

Editorial board

Chief Editor : Dr. Jambay Dorji, DCVO
Email- jambayd@moaf.gov.bt

Data manager : Ludup Pelmo, Admin Asst.-II
Email- ludup.pelmo@gmail.com

Contributors:

- Veterinary clinical services data – Dr. Jambay Dorji & Ludup Pelmo
- Laboratory report – Kinzang, Punya, Pema Tshomo & Dr. Jambay Dorji
- Medicine usage – Sonam Zangmo
- ADR & AEFV case reports (2020-2021) in veterinary field – Dr. Meena Devi Samal & Tshering Yangchen
- Budget usage - Tula Maya Sharma
- Critical veterinary services provided during lockdown 2.0 – Dr. Pema Tshewang
- Client satisfaction rate survey – Dr. Pema Tshewang
- Virtual training of Veterinarians on Ultrasound machine operation – Dr. Jambay Dorji
- Training on General examination of animals and prescription writing for Paraveterinary professionals of NVH – Dr. Jambay Dorji
- Remote monitoring of pet registration services in veterinary hospitals – Dr. Jambay Dorji
- Block week visit by CNR – Dr. Jambay Dorji
- Case studies - Respective authors

Compiled and Edited by Dr. Jambay Dorji

1. Foreword



Veterinary Clinical services is considered as an essential animal health services and although the past two years has been affected by the COVID19 pandemic, NVH has ensured that the Veterinary clinical services were provided to the clients continuously. It was evident especially during the two lockdowns in Thimphu.

Like most of the government agencies, NVH had to re-prioritize its activities since the budget allocation received was very minimal in 2020-21. Despite the inadequate financial support and various other restrictions, we have managed to provide efficient services as mandated.

I am particularly delighted with the procurement and installation of important diagnostic equipment such as Digital X-ray, Doppler Ultrasonography and Blood analyzer machine. We also managed to procure an endoscopy machine for pet animals. This has further strengthened our diagnostic capacity and the demand for advanced services can now be met to some extent which will to bolster our image. NVH can now function as Referral center in true sense owing to the clinical expertise and advanced services that can only be provided at NVH.

The expected training requirement for these sophisticated equipment could not be realized due to closure of borders. We will have to explore and resort to remote/ online trainings henceforth, given the uncertainties over international travel and quarantining requirements. NVH will prioritize and give due importance to the continuing professional development of its technical staff since the services that we provide keep evolving with time and therefore, it is paramount that we keep ourselves updated with the new scientific knowledge and skills.

We are seeing a positive shift in Veterinary clinical services in the country and it will only be a matter of time when we can compete with international level standards in our service delivery. It is our collective dream and we should work tirelessly to achieve our goals. I am most satisfied with the achievements that we make year in and year out and once again, I write this to convey my heartfelt congratulations to the team of dedicated professionals and other support staff for their sincere efforts. We should take pride in our work and further strive to improve it. I wish everyone for a more fruitful deliverance and achievement for 2021-22.

A handwritten signature in blue ink, consisting of a stylized 'A' followed by a large loop and a horizontal line extending to the right.

(Dr. Kinley Dorji)

2. Executive summary

The financial year 2020-21 was a successful year where we were able to achieve almost all the targets set in our annual performance agreement (APA) despite numerous challenges posed by the pandemic. Even during the two nationwide lockdowns, NVH continued to provide emergency services to the public. During the second lockdown, a total of 435 cases were attended out of which 402 were attended at the hospital and 33 were attended outside the hospital.

The total number of cases (new as well as repeat) received at NVH in 2020-21 was 11,815. 56% of the cases were attended during regular hours while 42% were attended during off hours and only 2% were attended beyond regular and off hours. Only nine cases were referred from other hospitals. The animals were presented with various disorders and digestive disorders were reported the maximum followed by musculoskeletal and skin affections respectively. The least number of cases were affections related to the urinary system followed by poisoning. A total of 129 surgical cases were reported. Fracture cases were recorded the highest followed by cherry eye and cut wound and C-section was recorded the lowest. Specialized services such as bone pinning and dental scaling were also provided to patients.

NVH sterilized 490 animals mostly dogs and cats. In dogs and cats, highest number of female animals is sterilized in comparison to male population and 87% of them are pets. In other animals only castration was performed in four bulls, five goats and a horse. A total of 77 pet dogs and cats were given contraceptive treatment and the usage has increased from the previous fiscal year.

A total of 3298 pets were vaccinated with Anti-Rabies vaccine of which 2,603 were dogs and 695 were cats. Unlike in dogs, re-vaccination in cats is not commonly practiced. A total of 2118 pet dogs were also vaccinated with DHPPi + L vaccines. Besides pets, poultry birds belonging to the Royal family were vaccinated against Marek and Newcastle diseases and four horse received rabies and tetanus vaccine. A total of 4751 animals were dewormed of which 2331 were dogs and 773 were cats.

During FY 2020-21, a total of 1685 pets were registered at this hospital, out of which 1137 were dogs and 548 were cats. Out of the total registered pets, 31 were for Royal pets while 1685 were for public. The total revenue generated from pet registration amounts to Nu 137,000.

Under diagnostic services, ultrasonography services were provided to 230 animals of which 199 were dogs and 31 were cats with an average turn around time (TAT) of 11 minutes per animal. Ultrasonography was mostly used for pregnancy diagnosis. The veterinarians and

Paraveterinarians received training on installation and operation of ultrasound machine Z-5 Vet. The x-Ray machine which was procured in the last financial year was also installed and is under operation. Radiologist from JDWNRH provided assistance in installation as well as provided basic training on operation of the machine to the staff. The laboratory service unit (LSU) received 1,268 samples were collected/received and performed 6643 tests. 166 samples were referred to NCAH for fungal and bacterial culture and identification, and antibiotic sensitivity test (ABST), histopathology and post mortem examinations.

The budget ceiling for medicine for the FY 2020-21 was Nu. 488,000 but medicines amounting to Nu. 657,699 were received from LCS, Phuntsholing. The increase in the amount is due to additional requirement of medicines which were arranged through emergency requisition since the budget allocated to this hospital was found inadequate. Additionally, medicines amounting Nu. 70,000 were procured for Royal use. A total quantity of 520 medicines were issued to Thimphu DVH, DPM program, Jangsa animal shelter, NPBC and BLDCL upon requisition.

The client satisfaction rate (CSR) for NVH was calculated at 85% 86.4% which is lower than the previous year (86.4%). The highest rating this year was for Q2 (Professionalism) and Q3 (facilities). Lowest rating was for Q5 (waiting time). The longer waiting time could be attributed to increasing number of cases each year coupled with inadequate staff to provide prompt services.

For the FY 2020-21, a total of Nu. 15.427 million was approved for NVH, which decreased by 46.3% when compared to previous fiscal year (28.702 million). The budget utilization percentage was 98.5% which is an improvement from the previous year at 97.6%.

3. Table of Contents

1. Foreword.....	3
2. Executive summary	4
4. Background.....	8
Mission.....	8
Vision.....	8
Mandates	8
Organogram	9
Human Resources	10
Working hours	10
5. Veterinary Clinical Services	12
Clinical cases	13
Surgical Cases.....	15
Sterilization	16
Vaccination	17
Deworming	18
Pet Registration.....	19
Diagnostic Services.....	20
Clinical Diagnostics	20
Laboratory Diagnostics	22
Medicine utilization	25
ADR & AEFV case reports (2020-2021) in veterinary field	27
Budget Utilization.....	29
6. Critical veterinary services provided during lockdown 2.0.....	30
7. Client Satisfaction Rate survey.....	36
8. Training report on Ultrasound machine Z-5 Vet installation at NVH.....	39
9. Training on General examination of animals and prescription writing.....	40
10. Report on Monitoring of pet registration services in Veterinary Hospitals (VHs)	42
11. Block week visit by CNR students.....	47
12. Case Studies	48

VETERINARIAN'S OATH!

Being admitted to the profession of veterinary medicine,

I solemnly swear

to use my scientific knowledge and skills

for the benefit of society

through the protection of animal health and welfare,

the prevention and relief of animal suffering,

the conservation of animal resources,

the promotion of public health,

and the advancement of medical knowledge.

I will practice my profession conscientiously,

with dignity,

and in keeping with the principles of veterinary medical ethics.

I accept as a lifelong obligation

the continual improvement

of my professional knowledge and competence.

4. Background

Animal health is one of the important support services under the Department of Livestock. Animal health services include clinical veterinary services, supply of veterinary medicines, vaccines, equipment, and diagnostic services. The veterinary clinical services are being provided through a network of animal health facilities such as the National Veterinary Hospital (NVH), Thromde Veterinary Hospitals (TVH), four Regional Livestock Development Centres (RLDC), 20 Dzongkhag Veterinary Hospitals (DVH) and 196 Livestock extension centres (LEC/RNR-EC).

Since the first establishment of animal health services in the early 1960s, we have come a long way, and made tremendous progress, both in terms of infrastructure and human resource capacities. Over the years, the sole focus on treatment of animals has slowly shifted to the overall development of animal health sector in the country through strengthening of Veterinary Clinical Services. The animal health component complements the animal production, which is one of the important contributors to the country's socioeconomic development through income generation and food self-sufficiency. Animal health (along with nutrition and management) is directly linked to the productivity of the animals and the animal health in turn rely on the quality of the veterinary clinical services.

NVH is the referral center and lead agency for veterinary clinical services in the country and therefore, plays a major role in delivery and development of efficient veterinary clinical services in the country.

Mission

Provide high quality and efficient veterinary clinical services to improve animal health and welfare.

Vision

Function as a model Veterinary Institution in providing state of the art Clinical Veterinary Services in the region.

Mandates

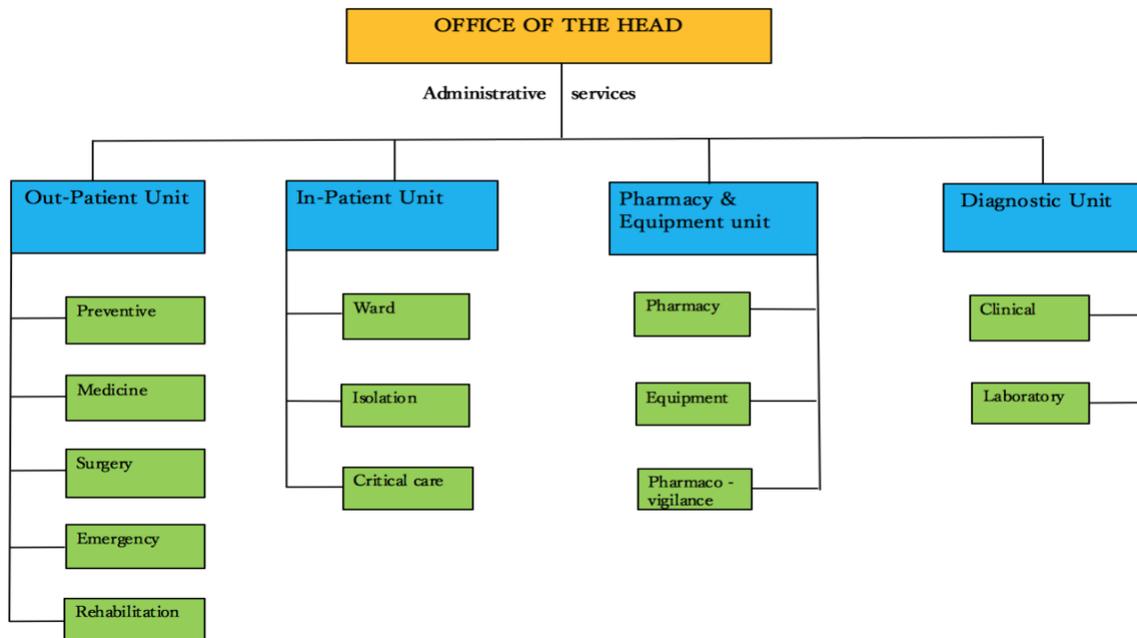
- Provide high quality clinical veterinary services.
- Function as a national referral hospital for clinical veterinary services in the country.
- Function as an institute for capacity development in clinical veterinary services.
- Plan, coordinate, monitor and evaluate clinical veterinary services in the country.
- Support development of policies, strategies and plans for animal health.
- Support research on animal health.
- Act as pharmaco-vigilance centre for veterinary clinical services.

Veterinary Clinical Services

Various veterinary clinical services provided by NVH (but not limited to) are as follows:

- Consultation/ Treatment of sick animals
- Surgical interventions
- Sterilization
- Deworming
- Vaccination
- Registration of pet dogs and cats
- Referral services
- Technical backstopping on clinical veterinary services
- Issue of health certificates for pets
- Rescue and treatment (both domestic as well as wild animals) in collaboration with relevant stakeholders

Organogram



There are four Units; Out-Patient, In-Patient, Pharmacy and Equipment and Diagnostic. These units are further divided into 13 Sections. The new organogram is aimed at delineating various services under these sections and to delegate clear job responsibilities for efficient service delivery. Out of the 13 sections, the Critical care section has not been operational due to lack of advanced equipment that are needed for the purpose of critical care.

Human Resources

NVH has five Veterinarians, ten Para-veterinary professionals/ Animal Health Supervisors, three Assistant Laboratory Technicians and nine Non-technical staff. The non-technical staff comprise of a Senior Administrative Assistant and an Administrative Assistant/ Data manager. Rest of the support staff are six ESPs/ Animal attendants, one GSP and two drivers. One new staff (1 Paravet) joined NVH and two staff left NVH during 2020-21.

Details of Staff who joined and left NVH in 2020-2021

Sl. No.	Name of staff	Designation	Remarks
1.	Tshering Duba	LHS	Transfer from Wangdue Dzongkhag
3	Gembo Tshering	Sr. LHS	Superannuation
2.	Ugyen Phuntsho	Driver	Resignation

Working hours

The National Veterinary Hospital provides regular services from 9am till 3pm during weekdays (Monday to Friday) and 9am till 1pm during Saturdays. During the weekdays and Saturdays, a para-veterinarian attends to the cases till 8pm and 5pm respectively after normal hours. During Sundays and government holidays, two Para-veterinarians provide off-hours services from 9am till 3pm. A veterinarian is called on duty when para-veterinarians are unable to handle the emergency cases. For any emergency cases beyond the given times, emergency cases are attended 24 X 7. However, the hospital is planning to provide 24 hours' services in the future.

