticks. Within the tick's gut the parasite undergoes sexual reproduction, gametogeny and produces zygotes. The zygotes turn into kineses and migrate to salivary glands where sporogony takes place and leads to production of sporozoites which are the infective stages capable of transmission upon attachment of ticks to a domestic cat. While feeding, the tick injects sporozoites, which invade host mononuclear cells, undergo asexual replication. These infected cells, containing merozoites called schizonts which act as thrombi and can obstruct blood vessels, particularly in the liver, spleen, and lungs, leading to widespread dissemination, parasitic thrombosis, circulatory compromise, tissue infection, and a severe systemic inflammatory response.

This cascade of events can result in multi-organ dysfunction, failure, and death within three weeks of infection. The multinucleated schizonts from the mononuclear cells rupture and release merozoites, which invade additional mononuclear cells or red

blood cells, where they form piroplasms. This late-stage disease manifests as erythroparasitemia, leading to hemolytic anemia and erythrophagocytosis. Many cats succumb within couple of days of seeking treatment at a veterinary clinic. In cats that survive the initial infection, piroplasms can persist for months, years, or even for life, even though schizonts are no longer detectable.



Schematic life cycle of *Cytauxzoon felis*

Clinical Presentation

Cytauxzoonosis can manifest either as an acute life-threatening condition or as a subclinical form, often detected coincidentally. The acute form seen during schizogenous phase of *C. felis* infection with mortality rate close to 90%. The chronic subclinical form is the result of surviving an acute phase and evident during the erythrocytic merogony phase of *C. felis* infection. Felids exhibiting the subclinical form serve as reservoirs for potential future tick and felid infections and do not show any apparent benefit from known treatments.

Cytauxzoonosis manifests as a rapidly progressive illness lacking specific clinical findings. Commonly reported symptoms in acute phase include depression, anorexia and lethargy, high fever, jaundice and generalized pain are frequently observed during examination of affected cats. Though fever is a hallmark sign, hypothermia may occur in severely ill cats, and some cases exhibit cyclical fluctuations in daily temperatures. Signs of hemolytic anemia are common, such as pale mucous membranes, dark urine, enlarged spleen, and liver. Some cats may progress to late-stage disease, displaying neurological symptoms like unsteadiness, seizures, and involuntary eye movements, along with hypothermia, a moribund state, and even coma. Many affected cats succumb within a week of the initial onset of clinical signs. Other consistent findings in cytauxzoonosis cases encompass dehydration, rapid breathing, elevated heart rate, difficulty breathing, pale mucous membranes, abdominal discomfort upon palpation, enlargement of lymph nodes and spleen, vocalization, protruding third eyelid, altered mental state, moribund condition, and ecchymose.

Cats that survive the acute phase of disease display signs of erythrocyte regeneration approximately three weeks following infection with resolution of subnormal body temperature and clinical symptoms shortly thereafter. Felids with chronic disease show no symptoms and sustain persistent infection for years, potentially for their entire lives. They appear protected from recurrent clinical disease; however, this protection may not last life long.

Disease Diagnosis

Clinical diagnosis

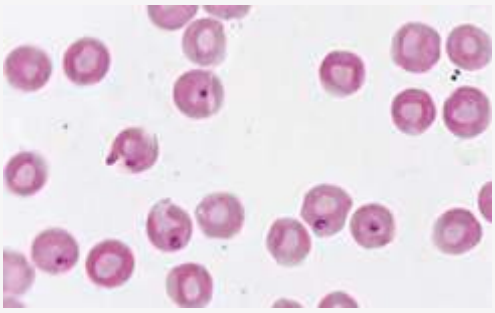
While there are no distinct clinical signs exclusive to feline cytauxzoonosis, the most prevalent manifestations in domestic cats within epidemic regions are the sudden appearance of jaundice, loss of appetite, and lethargy. Imaging studies typically do not reveal specific findings; however, hepatomegaly and splenomegaly resulting from parasitic vascular blockage are frequently observed. Complete blood counts and serum biochemical analyses, while not specific, are valuable for diagnosing acute cytauxzoonosis. Common clinicopathological findings encompass non-regenerative anemia, leukopenia with lymphopenia is part of a stress leukogram, thrombocytopenia may result from disseminated intravascular coagulation (DIC), pancytopenia, elevated bilirubin levels, bilirubin in the urine, and heightened liver enzyme levels. These alterations are linked to erythrophagocytosis and systemic inflammatory response syndrome (SIRS). Coagulation times typically lengthen due to disseminated intravascular coagulation. Additional biochemical irregularities comprise low albumin levels, elevated blood sugar, pre-renal azotemia, and electrolyte and acid-base imbalances associated with the SIRS condition.

Key Points

- Cytauxzoonosis is an emerging tick transmitted disease of cats, caused by Cytauxzoon felis.
- It is a rapidly progressive illness lacking specific clinical findings.
- Common symptoms are depression, anorexia, lethargy, fever, jaundice, neurological symptoms and/or hemolytic anemia.
- Many affected cats succumb within a week of the initial onset of clinical signs
- The primary method of diagnosis is detection of organism in thin blood smears or in fine-needle aspirates.
- PCR is considered as most sensitive and specific method for diagnosis.
- The standard treatment involves a 10-day regimen of atovaquone in combination with azithromycin.
- Prevention strategies primarily revolve around utilizing effective tick control measures.

Microscopy

The primary method for detecting parasites is through microscopic examination, which involves observing signet ring shaped intra-erythrocytic piroplasms in thin blood smears or schizont-filled macrophages in fine-needle aspirates. These samples are typically stained with Giemsa or Field staining techniques. Fine-needle aspirates can be obtained from various tissues such as the spleen, liver, lymph nodes, or lungs. However, it's important to note that the sensitivity of both these methods is very low and piroplasms may not appear in RBCs until several days after the onset of clinical signs. Also, cats that develop subclinical infection or recover from disease often maintain low numbers of parasites in RBCs for months, years or for lifelong hence detection of piroplasms does not confirm the active disease due to cytauxzoonosis.



Signet ring shape piroplasms of *C. felis* in RBCs

Molecular diagnosis

Commercial PCR testing for *C. felis* infection is available and is considered the most sensitive and specific method for identifying the presence of the parasite. However, similar to piroplasm observation, a positive PCR result may also be detected in cats that have recovered from the infection and maintains the parasite at low levels in the absence of cytauxzoonosis active disease, thus, making it difficult to differentiate between acute and chronic(carrier status) infection of *C. felis*. One significant limitation of PCR testing is its timing and any delay in receiving results can be critical for this rapidly progressive disease. Therefore, if cytauxzoonosis is clinically suspected, treatment should not be postponed while awaiting PCR results.

Immunodiagnosis

No immunological diagnostic kits for detection of antibodies to *C. felis* are commercially available since antibodies take time to develop in acute disease in domestic cats or have only low titers of antibody before death.

Treatment

In the past, cytauxzoonosis was widely regarded as a fatal condition in domestic cats, with mortality rates close to 90%. Therefore, it is imperative to initiate treatment as soon as possible for all cats suspected of having cytauxzoonosis, even in the absence of a confirmed diagnosis. The occurrence of survival cases appears to be on the rise due to advancements in treatment and/or the potential presence of a less aggressive strain of *C. felis* in India and Asia. The current standard treatment for cytauxzoonosis typically involves administering a 10-day regimen of the atovaquone (15 mg/kg, orally, TID), in combination with the azithromycin (10 mg/kg, orally, SID), along with comprehensive supportive therapy. Despite following the recommended treatment protocol, some cats may continue to harbor *C. felis,* serving as reservoirs for infection to other cats. Other options includes imidocarb dipropionate (3.5 mg/kg i.m. two doses 5-7 days apart) but the survival rate is much low compare to combination protocol.

Comprehensive supportive and critical care measures, including intensive fluid and oxygen therapy, administration of antithrombotic treatments like unfractionated heparin at a dosage of 200 U/kg subcutaneously every 8 hours, blood transfusions, antibiotics, and analgesics, are essential for sustaining the cat's life while antiprotozoal drugs and the immune system combat the infection. Intravenous fluid therapy should be administered, supplemented with potassium chloride as necessary, to address any ongoing fluid losses. The prognosis for cats diagnosed with cytauxzoonosis considered guarded to fair, especially when appropriate intensive care with atovaquone and azithromycin is administered. There is speculation that varying strains of *C. felis* may differ in their severity. Therefore, it is advisable for cats to receive treatment with optimal supportive care.

