Ovarian thecoma in an asymptomatic bitch: a case report

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Keywords: thecoma, ovarian tumors, ovary, bitch

Introduction

In domestic animals, ovarian tumors can originate from three distinct portions of the ovary including epithelium, germ cell, and sex cords. Sex cord tumors include granulosa cell tumor, thecoma, luteoma, Sertoli cell tumor, lipid cell tumor (1). Granulosa cell tumor is the most common ovarian tumor in bitches, occurring in about 50% of cases (2). Thecoma contains steroid-type cells resembling luteinized theca and luteinized stromal cells. This tumor can be classified into three types including estrogenic, androgenic and nonfunctional thecoma (3). The clinical signs which usually observed in sex steroid hormones-producing tumors are abnormal estrous cycles, behavior changes, and myelosuppression (1). There are few reported cases of thecoma in bitches (4).

Case details

History

An eleven-year-old, nulliparous, intact bitch was presented to Prasu-Arthorn Animal Hospital, Faculty of Veterinary Science, Mahidol University for follow-up about hepatic disease regularly. Ultrasound examination found an unremarkable of liver abnormality. Notwithstanding, the mixed echogenic parenchyma was accidentally observed in both ovaries (Fig.1). In this case, the last estrus cycle occurred 2 years ago; moreover, the prolonged interestrus interval was presented.

Clinical finding

The dog had no any signs of estrus such as vulva swelling and bloody vaginal discharge. Diagnostic tests included complete blood count (CBC), serum biochemical analyses, determination of serum sex steroid hormone concentrations and vaginal cytology. The CBC and serum biochemical values were normal. Serum progesterone concentration was 0.44 ng/ml, and serum estradiol concentration was less than 10 pg/ml. Moreover, the majority of vaginal epithelial cells were parabasal and intermediate cells. The results of the sex steroid hormone levels and vaginal cytology test indicated that the dog was in anestrus stage of estrous cycle. Therefore, results of physical examination and laboratory data were suggestive of an ovarian cyst or ovarian tumor.

Treatment and outcomes

Exploratory laparotomy was performed to evaluate the ovarian abnormalities. In the abdomen, no signs of metastasis were observed. Ovariohysterectomy was then performed. Both ovaries were evaluated for gross and histopathological examination. For the gross appearances, both sides of the ovarian mass were slightly oval, firm consistency, measuring 3.0x3.0x2.5 cm. The external surfaces were irregular and whitish (Fig.2). On histological examination, tissue sections from the tumor were composed of oval or spindle-shaped cells, which arranged in interlacing fascicles. Individual cells showed vesicular nuclei varying from ovoid to fusiform in shape. Moreover, there were faintly eosinophilic, and vacuolated cytoplasm with poorly defined borders (Fig.3). On the basis of these histological findings; the tumor mass of the ovaries was considered to be a thecoma, which is a benign sex-cord stromal tumor. For the follow-up, the dog has remained clinically normal three months after removing the thecoma.
Figure 2. The cross-section of the ovarian tumors in this case.

Figure 3. Histological section of the ovarian thecoma stained with hematoxylin-eosin.

Discussion

The enlargement of ovary could be related to neoplastic (e.g. granulosa cell tumors and thecoma) or non-neoplastic (e.g. ovarian hematoma and ovarian abscess) causes. Reported incidence of ovarian tumors in bitches with neoplasia is approximately 0.5 to 6.0 per cent (5). This case had no changes of sex steroid hormone level and was in anestrus; therefore, this lesion might be nonfunctional thecoma. Although this case had no threateningly clinical signs, the ovariohysterectomy for ovarian tumor removal is the suggestive choice of treatment due to the visceral organs compression of the proliferating tumor. The prognosis after removal of this tumor is good since it is a benign tumor, and none of small animal cases was reported about malignancy (6).

References

Novel methods to diagnose pulmonary hypertension assessed by thoracic radiography

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Keywords: degenerative mitral valve disease, dogs, pulmonary artery, pulmonary hypertension, thoracic radiography

Introduction

Pulmonary hypertension (PH) is a condition caused by an increase in pressure within the pulmonary system more than 30 mmHg. Common causes of pulmonary hypertension include 1) an increase in right ventricular cardiac output e.g., congenital shunt, 2) an increase of pulmonary vascular resistance, and 3) an increase of venous pressure from advanced left-sided heart disease. In the past, the major cause of pulmonary hypertension in dogs was heartworm disease. However, nowadays, most of the dogs develop pulmonary hypertension secondary to the advanced left-sided heart disease such as degenerative mitral valve disease (DMVD). The prevalence of pulmonary hypertension in DMVD dogs is approximately 13-53% (1-5).

Clinical signs of dogs with PH include cough, dyspnea, weakness, and syncope. The gold standard diagnostic method of PH is the direct blood pressure measurement through cardiac catheterization (6). However, the cardiac catheterization is an invasive method that needs to anesthetize the dogs; therefore, it is not routinely used for PH diagnosis in veterinary medicine. Dogs usually are diagnosed with PH by measurement an estimated pulmonary pressure via echocardiography. However, To perform echocardiography has some limitations including the requirement of an expensive ultrasound machine and an experienced echocardiographer; therefore, in veterinary medicine, the diagnosis of PH is limited for the referral centers and the veterinary teaching hospitals.

Radiography is one of the best screening methods for heart diseases and congestive heart failure condition in dogs. However, the radiographic assessment for PH in dogs using nowadays including changes of cardiac silhouette i.e, reversed D shape and an enlargement of main pulmonary artery and branches are subjective and non-specific. Also, the sensitivity of radiography on PH diagnosis is low. However, the radiographic examination is the method that is easy to access and routinely use in all animal hospitals. Thus, the objective measurement method assessed by radiography that is able to diagnose PH is very important and useful in veterinary medicine.

This study aimed to create the measurement method that can distinguish dogs with and without PH.

Materials and methods

The digital radiographic images of small breed dogs with age more than 1 year old and weight less than 10 kg were retrieved. Only good quality films were recruited to the study. All dogs had been performed echocardiography to classified into 2 groups. The PH group was dogs with estimated pulmonary pressure more than 30 mmHg. Dogs with estimated pulmonary pressure less than 30 mmHg was included in the non PH group.

On the right lateral radiographs, the parameters including the width of the pulmonary artery and the width of pulmonary vein were measured. The measurements on ventrodorsal radiographs included the width of the pulmonary vein and artery crossing the rib 9th (Fig. 1) the width of the rib 9th, and the length and the width of the 9th thoracic vertebrae. Then, mathematical formulae from parameters mentioned above were created.

Figure 1 The measurement of the pulmonary artery (PA) (red) and vein (PV) (blue) on the ventrodorsal view
Statistical analyses were performed using SPSS version 24. The Chi-Square was used to test the independence of value from each formula between the PH and the non-PH group. The p-value less than 0.05 was considered statistically significant. The correlations between age and weight and value from each formula were analyzed by the Pearson correlation. The Receiver Operating Characteristic (ROC) curve was performed to determine the cut-off, sensitivity, and specificity of each formula for diagnosing PH.

**Results**

Radiographs of 72 dogs were retrieved. The average ± standard deviation (SD) weight of dogs was 6.40 ± 4.40 Kg. Breeds of dogs included Poodle (19), Shih Tzu (15), Mixed breed (10), Pomeranian (6), Chihuahua (5), Jack Russel (4), Yorkshire Terrier (4), Miniature Pinscher (3), Pekingese (2), Cavalier King Charles Spaniels (1), Cocker Spaniel (1), Miniature Schnauzer (1) Pug (1). The age range was 2-19 years old. Thirty-five were females and thirty-seven were males. Fifty-seven were in the non-PH group comprised of twenty-nine normal dogs and twenty-eight DMVD dogs, and the PH group consisting of fifteen dogs.

From a total of twelve formulae, seven formulae could be used to distinguish PH and non-PH dogs. Five out of seven equations could even differentiate between DMVD with and without PH. All of five formulae were from the measurements on the ventrodorsal view.

1) The ratio between the area of the pulmonary artery crossing the rib 9th and the area of the 9th thoracic vertebrae; areaPA/areaT9).

2) The ratio between the area of the pulmonary vein crossing the rib 9th and the area of the 9th thoracic vertebrae; areaPV/areaT9).