Sl. No	Day	Time	Off- hours	Emergency
1	Monday to Friday	9am-3pm	3-8pm	24 hrs. on call
2	Saturday	9am-1pm	1-5pm	
3	Sunday & government holidays	9am-3pm		

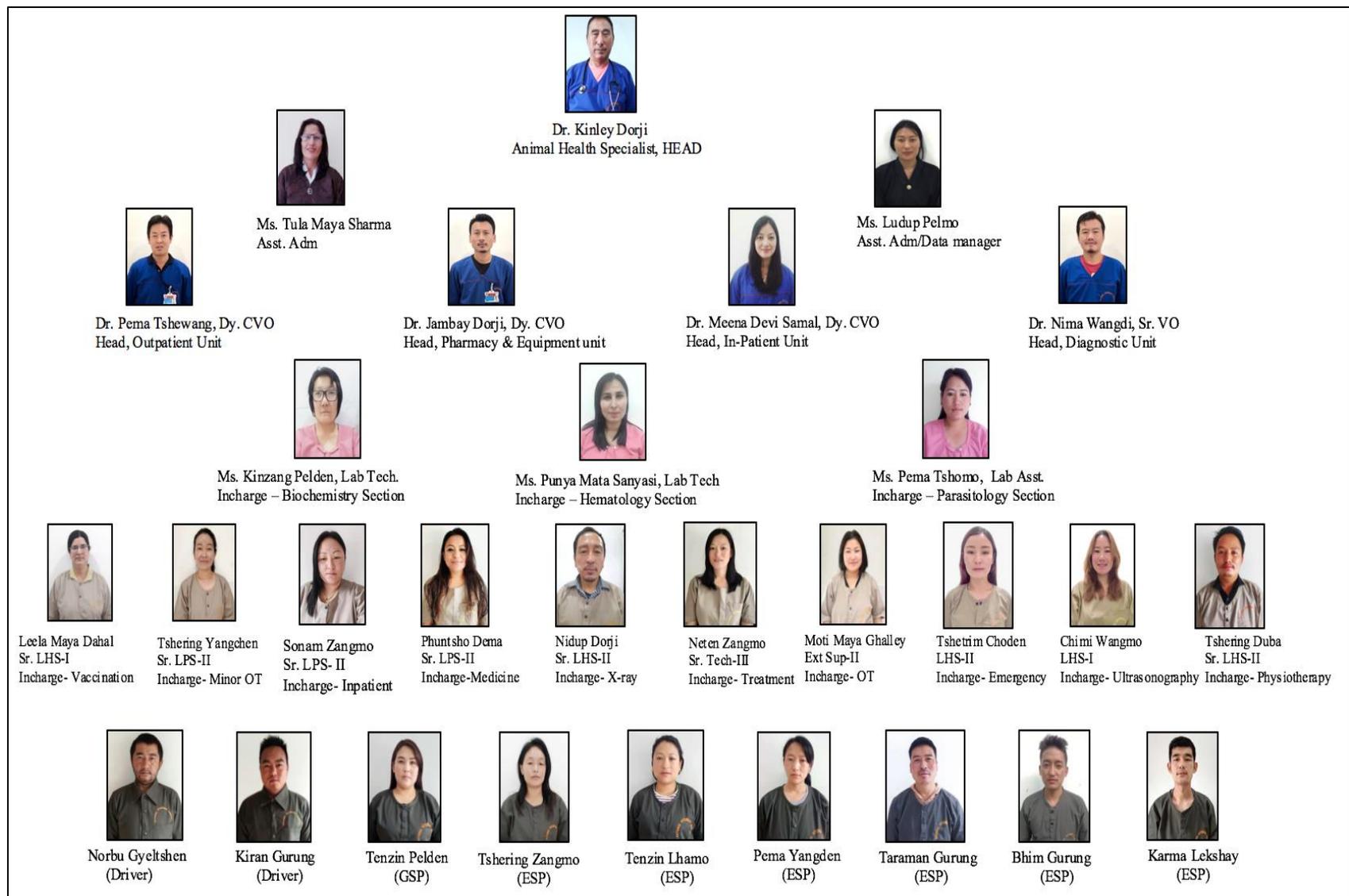


Fig: Staff details with designation and job responsibilities

5. Veterinary Clinical Services

The primary veterinary clinical services provided by NVH are Deworming, Vaccination, Consultation and Treatment, Surgeries including sterilization and pet registration. The diagnostic services are provided through both laboratory and radio-imaging modes. Additionally, NVH also provides rehabilitation services for paraplegic animals with the help of radio/ light/ heat therapy and treadmill. Pet registration and vaccination services are provided during normal working hours only while sterilization services are provided during Tuesdays and Fridays based on the appointment system. Rests of the services are provided during both regular and off-hours.

The total number of cases (new as well as repeat) received at NVH in 2019-20 was **11,815**, which has decreased by 42.9% when compared with previous fiscal year (20,684). The drop in the number of cases could be due to enforcement of two lockdowns in the capital whereby the services were limited to only emergency cases.

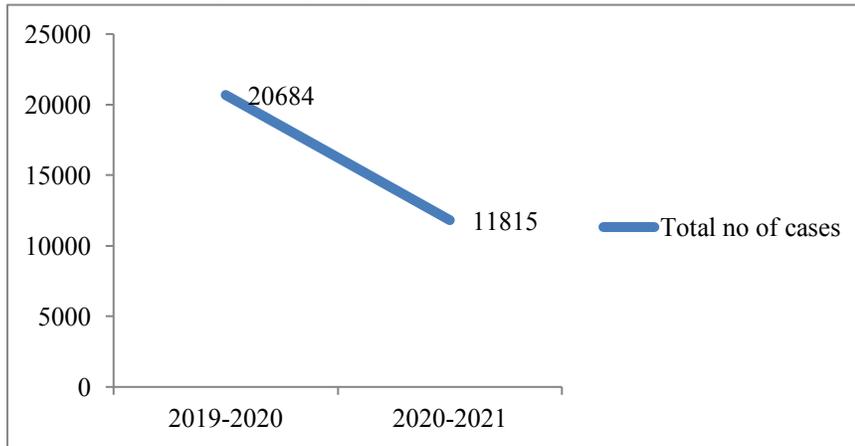
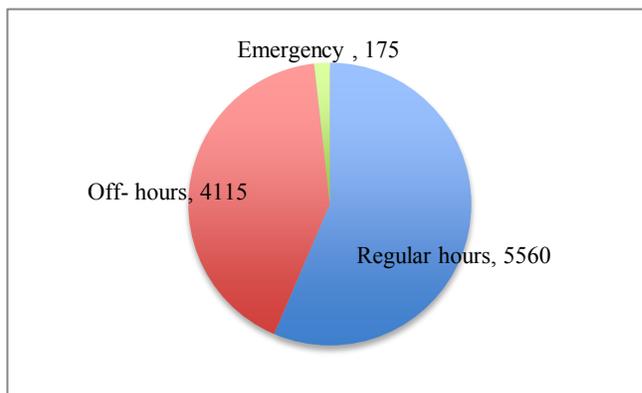


Figure 1: Comparison in the number of cases between FY 2019-20 and FY 2020-21.

56% of the cases were attended during regular hours while 42% were attended during off hours and only 2% were attended beyond regular and off hours.



Types of cases	Numbers
Referral cases	9
Outdoor cases	316
Royal cases	381

Table 1: Royal, out-door and referral cases

Figure 2: Various cases attended during different time schedule

Clinical cases

A total of **5,942** new cases were brought to NVH in 2019-20. The **5,873** registered cases were the repeat/ follow up records of these new cases. The drop in the follow up cases is mainly due to enforcement of two lockdowns in the capital whereby oral medicine were prescribed to prevent client to visit the hospital for the medications. As per the VIS classification format, cases were classified into various systemic disorders. Digestive disorders were reported the maximum followed by musculoskeletal and skin affections respectively. The least number of cases were affections related to the urinary system followed by poisoning.

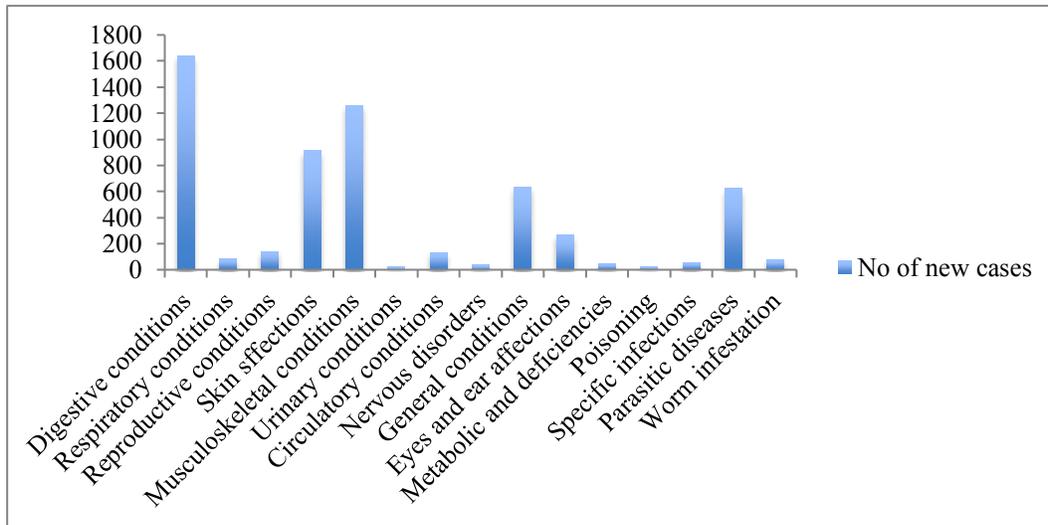


Figure 3: Type of disorders attended at NVH

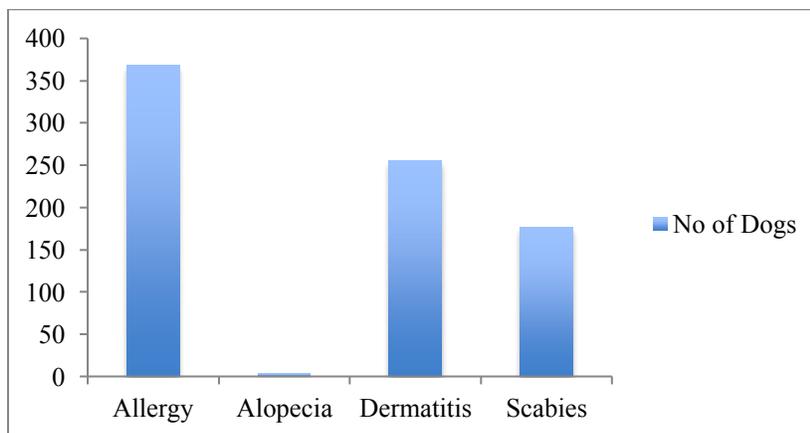


Figure 4: Common skin affections in dog

Surgical Cases

A total of **129** surgical cases were reported. Fracture cases were recorded the highest (30.2%) followed by cherry eye and cut wound (21%) and c-section was recorded the lowest (3%). Specialized services such as bone pinning (6 cases) and dental scaling (5 cases) were also provided to patients.

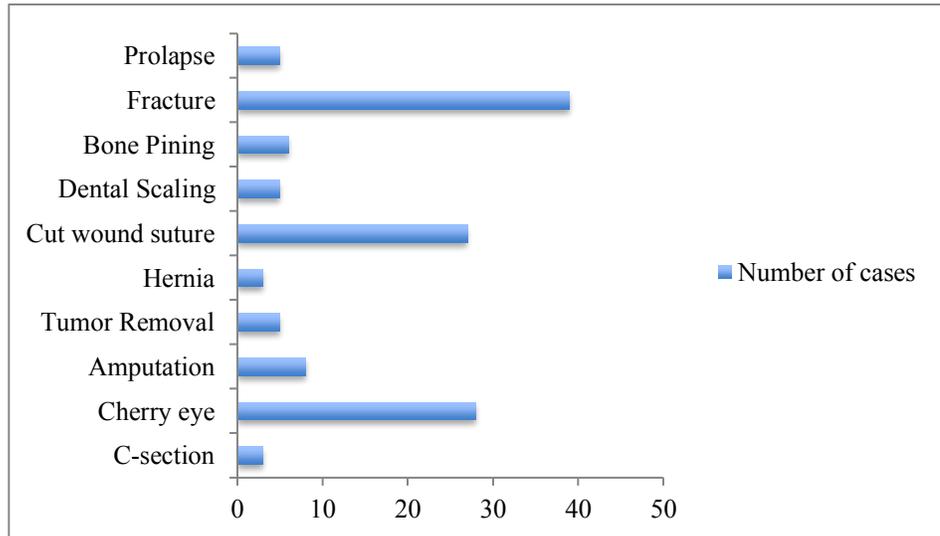


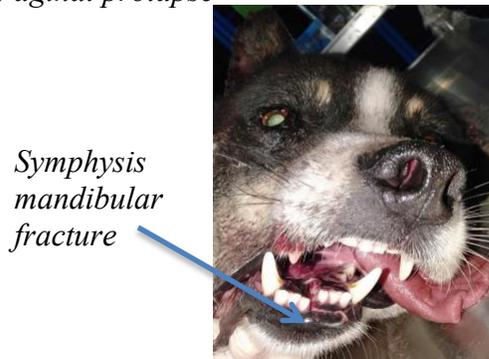
Figure 5: Surgical cases



Vaginal prolapse



After surgery



Intramedullary pinning

Sterilization

NVH provides routine sterilization services to the pet animals twice in a week and for farm animals it is provided in outdoors. This year, NVH sterilized **490** animals mostly dogs and cats.

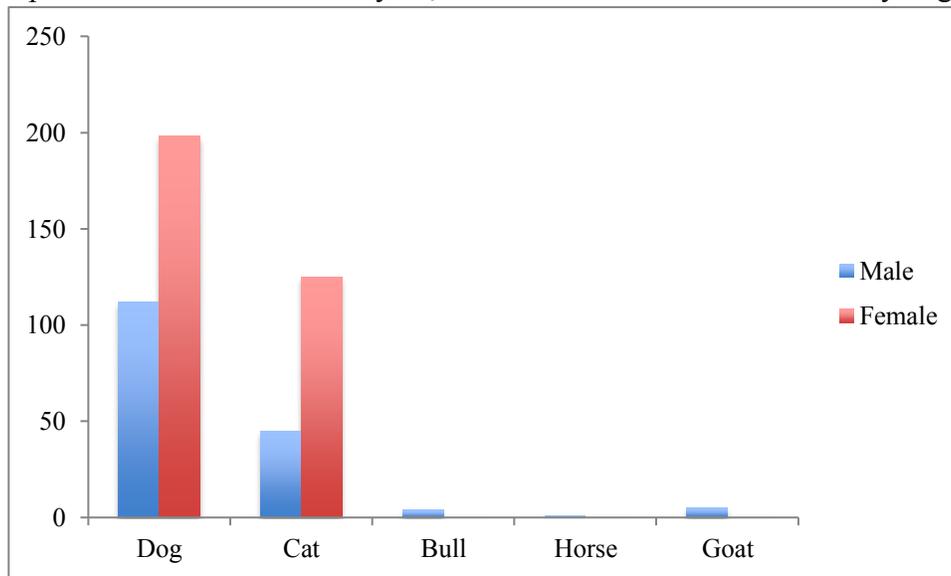


Figure 6: Sterilization in different animals as per sex

In dogs and cats, highest number of female animals (323) is sterilized in comparison to male population (157) and 87% of them are pets. In other animals only castration was performed in four bulls, five goats and a horse. Some pet owners prefer non-invasive method of birth control. As an alternative to surgical method of sterilization, oral and injectable contraceptive (Medroxyprogesterone) are also provided. A total of **77** pet dogs and cats were given contraceptive treatment and the usage has increased from the previous fiscal year.