Prevention

Currently, no vaccines against *C. felis* exist and in areas where the disease is common, prevention strategies primarily revolve around utilizing effective tick control measures for cats. The effectiveness of tick control using spot-on formulations containing fipronil, selamectin or imidacloprid + moxidectin or collars containing imidacloprid/flumethrin in preventing transmission of *C. felis* has been validated but it cannot protect cat 100% from *C. felis* infection. Additionally, keeping cats indoors is recommended to minimize exposure to ectoparasites and the diseases they may transmit.

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Dental Extraction in a Tigress (Panthera Tigris)

C. C. Wakankar, Vinaya Jangle, Nikhil Bangar, Neha Wakankar, Naval Ghule and Manish Pingle

Mohini, a 3 year tigress from Sanjay Gandhi Nationan Park, Mumbai, (SGNP) was having a fistulous wound on the right nasal bone for 5 months. Conventional treatment by dressing, draining, debridement of the wound and oral/injectable antibiotics did not yield results. Considering the possibility of dental abscess, she was examined under anaesthesia (Xylazine + Ketamine) and intra oral x ray were made. Apical abscess of right upper canine was suspected. Palliative treatment was further carried out until decision for surgery was made.

On 14/07/2023, anaesthesia was induced with xylazine (1mg/kg) and Ketamine (4mg/kg). The tigress was intubated with 12mm endotracheal tube. Inhalation anaesthesia was performed with 2% Isoflurane. Extraction of right upper canine was planned. A flap was made between the premolar and corresponding incisor. The gingiva was separated from peri-dontal ligament by dental elevators. Further, to loosen the tooth from alveolar ligament, elevators were used but since the tooth was firm, a small size bone chisel was carefully used working at buccal and palatal side. When sufficient looseness was achieved, the canine was further loosened by rotational movements to release from alveolus. For this purpose, conventional extractors were inadequate and hence pliers were used. When sufficiently loose, the tooth was extracted. The alveolar cavity was thoroughly irrigated with normal saline solution and the flap was sutured with 1/0 vicryl leaving a small opening for drainage.

Post-operatively, Injection Moxel (Amoxicilin) 750 mg IM was given for 5 days. The fistula healed uneventfully in 15 days.

1. Inhalation anaesthesia

2. Elevation of flap

3. Release of peri dontal ligament

4. Extracted canine tooth

5. Flap

6. Healed fistula at 2 months

(A) Partial Maxillectomy For Fibrosarcoma and Surgical Reconstruction of the Maxillofacial Defect in a Dog Using A Titanium Patient Specific Implant (PSI)

Surgical Procedures Performed at
MAXPETZ (Formerly PetZone and Max Vets) Centres.


Dr. Leena Dalal


Dr. Kunal Dev Sharma

Dr. Leena Dalal,
Dr. Kunal Dev Sharma,
Dr. Bhanu Dev Sharma and
Dr. Deep Vasudeo


Dr. Deep Vasudeo


Dr. Bhanu Dev Sharma

The goal of the maxillofacial reconstruction includes anatomical, functional, and aesthetic restoration of the defect left after a partial maxillectomy was done to surgically excise a tumour with adequate margins. The patient, operated on at the MaxPetZ Mahalaxmi Centre, was a 7 year old, 28 kg Female spayed Labrador mix breed dog who had an odontogenic fibrosarcoma of the maxilla. The tumour involved the maxilla at the base of the maxillary canine tooth and a small part of the maxilla over the nasal cavity, and was localised with no spread of the cancer noted on CT.

The initial procedure included computed tomography (CT) imaging both for staging the cancer and for three-dimensional (3D) printing and implant design. Titanium was selected as the implant material because of its biocompatibility, strength, and osseointegrative properties. The titanium PSI of 0.8 mm thickness with 2.4/2.7 cortical screw holes was custom designed to reconstruct the maxillary defect and seal the nasal cavity.

A caudal maxillary (infraorbital foramen) nerve block was performed to augment general anesthesia. The canine tooth was extracted, and the maxillectomy performed with a high speed oscillating burr and hammer and chisel using the 3d model as a guideline for the margins.

The patient specific titanium plate was placed over the defect and screwed into place with three titanium screws. A lip flap was created and sutured over the implant.

The mandibular canine on the same side was extracted to prevent it causing injury.

Six months post-operatively, the dog remains active with good appetite, stable weight, and shows good facial symmetry without enlargement of the implant, exposure or any implant-related problems. There has been no recurrence of the tumour.


CT image of the mass


3d printed skull from patients CT for implant modelling


The Patient Specific Implant (PSI)

Post operative radiograph of the patient with the implant in place


At 6 months post surgery showing facial symmetry

(B) Trans Catheter Edge To Edge Repair (TEER) of the Mitral Valve in a Dog Using A Valve Clamp

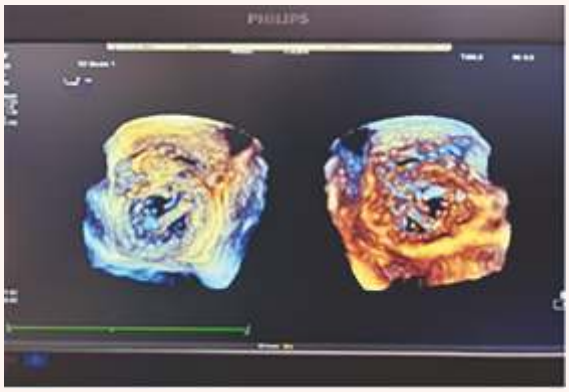
Mitral valve disease is caused by degenerative changes in mitral valve leaflets which result in back flow of blood into left atrium causing left heart dilation and subsequent congestive heart failure as the disease progresses.

The TEER procedure is a hybrid surgery technique: It is minimally invasive and does not require a cardio pulmonary bypass machine since it's a beating heart procedure.

TEER is entirely an image guided procedure and is done under trans oesophageal 4D echocardiography and fluoroscopy guidance in a beating heart. A thoracotomy is done to get Cardiac apical access and trans catheter imaging guided clamping is done of the mitral valve leaflets to reduce the leakage. The MaxPetZ team trained on this procedure is led by Dr. Bhanu Dev Sharma and includes an interventional cardiologist, cardiologist, cardiac anaesthesiologist and soft tissue surgeon & assistant surgeon. It's a new procedure for the whole world but the preliminary results have been promising so far. The procedure is not considered experimental rather is a viable surgical treatment option now. The procedure is similar in concept to Mitra clip procedure in humans which has benefitted and saved many human lives so far.

Our OT setup for the TEER mitral valve procedure

Thoracotomy with LV suturing



4d ultrasound imaging to check rotation, placement of the clamp and valve anatomy

X plane imaging using TEE 4D probe

Fluoroscopic Imaging during the surgery

(C) Total Hip Replacement

These Total Hip Replacement surgeries were done in MaxPetZ Delhi and MaxPetZ Mumbai hospitals by a team of Indian vets. The dogs - Ziggy, Kuro and Loki alike have now recovered completely after undergoing Total Hip Replacement surgeries and extensive post-operative care.

This is the first time in India that orthopaedic stalwarts have come together and formed a team to perform Total Hip Replacement in animals in India. The expert team of orthopaedic veterinarians comprises of Dr. Kunal Dev Sharma, Dr. Milind Hatekar and Dr. Vikram Dave and this team has together conducted these first-of-its-kind surgeries in India.

Post operative radiograph

Ziggy, one-year-old Belgian Shepherd's specialised Total Hip Replacement surgery was done at the MaxPetZ hospital in East of Kailash, New Delhi and Loki- a male Golden Retriever was operated at the MaxPetZ Mumbai Mahalaxmi Hospital. In both these surgeries, cement less neck sitting and HA coated cups have been used along with titanium screws to fix the hip. The surgery has given the dogs a new lease of life helping them be mobile once again. Both the dogs went through a very crucial 3/4-week recovery period which was planned with much care by the MaxPetZ expert team of doctors. After an animal undergoes a THR surgery, there is a specially tailored post-operative care module that needs to be followed strictly for the proper and speedy recovery of the animals, and the MaxPetZ team follows them with complete diligence. Ziggy and Loki have made a quick recovery post the surgery and are currently doing well.