3) The ratio between the area of the pulmonary artery crossing the rib 9th and the width of the 9th thoracic vertebrae; areaPA/widthT9)

4) The ratio between the width of the pulmonary artery crossing the rib 9th and the width of the 9th thoracic vertebrae; widthPA/widthT9)

5) The ratio between the width of the pulmonary vein crossing the rib 9th and the width of the 9th thoracic vertebrae; widthPV/widthT9)

Values from only one formula, areaPA/widthT9 correlated weakly with body weight (Table 1). The cut-off value, sensitivity, and specificity of each formula are summarized in Table 1.

Based on the sensitivity and specificity, two out of five formulae were selected to evaluate positive predictive value (PPV), negative predictive value (NPV), and inter- and intra- observer coefficient of variation (CV) (Table 2).

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*indicate statistically significance

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Discussion

This study presents the new measurement method assessed by thoracic radiography to distinguish dogs with and without PH secondary to DMVD. The width and area of the pulmonary artery and vein crossing the rib were used as major parameters for creating formulae. The width and area of the thoracic vertebrae were used as normalized parameters to reduce the variation of each dog. Based on the results of this study, the ventrodorsal view is the better view to reveal and measure the pulmonary artery and vein. The best landmark to measure the size of the pulmonary artery and vein is at the level of the rib 9th (7). Therefore, the width and the area of 9th thoracic vertebrae that is located in the same region as the rib 9th was used as self-normalized parameters of each dog.

Only one formula, areaPA/widthT9 moderately correlate with the body weight; therefore, this formulae is not recommended to use. From the results of this study, the recommended formulae are areaPA/areaT9 and widthPA/widthT9. Both formulae provided moderate sensitivity and specificity. The negative predictive values of both formulae were high, but the positive predictive values were moderate suggesting that these methods are suitable to use as a screening method before confirming PH with echocardiography and for ruling out dogs without PH. Although the areaPA/areaT9 provided more specificity, better positive and negative predictive values, and less inter- and intra- observer coefficient of variations, it might take a bit longer times to assess because four parameters need to be measured at each evaluation.

The limitations of this study are firstly the use of ventrodorsal position which is not the best view for revealing the pulmonary vessels. However, the ventrodorsal position is more popular in Thailand. Therefore, the ventrodorsal view was chosen to study for a more practical use. Secondly, not only the pressure but also the volume can cause the enlargement of pulmonary vessels that might affect the diagnosis. Lastly, these methods cannot be used in radiographs with silhouette signs that obscure the pulmonary vessels e.g., pleural effusion or severe lung consolidation.

In conclusion, the new objective measurement methods created in this study can be used as a screening method for diagnosis PH particularly in dogs affected with DMVD.

Acknowledgement

Special thanks to Assist.Prof.Dr. Chaidate Inchisri and Prof.Dr. Padet Tummarak for assistance in statistical analysis.

References

The efficacy of oral administered Fluralaner for generalized juvenile-onset demodicosis in 3 months dog: a case report

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Keywords: Fluralaner, demodicosis, Demodex

Introduction

Demodicosis is a disease from Demodex mites which are normal flora in dogs overproliferate in skin. The diagnostic technique is proper skin scraping. This disease can be classified as juvenile and adult-onset demodicosis depend on aging and localized or generalized lesion. Normally juvenile-onset form may not need to be treated in localized lesion. Treatment is recommended when demodicosis occurs in generalized form. Although demodicosis can be cured, sometimes that can be challenging to treat because of length treatment time, secondary infection as deep pyoderma, underlying cause and last important one is client’s demand and financial. Thus the greatest outcome for treating is in short time resolving and non-high cost. The goal of treatment in this study is report efficacy and side effect of new medicine as Fluralaner in generalized juvenile demodicosis in dog.

Materials and methods

A male 3 months Pug dog was presented generalized folliculitis and diagnosed to demodicosis. The scraping was found all stage demodexs; most alive and less death adults. The patient was previous treated that client claimed he was more worse from beginning with ivermectin by subcutaneous injection weekly for 4 times at private clinic 1 month ago. Fluralaner was given per oral single dose as same dose for flea and tick preventing. Then he was rechecked skin scraping every 2 weeks for one month and then followed a month apart for two skin scraping after negative.

Results and discussion

All lesions were improved more than 50% within 2 week and depopulation of Demodex mites. Skin scraping was found only 2 death adult Demodexs at 6 weeks, all negative first time at 10 weeks and one month apart had rechecked second all negative. Patient was followed until one year old without recurrence demodicosis. Adverse effect had not be seen along with all study time. In conclusion, this report shows fluralaner is effective drug and not seen adverse effect in young dog, reasonable treatment timing and financial cost for patient and client as single dose in a case of generalized juvenile demodicosis.

Acknowledgements

This report was performed at Thonglor pet hospital pattaya branch.

References

3. Fluralaner (Bravecto®)
Obstructive ureteral calculi and recurrence of cystic calculi in a guinea pig (*Cavia porcellus*)

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**Keywords:** guinea pig, urolithiasis, cystic calculi

**Introduction**

Urolithiasis is a common problem in Guinea pigs. Calculi such as calcium oxalate, calcium phosphate and calcium carbonate, can be located anywhere in the urinary tract. The exact etiology is still poorly described, however, high calcium diet e.g. pellet base on alfalfa, alfalfa hay, green rich vegetable and pellet high in vitamin D, may contribute to this condition.

Clinical signs depend on the number, size and location of the calculi. Lower urinary tract calculi (urinary bladder and urethra) may show signs of hematuria, stranguria, dysuria, lethargy and anorexia. Having a ureteral calculus may cause severe pain, but in contrast, the clinical signs may be non-specific. Signs of lethargy, anorexia, weight loss and hunch posture may be observed. This guinea pig had pain during abdominal palpation. Imaging diagnosis by radiography and ultrasonography should be done to rule out other causes of abdominal pain and locate the calculi.

For treatment, medical treatment or surgical treatment could be done, based on the type, size, and location of calculi. Surgical treatment is the best choice for large obstructive calculi. Restriction of high calcium diet is recommended.

**Materials and methods**

**Case history:** This 1.07 kg, 5-year-old, male, guinea pig visited the Small Animal Hospital, Faculty of Veterinary Science, Chulalongkorn University, with signs of dysuria, 15 days post-cystotomy from a private clinic. The animal was lethargic. On the previous day, the guinea pig was alert and had normal urination. On physical examination, there was 5% dehydration and the urinary bladder was easily palpated. Radiography and ultrasonography were done. The animal was catheterized with foley catheter. The urine was turbid white with 3 cystic calculi, size 0.2-0.4 cm, during catheterization. The animal was treated with fluid therapy, antibiotics, analgesics and gastrointestinal stimulant drugs.

Even though catheterized, this guinea pig still showed signs of dysuria until death. The carcass was submitted to Pathology unit, Faculty of Veterinary Science, Chulalongkorn University, for necropsy. The tissue samples were collected and fixed in 10% neutral buffered formaldehyde, embedded in paraffin, sectioned, and stained with hematoxylin and eosin (H&E) for additional histopathological examination. Moreover, the calculi were also submitted for composition identification.

**Results and Discussion**

**Radiography:** Abdominal radiography revealed gas filled stomach, small intestine and cecum. There was a smooth margin, round shaped, seed-like foreign body in the colon. Approximately 5-6 cystic calculi, measuring 0.1 cm, and 1 large calculus, measuring 0.45 cm, were found (Fig.1). Gas bubbles were observed in urinary bladder due to catheterization.

**Ultrasonography:** On ultrasonography, there was cystitis, steatitis with ascending pyelonephritis (Fig.2B). Cystic calculi were found (Fig.2A). A hepatic nodule/cyst was also observed.

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**Fig.1** Abdominal radiograph; round seed-like foreign bodies in the colon with approximately 5-6 calculi in the urinary bladder.

**Fig.2A** Urinary bladder; thickened urinary bladder wall with multiple cystic calculi.

**Fig.2B** Kidney; pyelonephritis.
Clinical pathology: Urine bacterial culture: Klebsiella spp. The calculi identification was calcium phosphate carbonate.

Gross examination: The abdomen contained 8 ml. of serosanguineous fluid (fluid analysis: TNCC = 0, protein = 2.6, SG 1.014; transudate). The liver had diffuse irregular surface and was yellowish with fibrous and purulent material attached to the surface. A cyst was observed at the left lateral lobe. The spleen had bulged margins. The kidneys had diffuse hemorrhage and irregular surface. The urinary bladder wall was thickened with hemorrhage of the mucosa. Four pieces of yellowish cystic calculi, measuring approximately 0.3 cm were found. There were also 3 pieces of yellowish calculi obstructing the right ureter. The right ureter was severely thickened and dilated.