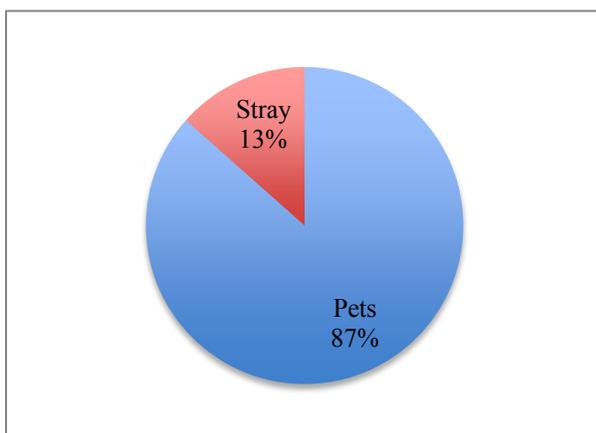


Figure 7: Sterilization of pets and stray

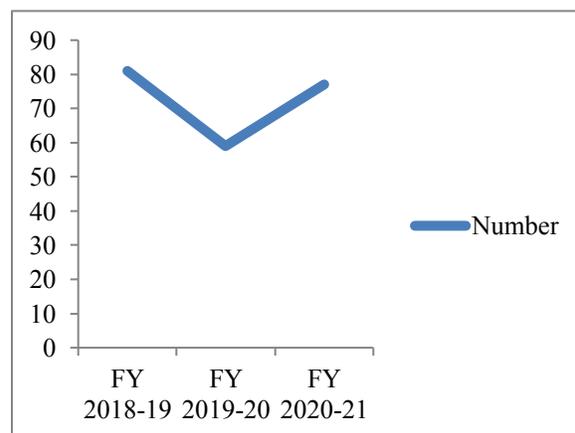


Figure 8: Usage of contraceptive medicine

Vaccination

Vaccination is one of the most effective ways to protect animals from contracting infectious diseases. There are two types of vaccines available for dogs namely DHPPi+L and ARV while cats are provided with only ARV. Rabies vaccine is provided free of cost because of public health significance while DHPPi+L vaccine has to be purchased from Karma Pharmacy (sole agent for Virbac DHPPi+L).

A total of **3298** pets were vaccinated with Anti-Rabies vaccine of which 2,603 were dogs and 695 were cats. Unlike in dogs, the re-vaccination in cats is lower than the primary vaccination indicating that the cats vaccinated in previous years do not receive the vaccines in subsequent years and consequently are left vulnerable to rabies infection. This could be due to lack of knowledge by the owners. Therefore the owners need to be advocated on the importance of re-vaccination in cats.

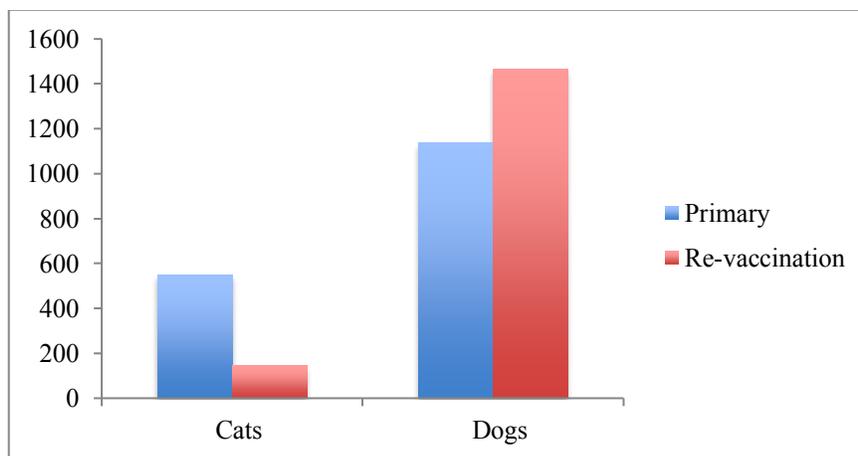


Figure 9: Primary and re-vaccination of Rabies in dogs and cats

A total of **2118** pet dogs were also vaccinated with DHPPi + L vaccines. The number of vaccination has reduced by 12.8% compared to last two fiscal years possibly due to shortage of vaccine at Karma Pharmacy as a result of the pandemic. Nevertheless the number has increased by 6.2% compared to the FY 2017-18 indicating that the owners understand the importance of vaccination.

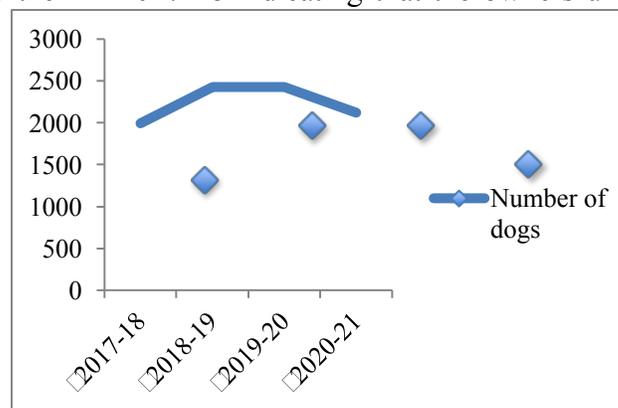


Figure 10: Trend of DHPPi+L vaccination over four years

Poultry birds belonging to the Royal family were vaccinated against Marek (66) and Newcastle (62) diseases. Four horse received rabies and tetanus vaccine.

Deworming

Worm infestation is common problem in young animals causing gastrointestinal upset and can predispose it to secondary disease. Many internal parasites of dogs and cats are also zoonotic and hence controlling intestinal parasites is a vital part of any preventive health care program.

A total of **4751** animals were dewormed of which 2331 were dogs and 773 were cats.

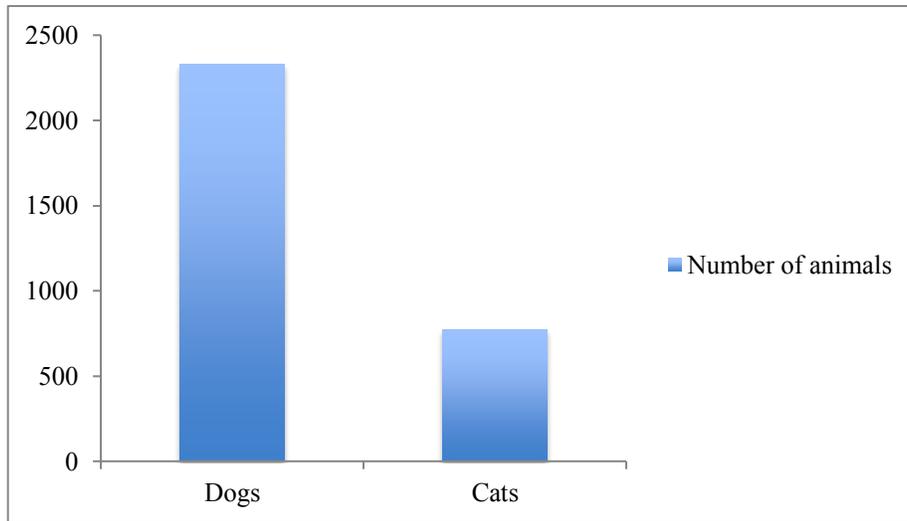


Figure 11: Deworming in dogs and cats

Table 2: Anthelmintics commonly used in pets

Sl no	Anthelmintic	Indications
1	Praziquantel	Tapeworm
2	Albendazole	Tapeworm, Roundworm & Hookworm
3	Piperazine	Roundworm
4	Pyrantel pamoate, Fendendazole & Praziquantel	Tapeworm, Roundworm & Hookworm

Pet Registration

As per the Livestock Rules and Regulations 2017, every pet shall be registered with the livestock office and ensure timely deworming and vaccination.

Currently only dogs and cats are registered at NVH. For the registration, the hospital charges Nu 100 per animal and the amount is deposited into the revenue account. The details of the owner and pet are maintained in the database.

During FY 2020-21, a total of **1685** pets were registered at this hospital, out of which 1137 (67%) were dogs and 548 (33%) were cats.

Fig: Pet registration as per animal

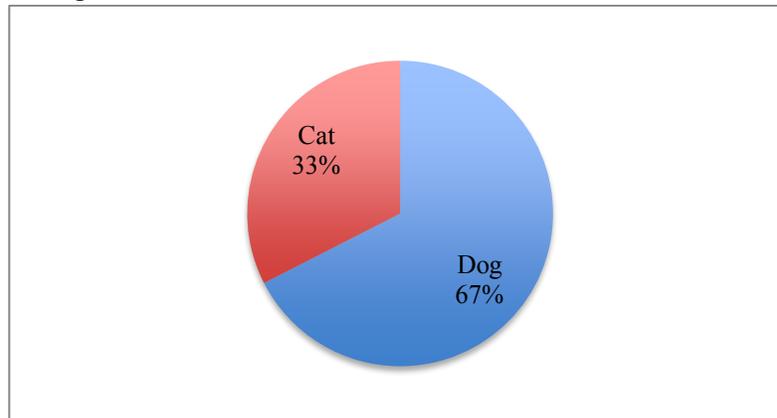


Figure 12: Pet registration as per animal

The pet owners keep more male dogs than female dogs but in cats they prefer female over male cats as male cats usually like to wander and not to be housed. Various breeds of dogs were brought for registration. The owners prefer more of exotic breed of dogs than local breed but in cats they keep mostly local breed cats.

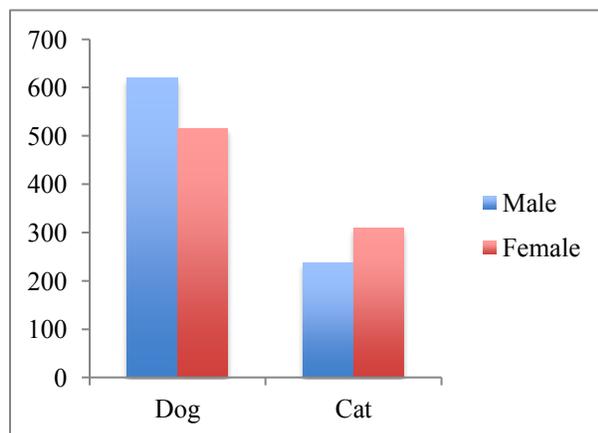


Figure 13: Registration as per sex

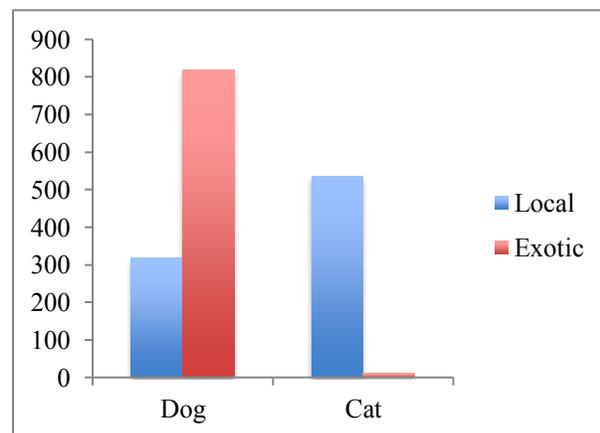


Figure 14: Registration as per breed

Out of the total registered pets, 31 were for Royal pets while 1685 were for public. The total revenue generated from pet registration amounts to Nu 137,000.

Diagnostic Services

Diagnostic services are divided into two components: Clinical and Laboratory.

Clinical Diagnostics

In 2020-21, ultrasonography services were provided to 230 animals of which 199 were dogs and 31 were cats with an average turn around time (TAT) of 11 minutes per animal. Ultrasonography examination were used to diagnose pregnancy (PD) in 117 animals and other examinations in 113 animals.

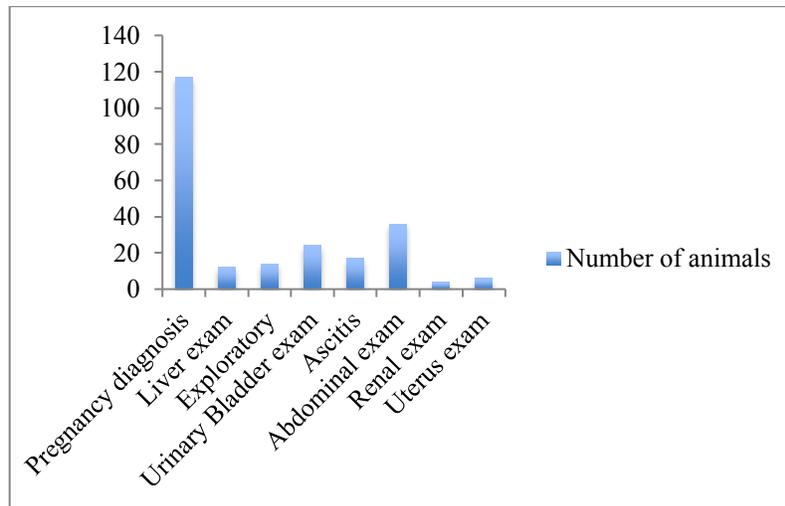


Figure 15: Ultrasonography cases in dogs and cats

After the installation of ultrasound machine Z-5 Vet in this hospital, the para-veterinarians were trained on the basics on operation of the machine, data entry, preparation of report, report printing and handling of probe.



Paravets learning to enter patient information into the system



USG examination in a dog performed by a Vet

In the last fiscal year, this hospital procured digital x-Ray machine but due to absence of a three phase electrical lines in the x-Ray room the machine could not be operated. However, in this fiscal year, with the financial assistance from the department, three-phase lines was installed and with technical assistance from JDWNRH, the machine was successfully installed and staff were also trained. The x-Ray machine was used mostly to diagnose fracture cases.



Positioning of animal for x-Ray



x-Ray image on the monitor after exposure

Table 4: List of diagnostic machines installed at NVH

Sl no	Name of machine	Status
1	Ultrasound	Operational
2	Endoscope	Operational
3	Digital x-Ray	Non-operational
4	Rhinoscope	Operational

Laboratory Diagnostics

The laboratory service unit (LSU) has three sections namely Parasitology, Hematology and Biochemistry. A total of 1,268 samples were collected/received and were subjected to various tests. 166 samples were referred to NCAH for fungal and bacterial culture and identification, and antibiotic sensitivity test (ABST), histopathology and post mortem examinations.