There are numerous other dogs operated in Mumbai and Delhi who have recovered well and leading a pain free, medicine free life with their pet parents and enjoy the routine life with an artificial joint with normal bio mechanics.

Post operative radiograph

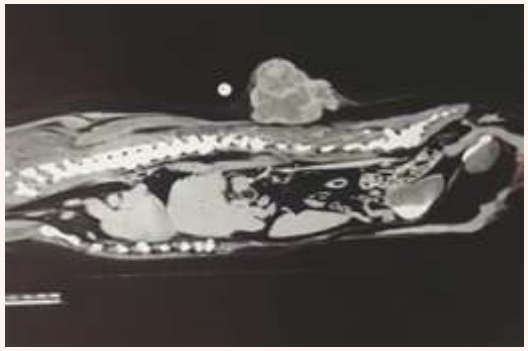
(D) Electroporation Augmented Surgery of a Deep Seated Tumour

Deep-seated tumors are tumors located underneath the muscle fascia level, such as intra- or inter-muscular tumors. While marginal excision is adequate for benign tumours like lipomas excision with a wide surgical margin is needed for malignant ones. This is not always possible due to the location of nerve bundles and consequences for muscle strength, and also when the malignancy has spread along a muscle plane the extent of spread is difficult to assess accurately even with advanced imaging. In these cases a marginal excision of the visible mass with delivery of a cytotoxic drug like cisplatin or bleomycin across the electroporated cell membrane of malignant cells is performed. The combination of the structural modifications of the lipid bilayer of cell membranes, due to the application of electrical pulses in the targeted tissue, with the concomitant intravenous administration of drugs acts as a bridge between local-regional and systemic treatments.

The following pictures are of a case that was recently operated for a large soft tissue sarcoma at MaxPetz. The dog was a 30kg 8Y Female Labrador Retriever who had a large deep seated soft tissue sarcoma on the dorsum. The CT images show the depth of the tumour and extension along the muscle plane, the margins of which are not possible to assess. The primary tumour was surgically removed with marginal excision and the surrounding tissues subjected to electroporation using a veterinary specific L electrode, with bleomycin intravenously administered.

Pre surgery photo of the tumour

Radiograph showing the tumour



CT imaging showing the tumour

L shaped 10 mm gap contact electrode used for the electroporation

Treatment and Management of a Rescued Fox Pup (Vulpes Bengalensis)

Dr. Deepa Katyal

Abstract

A rescued Fox pup less then a month old and weighing 328gms under went treatment at Dr. Deepa Katyal clinic in Chembur, Mumbai. The pup was found by Forest officials near Bhabha Atomic Research Centre, Chembur. The fore limb was badly mutilated and had a foul odour with haemoglobin down to 5gm/dl. Pain protocol used was local , injectable and integrated, pain score was 3 of 5. Dr. Deepa Katyal who specializes in pain management has been monitoring the treatment protocol.

History

A Fox Pup, which was around 28 days, Male weighing 223gm was presented in with a decaying and smelly wound on left fore limb 20th of April by the forest officials, rescued from BARC (Bhabha Atomic Research Centre) The wound was putrifying and showed presence of pus.

Clinical presentation

The pup was hyperthermic, temperature was 105.8, showed signs of dehydration and severe signs of malnourishment.

Blood pressure was low 80/60 mm per hg.

The mucus membranes were dry, pale & and the eyes were sunk in & showed sticky mucus discharge from the nose.

The skin showed signs of dermatitis, mainly mixed infection of yeast and bacteria. There was also infestation of few ticks(identified as Rhipicephalus sanguineus)

Diagnostics

Primary blood test showed an anaemia with a haemoglobin 6 gm/dl and PCV of 18 pg, WBC of 18k/ul .

Biochemistry values were in limit.

The Sugar level was 66mg/dl.

There was also leucocytosis high neutrophil counts of 71%, a peripheral blood smear was made to check for presence of tick borne diseases - The smear was negative for the same.

X-rays of chest showed an interstitial pattern indicative of bronchitis.

The left leg showed a fracture in the radio ulna distal extremity with soft tissue swelling .

Treatment plan

An IV canula (24 gauge) was placed in the right fore limb in the cephalic vein after shaving and cleaning area with Betadine and clinical spirit

Fluid therapy with lactated ringers solution & dextrose 5 percent who was administered for hydration.

Around 100 ml total fluids were administered.

Pain scale

A behavior-based acute pain scoring system–the Glasgow Composite Measure Pain Scale (CMPS) dog was considered and 5/20 was his pain score, which indicated urgent analgesic intervention.

Pain protocol

Medical management with intramuscular meloxicam at 0.2 mg per kg .

Sublingual buprenorphine at 0.04 mg per kg was administered.

Antibacterial intravenous injection included

Inj metrogyl at 10 mg per kg

Inj Amox at 25 mg per kg .

Supportive treatment

Iron dextran intramuscular at 10 mg per kg .

Inj Tribivet (Thiamine Hydrochloride: 50 mg. Pyridoxine Hydrochloride: 50 mg. Cyanocobalamin : 500 mcgKey. 0.5 ml intramuscular)

Nebulization with 5% normal saline was done for 20 mins.

Wound dressing

The pup was then stabilized and lignocaine splash was done tropically on the wound.

The wound was cleaned after the drip & 30 mins after the splash with Oxum spray (containing Oxidized Water 99.97%, Hypochlorous Acid 0.006 %.)

Later was dressed with gel lox 2%(s Lidocaine Hydrochloride (21.3mg), Sodium Chloride (6mg) as well as Silver stream (purified water, glycerol (glycerin), sorbitan monolaurate (Tween-20), TRIS, menthol and silver nitrate 0.01% (w/v).)

The leg was bandaged & stabilised.

The pup was hospitalised & phototherapy with class IV laser (companion animal) using power of2.5 watts & 280 joules was done once a day to combat pain & trauma and wound management laser of 272 joules covering treatment area of 5x10 using 3 watts setting once a day over the affected leg .

Nutrition

Feeding was done with Venkys (Ventripro feed supplement for puppies) force fed around 2 ml every 3 hrs for first 24 hrs due to no appetite.

The fox pup started responding to the treatment from the next day over and started eating more food per meal.

This continued till day 3, after which food intake became independent and consumption increased gradually.

After 1 week - The treatment protocol changed in terms of antibiotic as the wound was still discharging pus but the putrifying odour reduced and instead of intravenous saline & treatment, injection ceftriaxone once a day at 25 mg per kg subcutaneous along side supportive pain management @0.02 mg per kg with oral buprenorphine (addnok tab) containing (buprenorphine 0.2 mg per tab other ingredients are lactose monohydrate, mannitol (E421), maize starch, citric acid (E330), sodium citrate (E331), povidone (E1201), magnesium stearate (E470b).

Meloxicam was given at 0.1 mg per kg intravenous when the wound cleaning became more intensive, with removal of dead necrotic tissue surrounding the wound.

Splashes of lignocaine continued before wound dressing,interban maxima was added to the dressing protocol (Povidone Iodine (5%), Sucralfate (7%), and Metronidazole (1%),) along side Vetramil spray containing (Propylene glycol, Mel, Aqua purificata , Polysorbate-80, Ocimum Basilica, Lavandula Angustifolia, Pogostemon Cablin, Melaleuca Quinquenervia, Thymus Vulgaris.) once a day .

Progress-Since the pup was progressing both in weight (reaching 450 grams in 1 week) & demeanour.

The hematology report showed an increase in haemoglobin along side other parameters which stabilised we decided to wait for him to gain a good body weight before amputation of the limb.

