ROYAL 로얄동물메디컬센터
Royal Animal Medical Center & Animal Referral Center

2022 - 2분기
로얄동물메디컬센터
정기 증례발표회

2022.06.19 SUN AM 10:00 ~

PROGRAM

분기	성함	소속 / 직책	분야	강의명
2분기 (6월19일)	김영환	로얄동물메디컬센터 본원 원장	영상의학	비강 질환의 영상학적 접근법
				Imaging Approaches to Nasal Diseases
	한성영	로얄동물메디컬센터 강동 원장	영상의학	편측성 외안근염으로 진단된 두마리의 개에서 임상적 특징과 영상진단학적 소견
				Clinical features and Diagnostic imaging findings of Unilateral extraocular myositis in two dogs
	옹성민	로얄동물메디컬센터W 원장	영상의학	개에서 흔하지 않은 소뇌질환 : 1.지연성 소뇌위축 2. 부분 소뇌저형성
				Uncommon cerebellar disease : 1.late onset cerebellar abiotrophy, 2.hypoplastic cerebellar nodulus and ventral uvula
	이재희	로얄동물메디컬센터 본원 원장	내과	난치성/재발성 만성 피부염의 접근법
				How I treated to refractory_recurrent chronic dermatitis
	한만길	로얄동물메디컬센터W 원장	내과	개에서 면역매개성질환(IMHA, IMT 등)의 치료에 glucocorticoid를 꼭 투여해야 하는가?
				Should glucocorticoids be administered for the treatment of immune-mediated diseases (IMHA, IMT, etc.) in dogs?
	김세훈	로얄동물메디컬센터 본원 원장	외과	고관절탈구에서 고관절 관통핀의 적용
				Coxofemorla joint Transarticular pinning

ROYAL AMG
Animal Medical Group
로얄동물메디컬그룹

비강 질환의 영상학적 접근법

로얄동물메디컬센터 본원

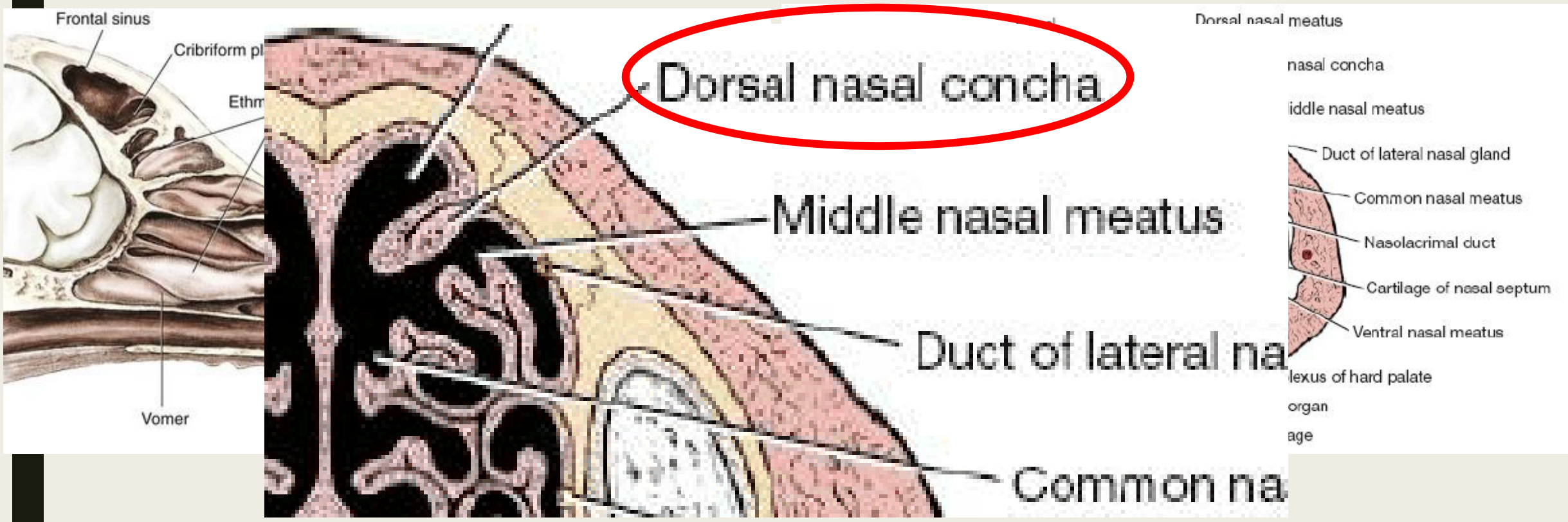
김 영 환 원장

비강 질환의 영상학적 진단 기법

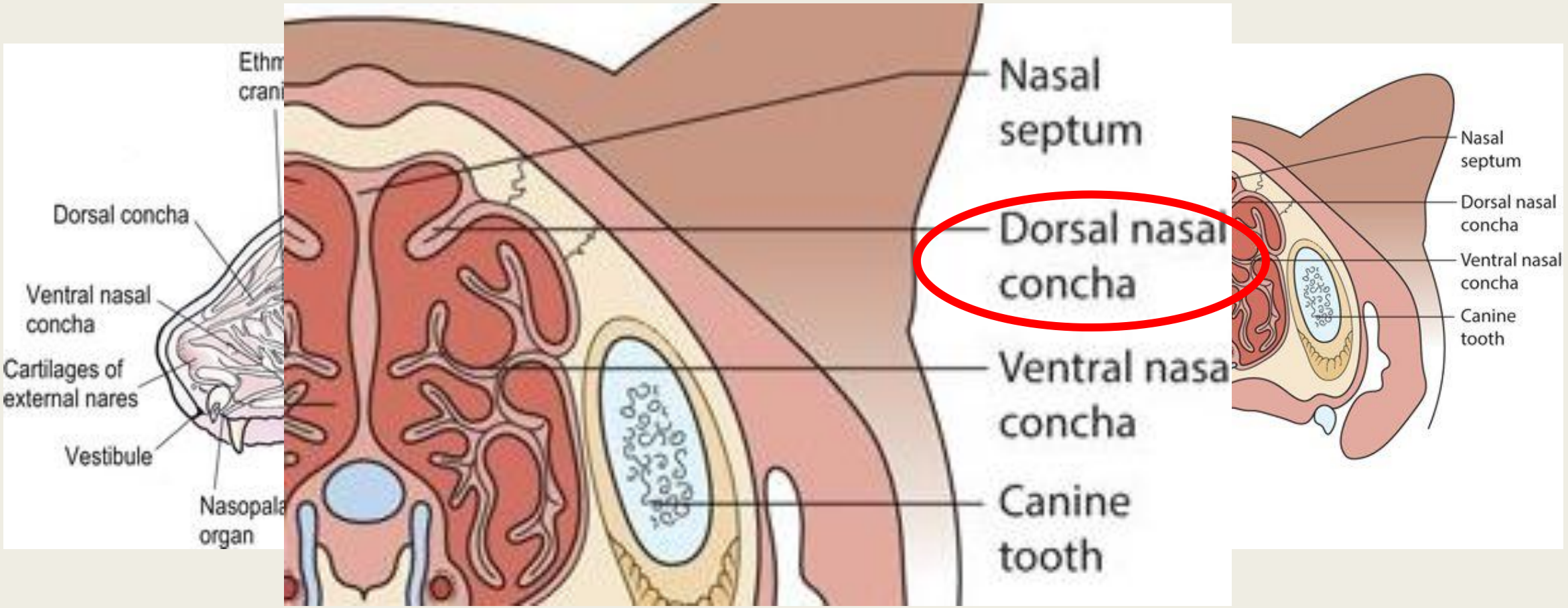
로얄동물메디컬센터
영상 진단과
원장 김영환

본 PPT에 사용된 일부 사진 및 그림은 구글에서 인용되었읍니다.

개 비강의 해부학적 구조


Frontal sinus
Cribriform pl
Ethm
Vomer
Dorsal nasal concha
Middle nasal meatus
Duct of lateral na
Common na
Dorsal nasal meatus
nasal concha
iddle nasal meatus
Duct of lateral nasal gland
Common nasal meatus
Nasolacrimal duct
Cartilage of nasal septum
Ventral nasal meatus
lexus of hard palate
organ
age