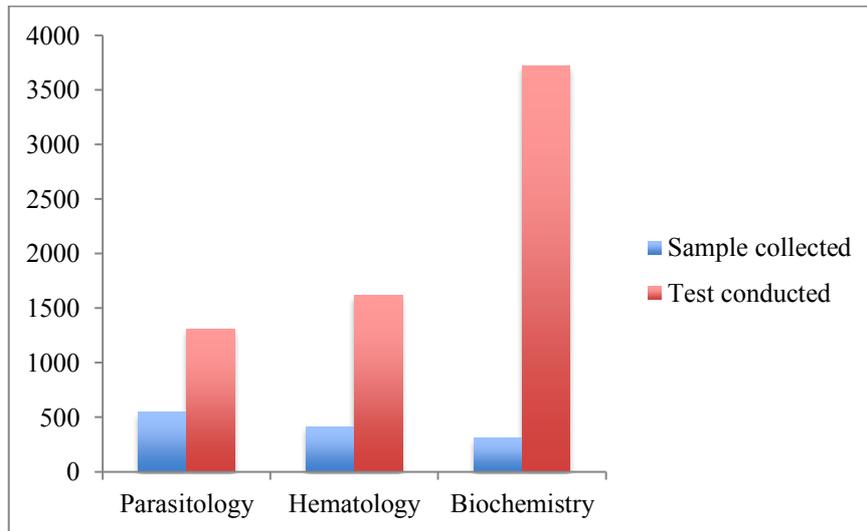


Figure 16: Number of samples collected and test conducted

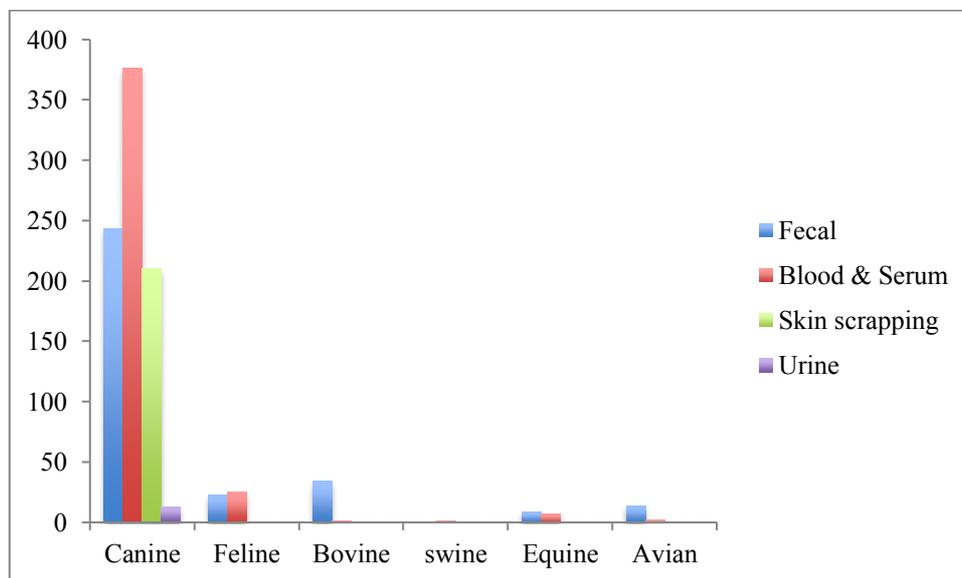


Figure 17: Species wise and sample type collected

Table 5: Types of Test performed in different sections

Section	Specimen	Test Type
Parasitology	Fecal	Direct examination
		Stoll method
		Sedimentation method
	Skin scrapings	10%KOH Digestion method
Hematology	Whole blood	DLC
		Hbg
		RBC
		WBC
		BP
		CBC
Biochemistry	Serum	LFT
		RFT
		Glucose
		Minerals (Ca & P)
		Electrolytes (K,Cl,Na,HCO ₃)
		Muscle enzymes
	Urine	pH
		Specific gravity
		Leukocyte
		Protein
		Blood

Parasitology Section

A total of **323** fecal and **210** skin scrapings were collected and examined for endo-parasites and ecto-parasites.

Table 6: Findings of fecal examinations in different animals

Species	Parasites
Dog	<i>Toxocara canis</i> , <i>Isospora spp.</i> , <i>Ancylostoma caninum</i> , <i>Dipylidium spp.</i>
Cat	<i>Toxocara cati</i> , <i>Isospora spp.</i> , <i>Dipylidium spp.</i> , <i>Taenia spp.</i> , <i>Spirometra spp.</i>
Cattle	<i>Strongyle spp.</i> , <i>Fasciola spp.</i> , <i>Paramphistoma spp.</i> , <i>Trichuris spp.</i>
Horse	<i>Strongyle spp.</i> , <i>Parascaris spp.</i> , <i>Fasciola spp.</i>
Poultry	<i>Capillaria spp.</i> , <i>Coccidia</i> , <i>Rallieitina spp.</i> , <i>Heterakis spp.</i>

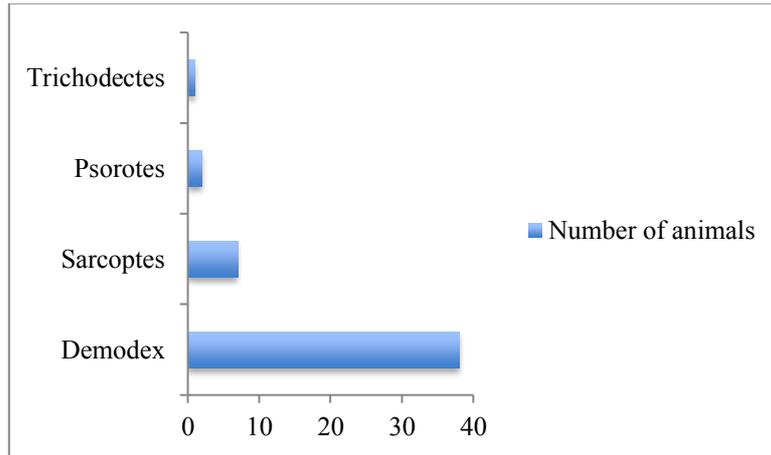


Figure 18: Findings of skin scraping examinations in dogs

The negative samples suspected of fungal and bacterial infection were referred to NCAH for culturing.

Hematology section

For hematology, a total of **412** blood samples were collected and **1614** tests were conducted.

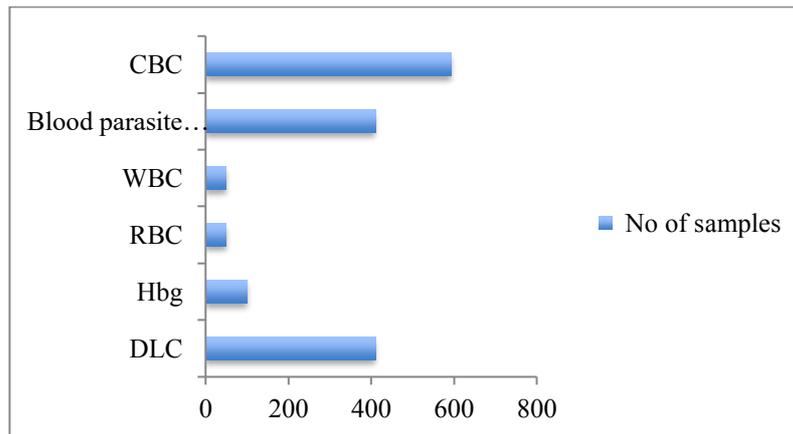


Figure 19: Type of test conducted

The commonly found blood parasite infection in both dogs and cats was *Anaplasma spp.*

Biochemistry section

The biochemistry test involves liver function test (liver enzymes & bilirubin) and kidney function test (creatinine and BUN) along with quantification of muscle enzymes, blood glucose, cholesterol and important minerals such as calcium and phosphorus and electrolytes such as potassium, chloride, sodium and bicarbonate. Total of **310** serums and **13** urine samples were collected for conducting the biochemistry tests and urine analysis respectively.

Medicine utilization

The budget ceiling for this hospital for the FY 2020-21 was Nu. 488,000 but medicines amounting to Nu. 657,699 were received from LCS, Phuntsholing. The increase in the amount is due to additional requirement of medicines which were arranged through emergency requisition since the budget allocated to this hospital was found inadequate. Additionally, medicines amounting Nu. 70,000 were procured for Royal use. In this fiscal year there was no expiry of medicines.

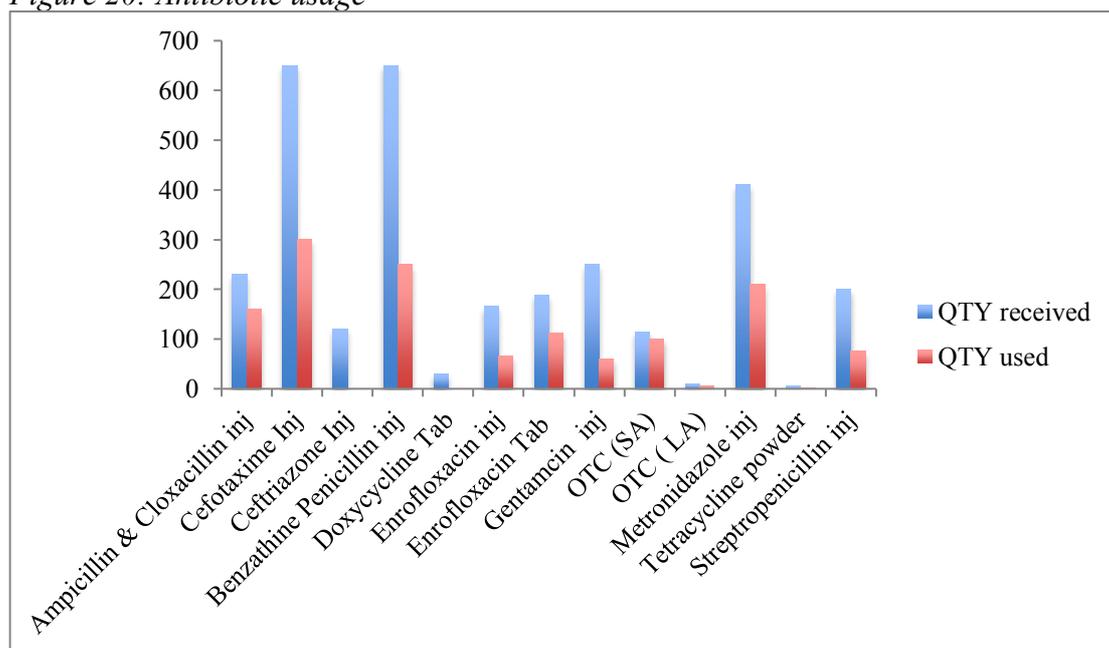
Medicine utilization percentage in 2020-21 was **84.9%** which has only increased by 0.1% compared to previous year (84.82%). The ten most commonly used medicines for 2019-20 are summarized in the table no 8. Ceftriazone and Prednisolone injectables had been used the highest (100%), followed by Meloxicam injection (95%) and Methycobalamine (87%).

Table 8: Ten most commonly used medicines

Sl.No	Name of Medicine	Qty received	Qty Used
1	Cefotaxime inj	600	250
2	Ceftriazone inj	121	121
3	Chlorpheniramine inj	120	50
5	Prednisolone inj	59	59
6	B'Complex Inj	256	80
7	Meloxcaim Inj	795	760
8	DNS inj	1502	800
9	Methylcobalamin inj	435	315
10	OTC (SA)	115	100

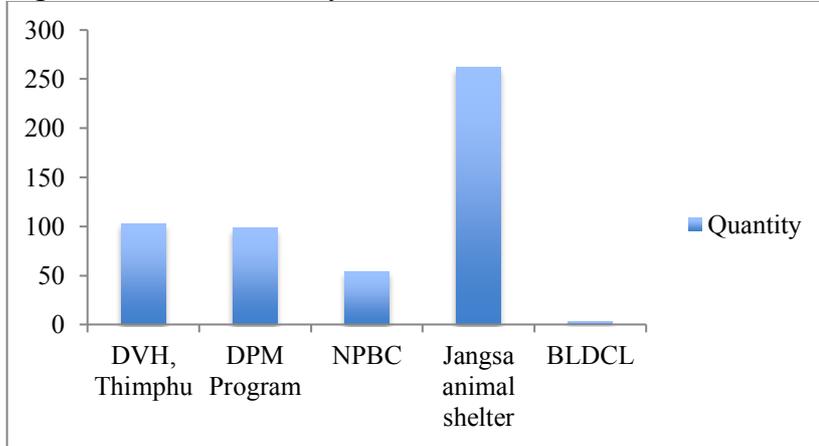
13 different types of antibiotics were received by NVH (Figure). OTC (SA) injection was used the highest (86.9%) followed by Ampicillin & Cloxacillin injection (69.7%) while Ceftriazone injection and Doxycycline tablets were not used at all.

Figure 20: Antibiotic usage



NVH had been supporting nearby hospitals or centers for medicines during the time of emergency such as disease outbreak or medicine shortage. In this fiscal year a total quantity of 520 medicines were issued to Thimphu DVH, DPM program, Jangsa animal shelter, NPBC and BLDCL.

Figure 21: Distribution of medicines to other centers



ADR & AEFV case reports (2020-2021) in veterinary field

NAME OF THE PET/ CASE NUMBER	SPECIES	Age	ADR	AEFV	NAME OF THE MEDICINE USED	NAME OF THE VACCINE	BATCH NUMBER	Reaction	DATE OF REACTION START	DATE OF REACTION STOPPED	Medicine given to counteract the condition	OUTCOM E OF THE REACTION	REPORTED BY	CAUSALITY Analysis (ABON system)
1343	Feline	2 yrs	-	yes	ARV	Rakshar ab	ARV: B- 03RAB00 121	facial swelling, dyspnea	19-09-20	19-09-20	Inj. CPM	Recovered	Tshering Yangchen	Possible
Daw/ 4005	Canine	3 mon	-	yes	ARV	Rakshar ab	ARV: B- 03RAB00 121	Vomiting, Pyrexia, lethargy	30-03-21	30-03-21	inj.DNS, inj. B. complex, inj.Prednisol one, inj. Metoclopra mide	Recovered	Dr. Pema Tshewang	Possible
Daisy/46 77	Canine	3 yrs	-	yes	ARV, DHPPi+I	Rakshar ab, virbac	ARV: B- 03RAB00 121, DHPPi+I:8 5T9 Sep 20	Paralysis	16-04-21	16-04-21	Inj. CPM	Recovered	Dr. Pema Tshewang	Possible
Tago	Canine	2 yrs	-	yes	ARV	Rakshar ab	ARV:03R AB00220, DHPPi+I: 85T9 sep 20	Facial swelling, Dyspnea	22-05-21	22-05-21	Inj. CPM	Recovered	Dr. Kinley Dorji	Possible
Khizo/43 62	Canine	3 mon	-	yes	DHPPi+I	DHPPi+I, virbac	DHPPi+I:8 5T9 Sep 20	Blepharitis of left eye	06-05-21	06-05-21	inj.CPM, eye drop containing antihistaminic	Recovered	Tshering Yangchen	Possible
2669	Feline	3 mon	Yes	-	Venuron Inj. (Methyoba lamine,vit B6 & nicotinami de) inj. Meloxicum	safecon lifescien ces	Venuron: SR20- 321, Meloxicu m: EOCI901	Diarrhoea	08-06-21	08-06-21	Metronidazol e suspension	Recovered	Tshering Yangchen	Inconclusive
Tandin Wangyel	Canine	21day s	Yes	-	Venuron Inj. Methyoba lamine,vit B6 & nicotinami de , Tab. Calcium	safecon lifescien ces	Venuron: SR20-321	lethargy and inappetan ce	16-06-21	18-06-21	inj. Dexamethso ne, withdrew the venuron	Death	Dr.Meena	Inconclusive
Paro	Canine	3 yrs	-	yes	ARV+ DHPPi+I	Rakshar ab, virbac	ARV:03R AB00220, DHPPi+I: 85T9 sep 20	laboured breathing and recumben t	23-06-21	26-06-21	inj. RL, ing. NDS, inj. Dexamethaz one, inj. Atropine sulphate,, inj. CPM, inj. Meloxicum	Recovered	Dr. Sonam Pelden	Possible
2230	Canine	3 Mon	-	yes	ARV	Rakshar ab	-	Vomiting and lethargic	-	-	-	Recovered	Dr. Jambay Dorji	Possible
Cheychey	Canine	2 yrs	-	yes	ARV	Rakshar ab	-	Vomiting, Pyrexia	-	-	-	Recovered	Dr. Pema Tshewang	Possible

Figure 28: Patient details reported for ADR/AEFV

I. Observations

- Most cases reported (8/10) were in canines and rest in felines (2/10)
- Out of the 10 reported cases, most of the cases were from NVH (9/10) and only one case was from the field (Paro, DVH).
- Most reported cases were that of AEFV (8/10) and only two cases were ADR.
- AEFV was commonly reported after administration of anti- rabies vaccine (Raksharab). The events were transient non- specific systemic effects, allergic and immune mediated reactions. All of the reported AEFV cases had favorable outcome after medical intervention.
- ADR was reported after administration of multivitamin injection consisting of Methylcobalamin, Vitamin B6 and Nicotinamide with concurrent use of other drugs (meloxicum, tab. calcium). The reported ADR reactions were dose independent and unpredictable (patient reactions).
- Only few cases took a longer course of 3-4 days for recovery, while rest lasted only for a day.
- The line of treatment to counteract these adverse reactions/ events was scientific in all the occasion.