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CONTINUING EDUCATION I SMALL ANIMAL February 2021 : How to approach fox casualties in general practice. Veterinary Ireland Journal I Volume 11 Number 2

Lumpy Skin Disease Virus Secret Unravelled

A multi-institutional team has unveiled origin and evolution of lumpy skin disease virus (LSDV) circulating in India. The analysis shows two distinct LSDV variants one with low and other with high number of genetic variations. The highly varied strain was found similar to LSDV strains from an out break in Russia in 2015 reports the study published in BMC Genomics.

drools VETERINARY HEALTH

NEW LAUNCH

WHERE EXCELLENCE IS ALWAYS THE PRESCRIPTION

DROOLS ARTICLE

Nutritional Management of Osteoarthritis in Dogs

Dr. Bhoomika R.
BVSC & Ah (Bangalore College)
Veterinary Product Executive (VET-PRO)

Introduction

Dogs with osteoarthritis (OA), a common and progressive condition that causes joint pain and decreased mobility, are affected. Managing one's diet is essential for reducing the symptoms and advancement of osteoarthritis. One of the most important tactics is to control diet and maintain an ideal body weight because obesity increases joint stress and inflammation, which worsens osteoarthritis. Dietary consumption of omega-3 fatty acids, namely docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), has demonstrated noteworthy anti-inflammatory effects and might reduce the intensity of osteoarthritis symptoms. Chondro modulating agents support injured cartilage restore and safeguard its integrity. Additionally in dogs with osteoarthritis weight loss combined with physical therapy can further enhance mobility and reduce pain in dogs. Effective management of OA often includes a combination of medical, physical, and nutritional strategies. This example focuses on the nutritional management of osteoarthritis in dogs.

Key points: Osteoarthritis, Nutrition, Weight management, Fatty acids, Body condition score, Poly unsaturated fatty acids.

Nutritional Strategies

Several nutritional components can aid in managing osteoarthritis in dogs. These include weight management, specific diets, supplements, and nutraceuticals.

1 - Weight management

The most efficient way to help maintain and improve joint health is probably through nutritional management to help achieve and maintain an ideal body condition. It is well known that obesity puts more strain on the articular cartilage and joint structures. Additionally, the metabolic activity of adipose tissue and the pro-inflammatory cytokines that contribute to obesity are both becoming more widely recognized. Obesity and osteoarthritis may go hand in hand because obesity can diminish activity levels, which raises the risk of weight gain and feeds the vicious cycle.

Score for Body Condition - Preventing the conditions of being overweight (BCS 6-7/9) or obese (BCS 8-9/9) requires assigning a body condition score (BCS) and muscle condition score. Obesity is defined quantitatively as being at least 30% heavier than one's ideal body weight.

Physical Rehabilitation and Exercise Modification - Frequent exercise is essential for the management of osteoarthritis in both humans and animals. It is essential to maintain a regular, moderated lifestyle that steers clear of irregular extremes of exercise (like weekend hikes) and activities that the pet is not accustomed to. Multiple shorter walks are preferable to one longer one. It is best to engage in the same activity each day, or to gradually increase it if tolerated. It's best to do a "warm-up" walk before engaging in high-impact activities (like playing with other dogs or chasing tennis balls).

Physical rehabilitation is a vital component in the management of osteoarthritis in pets. Through a combination of therapeutic exercises, hydrotherapy, manual therapy, and modalities, physical rehabilitation can significantly improve pain levels, enhance mobility, and support overall joint health. By incorporating these techniques into a comprehensive treatment plan, pets with OA can enjoy a better quality of life and greater functional abilities.

Common Rehabilitation Techniques

i. Hydrotherapy:

- Swimming: Swimming is a low-impact exercise that reduces stress on joints while allowing full-body movement, which is excellent for building muscle strength.
- Underwater Treadmill: This provides a controlled environment where resistance can be adjusted, making it easier to customize the exercise intensity for each pet

ii. Manual Therapy:

- Massage: Therapeutic massage helps in relieving muscle tension, improving circulation, and reducing pain.
- Joint Mobilization: Techniques to gently move joints can improve their range of motion and flexibility.

iii. Therapeutic Exercises:

- Passive Range of Motion (PROM): Gentle movements of the joints through their normal range to maintain flexibility.
- Active Range of Motion (AROM): Encouraging pets to move their joints actively through exercises that they perform themselves.
- Strengthening Exercises: Exercises such as sit-to-stand, controlled walking, and obstacle courses to build muscle strength around the joints.

iv. Modalities:

- Laser Therapy: Low-level laser therapy can reduce pain and inflammation by stimulating cellular repair processes.

The key to managing and preventing osteoarthritis effectively is to achieve and maintain a lean body conformation through appropriate feeding practices and nutrition.

2 - Fatty Acid Metabolism

An essential part of a dog's diet is fat. Fat is not only a great, concentrated source of energy; it also contains the fat-soluble vitamins A, D, E, and K as well as important fatty acids like linoleic and a-linolenic acid. The body of a dog produces long-chain fatty acids, such as arachidonic acid (AA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA), using linoleic and a-linolenic acid. Since dogs cannot synthesize these essential fatty acids on their own, they must be supplemented through the diet.

Omega-3 fatty acids are among the various polyunsaturated fatty acids (PUFAs) that are involved in various bodily functions. Essential PUFAs, such as omega 3 and omega 6, are needed by mammals for a variety of purposes, but they must be obtained through diet. Endogenous formation of omega 7 and omega 9 PUFAs is possible. The location of the last double bond in the chemical structure determines how 3, 6, 7, and 9 differ from one another.

DHA (docosahexaenoic acid), EPA (eicosapentaenoic acid), and ALA (alpha lipoic acid) are examples of omega-3 fatty acids. Arachidonic acid (AA) and linoleic acid (LA) are examples of omega 6 PUFAs

Fatty acids, particularly omega-3 fatty acids, play a significant role in managing osteoarthritis in dogs. The primary omega-3 fatty acids beneficial for dogs with osteoarthritis are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). These fatty acids help reduce inflammation and support joint health through several mechanisms.

Omega-3 fatty acids help decrease the production of inflammatory mediators derived from arachidonic acid, an omega-6 fatty acid. By replacing arachidonic acid in cell membranes, omega-3s reduce the formation of pro-inflammatory eicosanoids. This shift leads to less inflammation and associated pain, improving joint function and mobility in dogs with osteoarthritis.

Furthermore, omega-3 fatty acids contribute to the resolution of inflammation through the production of resolvins and protectins, which help terminate the inflammatory response and promote tissue repair. This action helps manage chronic inflammation associated with osteoarthritis

EPA can also considerably decrease the loss of aggrecan in canine cartilage. In normal canine cartilage, synthesis and degradation of cartilage matrix are balanced processes. In arthritic joints, damage to chondrocytes causes so inflammation, pain, and the destruction of cartilage. EPA inhibits the upregulation of cartilage-degrading enzymes by blocking the signal at the level of messenger ribonuccic acid.

(EPA inhibits the up regulation of cartilage-degrading enzymes by blocking the signal at the level of messenger RNA)

3 - Joint supplements

Chondromodulating agents are used to maintain cartilage integrity and facilitate the repair of damaged cartilage in dogs with osteoarthritis (OA). These agents help by promoting the synthesis of cartilage matrix and hyaluronan and inhibiting catabolic enzymes that degrade joint structures. Here are some common chondromodulating agents and their roles in managing canine OA. Among these Glucosamine and chondroitin sulfate are two of the most commonly used supplements for managing osteoarthritis (OA) in dogs. These compounds play vital roles in maintaining joint health, slowing the progression of OA, and alleviating symptoms associated with this degenerative joint disease.

I - Glucosamine Hydrochloride

Functions:

- Building Block of Cartilage: Glucosamine is a natural compound found in healthy cartilage, particularly in the fluid around the joints. It is crucial for the synthesis of glycosaminoglycan, which are essential components of cartilage.
- Cartilage Repair and Growth: It promotes the formation and repair of cartilage by providing the necessary raw materials for cartilage production.
- Anti-inflammatory Effects: Glucosamine has mild anti-inflammatory properties, which help reduce joint inflammation and pain.

Benefits:

- Slows Cartilage Degradation: By contributing to the repair and maintenance of cartilage, glucosamine helps slow down the degenerative process of OA.
- Improves Joint Function and Mobility: By maintaining healthy cartilage, glucosamine helps improve joint function, thereby enhancing mobility and reducing pain in dogs with OA

II - Chondroitin Sulfate

Functions:

- Cartilage Structural Support: Chondroitin sulfate is a major component of cartilage that helps it retain water, providing elasticity and resistance to compression.
- Inhibition of Cartilage-degrading Enzymes: It inhibits enzymes that break down cartilage, thus protecting the cartilage matrix from further degradation.
- Anti-inflammatory Effects: Like glucosamine, chondroitin sulfate has anti-inflammatory properties that help reduce joint inflammation.