고양이 비강의 해부학적 구조

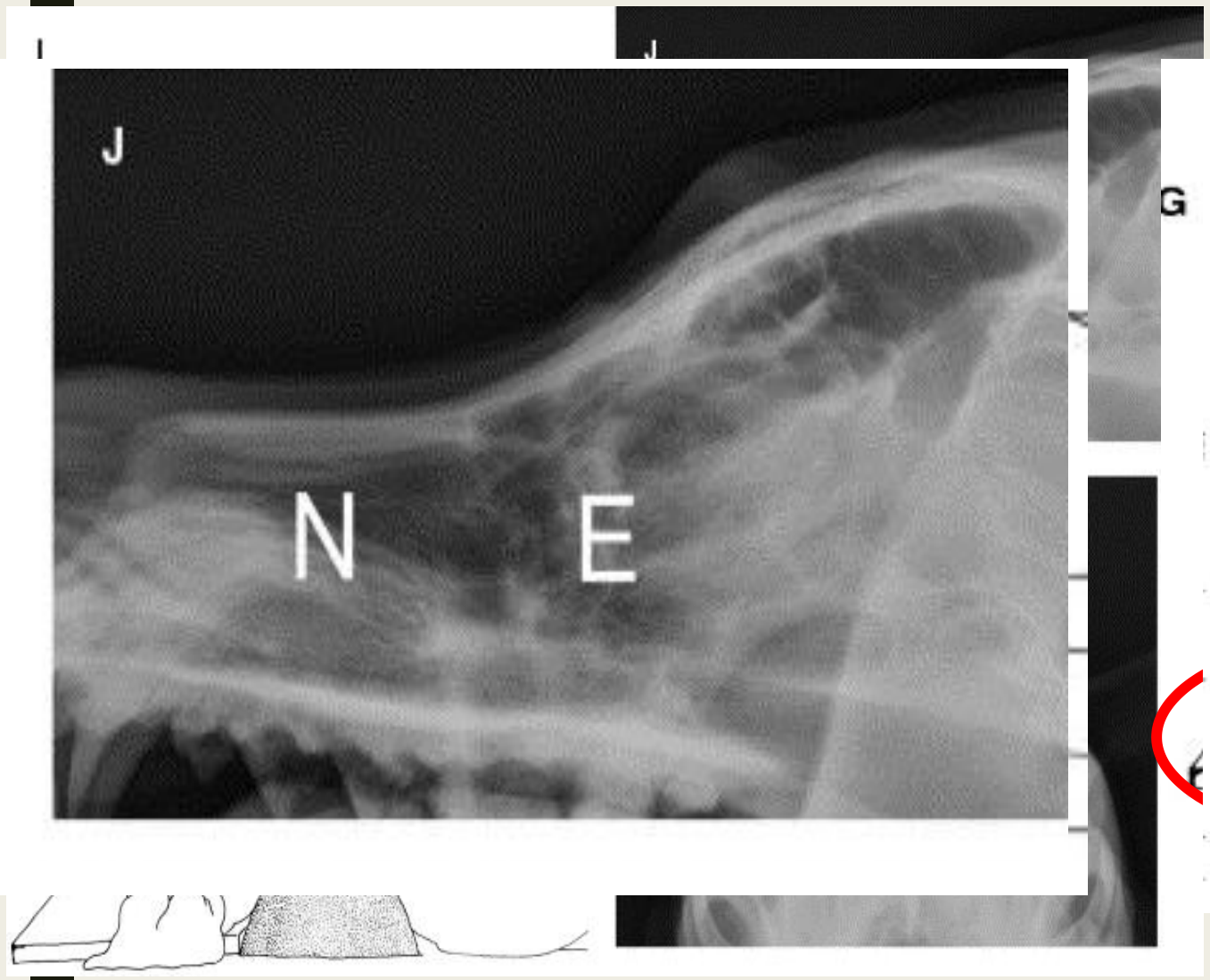


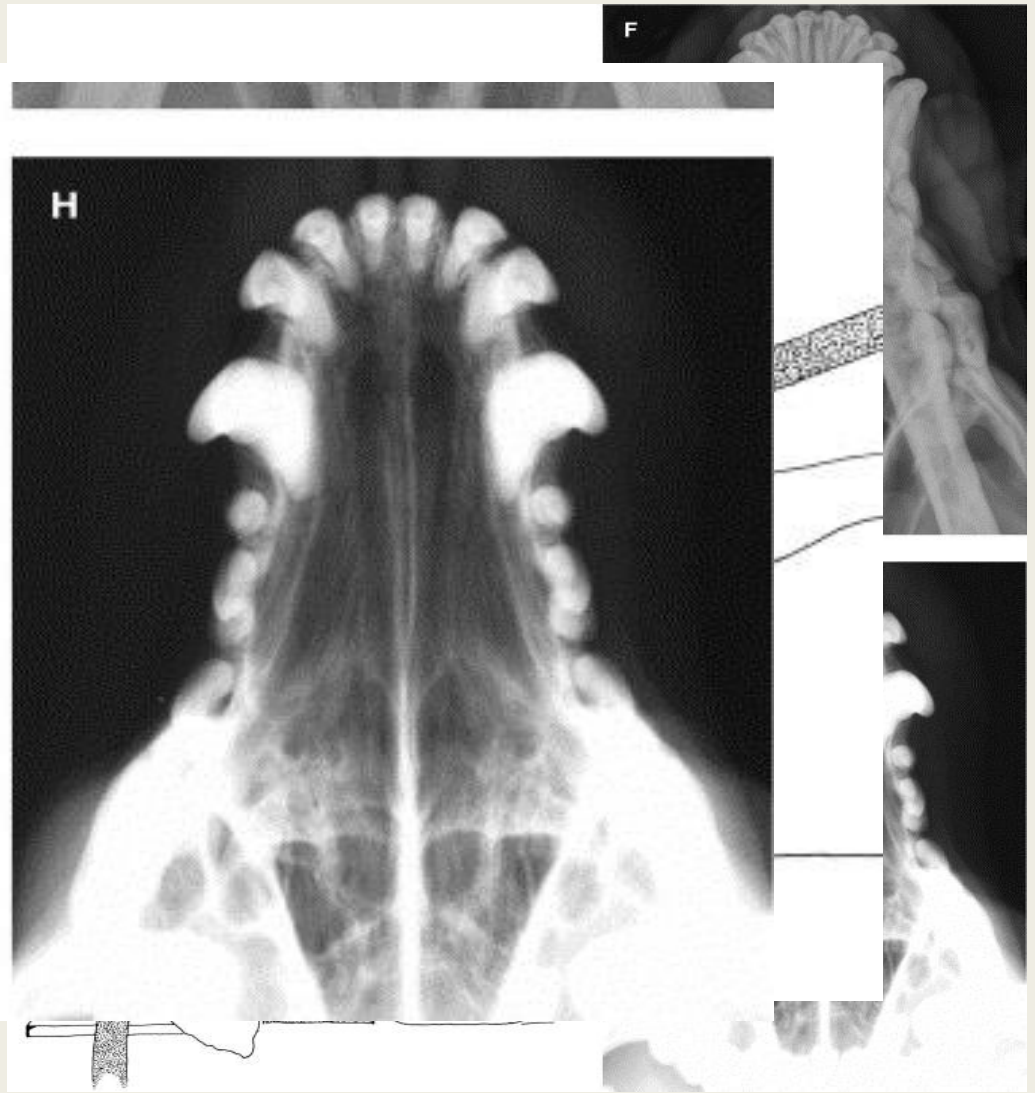
영상학적 진단 기구 소개 (진단시 장단점)

- X-Ray
  - *X-ray*
  - *Dental X-Ray*
  - *C-Arm*
- Rhinoscopy
- Computed Tomograph(CT)
- Magnetic Resonance Imaging(MRI)