Microscopic findings: Microscopically, the right ureter had hyperplasia of the epithelium with infiltration of neutrophils in the mucosa. Cross-sections of calculi within the lumen were lined by clumps of bacteria. (Fig.4.). The urinary bladder had severe locally-extensive necrosis and suppurrative inflammation (Fig.5). The spleen had moderate multifocal necrosis with aggregates of neutrophils. The liver had severe panlobular fatty degeneration with multifocal necrosis and bile duct proliferation and cystic formation.

Fig.4A, 4B Right ureter; hyperplasia of the epithelium with infiltrates of neutrophils in the mucosa and calculus in the lumen (*). (A; x20, B; x40).

Fig.5A, 5B Urinary bladder; Severe locally-extensive necrotic and suppurrative cystitis. (A; x20, B; x40).

Urinary tract disease is common in guinea pig. Diagnosis and treatment is basically similar to dogs and cats. The incidence of urolithiasis in guinea pigs is higher in middle-aged to older females. In contrast, the guinea pig in this case is a 5-year-old male. Diet is an important factor that may cause urolithiasis. This animal was fed with kale, celery, shallots and baysil routinely. These types of plants are rich in calcium and may cause the formation of calculi within the urinary tract. Inadequate water intake may also contribute to calculus formation. Calculi such as calcium oxalate, calcium phosphate and calcium carbonate are reported in guinea pigs. Uroliths in guinea pigs are commonly found in the lower urinary tract. In this case, calcium phosphate carbonate calculi were found in the urinary bladder and also throughout the length of the right ureter, causing upper urinary tract obstruction, which is rare in guinea pigs. Due to the rare location of the calculi, colonic foreign bodies were previously suspected by radiography. Signs of dysuria and stranguria did not improve after urinary catheterization in this animal due to the obstruction of the right ureter. Cystitis and ureteritis were consistent with bacterial infection and irritation secondary to having multiple calculi. However, pyelonephritis was not seen. The best treatment option for urolithiasis in this animal is ureterotomy/cystotomy for calculus removal. Unfortunately, this animal died before performing surgery. For prevention, high dietary calcium such as alfalfa, alfalfa-based pellet, and green rich vegetables, should be restricted. Instead, hay and high fiber vegetable (variety of fruits and vegetable) should be given. Moreover, water consumption and exercise should also be encouraged.

References
Rhodococcus equi infection in cat with pyothorax: a case report

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Keywords: Rhodococcus equi, cat, pyothorax

Introduction

Rhodococcus equi is a facultative, intracellular, gram-positive coccobacillus causing chronic suppurative bronchopneumonia and enteritis in horse with high mortality rate in 1 to 3-month-old foals. R. equi has also been detected in pyogranulomatous lesions of other companion animals and its incidence in HIV-infected human has increased during the last decade. There are a few reports regarding R. equi infection in cats with pleural effusion. This is the first report describes the clinic-pathological features, treatment and outcome of R. equi infection in domestic shorthair cat with pyothorax in Thailand.

Materials and Methods

A 5-months-old, 1 kg, intact male domestic shorthair cat was presented to Suvarnachad Animal Hospital with severe dyspnea. Physical examination revealed tachypnea, bilaterally decreased lung sound, muffled heart sound, 5% dehydration, slightly pink mucous membrane, rectal temperature of 102 °F and scar on the right lateral thorax. Thoracic radiographs on right lateral and ventrodorsal views showed increased opacity in the ventral thorax obscuring the cardiac silhouette and ventral diaphragmatic margin. The lungs were separated from the thoracic wall at the costodiaphragmatic recess and right hemithorax, indicating the presence of a pleural effusion (Figure 1A and 1B). Thoracocentesis was performed and the pleural fluid was yellowish, turbid and highly viscous. Cytology examination of the fluid revealed a predominance of degenerated neutrophils and macrophages with intracellular bacteria. Gram-positive organisms were presented on gram’s stain smear. Subsequent aerobic bacteriological culture identified Rhodococcus equi. Antimicrobial susceptibility tests showed that the organism was susceptible to ampicillin, amoxicillin-clavulanate, ciprofloxacin, gentamicin, erythromycin, and trimethoprim-sulfamethoxazole. Hematological examination revealed a leukocytosis (Table 1). The cat was anesthetized and chest drain was placed for fluid drainage. Warm sterile 0.9% sodium chloride was used for thoracic lavage four times daily for 7 days. The cat was treated with a combination of metronidazole intravenously at 10 mg/kg every 12 hours and amoxicillin-clavulanate intramuscularly at 20 mg/kg every 24 hours for 7 days.

Results and Discussion

On day 7 of treatment, the cat’s clinical conditions were dramatic response which included normal breathing, increased appetite and weight gained up to 1.7 kg. The pleural exudate gradually cleared and the chest drain was removed. The cat was discharged from hospital on day 10 of treatment and was treated with a combination of amoxicillin-clavulanate orally at 20 mg/kg every 12 hour. On day 30, the cat’s weight increased to 2.8 kg and he had good condition. Thoracic radiographs showed a complete resolution of the pleural effusion. (Figure 2A and 2B). The cat received the same medications until day 210. Thirty days after cessation of treatment, the cat had severe dyspnea, decreased appetite, abdominal distention and diarrhea. Pleural effusion and ascites were detected. The cat did not response to treatment, he died 21 days later. Based on the clinical and pathological findings, pyothorax caused by Rhodococcus equi was diagnosed. Although, common isolated pathogens in feline pyothorax include Pasteurella spp., Clostridium spp.,...
**Fusobacterium spp., Bacteroides spp., Actinomyces spp., Peptostreptococcus spp., and Prevotella spp.,** less than 20% of cases are *Staphylococcus spp., Rhodococcus equi, Nocardia spp., Escherichia coli, Salmonella spp., Klebsiella spp., and Proteus spp.* There have been sporadic reports in the literature of *R. equi* infection in cats associated with cutaneous pyogranuloma and pneumonia. In this case, the cat lived in a multi-cats household and played outdoor. There are also two horses live near the house. This is support the hypothesis that the route of *R. equi* infection in this cat would be through contaminated penetrating thoracic wound. Previous report revealed successful treatment of *R. equi* infection in cat with pyogranulomatous bronchopneumonia with doxycycline. However, amoxicillin-clavulanate and metronidazole were considered for the treatment for this cat. The cat clinically improved after 210 days of medical treatment. Unfortunately, the clinical signs recurred in 30 days after cessation of treatment and the cat died in 21 days even though he received the same medical treatment. Possible reason for the unsuccessful treatment outcome may associated with the development of resistance to metronidazole and amoxicillin-clavulanate. Furthermore, this cat was improved with thoracostomy tube placement and thoracic lavage on the first week of treatment. Benefits of thoracic lavage include reduction of pleural fluid viscosity, facilitation of fluid drainage, prevention of thoracostomy tube obstruction, dilution and reduction of bacteria and inflammatory mediators and debridement of the pleural cavity with breakdown of adhesions. *R. equi* is an importance emerging in immunocompromised humans. The routes of exposure are inhalation of bacteria from dust or soil, wound or mucous membrane inoculation and from domestic animals harboring *R. equi*. Therefore, an increased awareness of this disease is very important in immunocompromised humans.

**Table 1 Hematologic results**

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**Figure 2** Thoracic radiographs on right lateral (A) and ventrodorsal (B) views on day 30 of treatment.

**Acknowledgement**

The authors would like to thank the cat’s owner, veterinarians and staffs of Suvarnachad Animal Hospital for their supports.

**References**


**Figure 2** Thoracic radiographs on right lateral (A) and ventrodorsal (B) views on day 30 of treatment.
Introduction

Feline lower urinary tract disease (FLUTD) is the condition that can affect bladder or urethra of cats resulting in hematuria, stranguria, dysuria, periuria and pollakiuria (1). The major causes of FLUTD were idiopathic or called feline idiopathic cystitis (FIC) which accounting for 29-65% (2). In Thailand, Pusoonthornthum et al. reported 27.1% of FLUTD cases were idiopathic cystitis (3). Cats with FIC usually showed the signs of severe stranguria and dysuria lead to systemic condition such as accumulation of uremic toxin, acid-base imbalanced, decreased glomerular filtration rate and dead (4). The objective of the present study was to determine the risk factors such as age, breed, weight, body condition score and reproductive status that predispose the developing of FIC.