II. Causality Assessment of the Reports (ABON coding system)

- The case report of AEFV was mostly categorized in category B (Possible) and two ADR cases in Category O1 (inconclusive) after performing causality Assessment by ABON coding.

III. Action taken at National ADR centre

- Receipt and compilation of reports on real-time basis.
- Verify the consistency of symptoms reported in the cases to the literature of the products and other open resources.
- Trace out the batch numbers and other details of the data not provided in the reporting format.
- Track the distribution and usage of similar products (to the reported) and batch numbers across the country and verify for any reactions in the centers.
- Review and revise the format based on the reports that were received.

IV. Recommendations

- More aggressive awareness needs to be carried out for all the veterinary drugs/ biological users to enhance reporting from across the nation.
- Since every information in the format is critical for analysis and future actions, all information in the format to be provided while reporting the cases.
- Details of the drugs with reported cases of ADR/AEFV to be evaluated and if necessary to NVDF to be revised.

Budget Utilization

A total of Nu. **15.427** million was approved for NVH during FY2020-21 which has decreased by 46.3% when compared to previous fiscal year(28.702 million). Nu. 15.193m was used and the balance amount was Nu.0.234m (Table 7). The budget utilization percentage was **98.5%** which is an improvement from the previous year at 97.6%.

Table 7: Approved Budget for NVH, FY 2020-21 (Nu in million)

Sl. No	Title	Budget	Used	Balance
1	Personal emoluments	11.861	11.845	0.016
2	Operation and management services	1.502	1.446	0.056
3	Monitoring of program and mobility fund for NVH staff	0.202	0.202	0
4	Mobile clinic for Highlanders program	0.04	0.036	0.004
5	Procurement of air conditioners and diesel generator	1.6	1.571	0.029
6	Animal feed and fodder	0.189	0.093	0.096
7	Installation of three phase electrical lines	0.033	0	0.033
	Total (Nu in M)	15.427	15.193	0.234
	Utilization %	98.5		

6. Critical veterinary services provided during lockdown 2.0

Clinical Veterinary services had been identified as critical/ essential services that needed to be provided during the lockdown. Bhutan experienced two lockdowns and during both the lockdowns, NVH had been actively involved in providing critical veterinary services to the public.

During the local transmission phase, the risk of contracting the virus and spreading either from the clients to service providers and vice versa was quite high, therefore, contingency plans with stringent working protocols was developed for implementation. It was aimed to not only protect the staff and clients from potential spread of COVID19 but also to help preserve limited resources such as personal protective equipment (PPE) and other essential supplies during the lockdown. While providing critical animal health services is important, all efforts were made to ensure safety of the service providers as well as the clients.

NVH started providing Critical Veterinary Services/ Emergency services from 25th Dec 2020 after obtaining approval from Central Covid19 Task Force, Thimphu. The team providing these services were tested prior to starting work.

As per the contingency plan the hospital focused on providing critical clinical veterinary services such as emergency, ambulance pick and drop, medicine delivery and teleconsultations (fig 1) during the lockdown 2.0:

1. Emergency services

Only emergency cases (which needed urgent medical intervention) were attended. The hospital was open from 9am- 9pm every day. Emergency calls received beyond this time were also attended since the teams were stationed at the hospital only. The clients availed the emergency services by contacting through either the hospital's landline number (02-322432) or Facebook messenger (which was managed by the Veterinary doctor on duty).

A total of 435 cases were attended out of which 402 were attended at the hospital and 33 were attended outside the hospital (table 9). The laboratory samples were collected and tested in 21 patients out of 435 cases. A total of 93 Royal cases were also attended during the lockdown (26 at the Palaces and 67 at the hospital). The patients were either picked by the ambulance or brought in by the clients / pet owners after getting movement permit approval.

Emergency cases were attended even beyond the normal hours (1 case at 5am, 1 case at 7am, 2 cases from 9pm-1am, 1 case at 10pm).

Table 9: Summary of services provided during lockdown 2.0

Cases attended	Tele-consultatio	Ambulance pick up	Medicine delivered by hospital	Laboratory tests conducted
435*	286	210	113	21
*Cases attended at the hospital				402
*Cases attended outside the hospital				33
*Royal cases				93

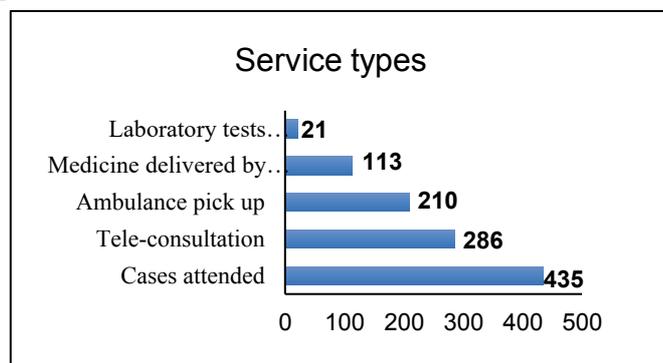


Figure 22: Various types of services provided during lockdown

Prior consultation with the Veterinary doctor on duty were made to assess the need for patient pickup or drop in by the clients. As per the doctor's assessment, patients suffering from various cases were provided with necessary medical intervention (table 10).

Table 10: Various services provided during lockdown 2.0

- Abscesses	- Acute Rhinitis	- Ascitis
- Choke (esophageal obstruction)	- Canine Transmissible Venereal Tumour	- Dystocia
- Chronic atopic dermatitis	- Eczema (Severe atopic eczema)	- Esophageal diverticulitis
- Eclampsia (postpartum hypocalcemia)	- Gastroenteritis (Parvo, Haemorrhagic)	- Hypersensitivity reaction
- High rise falls	- Idiopathic epilepsy	- Nutritional deficiency
- Penile deformity	- Prolonged anorexia	- Pyometra
- Poisoning	- Shock	- Renal disease/ kidney failure
- Vehicular trauma	- Wounds (dog bites, punctured/ lacerated)	- Other non-specific diseases

2. Ambulance services

Clients were picked and dropped by the ambulance since it was not possible to get movement permits for private vehicles during early stages of lockdown. Apart from a few clients who managed to get approval, rest were picked by the veterinary ambulance during the first two weeks of the lockdown. However, after relaxation of lockdown, more number of clients were able to get permits to travel using private cars

to the hospital. Some of the clients residing in the mega zone C1 even walked with their pets to the hospital after the relaxation of movement restrictions.

A total of 210 patients were picked up and brought to the hospital for necessary treatment by the hospital ambulance, which is almost half of the total cases received by the hospital (table 9). All COVID19 protocols were followed while picking up the patients and their owners by the ambulance.

3. Tele-consultation

Tele-consultations over the phone and through the hospital's official Facebook messenger were assessed by the public for seeking consultation with the Veterinary doctors on duty. The tele-consultations were made available and attended to even beyond the normal schedule as much as possible. A total of 286 teleconsultations were recorded during the lockdown. This number only represents the actual consultations made with the doctor on duty. It doesn't include the calls and consultations made with the technicians at the reception, otherwise the number would be higher. The teleconsultation was almost half (40%) the number of actual cases (60%) attended by the hospital (fig 2).

The teleconsultation was an important service provided during the lockdown which helped the clients to indulge in home remedies and care for their pets instead of visiting the hospital.

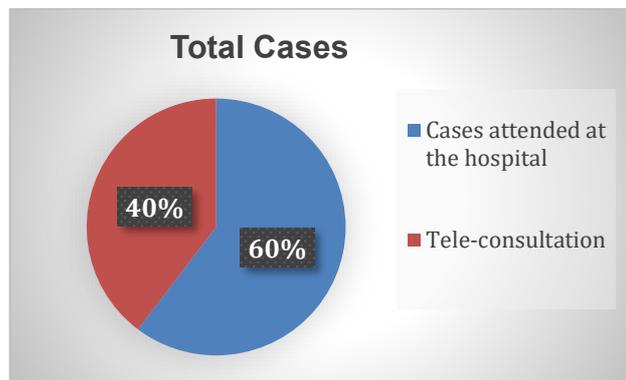


Figure 23: Teleconsultation vs actual cases attended at the hospital

4. Medicine delivery

NVH delivered necessary medicines to the clients for their sick pets during the lockdown. The hospital also contacted pharmacies on behalf of the clients for purchase of medicines which were not available at the hospital. These medicines were then delivered by the hospital to their homes. This arrangement was made for zones where pharmacies were not available/ open or when the delivery was thought to be delayed. Delivery of medicines were made to patients which were of non-emergency nature otherwise emergency cases were immediately picked up by the ambulance. A total of 113 numbers of medicine deliveries (table 1 & fig 1) were made during the lockdown.

Frontline Responders/ Service Providers (Teams)

A Six-member team was stationed at the hospital to provide emergency services. The team worked from 9am-9pm through-out the lockdown period. Emergency cases received beyond this time were also attended since the team was stationed at the hospital only. The team comprised of 1 Veterinarian, 2 Para-veterinary professionals, 1 Laboratory technician, 1 ambulance driver and 1 animal attendant (table 11).

Table 11: Details of team members on duty

Date	Team 1 (25-31/12/20)	Team 2 (1-8/1/21)	Team 3 (8-29/1/21)
Team members	<ol style="list-style-type: none"> 1. Dr. Jambay Dorji 2. Tshetrim Choden (Paravet) 3. Chimi Wangmo (Paravet) 4. Kinzang Pelden (Lab tech) 5. Norbu Gyeltshen (Driver) 6. Tenzin Pelden (GSP) 	<ol style="list-style-type: none"> 1. Dr. Meena Devi Samal 2. Nidup Dorji (Paravet) 3. Phuntsho Dema (Paravet) 4. Pema Tshomo (Lab tech) 5. Ugyen Phuntsho (Driver) 6. Pema Yangden (ESP) 	<ol style="list-style-type: none"> 1. Dr. Pema Tshewang 2. Sonam Zangmo (Paravet) 3. Neten Zangmo (Paravet) 4. Punya Mata Sanyasi (Lab tech) 5. Kiran (Driver) 6. Taraman (ESP)
	<ol style="list-style-type: none"> 1. Dr. Kinley Dorji 2. Tshering Yangchen 	<ul style="list-style-type: none"> - Attended Royal cases - Coordination/ facilitation of administrative and logistical arrangements including testing of the staff before and after duties 	

Table 12: Schedule of duty and various cases attended by each team during the lockdown

Team	Date	Cases attended at the hospital	Out call	Tele-consultation	Ambulance pickup	Clients using Pvt. car/ Walk to NVH	Medicine delivery by Ambulance	Lab test conducted
1	25-31/12/20	38	0	81	17	3	21	2
2	1-8/1/21	89	2	95	54	33	54	13
3	8-29/1/21	62	1	65	47	15	25	6
4	20-29/1/21 (Royal cases)	67	26	0	3	0	0	0
Total		189	3	241	118	51	100	21

Accommodation

The guest house at NVH was being used for accommodating the team members during their stay. All members used different toilets to prevent and ensure minimal contact between the team members. Drivers slept separately from the rest of the staff since the drivers were involved in picking and dropping off the clients.

Fooding

All essential food items were procured for the team members. Three meals and two teas were served daily. Designated cook was identified from each team to cook and perform the kitchen duties.

The working teams received Royal Tokha during Nyilo and Chunipa losars from His Majesty.

Monitoring of COVID protocols at the hospital

As per request, two Desups were deputed at NVH by Ashi Yewang Pendarica (Gojay of Motithang Desup unit) from 12/1/21 to help implement and monitor COVID protocols for clients visiting hospital but unfortunately, they could not continue after 18/1/21

Challenges faced while providing services and lessons learnt

The hospital and its team of service providers has been fortunate enough to not encounter any major challenges while delivering critical veterinary services during the lockdown 2.0. This could be attributed to the fact that the contingency plan including working modalities and SOPs on critical veterinary services delivery during times like the current lockdown were developed well before the first lockdown by NVH. It was only a matter of getting approval and implementing them.

Like all the Frontline responders, the staff of NVH has also looked up to and always been inspired by the tireless efforts and sacrifices made by our King. We were constantly guided by His Majesty's wisdom to work responsibly and with utmost dedication.

The department of livestock provided us with proper directives and facilitated necessary approvals from the Central Covid19 Task Force to enable us to provide services efficiently.

From the hospital management, we have ensured that logistics for our service provider teams such as accommodation, fooding and PPEs including timely testing for COVID19 were arranged at the hospital in order to safeguard the service providers as well as the general public. Therefore, we did not face any major issues/ challenges while delivering our services during the lockdown.

Every one of us has responsibilities towards the Tsa-Wa-Sum and NVH takes pride in being identified as one of many essential service providers during the lockdown. It is a great honour and privilege to be of service to The King, country and its people, especially in an unprecedented time like this.

The only areas of improvement felt necessary if such lockdowns happen in the future, were:

- Requirement of two ESPs since one ESP is unable to perform cooking duties as well as clean the hospital complexes
- Fix duty period of two weeks for the teams. The first two teams were on duty for 6 days and 8 days while the third team stayed for 21 days. The 14 days duty would not only save time and resource cost by undergoing frequent testings but also prevent the need to change members and seek approvals frequently.
- Need help of Desups to monitor the clients coming to the hospital following COVID19 health and safety protocols. Since all the staff were engaged in the hospital, it was not possible to monitor each and every client visiting the hospital.

Snippets from the lockdown 2.0



Team on Royal pets duty

Testing incoming team members & outgoing team members



Team 1



Team 2



Team 3



7. Client Satisfaction Rate survey

Introduction

Client satisfaction rate is “a measure of how products and services provided by a center meet or surpass client expectations. It is about whether or not service provider succeeds in making the clients happy. Since we are public servants, we must ensure that the services that we provide to our clients are of high standard and that they are satisfied with the services received.

Clients’ satisfaction rate (CSR) is determined by the service providers’ work ethics, professionalism and integrity at an individual level. At the agency level, it is determined by the facilities and the overall management system. The level of the CSR will help in making assessment and recommendations to the animal health centers for improving the efficiency of their services.

It is not straight forward to come up with good indicator for the veterinary clinical services at the national level. Suggestions were provided by colleagues working at national, regional and Dzongkhag veterinary hospitals (DVH) to come up with a national indicator. Prior to 2017, the indicator for veterinary clinical services was “no of cases”. This particular indicator had both pros and cons. The increase in the “no. of cases” could mean that there are frequent outbreaks of diseases and therefore the numbers are increasing. At the same time, it could be correlated to improved accessibility of animal health facilities for their pets/farm animals.

Therefore, at the Department and Ministry level, it was recommended to keep Client Satisfaction Rate (CSR) as an indicator to measure the success of veterinary clinical services. Subsequently, a random survey to determine the baseline for client satisfaction rate survey was carried out since 2017. Similar surveys are to be conducted each year to determine the client satisfaction rates which will be used as success indicator at the national level.