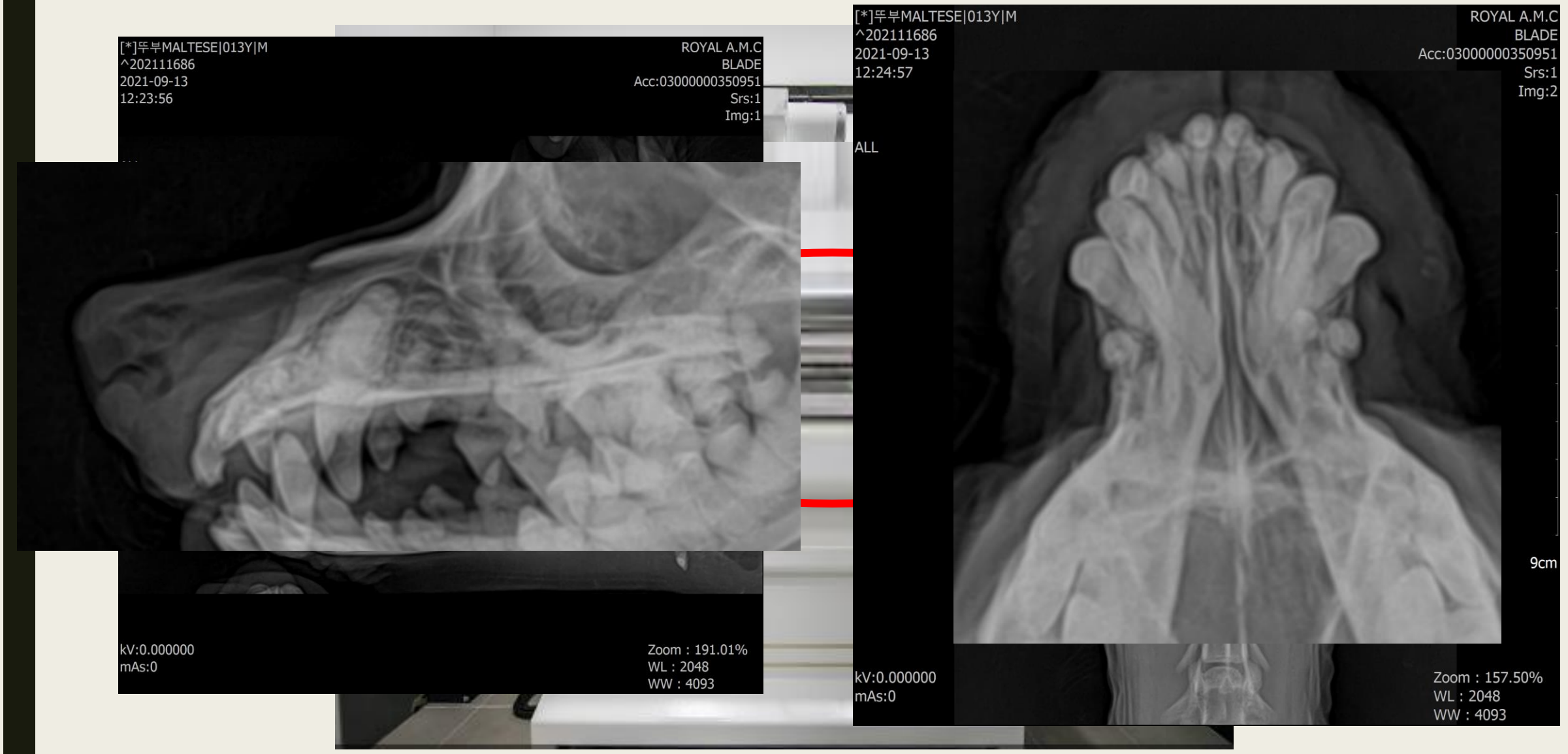
X-Ray 장비

비강 방사선 촬영법





두개골 방사선

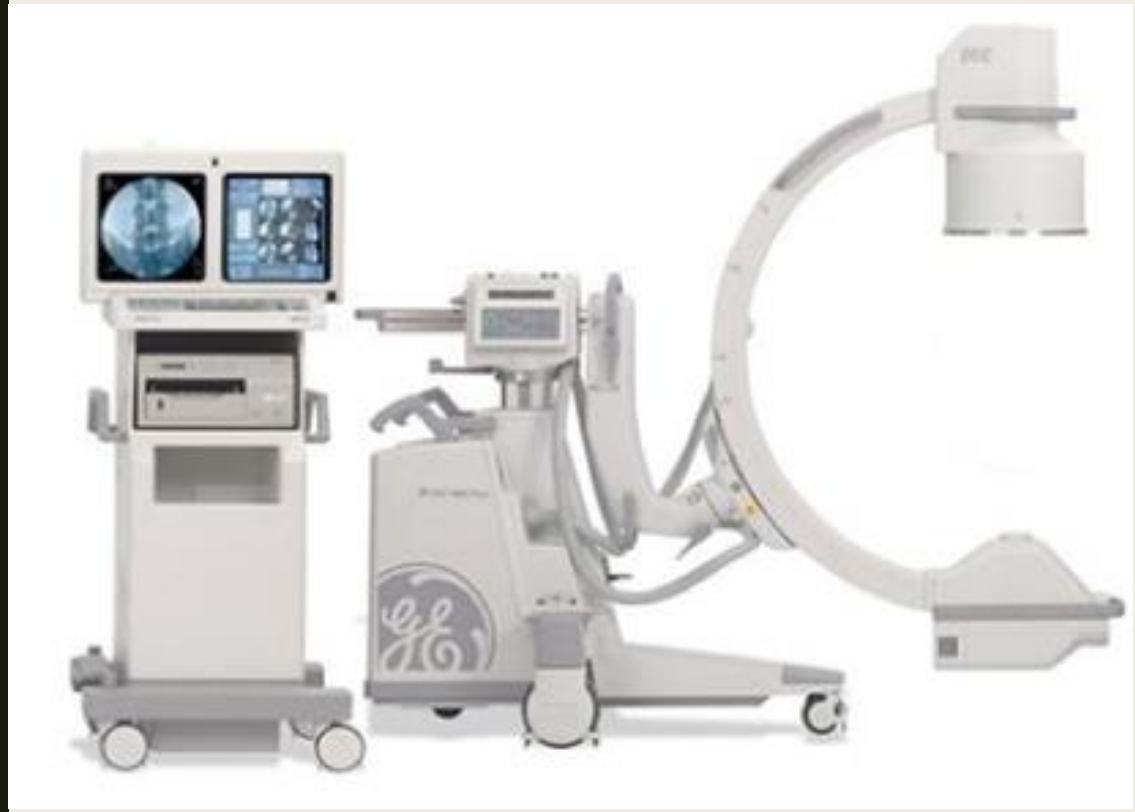

[*]뚜부MALTESE|013Y|M
^202111686
2021-09-13
12:23:56
ROYAL A.M.C
BLADE
Acc:03000000350951
Srs:1
Img:1
kV:0.000000
mAs:0
Zoom : 191.01%
WL : 2048
WW : 4093
[*]뚜부MALTESE|013Y|M
^202111686
2021-09-13
12:24:57
ALL
ROYAL A.M.C
BLADE
Acc:03000000350951
Srs:1
Img:2
9cm
kV:0.000000
mAs:0
Zoom : 157.50%
WL : 2048
WW : 4093

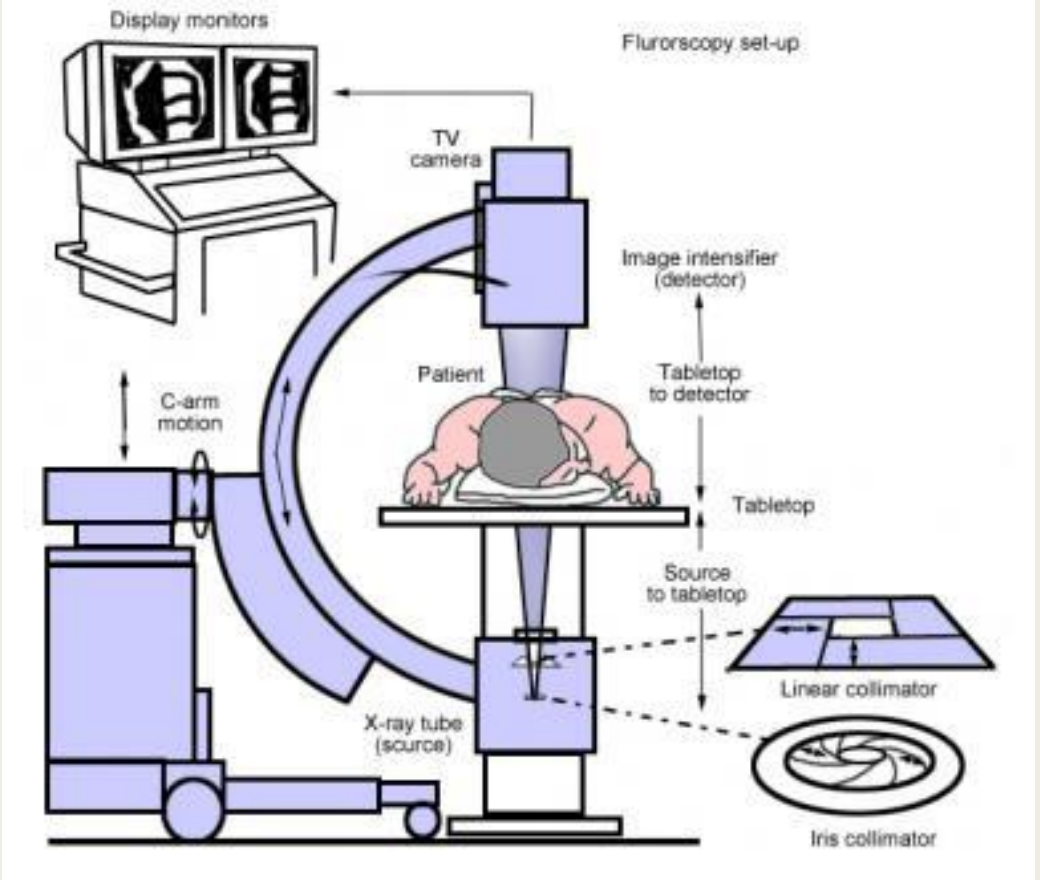
방사선 검사의 장단점

- 장정
  - *환자를 마취하지 않고 빠르게 검사 실시*
  - *검사 비용이 저렴함*

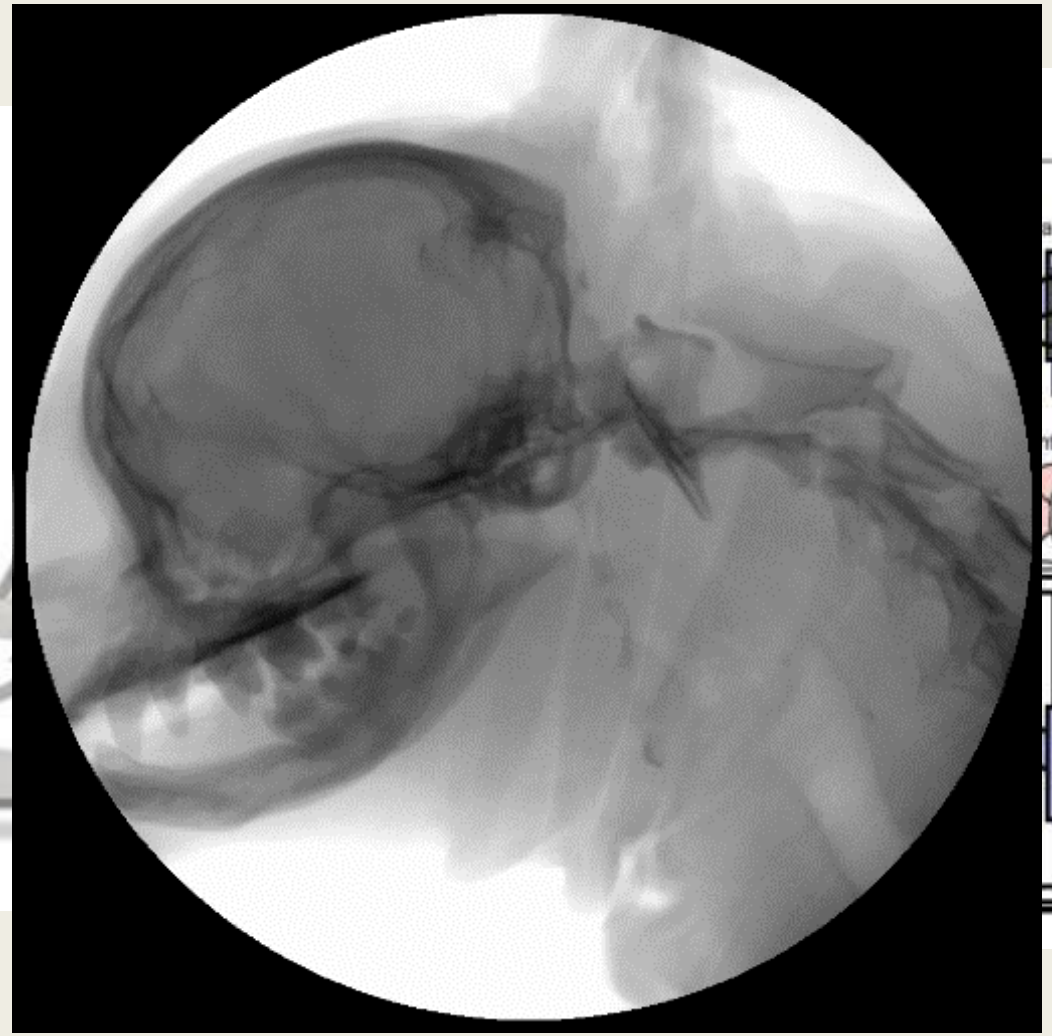
- 단점
  - *3차원구조가2차원영상으로 구현되어 정확한 평가가 어렵다*
  - *골구조물과 연부조직 구조물이 겹쳐, 병소확인이 어렵다*
  - *촬영방법이 어렵다(Flat-panel detector)*