Materials and Methods

The study population consisted of client-owned cats from Bangkok and surrounding areas presented to the Small Animal Hospital, Faculty of Veterinary Science, Chulalongkorn University. The cases were recruited from a group of 20 cats diagnosed with FLUTD. Another 20 clinically normal cats with normal physical examination, hematology, serum chemistry and urinalysis were also enrolled at the same period. An equal number of age and gender matched cats with FIC group were adults cats aged 7 months or older presenting the typical clinical signs associated with FLUTD (hematuria, dysuria, stranguria, periuria and pollakiuria). A final diagnosis consistent with FIC made by excluding other causes of FLUTD and considering the results of physical examination, CBC, serum chemistry, urinalysis, urine bacteriologic culture, abdominal radiography and/or ultrasonography (5,6). A questionnaire was completed by interview of each owner. The following information were gathered for all cat including age, breed, weight, body condition score and reproductive status of all cats. Descriptive results were reported as frequencies. Chi-square test was used to determine the significant association between risk factors and the development of FIC.

Results and Discussion

A total of 40 cats met the inclusion criteria for this study. Mean±SEM age of FIC and normal group were 4.41±0.64 years (median, 3.50 years; range, 11.2 years). Frequencies of interested variables were listed (Table 1).

Table1. Information on age, weight, body condition score, breed, reproductive status and coat length of cats with FIC and clinically normal cats.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. of cats with FIC n/N (%)</th>
<th>No. of clinically normal cat n/N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;3 years</td>
<td>6/20 (30%)</td>
<td>6/20 (30%)</td>
</tr>
<tr>
<td>3-7 years</td>
<td>12/20 (60%)</td>
<td>12/20 (60%)</td>
</tr>
<tr>
<td>&gt;7 years</td>
<td>2/20 (10%)</td>
<td>2/20 (10%)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-4 kg</td>
<td>7/20 (35%)</td>
<td>12/20 (60%)</td>
</tr>
<tr>
<td>&gt;4 kg</td>
<td>13/20 (65%)</td>
<td>8/20 (40%)</td>
</tr>
<tr>
<td><strong>Body condition score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/5</td>
<td>0/20 (0%)</td>
<td>0/20 (0%)</td>
</tr>
<tr>
<td>2/5</td>
<td>2/20 (10%)</td>
<td>0/20 (0%)</td>
</tr>
<tr>
<td>3/5</td>
<td>11/20 (55%)</td>
<td>18/20 (90%)</td>
</tr>
<tr>
<td>4/5</td>
<td>5/20 (25%)</td>
<td>2/20 (10%)</td>
</tr>
<tr>
<td>5/5</td>
<td>2/20 (10%)</td>
<td>0/20 (0%)</td>
</tr>
<tr>
<td><strong>Breed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSH</td>
<td>13/20 (65%)</td>
<td>19/20 (95%)</td>
</tr>
<tr>
<td>Persian</td>
<td>6/20 (30%)</td>
<td>0/20 (0%)</td>
</tr>
<tr>
<td>Other breeds</td>
<td>1/20 (5%)</td>
<td>1/20 (5%)</td>
</tr>
<tr>
<td><strong>Reproductive status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intact male</td>
<td>6/20 (30%)</td>
<td>10/20 (50%)</td>
</tr>
<tr>
<td>Castrated male</td>
<td>11/20 (55%)</td>
<td>7/20 (35%)</td>
</tr>
<tr>
<td>Intact female</td>
<td>0/20 (0%)</td>
<td>2/20 (10%)</td>
</tr>
<tr>
<td>Sterile female</td>
<td>3/20 (15%)</td>
<td>1/20 (5%)</td>
</tr>
<tr>
<td><strong>Coat length</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short hair</td>
<td>14/20 (70%)</td>
<td>19/20 (95%)</td>
</tr>
<tr>
<td>Long hair</td>
<td>6/20 (30%)</td>
<td>1/20 (5%)</td>
</tr>
</tbody>
</table>
Domestic short hair (80%; 32/40) was the most frequent breed. There were 15% of Persian (6/40) and 5% (2/40) of other breeds. Cats weighing more than four kilograms had higher trend of developing FIC than cats weighing 1 to 4 kilograms. Reproductive status of these cats were 40% (16/40) intact male, 45% (18/40) castrated male, 5% (2/40) intact female and 10% (4/40) sterile female. The majority of cats with FIC were male castrated (55%). Several studies try to investigate the risk factor of FIC. The bodyweight in FIC group had a significantly higher than control group (5, 6) consistent in this study. It seems that overweight condition might affect the activity level and lead to developing the abnormality of lower urinary tract. The present study were concordant with the earlier study which indicated that the major population in FIC group was castrated males (7). Castrated males tend to have a higher risk for lower urinary tract disease (8). The previous study suggested that purebred was not a risk factor for FLUTD (9) and FIC (5). In this study, DSH (OR=0.098; 95%CI 0.011-0.892) and cats having BCS3/5 (OR=1.360; 95%CI 0.025-0.748) were protective factors for FIC by univariate analysis.

**Acknowledgements**

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**References**

Cytotoxicity of potassium channel KCa3.1 blocker Triarylmethan-34 (TRAM-34) in feline kidney cell line

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Keywords: cat, feline kidney cell line, KCa3.1 channel blocker, Triarylmethan-34

Introduction

Chronic kidney disease (CKD) is an important problem of ageing cats. The prevalence of CKD in cats is 1.6–20% (1). The frequently reported pathological diagnosis of feline CKD is renal tubulointerstitial fibrosis (2). The major etiology of feline CKD still remains unknown. Recently, there are several studies investigate the intermediate-conductance Ca2+-activated K+ channel KCa3.1 (KCa3.1) that play a role in renal fibrosis (3,4,5). However, the role of KCa3.1 in feline kidney cells is unknown. Triarylmethane-34 or TRAM-34 is a selective KCa3.1 channel blocker that can inhibit KCa3.1 channel (6). Previously study in murine renal fibroblast cell line found that TRAM-34 can attenuate renal fibrosis (3). In diabetic nephropathy mice, TRAM-34 can suppress the development of renal fibrosis (5). In addition, TRAM-34 can protect cisplatin-induced renal cell apoptosis in vitro and mice model (7). Nevertheless, there are no previous studies to investigate the effect of KCa3.1 channel blocker in feline kidney cells. Therefore, the aim of this study was to determine the cytotoxicity of TRAM-34 in feline kidney cells.

Materials and Methods

The feline kidney cells (CRFK ATCC® CCL-94™, VA, USA) were used. Cells in TC-dish was cultured in DMEM supplemented with 10% fetal bovine serum, 100 U/ml penicillin, 100 μg/ml streptomycin and Non-Essential Amino Acids Solution. Cells were incubated under a humidified atmosphere consisting of 5% CO2 and 95% air at 37°C in incubator. All experiments were performed at passage 190-203. TRAM-34 (Sigma, St. Louis, USA) was dissolved by DMSO (VWR, PA, USA) to provide the stock solution of TRAM-34 (10 mM). CRFK cells (1x10⁴ cells/well) were cultured in a 48-well plate. Cells were added with different concentrations of TRAM-34 (0.1, 0.5, 1, 5, 10, 50 and 100 μM) at different time periods (24 and 48 hour (h)). The negative control cells have only culture medium. The DMSO control cells was added DMSO (at same amount added dose of TRAM-34). Cells were serum-free starved 16 h before add TRAM-34 or DMSO. The viability of cells were verified using the modification of Mosmann’s method for the MTT colorimetric assay (8). Cells in a 48-well plate was incubated with MTT (Sigma, St Louis, USA) (5 mg/ml) for 3 hours at 37°C. Then the medium was removed and then added 100 μl of DMSO. The samples in a 48-well plate were transferred to a 96-well plate and determined by using spectrophotometry at 570 nm (ELx800, Biotek, Vermont, USA). Three independent experiments (n=3) in triplicate were perform in this study. Results from the experiments reported as mean ± SEM. Statistical analyses were performed using the SPSS software (version 22) and data were analyzed by one-way analysis of variance (ANOVA), followed by Bonferroni post hoc test if equal variances or used Games-Howell if unequal variances. The statistical significant level was considered as p<0.05.