Benefits:

- Protects Cartilage: By inhibiting the action of cartilage-degrading enzymes, chondroitin sulphate helps preserve the integrity of cartilage.
- Reduces Pain and Inflammation: Its anti-inflammatory effects help alleviate pain and reduce inflammation associated with OA.
- Enhances Joint Lubrication: By retaining water in the cartilage, chondroitin sulfate helps maintain joint lubrication, which is crucial for smooth joint movement

Combined, glucosamine and chondroitin sulfate have a synergistic effect that amplifies the benefits of each supplement alone. This mixture promotes joints' general health and functionality by:

i Encouraging the growth and repair of cartilage

ii preventing the deterioration of cartilage

iii lowering pain and inflammation

iv Increasing flexibility and lubrication of joints

Studies have demonstrated that this combination, which is frequently present in many vi-commercially available joint supplements, can be useful in lowering the clinical symptoms of OA in dogs and enhancing their quality of life

4 - Antioxidants

Antioxidants are molecules that balance health by helping to control dog's body's natural oxidation process. This process produces compounds known as free radicals that are missing an electron. In order to lower the risk of developing various diseases, free radicals can help dog fight off infections and detoxify. But when they proliferate, they can interfere with DNA and cellular functions that are essential to dog's health. This is because free radicals 'steal' the missing electron they need from your dog's cells - including their DNA. So that's where antioxidants come in to help positively balance the oxidation process that produces free radicals. Antioxidants are produced naturally in dog's body, and they function by giving free radicals the electron they require to avoid stealing it from dog's cells. Antioxidants, however, can run out in the body, especially in older dogs. This results in oxidative stress, which is an imbalance between antioxidants and free radicals. This unhealthy physical state can increase the risk for all kinds of debilitating health issues in dogs.

Antioxidant-rich vitamins

I Vitamin E – Found in high concentration in dog's immune cells, plays a critical role in maintaining healthy circulation, boosting immunity, and healing muscles. As your dog ages, it can help ensure that their cells are formed correctly and protect them against diseases like cancer and heart disease and vision loss. One of the best antioxidants for aging dog is vitamin E because it's crucial to overall health.

II Vitamin C – A powerful anti-inflammatory agent, Vitamin C can become depleted in dog's body when the dog is sick or under stress. It is a potent anti-inflammatory agent. This strong antioxidant helps to stop the deterioration of tissue and cartilage. By boosting white blood cell responses and increasing interferon and antibody levels in your dog's bloodstream, it also helps protect against cancer, toxin overload, and bacterial and viral infections. In addition to protecting cell membranes, vitamin C is essential for adult dogs' cognitive function too.

Other antioxidants rich nutrients include

i Green Lipped Mussel: This supplement is rich in omega-3 fatty acids, glucosamine, and chondroitin, which help reduce joint pain and inflammation. Green Lipped Mussel also supports cartilage maintenance and improves joint mobility

ii Polyphenols: Found in foods like green tea and turmeric, polyphenols have strong anti-inflammatory properties. They help reduce the symptoms of osteoarthritis by protecting against the oxidative stress that contributes to joint damage

iii Glutathione: Often referred to as the "master antioxidant," glutathione helps detoxify the liver, boosts immunity, and supports cellular health. It plays a role in reducing inflammation and slowing the aging process, which can be beneficial for dogs with osteoarthritis

Additional Nutrients

I Hyaluronic acid - One of the main components of synovial fluid, and helps to maintain joint viscosity, support joint lubrication, and aid in shock absorption.

II Acetyl D-glucosamine, N-acetate - In order to preserve healthy joint structure and function, this polysaccharide "shortcuts" the glycosamino-glycan pathway.

III Manganese. Manganese is an essential nutrient involved in numerous chemical processes in the body, including bone formation and also helps to maintain collagen formation in joints and supports bone and cartilage health. Manganese, like methionine, is essential for chondrocyte viability and serves as a building block of cartilage.

Conclusion

Nutritional management plays a vital role in the holistic approach to managing osteoarthritis (OA) in dogs. By incorporating specific supplements and dietary adjustments, it is possible to alleviate symptoms, slow disease progression, and enhance the quality of life for affected dogs. Key components of an effective nutritional strategy include the use of glucosamine and chondroitin sulfatte to maintain cartilage integrity and facilitate repair, as well as omega-3 fatty acids for their anti-inflammatory properties. Antioxidants such as vitamin E, vitamin C, and polyphenols also contribute significantly by reducing oxidative stress and supporting joint health.

Weight management is crucial, as maintaining an optimal body weight reduces the mechanical load on joints and the inflammatory responses associated with obesity. Combining these nutritional interventions with regular, moderate exercise and veterinary-recommended treatments can help manage pain, improve mobility, and support overall joint health in dogs with OA.

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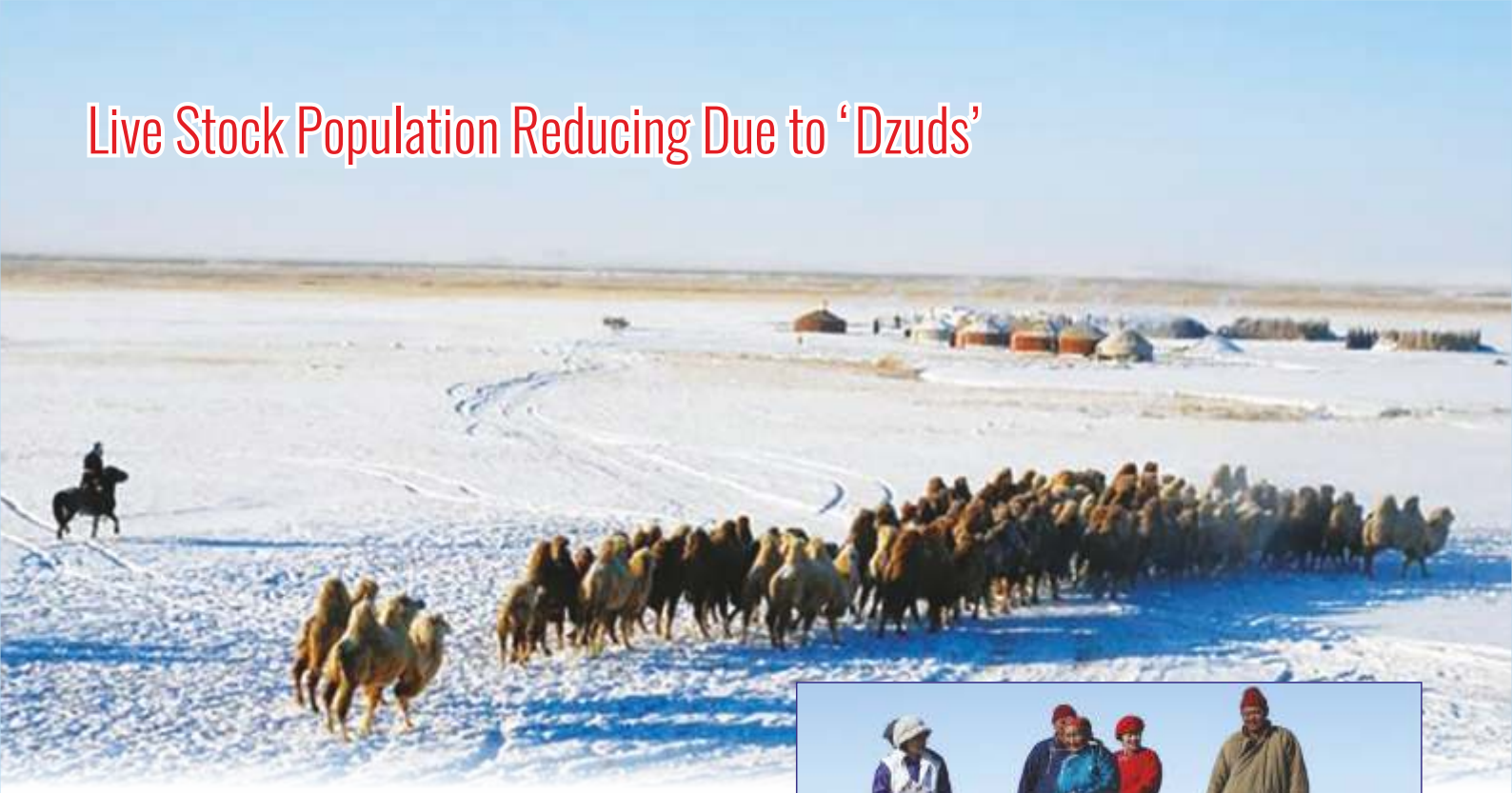
Live Stock Population Reducing Due to 'Dzuds'



Millions of livestock have perished as climate change impacts extreme winter weather in the East Asian nation of Mongolia. The climate change is contributing to land degradation, desertification, water scarcity, which makes livestock less fit to survive harsh winters. Extreme events are known as dzuds, which are characterized by below freezing temperature, strong winds and heavy snow and ice, that can wipe out entire herds of goat, sheep and horses.