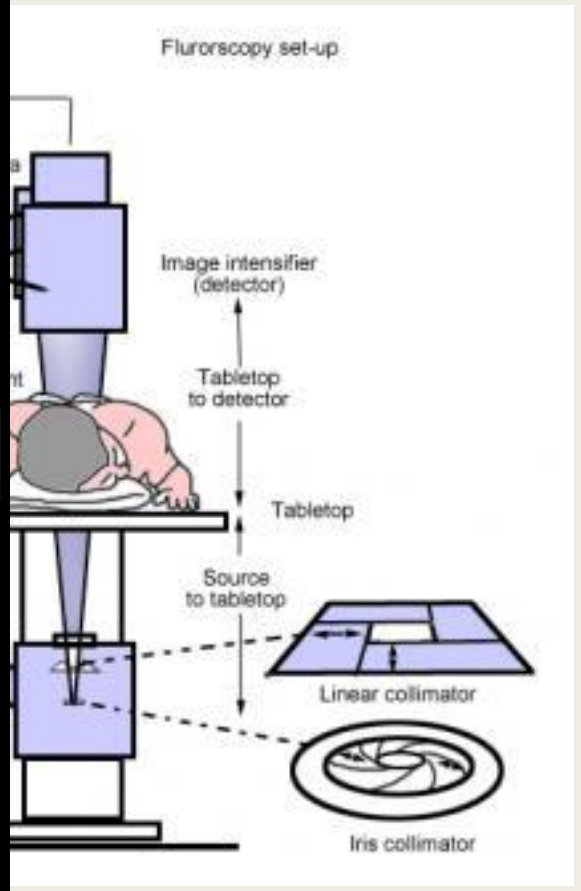
C-Arm 장비




Display monitors
Flurorscopy set-up
TV
camera
Image intensifier
(detector)
Patient
Tabletop
to detector
C-arm
motion
Tabletop
Source
to tabletop
Linear collimator
X-ray tube
(source)
Iris collimator

C-Arm



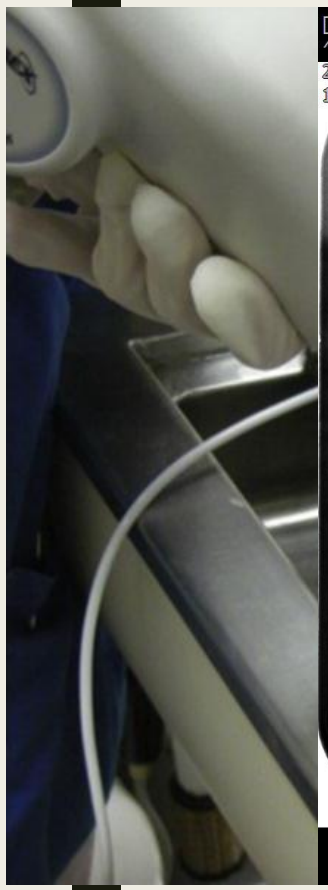

Flurorscopy set-up
Image intensifier
(detector)
Tabletop
to detector
Tabletop
Source
to tabletop
Linear collimator
Iris collimator

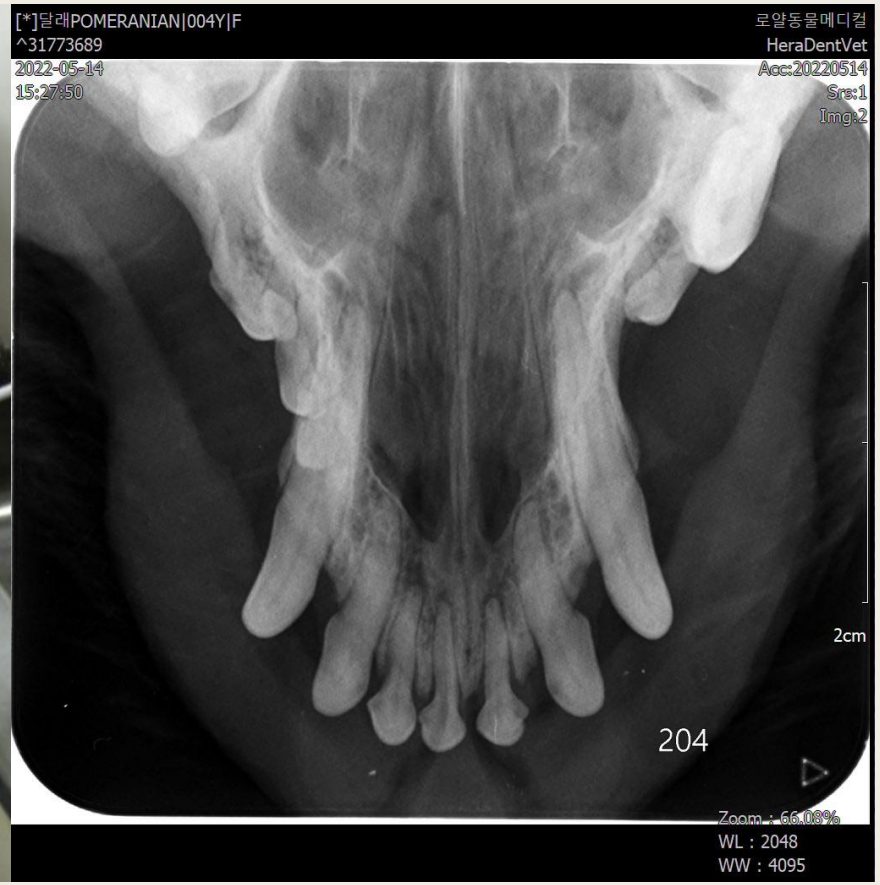
C-Arm 검사의 장단점

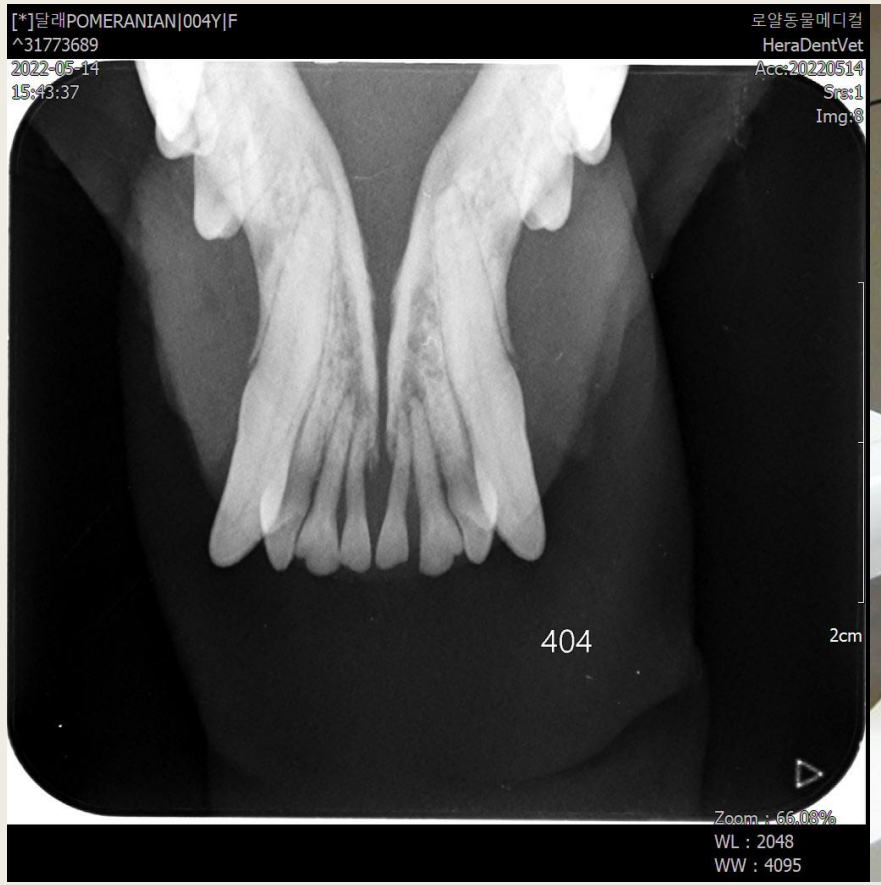
- 장점
  - *검사하고자 하는 부위를 신속하게 검사할 수 있다.*
  - *특별한 촬영기술이나 판독 기술이 필요하지 않다.*
  - *움직이는 구조를 실시간 평가할 수 있댜.*