Results and Discussion

The cytotoxicity results showed no significantly differences in cell viability between negative control cells and cells treated with TRAM-34 from 0.1 to 100 μM at 24 h (Fig. 1). The DMSO-control cells at 100 μM in 24 h had significantly lower percent of cell viability than at the concentration of 0, 1, 5 and 10 μM (Fig 2).
**Figure 1** Cytotoxicity of TRAM-34 by MTT method of TRAM-34 treatment at 0 to 100 µM concentrations for 24 and 48 h in CRFK cells

![Cytotoxicity of TRAM-34 by MTT method](image)

*P < 0.05 when compared with control by ANOVA
*P < 0.05 when compared with concentration at 0.1 µM by ANOVA
*P < 0.05 when compared with concentration at 1 µM by ANOVA

**Figure 2** Percent (%) viability by MTT method of CRFK cells at various concentrations of TRAM-34 treatment for 24 and 48 h, compared with DMSO control

![Percent (%) viability by MTT method](image)

*P < 0.05 when compared with control by ANOVA
*P < 0.05 when compared with concentration at 0.1 µM by ANOVA
*P < 0.05 when compared with concentration at 1 µM by ANOVA
*P < 0.05 when compared with concentration at 5 µM by ANOVA
*P < 0.05 when compared with concentration at 10 µM by ANOVA

For 48 h, the results showed no significantly differences in cell viability between negative control cells and cells treated with TRAM-34 from 0.1 to 50 µM at 48 h after treatment. Percent viabilities at 100 µM of TRAM-34 was significantly lower than percent cell viability at 0, 0.1 and 1 µM (Fig. 1, 2). The DMSO-control cells at 100 µM in 48 h had significantly lower percent cell viability than at the concentration of 0, 1 and 5 µM. (Fig. 2). Therefore, a significant reduction of cell surviving was seen started at 100 µM. We found the sub-toxic dose of TRAM-34 in CRFK cells as the concentration 50 µM in 24 and 48 h when compared with negative control cells. DMSO, vehicle of TRAM, increased time and concentration especially in the final concentration at 1 % is toxic to feline kidney cells. The toxic effects also reported previously that at ≥ 4% DMSO significant apoptotic changes in PC12 cells (9), whereas cytotoxic effects were observed in EAhy926 cells with 0.6% DMSO (10). The responses to DMSO were depend on the type of cells. Previously study of TRAM-34 used DMSO as vehicle found no observable toxic effects to cells with DMSO less than 0.1% (7, 11) and 0.5% final concentration (6). In summary, feline kidney cells treated with TRAM-34 from 0.1 to 50 µM concentrations (dissolved in DMSO less than 0.5 % final concentration (v/v)) were not toxic to feline kidney cell lines in 24 and 48 h and can be used to investigate its effect in feline kidney cells in the future.

**Acknowledgements**

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**References**

Successfully of using cryosurgery to treat amelanotic melanoma in a dog

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Keywords: amelanotic melanoma, cancer, cryosurgery, dog

Introduction

Melanoma is one of the most common oral malignancies tumor in the dog (7). Amelanotic melanoma is non-pigmentation granular mass which commonly shows pink instead of black or brown (1,6). The surgical excision of oral tumor is difficult due to it closes many important structures and has limited anatomical space. It also causes severe bleeding, pain and other complications. Cryosurgery is the surgery that uses a very low temperature of liquid nitrogen to destroy abnormal tissue. It could apply to cure benign and malignant tumor (3). It has not been used widely in veterinary compared with electrosurgery. Cryosurgery is useful for treatment of small, superficial, noninvasive lesion, or limitation of regional anatomy. It can be using with lesion near bone or cartilage and alternative treatment for recurrence tumors. Using cryosurgery to control benign and malignant lesion of the lip and oral cavity is effectively by destroy a local lesion and preserve the structure of this area (5). In this study, we describe the using of cryosurgery to treat amelanotic melanoma in a dog which has successfully outcome and had less complication.

Material and methods

An eleven year old male, shi zhu, 7.6 kilogram dog presented with chief complain of since last week ago the dog showed sign of decreasing appetite and found recurrence of the mass in oral cavity. This dog had the history of mass at the lower lip (amelanotic melanoma) that was removed by electrosurgery at five month ago. Physical examination found 1x2 cm with soft consistency and irregular surface at the floor of the left mandible. Thoracic radiography revealed clear lung and no metastatic mass was remark. The incisional mass was performed close to the border of abnormal and normal tissue. Placed cryoprobe (OPTIKON™ Cryo-Line) at the mass border and then intensively frozen the tissue around 15 second for 3 cycles. The extreme cold temperature was tear apart the tumor mass from the mandible and freeze the blood vessels to prevent the further malignant growth. We biopsy the tissue around the mass after cryosurgery to evaluate histopathological change and following the therapies in order to ensure the treatment has been successful and prevent tumor recurrence. The wound were close by using 4-0 polydioxanone ligation. NSAIDs and prophylaxis antibiotic were given to the dog for 7 days post operation.

Result and Discussion

The result of histopathological diagnostic oral mass revealed an amelanotic melanoma. The area around the oral mass shows clear margin after performed cryosurgery. The mass is responsive to complete surgery excision and the using cryosurgery could reduce the risk of tumor recurrence. After the cryosurgery, the dog had good recovery and did not found the swelling of tongue or hypersalivation. The dog gained normal appetite again 3 days after the surgery. Three months of the post-operative follow up by telephone, the owner describe the dog was alert, good appetite, not found hypersalivation and halitosis. Cryosurgery is a therapeutic method applied to treatment of benign and malignant tumor of the skin and mucosa. In previous study (2,3) suggest using histopathology to evaluate the response of tissue after cryotherapy. It can be used to decrease the tumor recurrence risk by induce cell death, vascular collapse and leading to tissue destruction at the surgical removing border (7). It is effective treatment for solid tumors of the oral, perianal, eyelid, skin, and others (7). The cryosurgery technique using cold temperature reduce the number of blood flow and extravascular fluid extraction that result in the dog has no pain and has more comfort after surgery (4) with very low recurrence (3).

In conclusion, we treated the oral mass in dogs with cryosurgery found efficacious result, safe, cost-effective, less complications and lower risk of recurrence. Cryosurgery is the method that can be used as an alternative for the treatment of amelanotic melanoma.
Acknowledgements

The authors want to thank the faculty and staff at the Small Animal Hospital, Chiang Mai University, who supported our data collection efforts.

References

Intra-abdominal *Acinetobacter lwoffii* infection in a dog: case report

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*Corresponding author: alternativechim@gmail.com

**Keywords:** *A.lwoffii*, abscess, gastrointestinal, peritonitis, surgery

A 14 year-old female Terria mixed breed canine, presented with complaint of lateral recumbency, inappetence and abdominal distention associated with a large, firm and painful mass was palpable. Ultra-sonofraphic findings presence of abdominal fluid and radio-graphic image revealed a homogenous soft tissue opacity in the cranial abdomen, obscuring and displacing the normal abdominal structures caudodorsally. This dog was taken to laparotomy, where a mass was found arising from the omentum and performed to remove. *Acinetobacter lwoffii* was identification after surgery from abdominal fluid and pus in mass.

**Introduction**

Bacterial intra-abdominal infections are rare in dogs. The infecting organisms typically reflect normal bowel flora and are a complex mixture of anaerobic and aerobic bacteria, which most frequent isolates are aerobic gram-negative bacilli (eg, *Escherichia coli* and *Klebsiella*) and anaerobes, especially *Bacteroides fragilis* (3).

*A. lwoffii* is a gram-negative aerobic non-fermentation bacilli. This bacteria occurs naturally as seen as a normal flora with colonizes on skin or mucous membrane of healthy human as well those of dogs and cats. In clinical aspect, *A.lwoffii* is an important nosocomial opportunistic infection and cause gastrointestinal disease in a dog in this case.

**Case description**

A 14 year-old, 9.95-kg, female Terria mixed breed canine, presented with complaint of lateral recumbency and abdominal enlargement. The dog was presented of abdominal increasing size over the 2 month to referred. On examination, this dog was depression, tachypnea and a left apical grade IV systolic heart murmur, prolonged CRT, pale membrane, hypothermia, abdominal pain upon palpation of the cranial and distension with negative fluid wave. Abnormal hematologic findings include leukocytosis (43.6×10⁹/L; reference rage [RR], 6-17×10⁹/L) and severe normocytic normochromic anemia (PCV 19%; [RR], 39-56%). Serum biochemistry profiles resulted to increase of BUN (BUN, 105 mg% ; [RR], 10-22 mg%) and hypercreatininimia (creatinine, 2 mg%; [RR], 0.4-1.5 mg%). Urinalysis was unremarkable. Abdominal radiographs revealed a homogenous soft tissue opacity in the cranial abdomen, obscuring and displacing the normal abdominal structures caudodorsally. Ultrasonographic examination of abdomen identified well-defined, lobular within the cranial to mid-caudal abdomen, but it was unclear as to where the mass was arising from. It was taken surgical technique, where a mass was found arising from the omentum of stomach.