Mongolia's nomadic herders are facing a savage "dzud" winter, with large herds of livestock frozen to death so far. Scientists say this lethal phenomenon – extreme cold and heavy snow following summer drought – is occurring more frequently and is linked to climate change.

Understanding the Terminology of Global Guidelines for the Prevention of Surgical Site Infection (Part I)

Dr. Madhura S. Vishwasrao
M.V.Sc (Surgery)

GLOSSARY OF TERMS:

Alcohol-based handrub refers to an alcohol-based preparation designed for application to the hands to inactivate microorganisms and/or temporarily suppress their growth. Such preparations may contain one or more types of alcohol, other active ingredients with excipients and humectants.

Antimicrobial skin sealants refer to sterile, film-forming cyanoacrylate-based sealants that are commonly used as additional antimicrobial skin preparation after antisepsis and prior to skin incision. These sealants are intended to remain in place and block the migration of flora from surrounding skin into the surgical site by dissolving for several days postoperatively.

Health care-associated infection, also referred to as "nosocomial" or "hospital" infection, is an infection occurring in a patient during the process of care in a hospital or other health care facility, which was not present or incubating at the time of admission. Health care-associated infections can also appear after discharge. They represent the most frequent adverse event during care.

Hygienic handrub refers to the treatment of hands with an antiseptic handrub to reduce the transient flora without necessarily affecting the resident skin flora. These preparations are broad spectrum and fast-acting, and persistent activity is not necessary.

Hygienic handwash refers to the treatment of hands with an antiseptic handwash and water to reduce the transient flora without necessarily affecting the resident skin flora. It is broad spectrum, but it is usually less efficacious and acts more slowly than hygienic handrub.

Interactive (advanced) wound dressings refer to modern (post-1980) dressing materials that are designed to promote the wound healing process through the creation and maintenance of a local, warm, moist environment underneath the chosen dressing when left in place for a period indicated through a continuous assessment process. Examples are alginates, semipermeable film membranes, foams, hydrocolloids and fibrous hydrocolloids, non-adherent wound contact materials and combinations of those.

Primary closure is defined as closure of the skin level during the original surgery, regardless of the presence of wires, wicks, drains, or other devices or objects extruding through the incision. This category includes surgeries where the skin is closed by some means. Thus, if any portion of the incision is closed at the skin level, by any manner, a designation of primary closure should be assigned to the surgery.

Resident flora refers to microorganisms residing under the superficial cells of the stratum corneum and found also on the surface of the skin.

Standard antibiotic prophylaxis refers to the prevention of infectious complications by administering an effective antimicrobial agent prior to exposure to contamination during surgery.

Surgical hand preparation refers to an antiseptic handwash or antiseptic handrub performed preoperatively by the surgical team to eliminate transient flora and reduce resident skin flora. Such antiseptics often have persistent antimicrobial activity.

Surgical hand rubbing refers to surgical hand preparation with a waterless alcohol-based handrub. **Surgical hand scrubbing presurgical scrub** refers to surgical hand preparation with antimicrobial soap and water.

Surgical procedure refers to an operation where at least one incision (including a laparoscopic approach) is made through the skin or mucous membrane, or reoperation via an incision that was left open during a prior operative procedure AND takes place in an operating room.

Surgical site infection refers to an infection that occurs after surgery in the part of the body where the surgery took place. Surgical site infections can sometimes be superficial infections involving the skin only. Other surgical site infections are more serious and can involve tissues under the skin, organs, or implanted material.

Surgical site infection is also defined as an infection that occurs within 30 days after the operation and involves the skin and subcutaneous tissue of the incision (superficial incisional) and/or the deep soft tissue (for example, fascia, muscle) of the incision (deep incisional) and/or any part of the anatomy (for example, organs and spaces) other than the incision that was opened or manipulated during an operation (organ/space)

Surgical wounds are divided into four classes. **1. Clean** refers to an uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital or uninfected urinary tracts are not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow non-penetrating (blunt) trauma should be included in this category if they meet the criteria. **2. Clean-contaminated** refers to operative wounds in which the respiratory, alimentary, genital or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered. **3. Contaminated** refers to open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (for example, open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, non-purulent inflammation is encountered, including necrotic tissue without evidence of purulent drainage (for example, dry gangrene), are included in this category. **4. Dirty or infected** includes old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

The 2016 World Health Organization (WHO) Global guidelines for the prevention of surgical site infection (SSI) are evidence-based and unique in that they are the first global guidelines of this sort, are based on systematic reviews and present additional information in support of actions to improve practice. They were developed by international experts adhering to WHO's Guideline Development Process and overall aim to achieve standardisation.

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Blood booster for anaemia, recovery & recuperation

Improves cardiac health & function

Enhances blood flow

Improves Immunity

Antioxidants protect the heart

Supports heart health, blood cells production, improved blood flow & antioxidant protection

Venttura

Arginine, citrulline & beetroot extract

Improve elasticity of blood vessels and enhance blood flow

Blood boosters

Iron, Copper, B-Vitamins & Papaya Leaf ext. Support hemoglobin production, RBC & platelet formation

Cardiac support

L-Carnitine, Taurine, Vit E & Turmeric extract Benefit heart health & function and antioxidant protection

Blood Boosting Iron, Vitamins, Amino Acids & Antioxidants Supplement

VENTTURA ARTICLE

Benefit of Nitric Oxide Booster Supplements for Cardiac Health in Dogs

Rajas Kulkarni

Nitric oxide (NO) boosters are gaining attention for their potential benefits in canine cardiac health. Nitric oxide is a vital molecule involved in various physiological processes, including vasodilation, blood flow regulation, and cellular communication. Nitric oxide boosters are supplements that increase the production or availability of nitric oxide in the body. Common ingredients in these supplements include L-arginine, L-citrulline, and beetroot extract. These compounds serve as precursors or facilitators of nitric oxide production. Some of the benefits of NO boosters include:

Improved Blood Flow

Vasodilation: Nitric oxide is a potent vasodilator, meaning it relaxes the inner muscles of blood vessels, causing them to widen. This process enhances blood flow and reduces blood pressure, which is crucial for dogs with heart conditions. Improved blood circulation ensures that the heart pumps blood more efficiently, delivering oxygen and nutrients throughout the body.

Reduced Blood Pressure

Hypertension Management: High blood pressure can strain a dog's heart, leading to heart disease or exacerbating existing cardiac conditions. Nitric oxide helps lower blood pressure by relaxing blood vessels, thereby reducing the workload on the heart.

Enhanced Oxygen Delivery

Increased Oxygen Supply: With better vasodilation and improved blood flow, nitric oxide boosters can enhance the delivery of oxygen to tissues and organs. This is particularly beneficial for dogs with heart disease, as their hearts often struggle to pump adequate oxygenated blood.

Anti-Inflammatory Effects

Reduced Inflammation: Chronic inflammation is a common issue in dogs with cardiac problems. Nitric oxide has anti-inflammatory properties that can help reduce inflammation in the blood vessels and heart, improving overall cardiovascular health.

Improved Exercise Tolerance

Increased Stamina: Dogs with heart issues often suffer from reduced exercise tolerance. By improving blood flow and oxygen delivery, nitric oxide boosters can help these dogs maintain better stamina and energy levels, making it easier for them to engage in moderate physical activities that are beneficial for their health.