- 단점
  - *방사선 피폭량이 많다*
  - *고가의 장비가 필요하다*
  - *방사선 기반의 검사로 비강구조물이 중첩되어 판독이 어렵다*

치과 방사선 장비




[*]달래POMERANIAN|004Y|F
^31773689
로얄동물메디컬
HeraDentVet
2022-05-14
15:27:50
Acc:20220514
Srs:1
Img:2
2cm
204
Zoom : 66.08%
WL : 2048
WW : 4095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^31773689
로얄동물메디컬
HeraDentVet
2022-05-14
15:43:37
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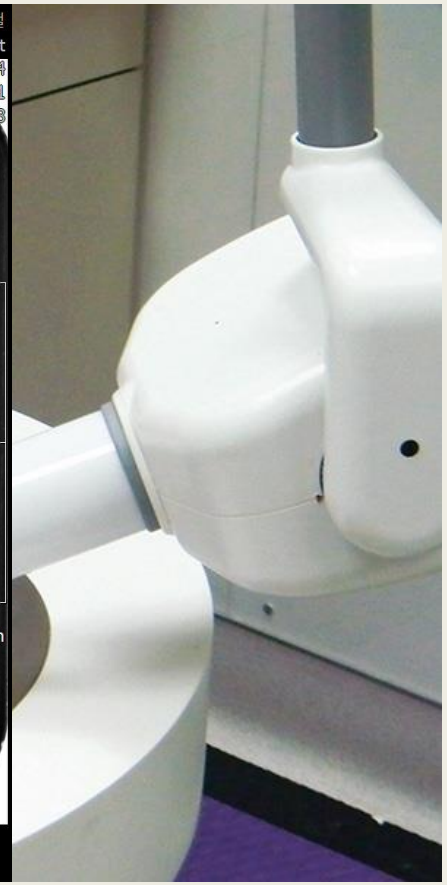
Img:3
404
2cm
Zoom : 66.08%
WL : 2048
WW : 4095

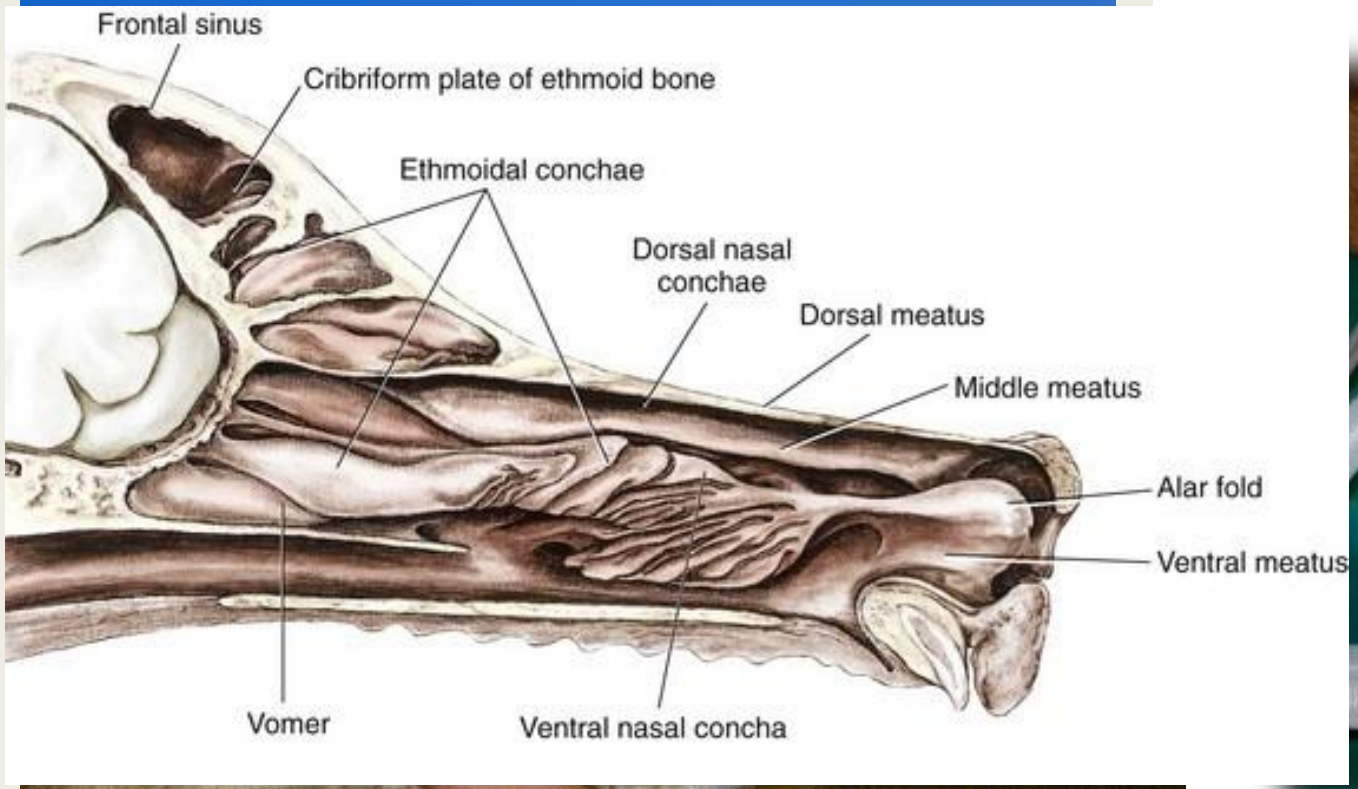


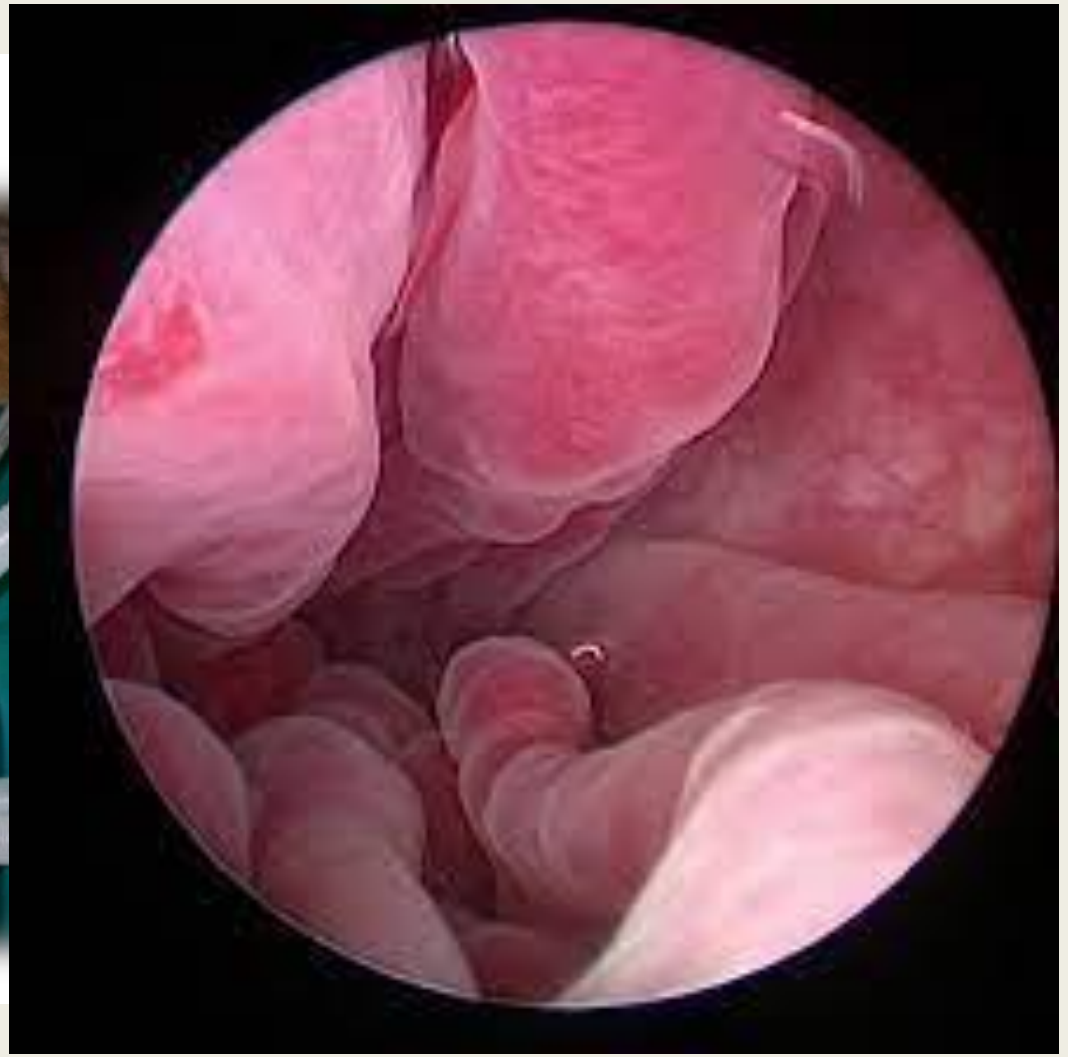
치과방사선 검사의 장단점

- 장점
  - *비교적 간단한 장비로 촬영이 가능*
  - *촬영시 조작이 간편함*

- 단점
  - *촬영시야가 좁다*
  - *반드시 마취후 검사가 가능*
  - Detector *손상 가능성이 높다*
  - *방사선 기반으로 비강조직이 중첩되어 촬영됨*

Rhinoscopy(비강경)