Methodology

The CSR is determined through a set of questionnaire filled by the clients who come to avail the veterinary clinical services at the animal health centers across the country.

Questionnaire

A set of five questions are designed to enable clients to provide their ratings. The criteria for the questions are based on the following parameters:

- a) Friendliness/ politeness of the staff ^[1]_[SEP]
- b) Professionalism ^[1]_[SEP]
- c) Facilities available at the hospitals ^[1]_[SEP]
- d) Promptness with which staff provide the services ^[1]_[SEP]
- e) Waiting time for availing the services ^[1]_[SEP]

Each question (Q1 to Q5) has a scoring scale from 1 to 10, 1 being very poor and 10 being Excellent. Question 6 is an open ended question to collate comments and suggestions to further enhance the services.

Note: Only clients who had visited the animal health center more than once to avail the services were included in the survey since they would have a better understanding of the system due to previous visit/ experience.

Animal Health Centers

Till 2019-20, only six identified animal health centers (NVH/TVHs/DVHs) were included based on location and consistent number of cases being reported. For 2020-21, 15 animal health centers were identified for the survey based on the presence of a Veterinary officer however, only four DVHs and NVH completed the survey. The other DVHs were mostly located in the parts of the country affected by COVID19 restrictions.

Number of clients interviewed ^[L]_[SEP]

The number of clients filling the survey in each AHC were as follows. The numbers were based on the caseloads received at the respective AHCs.

Table 13: AHCs and number of clients filling the questionnaires

Sl. No	Animal Health Centers	Number of clients interviewed
1	NVH	100
2	DVH, Bumthang	20
3	DVH, Haa	30
4	DVH, Punakha	28
5	DVH, Trongsa	20

Entry of clients' response in spread sheet

The responses to the questionnaires were filled in the excel spread sheet (as numerical rating) by the concerned Veterinary officer, computed and sent back to NVH. The information received from the veterinary hospitals were collated in a single Excel spreadsheet and further validated. A generic analysis was carried out to achieve the individual as well as overall CSR for the Department of Livestock.

Result and discussion

The responses were tabulated in the Excel sheet and percentage CSR calculated for the year 2020-21. The overall CSR for the five AHC is 86% which is greater than the set target of 85%.

Except for DVH Bumthang, rest of the AHCs achieved their CSR targets (>85%). Among the various parameters, Q3 (facilities) acquired the least score (Table 2). The clients are more aware and demand for specialized services which require advanced facilities. Most of the AHCs across the country are still not equipped and this has possibly led to reduced rating. The highest rating amongst the five parameters is for

the “waiting time” at 90%. The services are promptly provided to the clients once the patients are brought to the hospitals. Services are also provided through field visits but they take longer due to travel and logistical requirements.

Table 14: AHCs and their CSR scores

Agency/Q	Q1	Q2	Q3	Q4	Q5	Average
NVH	85	87	87	86	79	85
Punakha	97	97	93	97	96	96
Trongsa	95	89	70	96	94	88
Haa	98	97	86	93	92	93
Bumthang	69	70	35	67	91	66
Overall	89	88	74	88	90	86

Conclusion

The overall CSR is satisfactory which is indicative of the hard work and efforts put in by animal health workers across the country to provide efficient veterinary clinical services. However, AHCs especially in the districts need to be equipped with a few advanced facilities to enable accurate diagnosis and prompt treatment.

8. Training report on Ultrasound machine Z-5 Vet installation at NVH

Date: 23rd October 2020

Participants:

1. Dr. Kinley Dorji
2. Dr. Meena Devi Samal
3. Dr. Jambay Dorji
4. Dr. Rinchen Tshering (Intern)

Training on installation of ultrasound machine Z-5 Vet was conducted virtually through zoom meeting at the conference hall of NVH. During the training, Mr. Sudarshan described the features of the machine and its functions. He demonstrated how to connect the probes and turn on the machine. He briefed us on entering of information before the examination of the animal and to search for the information that was stored. There are functions to review the image and report and print the report. He showed us how to open the exam mode by pressing the probe button and to select the exam mode by trackball and pressing the set button. He covered on image adjustment wherein he showed us by adjusting gain and TGC, the image could be brightened and similarly by decreasing the depth the frame rate of gray scale imaging can be increased. He also showed us how to adjust the parameters such frequency and depth. He emphasized on using high frequency for examination of small animals and peripheral organs and low frequency for larger animals and for deep-seated organs. He covered on B mode, M mode and color mode imaging procedure. He showed us how to freeze the image, add comments, body marks and to measure the image. During the demonstrations, to get acquainted with the machine the participants used the two newly procured USG machines to practice.



9. Training on General examination of animals and prescription writing



A one-day training was conducted on 19th March 2021 on general examination of animals and prescription writing for the para-veterinarians of National Veterinary Hospital, Thimphu.

Diagnosis of disease in animals is difficult and strenuous process for veterinary clinicians because the patient cannot reveal any information about its suffering. The clinicians have to rely on the information provided by the owner (history taking) and examination of the animal. The purpose of examining the animal is to identify any abnormalities present in the animal and the risk factors that determine the occurrence of the disease in the individual or population. Therefore, possessing a sound knowledge and skills by the clinicians in examining the animal is of paramount importance in order to arrive at an accurate diagnosis.

Prescription writing is one of the important tasks of the clinicians to provide medications correctly to their patients. Improper recordings and illegible handwritings can lead to errors which in turn can adversely affect patients' well-being.

Objective of the training:

- To enhance the knowledge and skills of para-veterinarians on examination of animals.
- To gain knowledge on prescription writing.
- To foster a culture of continuous learning.

The training comprised of theory and practical classes. During the training, the participants learned how to approach an animal, observe for abnormalities before touching the animal, taking history about the disease/condition, to perform a physical

exam and subsequently record all their findings in a systemic manner into the prescription form.

Under history taking, the participants learned to record the primary complaint, disease history and deworming and vaccination status. In physical exam, they were taught to proceed from head to tail on the animal. They learned techniques used during physical examination such as palpation, auscultation and palpation. They also learned how to record the physiological parameters such as rectal temperature, pulse rate, respiration rate etc and also the normal physiological rates in animals. Under prescription writing, they learned about the parts of the prescription and to write the prescription clearly with legible handwritings without abbreviations and to provide clear and specific directions.

Demonstrations on performing a physical exam and recording in the prescription form were carried out which was followed by hands on practice by the participants.

10. Report on Monitoring of pet registration services in Veterinary Hospitals (VHs)

Background

The Pet Registration database was developed by the Department of Livestock in consultation with National Veterinary Hospital (NVH) and the pet booklet was reviewed by NVH and distributed to all the centers.

After the launch of pet registration database in 2016 and subsequent training of veterinary professionals in the operation of database and SoP on pet registration, teams from NVH visited veterinary hospitals and animal health centers across the country for monitoring in 2018. However in the following years, due to the pandemic, field visits could not be materialized.

Pet registration is one of the main activities across the hospitals and animal health centers and this also contributes to revenue generation. By recording the pet details in the database the total pet population as well as the kind of breeds kept by the public could be determined and helps in planning and coming up with reliable disease prevention and control program for pets as well as for indenting of medicines and vaccines. This also promotes responsible pet ownership.

In view of above, a questionnaire was developed and circulated to DVH In-charges to know the status of pet registration and operation of the database in the hospitals as well as challenges/issues encountered in implementation. Only 13 DVHs responded to the questionnaire.

Findings

Registration and fees

All 13 DVHs provide pet registration service to the public and out of which, only five hospitals (Bumthang, Sarpang, Punakha, Samdrup Jongkhar and Wangdue) charge the owners for registration as per the prescribed rates for urban and rural areas. The hospitals provide the service free of cost because of the difficulties in getting the revenue receipts, no executive order to charge for the service and staff shortage.

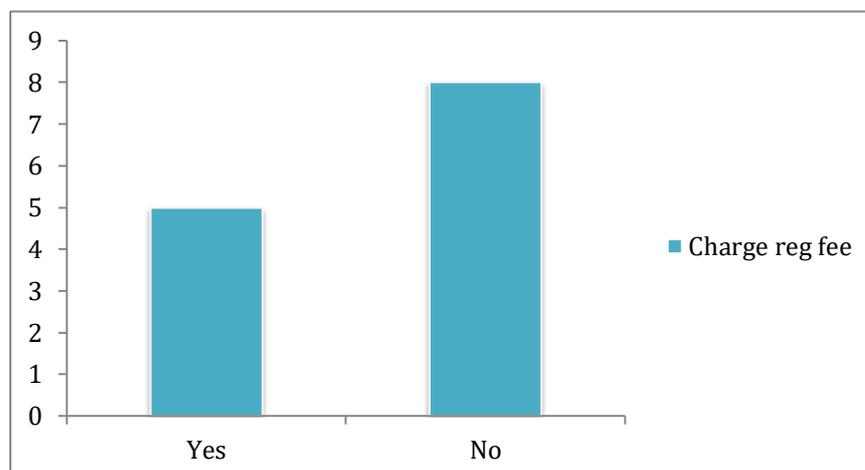


Figure 24: Charging of registration fee

Out of five hospitals that charge for the services, only three hospitals (Bumthang, Sarpang & Punakha) issue the money receipts and the fee collected through registration is deposited in the revenue account or revolving account or is kept at DVH.

All the hospitals follow the standard format during allocation of the registration number except DVHs of Trashiyangtse and Zhemgang where the numbers are allocated as per serial number. The details of pet owners and pets are recorded in the register maintained at the hospital as well as pet booklets which are issued to clients.

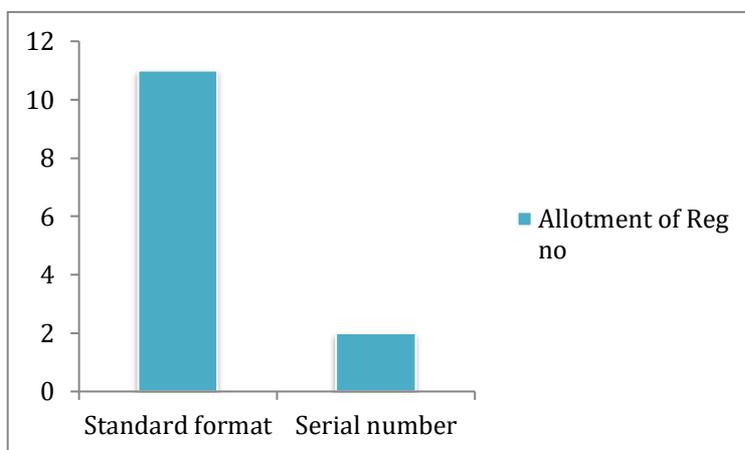


Figure 25: Allotment of registration number

Use of Database

DVHs of Paro and Wangdue use the pet registration database while the remaining DVHs do not. The reasons for not using the database were lack of training, the database was found not user-friendly and staff shortage.

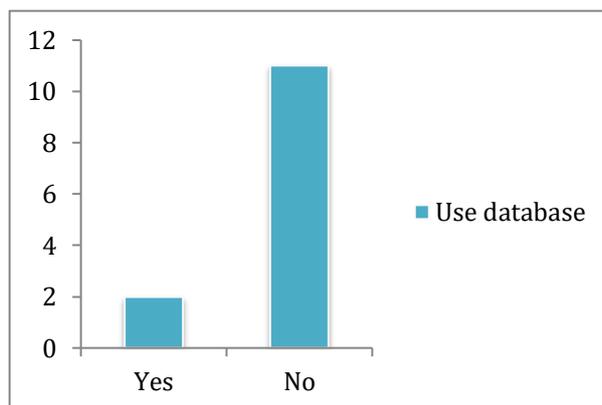


Figure 26: Use of database

Vaccine

All the hospitals provide Anti-Rabies and DHPPi+L (Distemper, Hepatitis, Parvo, Parainfluenza and leptospira) vaccines in dogs but the later vaccine has to be arranged by the clients. In cats, only rabies vaccine is used.

Registration in a year

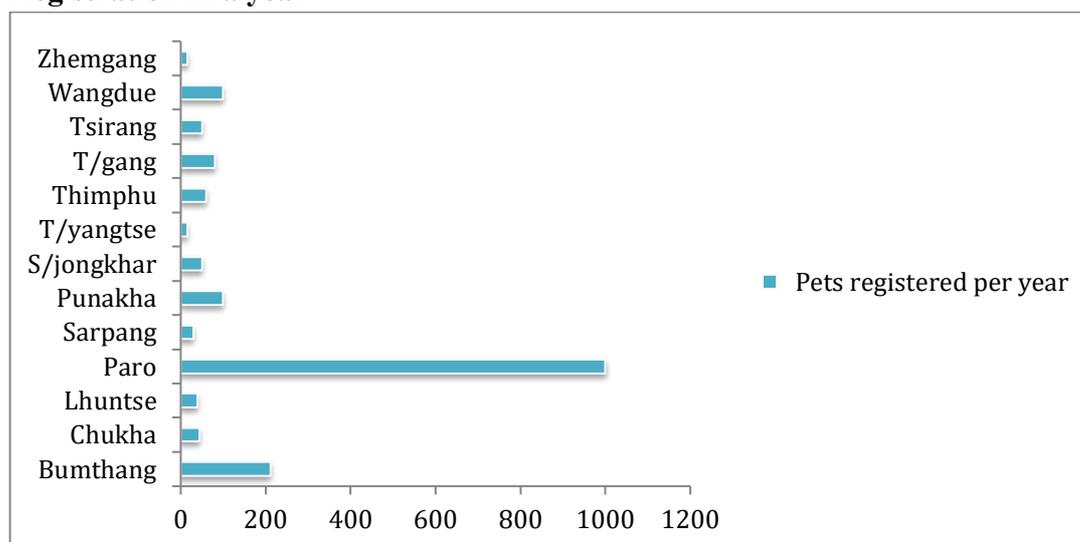


Figure 27: Pets registered per year

DVH, Paro has recorded the highest number of pet registration in a year and DVHs of Zhemgang and Trashiyangtse have recorded the least.

Recommendations

1. All the Veterinary Hospitals and Animal health centers shall charge the public for pet registration as per the prescribed rates for urban and rural areas henceforth. This is in accordance to the Livestock Rules and Regulations 2017.
2. The DVHs should process for revenue receipts from Revenue and Custom office and the fees collected should be deposited into the revenue account.
3. The pet registration database is undergoing system enhancement and once completed shall be followed by training on operation of the database. In the mean time DVHs shall use the offline database to register the pets.