Prevention of Blood Clots

Anticoagulant Properties: Nitric oxide helps prevent the formation of blood clots by inhibiting platelet aggregation. This is crucial for dogs with certain types of heart disease where blood clot formation is a risk.

Support for Endothelial Function

Vascular Health: Nitric oxide supports endothelial function, promoting healthy blood vessels and preventing atherosclerosis (the buildup of fatty deposits inside the arteries), which can lead to heart attacks or strokes in dogs.

Common Nitric Oxide Boosters and Their Sources

L-Arginine: This is an essential amino acid that is converted into nitric oxide in the body.

L-Citrulline: It is an amino acid that acts as a precursor to L-arginine, which then produces nitric oxide.

Beetroot Extract: Beetroot is a natural source rich in nitrates, which the body can convert into nitric oxide.

Nitric oxide boosters can offer significant benefits for canine cardiac health. **Venttura Petraceuticals 2.0 Ferro+** is a holistic blood building supplement that contains minerals and vitamins to promote blood cells & haemoglobin formation, antioxidants and amino acids **(Taurine & L-Carnitine)** for cardiac support and function and nitric oxide boosters like **Arginine, Citrulline & Beetroot Extract** that enhance blood flow thereby reducing strain on the heart and maintaining overall cardiac health.

Proud Moment for PPAM Members

Dr. Sangeeta Shah CE

Workshop on Echocardiography for Small Animal Veterinary Practitioners, 15 April 2024

Dr. Jairam Ramani

Dr. Jairam spoke on Managing Parasitic Infections in an Evolved World, in Pune on 05.05.2024

Dr. Chandrakant Galdhar, RSO, MVC, Mumbai

participated in the International Symposium on Food Safety and Control held from 27–31 May 2024 in Vienna, Austria, IAEA Head quarters.

Dr. Dinesh Vinherkar a member of the team that published an Important paper:

Interpreting sea turtle stranding with reference to the spatiotemporal analysis of hotspots along Maharashtra: implications for sea turtle conservation in Maharashtra, India.
Authors of this important article are Prachi Hatkar, Priyamvada Bagaria, Dinesh Vinherkar, Dhaval Kansara and Sagar Patel.
This paper is published Hamadryad Vol. 40 (1&2), pp. 37–49, 2023, ISSN: 2583-7818 (Online).

Dr. S. V. Vishwasrao

On World Veterinary Day Dr. S. V. Vishwasrao delivered a talk on Human Animal Bond. The talk was delivered on 14.05.2024, at Reliance Corporate Park, Navi Mumbai. The talk was organised by Reliance Industries Limited and Reliance Health Services.

Dr. Dinesh Lokhande Farewell Function

Dr. Dinesh U. Lokhande, Officer in Charge of MVC Goregaon Campus and Professor of TVCC was given a warm send of on his last day of Retirement from Mumbai Veterinary College. An excellent surgeon, teacher and soft spoken faculty always ready to help others. Dr. Lokhande, it was great having you as a colleague amongst us as PPAM member. We at PPAM wish you all the best.

PPAM and Boehringer Ingelheim Conducted a CE on 03.05.2024

PPAM along with Boehringer Ingelheim conducted a CE on 03.05.2024 at ITC Maratha, Near International Airport Terminal II, Mumbai.

Speakers were Dr. Umesh Kallahali, he spoke on Nasal Dermatosis - Common to Uncommon.

Dr. Merielle Servonnet, she spoke on NexGard-Insights into an innovative solution against Dog parasites. The event was free for all life members of PPAM.

PPAM CE on Small Animal Ophthalmology

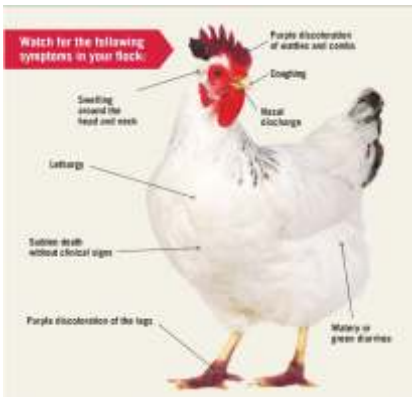
PPAM CE on Small Animal Ophthalmology was held on Sunday 12-05-2024 at The Club, Andheri, West, Mumbai.

Sr. No.	Speaker	Topic
1.	Dr. Kasturi Bhadsavle	Ocular Anatomy and Opthalmic Examination for General Practitioner. Decoding Blindness in Pets.
2.	Dr. Akash Vedpathak	A Window into the Eye-Tackling common Corneal Diseases in Dogs and Cats.
3.	Dr. Komal Raul	Opthalmic diseases in Exotic Pets.

A Very Rare and Critical Observations by Team of Scientist on Orangutan

A very rare and critical observations by team of scientist. Self-medication in non-human animals is often difficult to document. A team of researchers led by Isabelle . B Laumer et.al have reported and published in Times of India and Scientific Reporter their observation of a male Sumatran orangutan (Pongo abelii) who sustained a facial wound. Three days after the injury he selectively ripped off leaves of a liana with the common name Akar Kuning (Fibraurea tinctoria), chewed on them, and then repeatedly applied the resulting juice onto the facial wound. As a last step, he fully covered the wound with the chewed leaves. Found in tropical forests of Southeast Asia, this and related liana species are known for their analgesic, antipyretic, and diuretic effects and are used in traditional medicine to treat various diseases.

Avian Influenza - Veterinarians Need to be Careful and Extremely Alert in Public Interest



Avian influenza, also known as bird flu, is a highly contagious viral disease that affects domestic and wild birds. The disease has also been detected, on rare occasions, in mammals, including humans. Beyond its impacts on animal health, the disease has devastating effects on the poultry industry, threatening workers livelihoods, food security and international trade.

Where outbreaks occur in domestic birds, it is often the policy to cull all poultry, whether infected or healthy, to contain the spread of avian influenza. This represents heavy economic losses for farmers and a long-lasting impact on their livelihoods.

Migratory wild birds especially waterfowl, are natural reservoir of avian influenza viruses and they play a role in the spread the viruses across large geographical areas and also becomes victims of the disease.

Avian influenza is also a major concern for public health. Whenever avian influenza viruses circulate in poultry, sporadic cases of avian influenza in humans are sometimes identified.

Avian influenza can easily spread through: secretions and excretions from infected birds, especially faeces contaminated feed and water (in farms or live birds' market) contact with contaminated footwear, vehicles and equipment cross-border movements of birds, including wild birds' migration and illegal trade. While it primarily affects poultry and wild birds, avian influenza can occasionally be transmitted to mammals, including cats. Cats are unusual hosts of avian influenza. (Source World Organization for Animal Health).

WHO guide lines regarding precaution to be taken by people for prevention of Avian Influenza.

In areas with avian influenza outbreaks in animals, avoid:

1. Contact with sick or dead animals
2. Contact with animals in farms and animal markets
3. Entering areas where animals may be slaughtered
4. Contact with any surfaces that appear to be contaminated with animal faeces
5. Slaughtering or eating sick animals.
6. Follow good food safety practices such as avoiding the consumption of raw milk, eggs and meat; and hand hygiene, including regular handwashing with soap and water.

Dr. Shivani Tandel Article - Exotic Animal Practice in South Asia

Proud moment for PPAM Member. Dr. Shivani Tandel article - Exotic Animal Practice in South Asia to be published in Journal – Veterinary Clinics of North America.

The manuscript 'Exotic Animal Practice in South Asia' speaks about the evolution of exotic animal medicine right through the rich history of this region and how it is a rapidly evolving field in the subcontinent. The Manuscript touches up about the emergence of wildlife medicine, inception of exotic animal medicine to the subcontinent. This write up aims at elaborating how individual veterinarians made a mark in their respective fields which bought about the revolution of exotics in south Asia.

DROOLS ARTICLE

Understanding and Managing Cushing's Syndrome in Dogs

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Introduction:

As pet practitioners in India, it's essential to stay updated on prevalent health issues affecting our furry companions. One such condition on the rise among dogs is Cushing's disease, also known as hyperadrenocorticism. Understanding its signs, diagnostic methods, treatment protocols, and dietary considerations is crucial for effective management and improved outcomes.