**Treatment**

Exploratory and laparotomy were performed and the cranial abdominal cavity was explore. After premedication with 1.1 mg/kg of Xylaxine intramuscular route and 1 mg/kg of Zoletil intravenous route. General anesthesia and maintenance with isoflurane in oxygen, and Ringer’s lactate solution was administered at 5 ml/kg/h during anesthesia. Intraabdominal mass was confirm on abdominal exploration origin. A large mass (about 20×25 cm.) was found with firmly attached to stomach and adhered with omentum. The cytology of this mass found numerous neutrophils and other inflammatory cells with granulomatous rule out of neoplasia or lymphoma. Surgical technique to expose the lesion; first gastrotomy origin mass on stomach, then attach target on omentum. Abdominal fluid was collected to bacterial culture and identification. Abdominal cavity was lavage with NSS. This dog recovered from surgery without complication and was hypothermia for 18 hour after surgery. Postoperative care include antibiotic (Amoxicillin-clavunalic acid 20 mg/kg, sid, SC for 7 day), pain management with non steroidal anti inflammatory drug (Tolfenamic acid 4 mg/kg, sid, SC for 4 day) and continue fluid therapy with Ringer’s lactate in maintainance rate (40 ml/kg/day).
**Clinical relevance**

Intra-abdominal mass was classified as intraperitoneal, retroperitoneal or visceral abscess. This abscess developed by extensive of infection or inflammation resulting from conditions such as appendicitis, diverticulitis, Crohn disease, pancreatitis, pelvic inflammatory disease, or indeed any conditions causing generalized peritonitis. The infecting organisms typically reflect normal bowel flora and are a complex mixture of anaerobic and aerobic bacteria. Most frequent isolates are aerobic gram-negative bacilli and anaerobes due to this case with *A. Iwoffii* is causative agent.

**Reference**

The effects of Oxytocin on semen characteristics and gene expression in epididymis and vas deferens of domestic cats (Felis catus)

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Keywords: cat, oxytocin, sperm

Introduction

Oxytocin acts directly to its receptors along the male reproductive tracts (from seminiferous tubule to vas deferens). The oxytocin also controls the contractility of smooth muscle surrounded the reproductive tracts involving with spermiation and ejaculation (1). Generally, tom cats provide a small number of sperm with little semen volume, while the semen obtained from individual cats are frequently variable (2). Exogenous oxytocin is prone to increase the volume and number of ejaculated sperm in a number of species including rat, rabbit and ram (3, 4). This study aimed specifically at examining semen characteristics and the response of caudal epididymides and vas deferens by mean of gene expression (PTGS and OXTR) following oxytocin administration.

Materials and Methods

The study was performed according to the Chulalongkorn University Animal Care and Use Protocol (accession no. 1531078).

Study 1: To study the response of gene expressions, 5 healthy male cats were castrated. They were anesthetized and one of the testes and spermatic cord was removed. Another testis was castrated after intravenously oxytocin injection for 5 min (Oxytocin®, General Drugs House, Bangkok, Thailand, 10 IU/cat (0.5 ml)). Caudal epididymides and vas deferens were collected, extracted and reverse transcripted to cDNA. Subsequently, the gene expression was studied using the real time RT-PCR technique (ABI PRISM 7300 Real-time cycler, Applied Biosystems, Foster City, CA, USA.) with Luminaris Color HiGreen qPCR Master Mix (Thermo Scientific, Waltham, MA, USA.).

Study 2: To study the effect of semen characteristics, 5 healthy male cats were randomized by cross-over design to allocate the animals between OT group (Oxytocin, 10 IU/cat (0.5 ml), IV) and sham group (Normal saline, 0.5 ml, IV). After 5 min of injection, the semen was collected using an electroejaculator. The technique for semen collection is described elsewhere.

Data (mean±SEM) were analysed with SPSS version 20.0.0 (IBM, Armonk, NY, USA). The Statistical differences were tested using dependent samples Student’s paired t-test (study 2).

Results and Discussion

During anesthesia and oxytocin administration, cats from both of OT and Sham group presented normal vital signs such as heart rate, respiratory rate and blood pressure. The caudal epididymides and vas deferens from OT group presented the positive magnitude of PTGS and OXTR response compared with the sham group. Especially, the OXTR mRNA in vas deferens of OT group was significantly higher level compared with the control group ($p<0.05$). The OT administration also improved sperm concentration upto 2-fold compared with sham group (Table 1) as previous study in some species (3, 4). However, this study indicated that the oxytocin injection did not affect to semen volume, sperm motility and sperm viability suggesting that the oxytocin neither affect the accessory sex glands nor protein composition of seminal plasma. In conclusion, oxytocin administration prior to semen collection improve semen concentration but it did not affect to other sperm parameters.
Table 1 semen characteristics of Sham and OT group in cats.

<table>
<thead>
<tr>
<th>Group</th>
<th>Vol. (μl)</th>
<th>Conc. (x10⁶ spz/ml)</th>
<th>Motility (%)</th>
<th>Viability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sham</td>
<td>36.54±8.28 a</td>
<td>1863.0±344.2 a</td>
<td>88.1±3.3 a</td>
<td>88.2±1.4 a</td>
</tr>
<tr>
<td>OT</td>
<td>41.85±10.02 a</td>
<td>3841.1±732.6 b</td>
<td>87.6±1.9 a</td>
<td>85.4±2.4 a</td>
</tr>
</tbody>
</table>

^a^b different superscripts within the same column indicate values that are significantly different (p<0.05)

Acknowledgements
This work was financially supported by the Biology of Embryo and Stem cell Research in Veterinary Science Research Group (GSTAR 59-007-31-005), Chulalongkorn University.

References
The effects of PCSO-524 extract on vital signs, complete blood count, and blood chemistry in clinically-healthy normal cats

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Keywords: PCSO-524, completed blood count, blood chemistry, adverse effects, cats

Introduction

Chronic pain is commonly caused by degenerative joint disease, which is underdiagnosed in cats. PCSO-524 is an extract of Perna canaliculus, a known source of n-3 polysaturated fatty acids (PUFAs) with anti-inflammatory properties. Lipids extracted from the New Zealand green-lipped mussel (NZGLM) contain a complex mixture of mainly phospholipids (PL, 57–79%), triglycerides (TG, 10–25%), free fatty acids (FFA, 7–12%) and sterols (ST, 12–18%) (1). The total content of fatty acids (FA) contained in the Perna canaliculus lipid extract was 0.664 g/ml. The n-3 and n-6 PUFAs found in this lipid extract were EPA (20:5n-3) and DHA (22:6n-3), the two main n-3 PUFAs at low concentrations, stearidonic acid (SA, 18:4n-3), arachidonic acid (AA, 20:4n-6), a-linolenic acid (ALA, 18:3n-3), docosapentaenoic acid (DPA, 22:5n-3), heneicosapentaenoic acid (HPA, 21:5n-3) and some others in levels less than 0.50% (2). PCSO-524 is a source of n-3 polysaturated fatty acids with anti-inflammatory properties commonly used to treat osteoarthritis in human beings and dogs. The purpose of this study was to study the effects of PCSO-524 extract on vital signs, complete blood count, and blood chemistry in clinically-healthy normal cats.

Materials and Methods

Mixed breeds cats, aged 1 to 5 years, with body weights of 3 to 5 kg were studied. These cats were examined by a veterinarian and determined to be in good physical health and were divided into three groups (n=7); administered 1x the recommended maximum label dose, 2x the recommended maximum label dose (four soft gel capsules per day) and 3x the recommended maximum label dose (six soft gel capsules per day), with daily food for 28 days. They were acclimatized for 4 weeks before the beginning of the study. The animal caretaker provided basic husbandry to the cats (e.g., feeding and cleaning of litter boxes). Cats were fed with commercial dry adult cat food once a day and given fresh water ad libitum. Cages and litter boxes were cleaned at least once daily. Cats were allowed to run freely for at least 10 to 15 min per day while their cages were cleaned and were returned to their cages afterward. Individual feline health and physical examinations, including vital signs, ocular, nervous, musculoskeletal, and integumentary systems, were conducted. Signs of illness and behavioral changes were recorded, as were changes in hematology and blood chemistry values. Food and water consumption, and body weight were measured every day. The study was approved by the Chulalongkorn University Animal Care and Use Committee (IACUC).