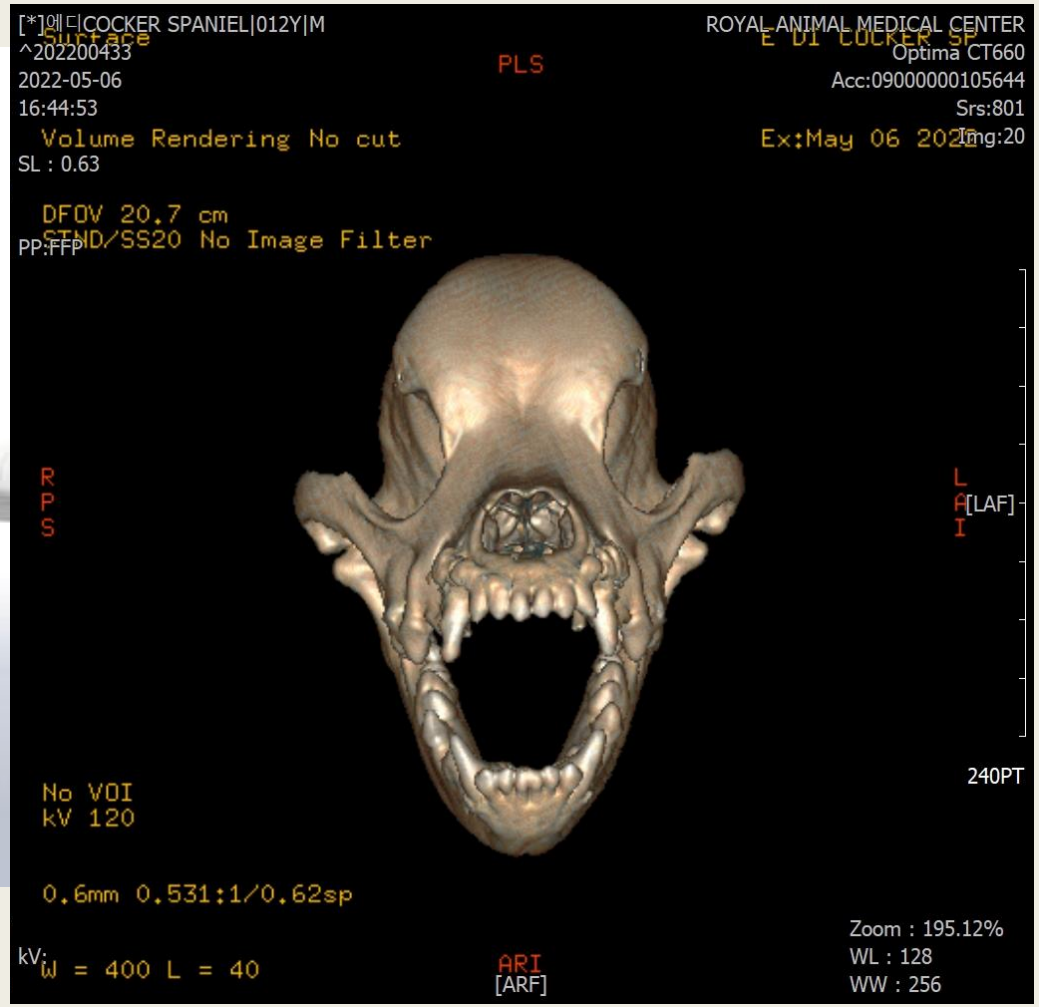


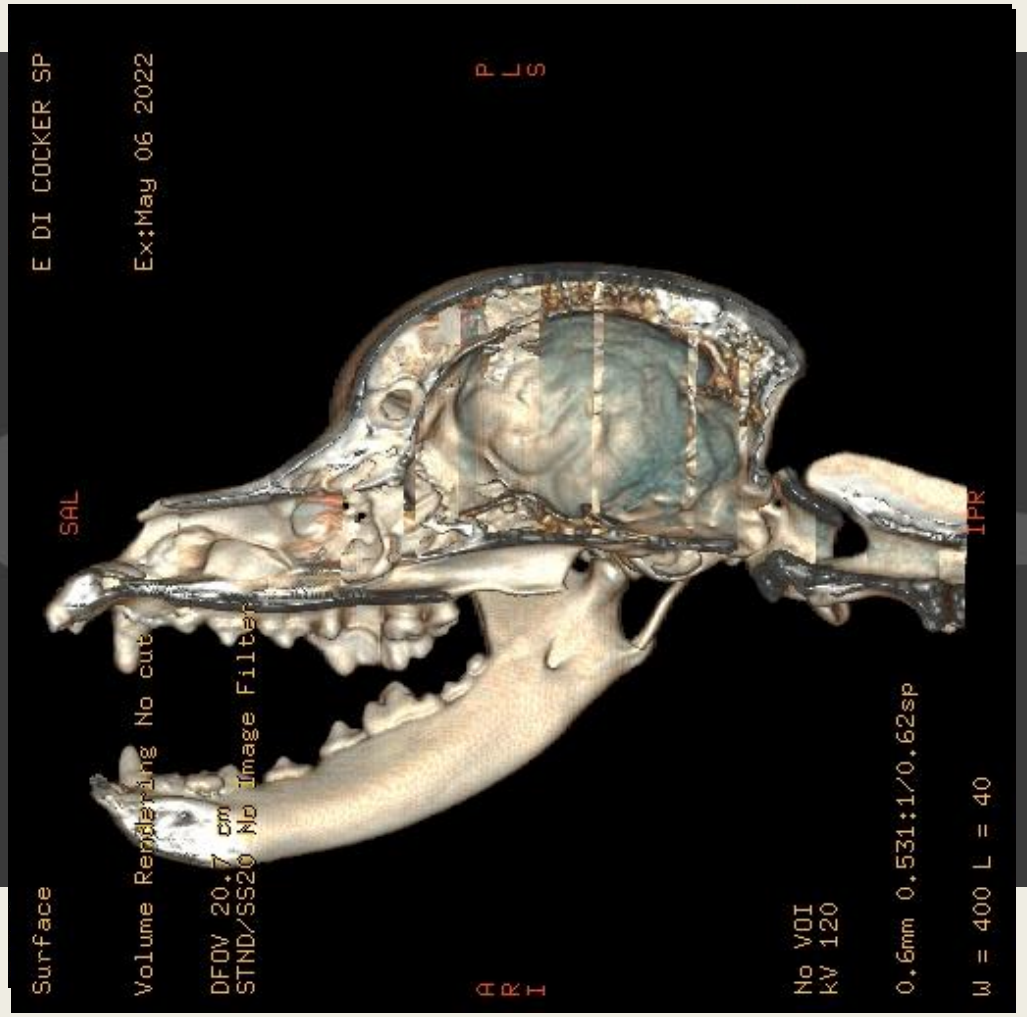
비강경의 장단점

- 장점
  - *환부를 실시간으로 검사 가능*
  - *검사시 조직 검사 및 간단한 치료 가능*

- 단점
  - *검사가 제한적(비갑개골의 파괴정에 따라 다름)*
  - *비강 구조가 좁고 길어 scope의 조작이 어렵다*
  - *화면을 보면서 scope을 조작하므로 숙련되 기술필요*

Computed Tomograph(CT)