Cushing syndrome refers to any cause of elevated cortisol concentrations

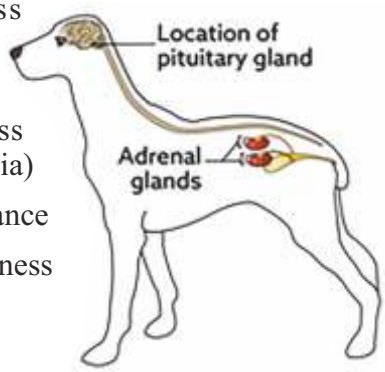
There are two major types that affect dogs

1) Pituitary Dependent Hyperadrenocorticism (PDH) - Is the most common form of Hyperadrenocorticism accounting for 80-85% of reported cases. It happens when there is a tumour on the Pituitary gland.
2) Adrenal Dependent Hyperadrenocorticism (ADH) - It is caused due to either a unilateral or bilateral tumour on the adrenal glands. About 10-15% of dogs will have this type.

Another kind called "Iatrogenic Cushing's Syndrome" happens due to prolonged use of steroids in animals.

Signs and Symptoms:

1. Polyuria, Polydipsia and Polyphagia
2. Weight gain, particularly in the abdomen
3. Muscle weakness and loss
4. Thinning of the skin and hair loss (Endocrine Alopecia)
5. Pot-bellied appearance
6. Lethargy and weakness



Diagnostic Protocols:

1) A thorough examination and history, as well as baseline blood (complete blood count (CBC) and biochemistry profile) and urine testing will give you an idea that Cushing's may be present. Certain laboratory abnormalities are commonly seen with Cushing's, such as a stress leukogram on CBC (a specific pattern in the white blood cell numbers), an elevation in the ALP, a lower urine concentration, and protein in the urine.
2) Imaging such as X-rays and abdominal ultrasound can also be helpful. An enlarged liver may be noted on X-ray. An abdominal ultrasound examination lets you see the adrenal glands and determine their size and the presence of a tumour. A CT Scan may also be performed for rule out both Adrenal as well as Pituitary tumours

Low-dose Dexamethasone Suppression Test

First, a sample of blood is drawn to measure resting cortisol levels. Then, dexamethasone (a corticosteroid) is administered into the dog's muscle or vein and additional blood samples are collected after four and eight hours to measure cortisol levels again.

Normally, cortisol would be suppressed after eight hours, but in dogs with Cushing's disease, cortisol remains increased. This is the preferred testing method and is typically the least expensive option.

ACTH Stimulation Test

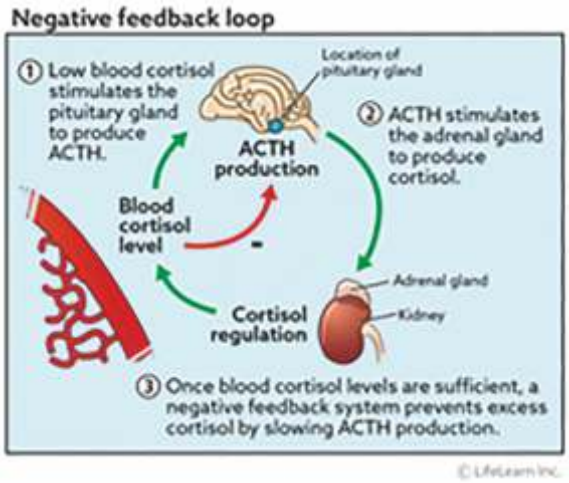
A blood sample is drawn to measure resting cortisol levels. Then ACTH is administered into the dog's muscle. One hour later, blood is drawn again to measure cortisol levels. In dogs with Cushing's disease, cortisol is increased in both samples.

To differentiate pituitary-dependent from adrenal-dependent Cushing's disease, additional tests may be done, including:

- High-dose dexamethasone suppression test: This test is exactly the same as the low-dose dexamethasone suppression test except that a higher dose of dexamethasone is given to the dog. Dogs with pituitary-dependent Cushing's disease typically have suppression of cortisol after eight hours, whereas dogs with adrenal-dependent Cushing's disease do not.
- Urine Creatinine-Cortisol Ratio: The UCCR is a useful screening test for canine hyperadreno-corticism as a low (normal) result makes Cushing's unlikely, with approximately 90% sensitivity. It is useful in those cases where hyperadrenocorticism is unlikely but needs to be definitely excluded.

Treatment Options:

Most cases of Cushing's disease can only be managed, not cured. Most commonly, treatment consists of one of the following types of medications:



1) Medication

- Trilostane (Vetoryl®): This is a steroid analogue that blocks a certain enzyme necessary for cortisol production, thus decreasing hormone level. This is the preferred treatment option.
- Mitotane (Lysodren®): This is a chemotherapeutic medication that destroys part of the adrenal gland so that it can no longer produce cortisol

2) Surgical intervention: In some cases, surgical removal of adrenal tumours may be considered, especially if they are causing excessive cortisol production.

3) Radiation therapy: For dogs with pituitary-dependent Cushing's disease, radiation therapy may be recommended to shrink the tumour and normalise cortisol levels.

4) Additionally, since dogs with Cushing's disease generally have high cholesterol, a low-fat diet is typically recommended. Potential diet options include Vetpro Gastrointestinal and Vetpro Hepatic diet.

Conclusion:

Cushing's syndrome poses significant challenges for both dogs and their owners, but with early detection, accurate diagnosis, and proper management, affected dogs can lead fulfilling lives. Pet practitioners in India play a critical role in educating pet owners, conducting timely screenings, and implementing appropriate treatment plans to improve outcomes and enhance the well-being of our beloved canine companions. Stay informed, stay vigilant, and together, we can make a positive difference in the lives of pets affected by Cushing's Syndrome.

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Ear tagging of Cattle a must from June 1, 2024 to curb illegal transport

Starting June 1, 2024, cattle from other states will be prohibited from entering the Maharashtra state without ear tagging. This initiative is aimed at preventing the illegal transportation and slaughter of animals. The sale of untagged animals at weekly markets and villages will also be banned, besides treatment at veterinary hospitals. The ear tag will have 12digit barcode for animals which will record their birth, vaccination, medical treatment and even ownership transfer. This is a part of National Digital livestock mission.

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SCAN TO KNOW MORE

Rare Himalayan Griffon Vultures spotted in Uttar Pradesh

A flock of rare Himalayan Griffon vultures has been spotted in the Etawah Safari Park Uttar Pradesh. This vulture is native to the native Himalayan plateau and adjoining Tibetan plateau. This vulture is listed as near threatened on IUCN Red list.

Veterinarians Mourn Death of Dr. Mohan Wani

Veterinarians mourn death of Dr. Mohan Wani, veterinarian and one of the finest cell biologists in the country and Director of National Centre for Cell Science.

The passing away of Dr. Mohan Wani, 59, director of Pune's National Centre for Cell Science, has shocked the scientific community.

Dr. Mohan will always be remembered as a smiling, simple, down to earth and most of all an amazing scientist and human being, who rose through the ranks to head the prestigious institution. The Department of Biotechnology and the scientific fraternity will miss him. According to Dr. Shekhar Mande, former director-general of the Council of Scientific and Industrial Research, Dr. Mohan Wani was one of the finest cell biologists in the country. Dr Wani was appointed director of the NCCS, a premier research institute under the Department of Biotechnology of the Ministry of Science and Technology in 2022. He completed his master's in veterinary surgery from Nagpur Veterinary College. Thereafter, he obtained his PhD in human medicine from St George's Hospital Medical School, University of London. He was also a fellow of prestigious science academies like the Indian National Science Academy, National Academy of Sciences India, National Academy of Veterinary Sciences and the National Academy of Medical Sciences He was a recipient of several prestigious awards, including the Commonwealth Fellowship, BM Birla Science Prize and the National Bioscience Award. Dr. Wani had made significant research contributions in understanding the regulation of cellular and molecular pathophysiology of important skeletal and autoimmune diseases, including osteoporosis, osteoarthritis and rheumatoid arthritis. His group has also contributed to stem cell biology and regenerative medicine. Entire PPAM family express their heart felt condolences and pray to almighty for peace of departed soul.

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