Workshops /meeting and training attended by NVH staff (in-country)

Sl. No	Name of Workshop/Training/Meeting	Venue	Date	Name of Staff who attended
1	Workshop on develop AMU data collection tools for animal health	Thimphu	12 to 17/10/20	Dr. Pema Dr. Jambay
2	AMR training	Paro	18 to 22/10/21	Punya Mata
3	AMR training	NCAH, Serbithang	28/10/20 to 1/11/20	Punya Mata
4	AMR alert and Response protocol	Paro	6 to 8/11/20	Dr. Pema
5	Training of Laboratory Diagnosticians on LIMS	Punakha	18 to 20/11/20	Dr. Meena Kinzang Peldon Punya Mata Pema Tshomo
6	Write shop for Yak and Mastiff Breeding Strategy Documents	Gasa	15 to 20/11/20	Dr. Pema
7	GID training & Ethnoveterinary practice survey	Bumthang & Trongsa	5 to 11/12/20	Dr. Jambay
8	G2C Training	Monggar	16 to 21/12/20	Dr. Jambay
9	Smart Assistant Training	RIM, Semtokha	3 to 17/2/21	TM Sharma
10	Write shop to develop competency based framework for veterinary officers	Punakha	24/2/21 to 2/3/21	Dr. Pema Dr. Jambay
11	Ethnoveterinary practice survey	Sakteng	6 to 18/3/21	Tshering Duba
12	AMR Training	Paro	8 to 9/3/21	Dr. Pema
13	Technical working group	Paro	12 to 13/3/21	Dr. Pema
14	Smart Assistant Training	RIM, Semtokha	22/3/21 to 2/4/21	Ludp Pelmo
15	Consultative Workshop on Animal Tshethar Practices Guideline	IMS, Serbithang	13 to 14/4/21	Dr. Pema
16	Rabies Training	NCAH, Serbithang	12 to 16/4/21	Pema Tshomo
17	WHONET training	Bumthang	17 to 22/4/21	Punya Mata
18	Review 2nd draft of	NCAH,	24 to	Dr. Pema

	Animal Health and Production bill 2020	Serbithang	28/5/21	
19	Tender Evaluation of veterinary Medicines	NCAH, Serbithang	31/5/21 to 11/6/21	Dr. Jambay
20	Finalization of Questionnaire for Prescription survey on AMR and AMU at Community Pharmacies	NCAH, Serbithang	7 to 8/6/21	Dr. Pema
21	DPM program	Tsirang	16 to 22/5/21	Dr. Meena

Workshop/Training/meeting attended by NVH staff (ex -country)

Sl. No .	Name of Workshop/Training/meeting	Venue	Date	Name of Staff who attended
1	Master of Veterinary Science in Surgery	Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana, Punjab, India	7/12/20 to 6/12/22	Dr. Nima Wangdi

11. Block week visit by CNR students

The second year students of BSc Animal Science of College of Natural resources visited this hospital for block week on Clinical Veterinary Medicine from 8th to 12th March 2021 to get hands on trainings and field exposure on attending clinical cases. Presentation on the background, vision and mission and mandates of the hospital was made to the students. The students were divided into groups and were allocated to consultation rooms, vaccination room, treatment room, operation theatre and laboratory rooms.

In the consultation rooms, the students were taught how to examine an animal, history taking, to record the physiological parameters and writing the prescription. They got exposure to different examination equipment such as pulse oximeter, BP machine and otoscope and diagnostic machines such as endoscope and ultrasound. They learned about common cases that are presented to the hospital and the line of treatment for such disorders. They also learned about different medicines available at the hospital along with its dosage and indications.

In the treatment room, they learned to administer medications to the animals through intramuscular, intravenous and subcutaneous routes. They carried out wound dressing in animals. They also learned about the different vaccines available for dogs and cats and the vaccination and deworming schedules. The students witnessed different surgeries performed in OT as well as got opportunity to assist the vets during surgery. In the lab, they learned the procedures for fecal examination, skin scrapping, bloodstaining and counting and biochemistry test.

The students were provided with case scenarios where they were required to diagnose the condition/disorder and provide the line of treatment. This was followed by presentation and discussion among other students. Lastly, evaluation of the students was done through a test where majority of them performed exceptionally well.



12. Case Studies

12.1 Zygomycosis in a Dog

Jambay Dorji¹ and Pema Tshomo¹

¹National Veterinary Hospital, Department of Livestock

Introduction

Skin infection is very common in dogs and is one of the main causes of treatment at this hospital. The common causes for skin conditions in dogs are external parasites (mites, fleas and ticks), bacteria, fungus and allergies. Skin problems in dogs are more prevalent in the warmer seasons, where seasonal allergies and other allergic symptoms are more likely. This year a total of 803 dogs were presented for different skin conditions to this hospital and seven dogs tested positive to zygomycosis.

Zygomycosis is a fungal infection in dogs caused by Zygomycocetes. The types of fungi responsible for this disease are the Rhizopus and the Mucor. The fungi are found commonly in the soil, food, water and decaying vegetation. The organism may enter the body through the respiratory tract or gastrointestinal tract or through wound inoculation. The skin lesions are characterized by ulcerated, draining nodules or by non-healing wound.

This case report describes the diagnosis and treatment of zygomycosis in a dog.

Anamnesis

A 2 years old male dog was presented to this hospital with complaints of rashes on the back, abdomen and limbs and constantly itching with alopecia.

Observation & Treatment

On examination of animal, there were papular rashes on the back and abdomen with ulcerated wound on the limbs. There was discharge from the wound. The wound was worsened by constant licking and biting by the animal.

Skin scrapings were collected from the animal and were subjected to 10% KOH for examination of mites at our lab and test result was negative to mite infestation. Based on the symptoms the animal was treated with following medications:

- Inj Ivermectin @ 0.2mg/kg SC
- Inj CPM @ 0.5mg/kg for 5 days
- Inj Gentamicin @ 4mg/kg for 5 days.

Wound dressing was carried out and advised to apply E collar on the animal.

After the treatment course, the itching by the animal has reduced considerably but the lesions on the skin have spread further on the body. Skin scrapings were collected again and the sample was sent to NVL, NCAH for fungal test. Meanwhile the dog underwent symptomatic treatment.



Ulceration on the neck



Lesions on the foot



*Severe swelling and ulceration with multiple draining lesions on the foot
(Picture courtesy: Small Animal Dermatology, Third edition)*

Laboratory Information Management System(LIMS) Report			
National Veterinary Hospital, Moolthang			
Department of Livestock, Ministry of Agriculture & Forestry			
INTERIMINAL VETERINARY LABORATORY REPORT			
Sender Ref No. 0241	Sample Registration No. 1283	Diagnosis ID 1218	
Owner:	Taklong Lhasan	Address Phungo, Threngsithong	
Animal Details	Sex	Threngsithong	
Lab Ref No.	Sample Centre, Bseal, Labokor Refuser	Animal Clinic	
Sample From:	National Veterinary Hospital, Moolthang	Sample Sent Date:	07/07/2021
Sample Sent to:	Laboratory Services Unit, National Centre for Animal Health	Sample Received Date:	07/07/2021
Specimen:	Identify	Registration Date:	07/07/2021
Refused by:	Phong Sathana		
Laboratory Findings			
Mycology Test	Result	Result Reference	
Fungal Culture	Rhizopus spp	None	
Checked by:	Phong Sathana	Entered Date:	26/07/2021
Test conducted by: <u>Phong Sathana</u>			
Test verified by: <u>Dr. N.K. Phasa</u> (1202040402)			
Diagnosis	Zygomycosis	Diagnosed Date:	26/07/2021
Diagnosed by:	Dr. N.K. Phasa		
Recommendation:			
Use antiparasitic agents			
Recommended by: Dr. N.K. Phasa			
Recommended Date: 26/07/2021			

Fungal test result

Laboratory findings

The skin scrapings tested negative to mite infestation but tested positive to Rhizopus spp upon fungal culture at NVL, NCAH.

Diagnosis

Based on the fungal culture report, the skin infection was diagnosed as Zygomycosis.

Treatment

The wound was treated with antiseptic solution and ointment for a week. Amphotericin B @ 0.5mg/kg as administered three times a day intravenously for seven weeks with B complex tablets once a day orally for two months. The owner was advised to bathe the animal with Miconazole shampoo once in week.

Discussion

Zygomycosis is a rare disease in dogs. The disease is not contagious to other animals or to humans. The dogs that are immunocompromised are more susceptible to the infection. The skin lesions are nodular and ulcerated with significant amount of drainage and are found on the neck, back and limbs. The diagnosis of zygomycosis is accomplished through cytology of the exudate where there is granulomatous inflammation with fungal elements, dermatohistopathology shows nodular to diffuse granulomatous dermatitis and panniculitis with numerous broad, occasionally septate, irregularly branching hyphae that have nonparallel sides and in fungal culture the causative organism is seen. The disease should be differentiated from other fungal infections especially pythiosis and leishmaniasis, deep bacterial infections and neoplasia. Surgical excision/debridement of the lesion/wound and long-term (weeks to months) systemic antifungal therapy such as Amphotericin B should be administered and continued at least one month beyond complete clinical resolution.

Conclusion

The animal responded positively to Amphotericin B and fully recovered after the course for a month. Amphotericin B is currently not available for veterinary use in the country and was arranged from human hospital. It is important to note that skin infections that are non-responsive to external parasite treatment should be subjected to culture of specimen to rule out fungal infections.

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12.2 SURGICAL MANAGEMENT OF UROLITHS IN A DOG

Dr. Kinley Dorji¹ Dr. Meena Devi Samal¹ Rinchen Tshering¹ Tshering Dhendup¹

¹National Veterinary Hospital, Motithang, Thimphu

Back ground

Urinary stones also known as urinary calculi or uroliths may form in the kidney or urinary bladder and can be passed to ureter or urethra. It is a multifactorial condition due to combined influences of physiological, nutritional and managemental factors. Uroliths are predominately composed of calcium oxalate, calcium phosphate, calcium carbonate, struvite, cystine, urate, tyrosine crystals and xanthine. The most common types of uroliths are struvite and calcium oxalates in dogs and cats. Struvite uroliths are commonly linked with urinary tract infections in dogs and nutritional factors (high ash and low acidic diet) in cats. PH of urine plays an important role in formation of uroliths, alkaline PH (PH>8.0) favors formation of phosphate, carbonate and struvite calculi and acidic PH (<7.0) favors formation of urate and silicate uroliths.

Struvite uroliths are commonly reported in female dogs because they are more prone to urinary tract infections. Calcium oxalate uroliths are more commonly seen in male dogs because of increased oxalate production of oxalate mediated by testosterone. Animal with hepatic dysfunction or congenital hepatic anomalies are prone for urate uroliths due to compromised clearance of uric acid from the blood. Breeds like Dalmatians are prone to urate uroliths because they lack uricase enzyme in their kidney and liver cells

Diagnosis of the condition is mainly done based on clinical, ultrasonographic, radiological and microscopic examination of the urine sediment (Kalinski et al., 2012). Radiography and ultrasound, both play an important role in detecting uroliths, Radiography helps in detecting the radio opaque/ dense uroliths (e.g. struvite, calcium oxalate) their shape, sizes and locations (urethra in male dogs/ cats which cannot be detected by ultrasound examination) where as ultrasound helps in detecting the less radio dense uroliths (e.g. urate, cystine).

Presentation/ Anamnesis

A three year old Male Damtsi dog was presented with the history of stranguria, inappetance, strong ammonia odor of the urine and hematuria. The dog was alert with euthermia and pink conjunctival mucus membrane. Blood and urine samples were collected for serum biochemistry, CBC and urinalysis. X-rays and ultrasound examination were also performed.

Laboratory findings:*Serum Biochemistry:*

The Serum biochemistry were as follow:

Parameter		Reference range
Uric system pack	1.1 mg/dl	3.6-7.0 mg/dl
Urea system pack	8.4 mg/dl	21.4-59.9 mg/dl
ALT	12.9 mg/dl	21.0-102.0 mg/dl
AST	11.4 mg/dl	16.0-118.0 mg/dl
Total protein	5.11 g/dl	5.40-8.00 g/dl
Alkaline Phosphatase	36 U/L	0-140 U/L
Calcium	5.9 mg/dl	7.6-11.6 mg/dl

There were no elevated parameters of BUN, ALT and AST.

Hematological examination:

Reference range (%)	8-21	2-10	58-85	0-9	0-1
Cells	lymphocytes	Monocytes	Neutrophils	Eosinophils	Basophiles
Rest sample (%)	32	03	52	12	01

Microscopic hematological examination revealed that the patient was positive for Anaplasma sp.

Qualitative Urinalysis:

Collection of urine sample by transurethral catheterization was unsuccessful as the catheter couldn't be advanced beyond the region of distal oспенis. Analysis of urine obtained by free flow sampling was done.

The result of urinalysis was:

Cells	Sample result
Leucocytes (cell/ul)	Nil
Ketones (mmol/L)	Nil
Nitrile (mmol/L)	Nil
Urobilinogen (umol/L)	+1
Bilirubin (umol/L)	Nil
Protein (g/L)	+3
Glucose (mmol/L)	Nil
Specific gravity	1.030
Blood cell/ul)	+2
PH	5.5



Microscopic examination of the urine sediment showed presence of oxalate crystals.

Ultrasound examination: The urinary bladder was fully distended with Urinary bladder wall thickness of 0.6cm. The cortex of both the kidneys had uniform granular echo texture with well distinction between medulla and cortex.

Radiographic examination: Showed hyperechoic urethral plugs along the os penis.

Diagnosis: Based upon the case history, clinical, laboratory and diagnostic examinations, the dog was diagnosed with oxalate urolithiasis.

Treatment:

Generally there are four treatment options for urolithiasis:

1. Surgical removal
2. Non surgical removal i.e. urohydropropulsion
3. Medical -dietary dissolution
4. Laser lithotripsy.

Choice of treatment depends upon the type, size, shape, surface contour and location of the uroliths. Urohydropropulsion is opted when the uroliths are smaller size; this procedure involves catheterization of urinary bladder and distending the urinary bladder with sterile isotonic solutions. When maximal luminal distention is achieved, forceful digital compression of the urinary bladder is applied in order to propel the stones through urethra.

Medical- Dietary dissolution is effective for urate uroliths. It involves giving purine restricted diets, using urine alkalizers, allupurinol @ 15mg/kg BID and antibiotics as indicated. Though dietary management is non invasive, it takes several weeks for the stones to get dissolved and the tailored diet will not work unless they are fed exclusively.

Laser lithotripsy is the latest method to treat uroliths. High energy shock waves are passed through the body in order to break down the uroliths into small sizes which can be easily passed through the urine.

In this case surgical removal of uroliths by scrotal urethrostomy was opted as the oxalate uroliths cannot be dissolved with medical- dietary management and urohydropropulsion is not effective in patients with uroliths lodged in urethra.

Surgical Management- Scrotal urethrostomy

A General Anesthesia was given using inj. Xylazine @ 1mg/kg, Inj. Ketamine @ 10mg/kg, inj. Diazepam @ 0.5 mg/kg. Prescrotal and scrotal region was prepped for the surgery.



Fig: A midline prescrotal incision was made over the caudal penile body and the dog was neutered using closed castration technique.



Fig: Urethral catheterization was done to mark the region of obstruction and the incision was extended further.



Fig: Subcutaneous fats were incised to expose the ventral penile body and retractor penis muscle. The retractor penis muscle was bluntly displaced exposing the urethra which is purple in color.

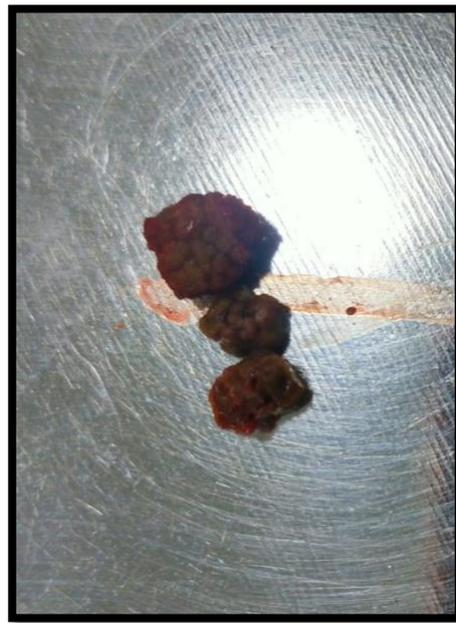


Fig: An incision was made caudal to the area of obstruction and three uroliths measuring 6mm, 5mm and 2mm were retrieved.