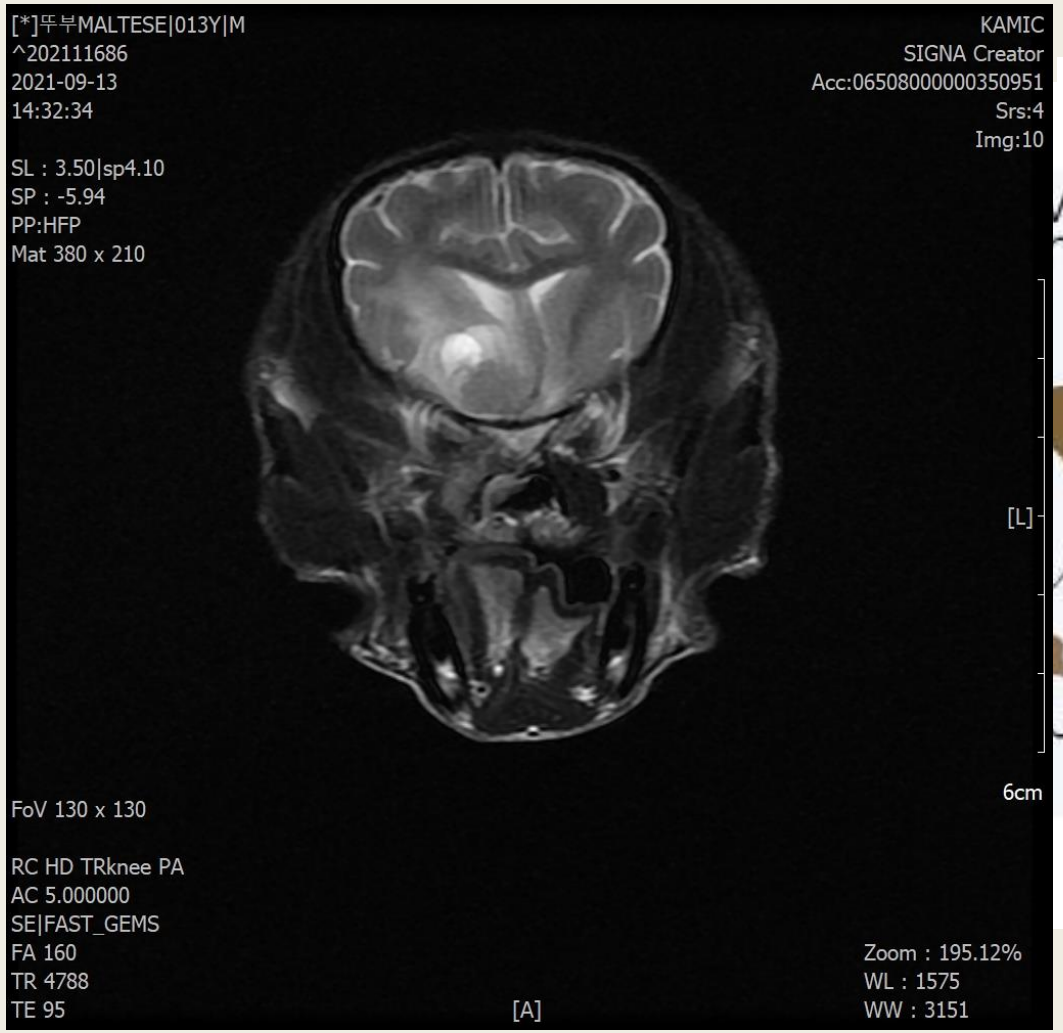


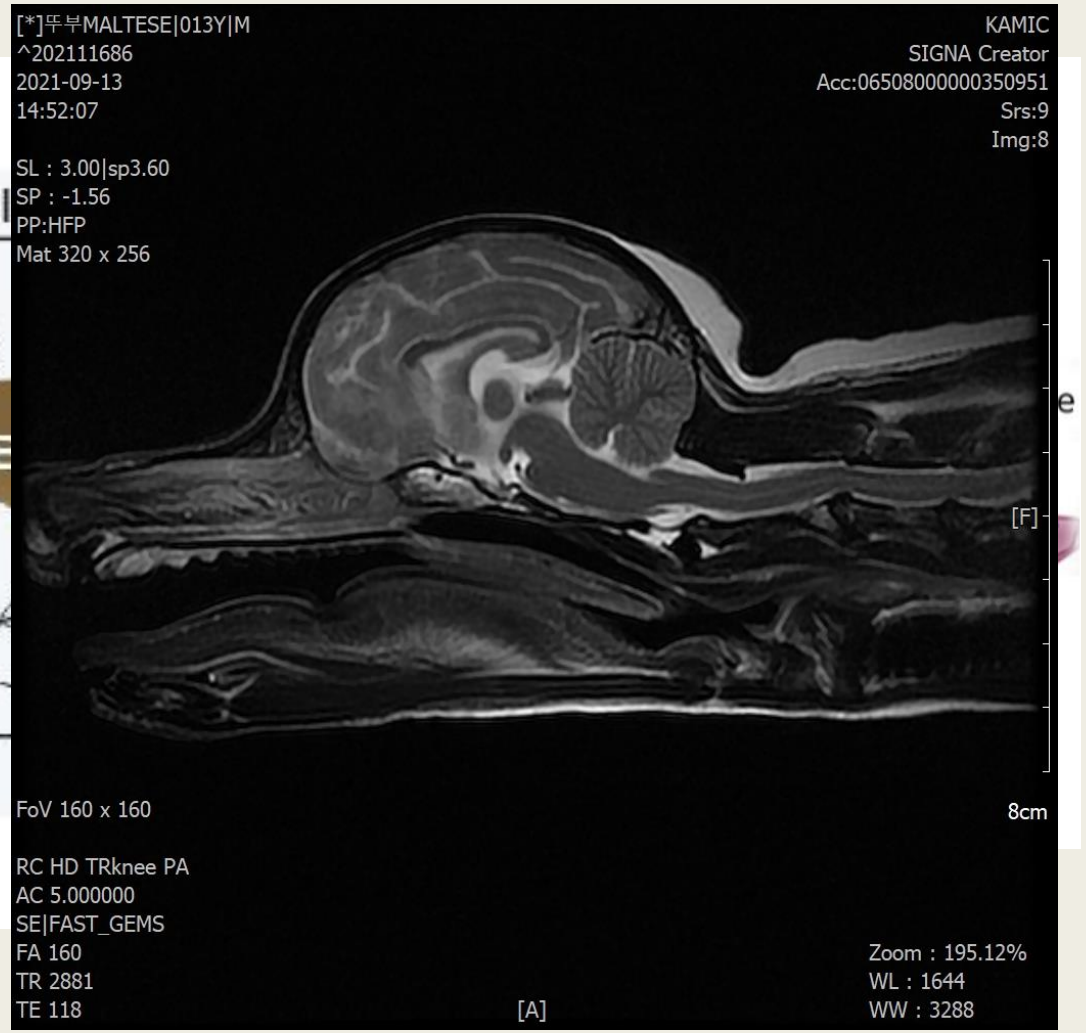
CT 검사의 장단점

- 장점
  - *뼈와 연부조직을 동시에 평가가 가능*
  - *검사부위 영상의 다양한 각도 평가 가능(Axial, MPR, 3D)*
  - *검사 시간이 짧다*
  - *정확한 해부학적 정보 전달*
  - *종양성 질환의 전이 평가 우수*

- 단점
  - *마취가 필요*
  - *장비운용 능력 필요*
  - *고가의 장비*

Magnetic Resonance Imaging(MRI)





MRI 검사의 장단점

- 장점
  - *연부조직 평가가 우수*
  - *종양성 질환의 진단이 우수*

- 단점
  - *검사시간이 길다*
  - *고가의 진단장비*
  - *장비운용이 어렵다*
  - *마취가 필요하다*
  - *뼈구조물을 평가할 수 없다*