Results and Discussion

No abnormality of the ocular, nervous or musculoskeletal systems was observed. The integumentary system appeared to be softer and shinier. No signs of illness or behavioral changes were observed, and there were no statistical differences in body weight, body temperature or other vital signs at any time point. All cats appeared to demonstrate regular food intake and activity. Complete blood count (CBC) and blood chemistry results were within the normal reference range. Creatinine levels on day 14 and 28 in one tablet per day were significantly lowered than day 0. However, at the dose of six capsules per day (three times the normal recommended dose in humans), the feline blood samples revealed lipemia. This resolved 108 days after cessation of PCSO-524 administration (Table 1).

The results of this study demonstrate that CBC and blood chemistry levels were within the normal reference ranges among clinically healthy normal cats administered two to four capsules of PCSO-524 per day for 28 days. At a dose of six capsules per day, feline blood samples revealed lipemia, which may have been due to the fact that PCSO-524 comprises triglycerides (TG, 10-25%), free fatty
acids (FFA, 7-12%) and sterols (ST, 12-18%) (1). Supplementation of PCSO-524 at two to four capsules per day for 28 days in clinically healthy normal cats has no adverse effects. Further study is needed to investigate the role of PCSO-524 in geriatric cats with DJD and other degenerative diseases in the future.

Acknowledgements

The PCSO-524 were supported by Pharmalink International Company Ltd. The author would like to thank Miss Kanokgarn Chaiyasup, Watinee Saowiang, Sirikarn Saetae, and Arisa Tatongjai for their help in the study.

Table 1 Complete blood count and blood chemistry levels in cats receiving one tablet of PCSO-524 twice per day on days 0, 14 and 28 of treatment

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal Value</th>
<th>Day 0</th>
<th>Day 14</th>
<th>Day 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT (SGPT) units</td>
<td>30-80</td>
<td>53 ± 3.91</td>
<td>ND</td>
<td>50.57 ± 5.26</td>
</tr>
<tr>
<td>Alk. phosphatase units</td>
<td>9-42</td>
<td>26.66 ± 3.65</td>
<td>ND</td>
<td>39.07 ± 9.78</td>
</tr>
<tr>
<td>BUN mg%</td>
<td>15-35</td>
<td>25.33 ± 0.74</td>
<td>ND</td>
<td>24.33 ± 0.59</td>
</tr>
<tr>
<td>Creatinine mg%</td>
<td>0.8-1.8</td>
<td>1.43 ± 0.14</td>
<td>1.07 ± 0.14†</td>
<td>1.16 ± 0.2†</td>
</tr>
<tr>
<td>Cholesterol mg/dl</td>
<td>95-130</td>
<td>110.86 ± 12.46</td>
<td>ND</td>
<td>113.86 ± 10.66</td>
</tr>
<tr>
<td>Triglycerides mg/dl</td>
<td>20-100</td>
<td>ND</td>
<td>ND</td>
<td>84.29 ± 13.62</td>
</tr>
</tbody>
</table>

Kaneko et al., 1997; ND = not determined
† p<0.05 when compared between day 0 and day 28 of treatment
‡ p<0.01 when compared between day 0 and day 14 of treatment

Table 2 Complete blood count and blood chemistry levels in cats receiving two tablets of PCSO-524 twice per day on days 0, 14 and 28 of treatment

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal Value</th>
<th>Day 0</th>
<th>Day 14</th>
<th>Day 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST (SGOT) units</td>
<td>10-59</td>
<td>19.26 ± 4.45</td>
<td>23.2 ± 4.04</td>
<td>25.2 ± 4.76</td>
</tr>
<tr>
<td>ALT (SGPT) units</td>
<td>30-80</td>
<td>15.64 ± 3.28</td>
<td>26.96 ± 5.87</td>
<td>23.8 ± 6.93</td>
</tr>
<tr>
<td>Alk. phosphatase units</td>
<td>9-42</td>
<td>45.22 ± 12.87</td>
<td>53.76 ± 19.53</td>
<td>44.66 ± 6.34</td>
</tr>
<tr>
<td>BUN mg%</td>
<td>15-35</td>
<td>25.74 ± 1.01</td>
<td>24.32 ± 1.65</td>
<td>23.7 ± 1.09</td>
</tr>
<tr>
<td>Creatinine mg%</td>
<td>0.8-1.8</td>
<td>1.6 ± 0.21</td>
<td>1.46 ± 0.12</td>
<td>1.54 ± 0.09</td>
</tr>
<tr>
<td>Cholesterol mg/dl</td>
<td>95-130</td>
<td>116.6 ± 13.06</td>
<td>121 ± 8.22</td>
<td>121 ± 7.48</td>
</tr>
<tr>
<td>Triglycerides mg/dl</td>
<td>20-100</td>
<td>72.6 ± 14.01</td>
<td>76 ± 14.11</td>
<td>78.2 ± 18.53</td>
</tr>
</tbody>
</table>

Kaneko et al., 1997.

References

Hepatic vascular hamartoma in cat: case report

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Keywords: vascular hamartoma, liver

Introduction

Hamartoma is a benign tumor-like lesion occurring on any organ, but it seems to represent a congenital, localized and abnormality of development. The clinical signs were variable depend on location (1). The hepatic vascular hamartoma diagnosed in the case with localized proliferation of mature blood vessels with in normal hepatic parenchyma, however, some of hamartoma has not any harmful to the patient (2). The prevalence of hepatic hamartoma in feline population was unknown, because of the absence of case reports, considered it extremely rare.

Case background

A 6 months old stray Thai breed cat, which name is Tigger, came to Prasu-Arthorn Animal Hospital with depress, anorexia, vomit and abdominal distention. From history taking, the owner fed this cat for 3 months, complete vaccination and deworming. The cat vomited 2 times a day and vomitus was undigested food. The general appearance was depress, normal vital sign and 2/5 on body condition score. The cat had slightly pale mucous membrane, 7% dehydration, and abdominal enlargement with no cramp on physical examination. The fecal test results were cocci-shape bacteria 2+ with a few rod-shape bacteria in feces. SNAP FIV/FeLV Combo Test (IDEXX Laboratories Inc., United States) was negative. Radiographic finding revealed moderate gas in stomach. CBC showed thrombocytopenia hyperproteinemia and Rouleaux formation on blood smear. Abnormality of serum biochemistry was azotemia. Ultrasonography and exploratory surgery were performed. Ultrasonography revealed hepatic cyst (Figure1). Exploratory surgery presented the retroperitoneum and visceral organs edema and covered with fibrin was observed (Figure2). The hepatic cyst and mesenteric lymph node were surgical biopsy. Histopathological finding of hepatic cyst revealed a vascular hamartoma (Figure3). The virus infection was suspected from histopathological finding of the lymph node.

Discussion

A hamartoma was an excessive and unorganized growth of normal cells and associated tissues that were in the organ which they occurred. It was considered to be congenital malformation (3). The majority of hamartoma was diagnosed in young patients, often before onset of skeletal maturity (4-6). Hamartoma may occur as an accidental finding. Vascular hamartoma had clinical sign secondary to spontaneous hemorrhage, mass effect or adherence to adjacent tissues (3). Previous reports of hamartoma in various species, where they were reported involve many tissue types. One case reported mesenchymal hamartoma in human showed the same history of vomit and abdominal distension. On physical examination a large, painless abdominal mass was noted (1). The lesion also appeared cyst of variable size same as this case.

Figure1. Abdominal ultrasonography finding: two hepatic cysts at right lateral lobe.

The histopathology of the hepatic vascular hamartoma was composed of numerous vascular structures (2). Some abnormal large arteries were characterized by a small and tortuous lumen with a vascular space lined by a layer of endothelial cells. Some vessels were filled with blood (7). This pathological examination was a final diagnosis.
Figure 2. The retroperitoneum and visceral organs edema and were covered with fibrin especially intestine (arrow).

Total surgical resection of liver lobe which has lesion is recommended for treatment. Most case in human prognosis was excellent (1). There were no reported cases of recurrence. Mortality was related to surgical complication (8). In this case, we couldn’t assess the treatment effective because the cat was died. The success of surgical resection of liver lobe of hepatic vascular hamartoma in cat was unknown due to less report of this disease in cat. The hepatic vascular hamartoma may not a cause of death. In this case, feline infectious peritonitis (FIP) was suspected.

In conclusion, vascular hamartoma is a developmental anomaly rather than a neoplasm. The abnormal growth causes problems due to adherence to adjacent tissue and secondary compression (9). Hepatic vascular hamartoma in cat is a rare. However, it is important to recognize them as a differential diagnosis for hepatic cysts in cat. The surgical resection may by a viable treatment option with an excellent prognosis in the long term.