Another urinary catheter was introduced through the incised urethra to the urinary bladder to empty the urine from urinary bladder. 40 ml of normal saline were flushed through the catheter into the urinary bladder and again emptied in order to flush out uroliths if present.

The urethra was sutured using Polyglycolic acid 5.0, simple interrupted suture method. A simple continuous suture method applied the muscle and subcutaneous tissues. Before closing the skin, the incision was checked for leakage by flushing normal saline through the catheter. The skin was closed using Polyglycolic Acid 2.0, intradermal suture technique.

Post operative care

1. The dog was given a course of Doxycycline @ 10mg BID, PO for 1 month (to treat Anaplasma as well)
2. Inj. Meloxicum @ 0.3mg/kg for 2 days
3. Advised to E-Collar the patient for 1 week
4. Advised the owner to allow the patient to have access to water in adlibitum

The patient showed successful recovery.

Conclusion

When a patient is presented with the symptoms of dysuria, hematuria, or stranguria, it is important to carry out haemato biochemistry test, urinalysis, ultrasonography and radiography.

Ultrasonography and Radiography are important diagnostic tools to confirm urolithiasis. Radiography is useful in detecting and enumerating uroliths in kidney, urinary bladder and urethra whereas ultrasonography is superior in detecting radiolucent or less radio dense uroliths as well as to detect cystitis and neoplastic growth in urinary bladder.

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12.3 ENTROPION IN A DOG

Dr. Meena Devi Samal¹ Chimmi Wangmo¹ Tsheltrim Choden¹

¹National Veterinary Hospital, Motithang, Thimphu

Introduction

Entropion is the inward deviation of the palpebral border of the eyelid. There are three categories of Entropion based on its causes.

- 1) Conformational: caused by anatomic abnormalities of the eyelids
- 2) Spastic: caused by marked contraction of orbicularis oculi muscle
- 3) Cicatricial: caused by scarring from injury or previous surgery

Conformational entropion is mostly seen in dogs and sheep. Conformational entropion usually affects both the eyes with marked asymmetry in severity of the entropion although only one eye may also be affected. The lower eyelid is mostly affected than upper eyelid. When upper eyelid is affected it is mostly associated with heavy eye brows e.g. chow chows. In Brachycephalic breeds, entropion is more notable at the medial canthus and medial lower eyelid whereas in mesocephalic breeds e.g. Golden retriever, Beagle, entropion of lateral canthus and lateral part of lower eyelid is seen. Conformational entropion is inherited in most of the dogs, it may be evident right after the pup open their eyes or may be evident after maturity as the skull and its associated facial skin gains their adult conformation. Spastic entropion occurs due to the spasm of orbicularis oculi muscle caused by painful conditions such as conjunctivitis, uveitis, ulcerative and non-ulcerative keratitis. Spastic entropion is common in cats as they are affected by feline herpes virus causing corneal diseases. However significant entropion in all species are associated with varying degrees of trichiasis and spastic entropion is the component of all cases of entropion

Case History

A four year old adult Labrador cross male dog was presented with the history of frequent blinking and inability to open right eye with purulent ocular discharge. The owner reported that the dog used to have same on and off issue in milder degree since puppyhood but it worsened since 2-3 months.



Pic: Entropion in a dog

Clinical Symptom

On physical examinations the dog exhibited following symptoms

- Blepharospasm
- Purulent ocular discharge
- Spastic entropion
- Conjunctivitis

Diagnosis

Based on the physical examination, the dog was diagnosed with Conformational entropion of lateral canthus and lower eyelid of right eye associated with spastic entropion.

Treatment

Assessment for entropion correction includes an evaluation of the lid movement, concurrent ocular problems, extent of the primary defect and amount of spastic component (Gelatt et al 2000). There are two methods to correct lower eyelid entropion:

1. Temporary method/ Non surgical correction: It involves temporary tacking of the eyelids. It is mainly used in :
 - Patients with underlying treatable cause e.g. corneal ulcer, the eyelid is tacked till the cause is treated/ controlled
 - Young patients, as the entropion might resolve as they mature. Permanent surgical method is best delayed until facial maturity is reached.
 - Patients with temporary cause of entropion e.g. enophthalmos caused by dehydration or lack of orbital fat.
2. Permanent method/ surgical correction by Hotz-Celsus technique.

In this case we chose to correct the lower eyelid entropion by surgical method using Hotz- Celsus technique as the dog had already attended facial maturity and was conformational entropion.

Presurgical treatment:

In order to control the infection of the affected eye prior to surgery, a course of tab Enrofloxacin @ 4mg/kg for 5 days and eye drop containing antibiotics along with anti inflammatory was instilled on the affected eye three times a day for 5 days.

Surgical correction: Modified Hotz- Celsus resection

General anesthesia using xylazine @ 1mg/kg, ketamine @ 10mg/kg and diazepam @ 0.5mg/kg was given. Peri ocular region was aseptically prepared by clipping hair on the surgical site and gentle scrubbing with dilute Povidone iodine solution. Topical eye drop was instilled prior to the surgery

1. A parallel incision was made 2mm away from the lower eyelid border. A second skin incision that arches away from the eye, beginning at one end of the first incision and ending at the other end of the first incision was made. The distance between the first and the second incisions was at the widest at 6-7 'o- clock' position where the entropion of the lower eyelid was the most.



Figure 1

2. The crescent shaped section of the skin is excised using tenotomy scissors.
3. Polygalactin 5.0 was used as suture material and the surgical incision was closed by placing sutures perpendicular to the eyelid margin with the use of 'Rule of Bisection',



Figure 2

The first suture was applied at the center (at the widest point of resection) of the first and second incisions. The second suture was placed in between the first suture and one incisional end (near medial canthus), the third suture was placed in between the first suture and the other end of the incision (near lateral eye canthus) as shown in Figure 2. Sutures were tightened only when there was perfect apposition of skin. Remaining sutures was placed where ever required (Figure 3). The suture tags were cut short to avoid corneal contact with the suture tags.

Post Operative care:

1. Antibiotic course with Enrofloxacin @ 4mg/kg for three days
2. In. Meloxicum @ 0.3mg/kg
3. Ocular Antibiotic ointment for topical application over the surgical Wound for 7 days.
4. Advised the owner to E. collar the dog for 7 days



Figure 4. One week post surgery

Conclusion

The success of entropion treatment can be achieved with careful patient evaluation, selection of correct surgical technique, meticulous surgery and proper post operative management. Assessment of the extent of skin resection should be always done before surgery in order to avoid over or under correction. Over correction will cause Cicatricial entropion. In this case, the dog recovered successfully.

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12.4 Azalea (*Rhododendron* spp) Plant Poisoning in Dogs

Meena Devi Samal¹, Tshering Dendup¹,

¹National Veterinary Hospital, Thimphu

Introduction

Azalea, rhododendron species belonging to Family Ericaceae is a shrub grown in high altitude but nurtured as an ornamental flower worldwide. All parts of the plant including flowers and nectar are consider toxic, although there may be considerable variation between species and even amongst plants of the same species depending on the growing conditions. Household pets, while not commonly poisoned, are at risk of poisoning if they eat the leaves and flowers. Livestock are poisoned more often where rhododendrons are accessible to the animals, especially in winter time when the evergreen leaves are an attraction. Honey made by bees feeding on the nectar of rhododendrons has long been known to be toxic to people who eat the “mad-honey”.



Fig. *Rhododendron* (Azalea)

All species of the family Ericaceae contain varying quantities of toxic diterpenoids collectively known as grayanotoxins I and II (formerly andromedotoxin, rhodotoxin, and acetylandromedol). Grayanotoxins act to increase sodium channel permeability of cells by opening the channels to sodium, which enters the cells in exchange for calcium ions, thus rendering the channels slow to close so that the cell remains depolarized. Even small volume of plant can cause clinical symptoms of toxicity although onset is slow. Symptoms can occur when dogs consume as little as 0.2% of their body weight.

The clinical signs of toxicity include anorexia, depression, hypersalivation, emesis, colic, tenesmus, tachypnoea followed by bradypnea. Other symptoms are kidney failure and liver failure. The symptoms usually exhibit slowly due slow absorption from gastrointestinal tract after ingestion. Specific antidote does not exist for this plant poisoning. This study reports case of accidental azalea poisoning in dog.

Case history

A 4 years old female, French Bulldog, 20 kg was presented in National Veterinary Hospital, Thimphu Bhutan with initial clinical signs of emesis, hypersalivation and blood tinge faeces. The feed intake was normal and vaccination and deworming up to date. After careful history taking food allergy, gastroenteritis and chemical poisoning was ruled out. Following day clinical sign progressed into anorexia, emesis, tachypnoea and fresh blood in faeces. The owner also reported leaves in the faeces. Diagnosis of disease became evident from the picture owner took from the faeces of

dog. After careful examination and environmental history, the case was confirmed as Azalea plant poisoning.

Treatment

The treatment was symptomatic and supportive as no antidote is available for the toxicity. Initially animal was treated with metoclopramide @ 0.2 mg/kg bw i/m, atropine sulphate @0.2 mg/ kg bw i/m and ranitidine @ 0.5 mg/kg bw i/m. Following day, after confirmation of toxicity fluid therapy was started for 5 days. DNS @ 250 ml i/v, RL @ 250 ml i/v was infused. Activated charcoal @ 6 g p.o was also administered to facilitate absorption of toxins. The animal recovered fully after 5 days of treatment.

Conclusion

Toxic plants and seeds are found in apartments, houses, and gardens worldwide, and it is relatively common for dogs to accidentally consume house or outdoor plants. Nevertheless, there is a general lack of information concerning pet poisoning associated with plants, and most of the literature is mainly associated with common garden plants, based on the clinical picture and management of those plant poisonings, although there has been a serious advance in this area in recent years. Research is needed not only to determine which plants represent a potential risk for animal health and production but also to investigate their phytochemistry and toxicology. It would be very useful if veterinarians were able to document plant poisoning cases through government reporting services. Furthermore, university and government scientists, veterinarians, and extension personnel could fully investigate the various toxicoses and publish their findings in specialized journals. This would help to identify toxic species for further phytochemical and toxicological studies and possibly pharmacological activity.

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12.5 Surgical management of Aural Hematoma in a dog

Pema Tshewang¹

¹Deputy Chief Veterinary Officer, National Veterinary Hospital, DoL, MoAF

Introduction

An aural hematoma is a subcutaneous swelling on the pinna which is usually fluctuating (3). It is formed when traumatic rupture of the capillaries and separation of the auricular cartilage and skin occurs. Blood vessels in the pinna rupture as a subsequent to trauma or excessive shaking of the head. Blood fills the space between the skin and the cartilage, causing pain and potential deformity of the ear, if not left untreated. It may be unilateral or bilateral and can affect both dogs and cats, although dogs are more frequently affected (1, 5). Among the dog breeds, large dogs such as Labrador, Golden Retriever and Alsatian are more susceptible (1).



Picture: Aural hematoma (ear pinna filled with hemorrhagic fluids). Notice the bulge/swelling on the inner side of

Case history

A mixed Alsatian dog about eight years of age was brought to the National Veterinary Hospital with a swollen left ear pinna. On palpation, the concave side of the ear pinna was filled with fluid and soft to touch. There was no evidence of pain on the ear during palpation. The dog was observed to be frequently shaking its head and trying to scratch with its paw on the affected ear due to the discomfort caused by the swelling. Other than that the dog was apparently healthy with normal appetite and disposition. The dog was also up to date with its vaccination and deworming. According to the owner, the dog had no previous history of similar problem.

Diagnosis

Based on the presented signs and symptoms, the condition was diagnosed as Aural Hematoma. Since, the condition is presented with visible, unchallenging signs and symptoms, the condition can be easily diagnosed. In the early stages of development, the hematoma can be warm to the touch, the skin may be erythematous, and the pet may experience discomfort. Swelling associated with an aural hematoma is most apparent on the concave inner surface of the pinna. The prognosis of the case was good.

Treatment

The dog was initially treated with a combination of fluid aspiration, irrigation with povidone iodine antiseptic and pressure bandaging of the affected ear. The patient had constantly removed the pressure bandages and recurrence of fluid build-up and swelling was observed. Therefore, surgical intervention was opted. The patient was subjected to routine pre-screening for surgery and deemed to be fit for surgery. Surgical preparation was carried out under general anesthesia: inj. Xylazine @ 1mg/kg body weight followed by Ketamine and Diazepam combination prepared @ 10mg/kg body weight and 0.2mg/kg body weight respectively.

The surgical site was well shaved and cleaned with povidone iodine. The animal was then transferred to the operation theatre. The patient was kept on the lateral recumbency with the affected ear on the upper side (a).



a. Putting the drape and fibroids



b. Making a longitudinal incision



c. Draining of hemorrhage



d. Flushing with povidone



e. Simple interrupted suture



f. Applying pressure bandage

A longitudinal incision along the concave surface (inner side) of the ear pinna was made (b). The hemorrhagic fluid accumulated in the ear escaped through the incision. Along with it, fibrotic fluid was also aspirated (c). After complete drainage of the fluids, the ear was instilled with Benzathin penicillin powder. Then the incision was closed using non-absorbable suture (Nylon) using interrupted suture technique (e). The incision wound was cleaned and applied with Lorexane ointment (Gamma benzene hexachloride, Proflavin hemisulphate and Cetrimide) and the ear flap was then bandaged with along the head to prevent fluid from building back up (f). The owner was advised to put an Elizabethan collar to protect the ear from possible trauma during scratching/rubbing. An injection of Meloxicam @ 0.2mg/ kg body weight was administered

subcutaneously and inj. B. Penicillin @ 40000 IU/ kg body weight was given through deep intramuscular route.

The patient was reviewed after two days. There was no evidence of swelling and the wound was healing well. The wound was dressed with povidone iodine and applied with Lorexane ointment. Inj. Benzathin Penicillin was also repeated.

On the 10th day, the wound had healed and the nylon suture was then removed.

Discussion

Although the Aural hematoma can be successfully treated, complications and recurrence could occur if required precautions are not taken, even leading to marked deformation of the pinna. During normal healing, the fluid resorbs and fibrosis occurs. This contraction of the fibrotic tissue results in malformation of the pinna (3)

Conventional treatment involving needle aspiration follows immediate recurrence of hematoma. Success with needle aspiration alone is rare, but repeated aspirations followed by local injection of corticosteroids helps in healing upto some extent (4). Medical management is the most common treatment choice on initial presentation. This form of treatment is minimally invasive and reduces costs as sedation is not typically required. It is ideal for early onset or smaller hematomas.

Surgical intervention is the method of choice in treating recurrent and persistent aural hematomas (3). The goals of surgery are to remove the hematoma, prevent recurrence and retain the natural appearance of the ears. Several incisions (S, circular punch or longitudinal) can be made and various suture techniques (mattress, button, multiple simple interrupted etc) are known to be effective in preventing the recurrence of hematoma (2).

Conclusion

The prognosis for aural hematoma in dogs and cats is good to excellent as long as the underlying etiology is addressed. It is important to remember that unless trauma to the ear has occurred, development of an aural hematoma is not a primary condition. Primary, predisposing, and perpetuating factors leading to otitis and/or aural hematoma development need to be addressed to have successful resolution of the hematoma.

References

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