Reference
Ciliary adenocarcinoma in a dog

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Keywords: adenocarcinoma, anterior chamber, ciliary body

Introduction

Primary ocular neoplasia is rare in domestic animal. A recent study of 3,496 intraocular and optic nerve neoplasia cases exhibited incidence of iridociliary adenocarcinoma around 4.4% (1). Iridociliary adenocarcinomas are characterized with clinical appearances of non-pigmented to lightly pigmented pink masses that may protrude into the pupillary aperture and displace the iris face anteriorly (2). Common clinical signs including uveitis, dyscoria, lens subluxation, cataract, and retinal detachment, and secondary glaucoma (3). Prognosis for survival is good in patients who underwent enucleated promptly (4).

This present report showed a case of ciliary adenocarcinoma in Shih Tzu as a primary ocular tumor in ciliary body with no metastasis.

Materials and methods

Case background

A 7-year old, Shih Tzu, body weight 7.4 kg presented at a animal Hospital with the ophthalmic concerns. Physical examination revealed remarkable signs and symptoms on both eyes during the examination: irritation, perilimbal hyperemia, and a pink mass at the anterior chamber of the left eye (Figure 1). The clinical symptoms have been observed about 2 weeks, while the mass within a left eye was visible 2 months ago.

Ophthalmic examination & diagnosis

Besides a pink intraocular mass at anterior chamber, examination of both eyes displayed positive palpebral reflex, pupillary light reflex (PLR), direct and indirect menace response. Conjunctiva had mild hyperemia but normal corneal appearance. Fluorescein staining was negative on both eyes. Schirmer tear test (STT) indicated 20 mm/min (left eye) and 8 mm/min (right eye). Intraocular pressure (I.O.P) was determined 15 mmHg (right eye) and 17 mmHg (left eye). According to those evidences, the dog was primarily diagnosed that encountered to keratoconjunctivitis sicca (KCS) with a mass at anterior chamber at left eye.

For further diagnosis, samples from an anterior chamber mass were collected using fine needle aspiration (FNA) technique. Cytological findings indicated squamous cell carcinoma was suspected. Therefore, removal of left globe with mass biopsy was recommended by the pathologist.

Treatment

A technique of transconjunctival enucleation (left eye) was performed under general anesthesia. According to sample collection, interestingly, an intraocular mass also invaded behind iris. Surgical wound was treated routinely until suture removal. Later, the remained right eye was further treated for KCS.

Results and Discussion

Microscopic examination of the mass revealed cuboidal to columnar cells with round to ovoid vesicular nuclei and moderate amounts of cytoplasm. In addition, tumor cells arranged in either papillary, tubular, glandular, or rosette-like formations and palisading phenomenal also presented (Figure 2.). Finally, ciliary adenocarcinoma was diagnosed.
Currently, a clinical guideline for anterior uveal tumor treatment in veterinary has not been clearly established. In iridociliary adenocarcinomas surgical excision or evisceration carries the risk of recurrence so enucleation is both diagnostic and most reliably curative in cases (5). Although prognosis for ciliary body adenocarcinomas treatment by enucleation is good and metastasis is rare (1), a follow up program has been managed in every 3 month by thoracic radiograph.

**Acknowledgements**

The authors would like to thanks Dr. Ruangrat Buddhirongawat for tumor surgical removal and case consultation. We also appreciates staff in surgery department, Prasu - Arthorn Animal Hospital, Faculty of Veterinary Science, Mahidol University for assistance and providing necessary facilities for our study.

**Reference**

The first case report: canine intranasal malignant melanoma in Thailand

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Keywords: canine, melanoma, malignant melanoma, nasal cavity

Introduction

Intranasal tumours are rare tumours that accounted for around 1% to 2% of all canine tumours (1). More specifically, canine intranasal malignant melanoma is a very rare tumour that has been described in a few reports in the veterinary literature. Although melanoma is a relatively common tumour of dogs, the most common locations are oral mucosa and the haired skin. Canine oral melanomas behave by a malignant manner while haired skin melanoma behave by a benign manner. From this extremely diverse biological behaviours, the melanomas originated from the mucosa tends to be a malignant melanoma (2). The purpose of this report is to describe the clinical presentation, diagnostic protocols, and response to surgical treatment as the first case of an intranasal malignant melanoma found in Thailand.

Materials and Methods

“Bazenji” a 14-year-old, castrated-male, mixed-breed, 23 kg dog, presented at the Small Animal Hospital Chiang Mai University with an intermittent unilateral epistaxis (the right nostril) for 1 month. Physical examination revealed a black single irregular mass in the right nasal cavity (Fig. 1a). The dog was bright, alert and responsive, but presented with a clinical sign of constantly rubbing his nose due to irritation. There was no detectable enlargement of regional lymph nodes from palpation. Blood profiles (complete blood count and serum biochemistry panel), urinalysis, and buccal mucosal bleeding time were normal. A systolic blood pressure was 120 mmHg. Radiographic finding indicated no evidences of lung metastasis. Abdominal ultrasound was done as well and no abnormalities were noted. The cytology from Fine Needle Aspiration suggested that the mass is possibly melanoma. As a results, the stage of tumour was classified as T2N0M0 (stage II) according to the World Health Organization (WHO) staging system for Canine oral melanoma (3). The primary treatment was a local tumour control with surgical excision (3).

The dog underwent general anesthetic protocol with premedication with diazepam (0.25 mg/kg IV) and morphine (0.5 mg/kg IM), induction with propofol (to effect IV), and maintenance with isoflurane. Surgical excision was done with a 1 cm margin of normal tissue. The wound was left to be healed by secondary intention. The resected mass was then collected in 10% formalin solution for histopathology. After operation, the dog was treated with antibiotic (Cephalexin at a dose of 25 mg/kg, twice daily for a week) and pain killer (Firocoxib 5 mg/kg, twice daily for 4 days).

Results and Discussion

The histopathology of the tissue section was confirmed as a malignant melanoma (Fig. 2). A recurrence mass was diagnosed at the same site at 1 month after the first surgery (Fig. 1b). The second surgery was performed and also confirmed as malignant melanoma. So the dog was referred to do Computed Tomography (CT) scan to plan for radiotherapy. The imaging revealed a soft tissue mass causing nasal turbinate bone lysis in the right nasal cavity and lung metastasis (Fig. 3).

Thus, the owner decided to treat him with palliative care by acupuncture and homemade diet with immune supplement such as fish oil, vitamin C, folic acid, Transfer factor®. The dog died with neurologic problem and pulmonary metastasis 5 months after initial diagnosis of the intranasal malignant melanoma. The necropsy found several distant organs metastasis (Fig. 4). In the view of rare tumour, this dog had good quality of life.

The clinical signs of Bazenji were similar to previous report of the canine intranasal malignant melanoma (4). However, there is a difference to Hicks and Fidel report that no oral malignant melanoma occurred in this case. Thus, this case possibly has an intranasal malignant melanoma as a primary tumour. This supports that the intranasal malignant melanoma is an aggressive tumour that
various therapeutic approaches such as surgery, chemotherapy and radiotherapy are unable to be curative after metastasis.

Acknowledgements

I would like to thank our beloved Bazenji and all people who love and take care of him. The staffs from small animal hospital, faculty of Veterinary Science, Chulalongkorn University and Chiang Mai University, for their help and encouragement.

References


Figure 1. The appearance of a 14-year-old dog with intranasal malignant melanoma before surgery (a) and recurrence 1 month after surgery (b).

Figure 2. Histological tissue section of intranasal malignant melanoma. The figure showed well-circumscribe mass composed of numerous atypical melanocytes arranged in small nested to solid pattern. The cells were round to ovoid with small basophillic nuclei, pale eosinophillic cytoplasm and abundant intracytoplasmic brown black melanin pigments (H&E stain, Original magnification x100 and x400)

Figure 3. A Computed Tomography (CT) image of a sagittal section (a), a transverse section (b) and a dorsal plane section (c) of a dog with intranasal malignant melanoma. The arrow is pointing to the right side of the nasal cavity which has suffered from destruction of turbinates bone and the mass that appears the same shade of grey as the soft tissues of the dog’s head. A a transverse section of the same dog at the level of the lung (d) demonstrating the lung nodule was detected.

Figure 4. Gross appearance of canine intranasal malignant melanoma (a) with several distant metastasis. Brain metastasis (b). Pulmonary metastasis (c). Cardiac metastasis (d). Splenic metastasis (e).