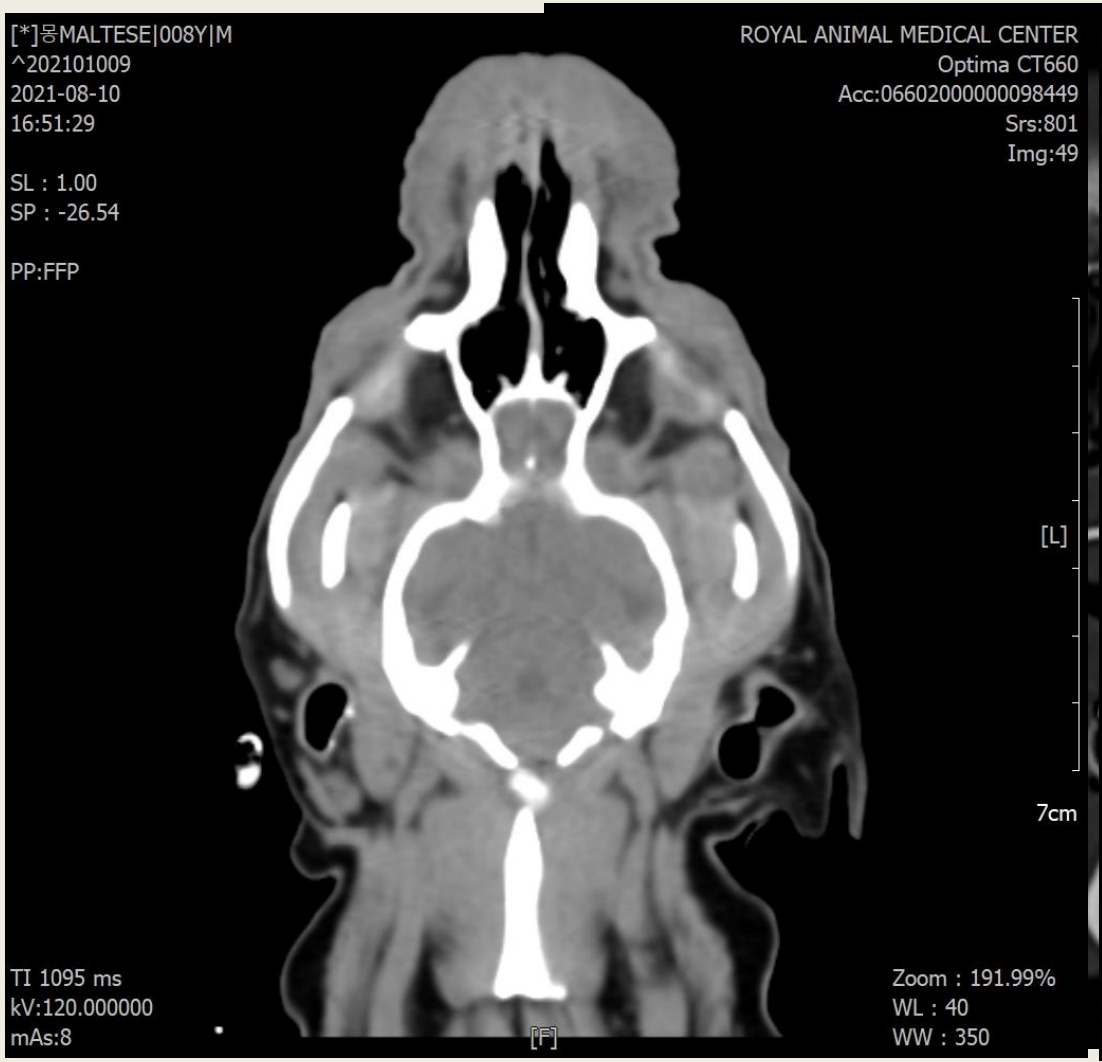
증례

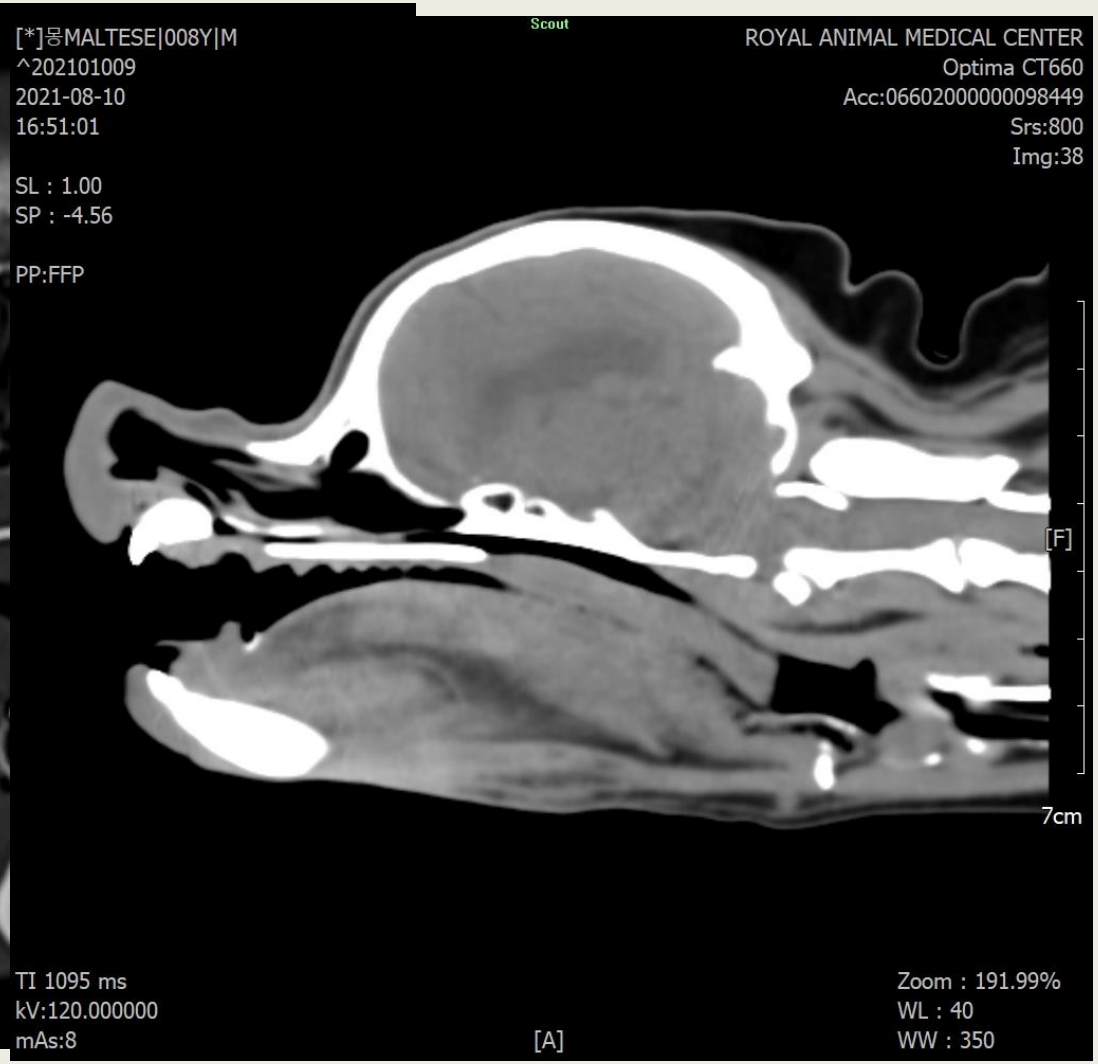
증례 1

- Maltese, CM, 7Y, 5.8kg

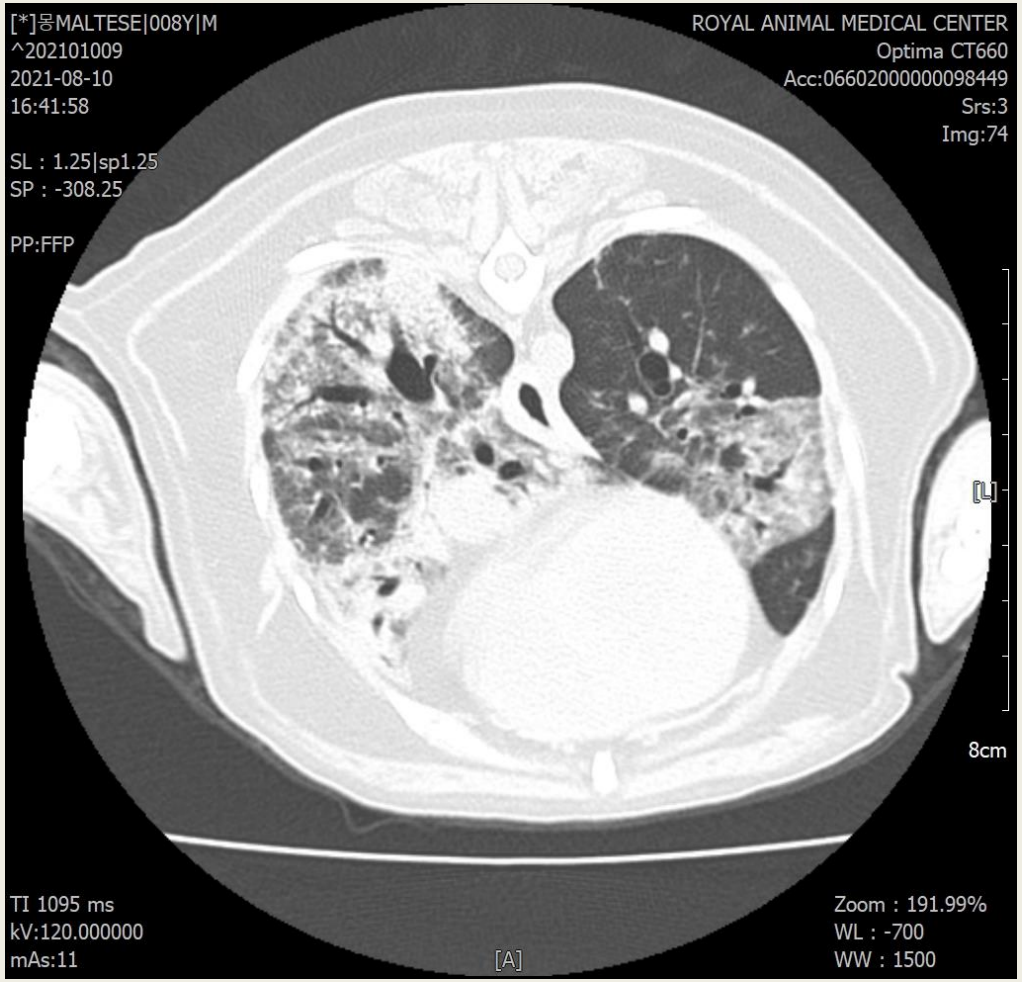
- CC
  - *비강에 무언가가 걸린듯한 노력성 호흡*

비강 수준의 CT가로 단면 영상

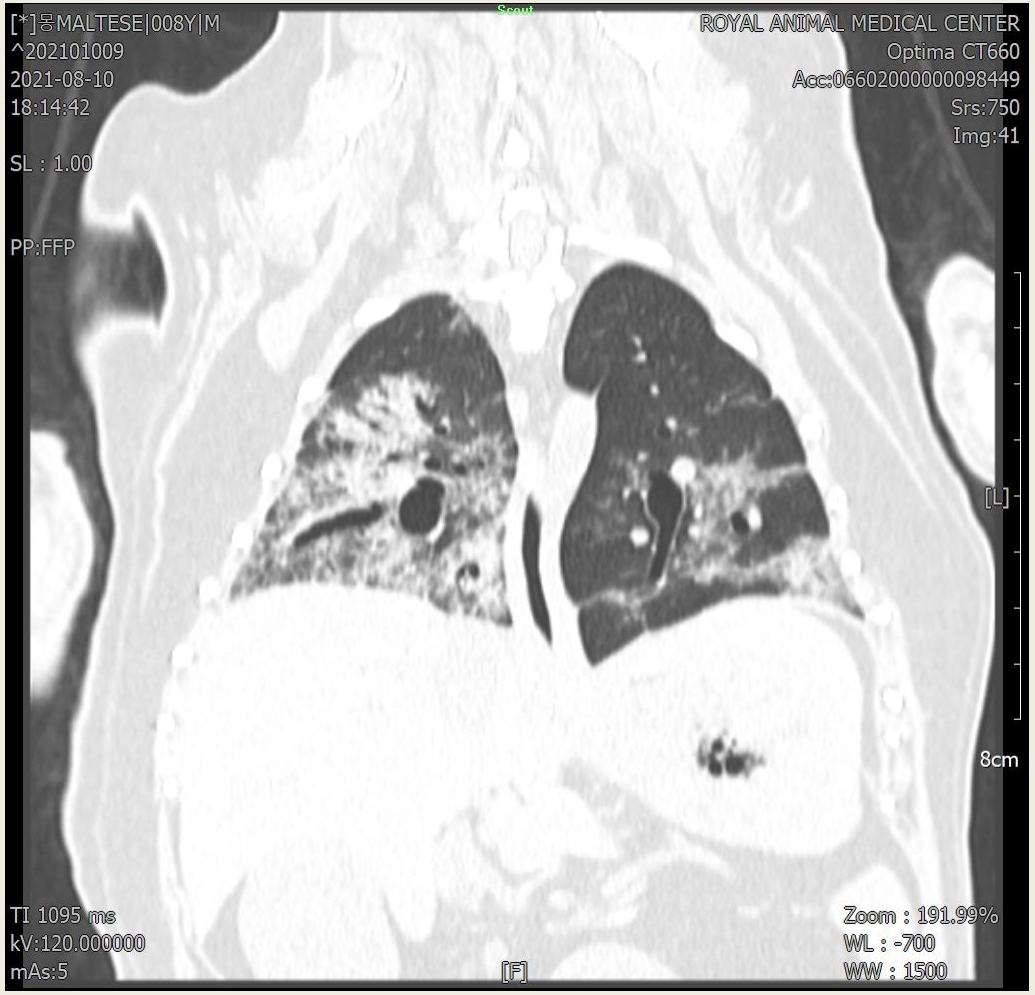




흉부 CT 평가

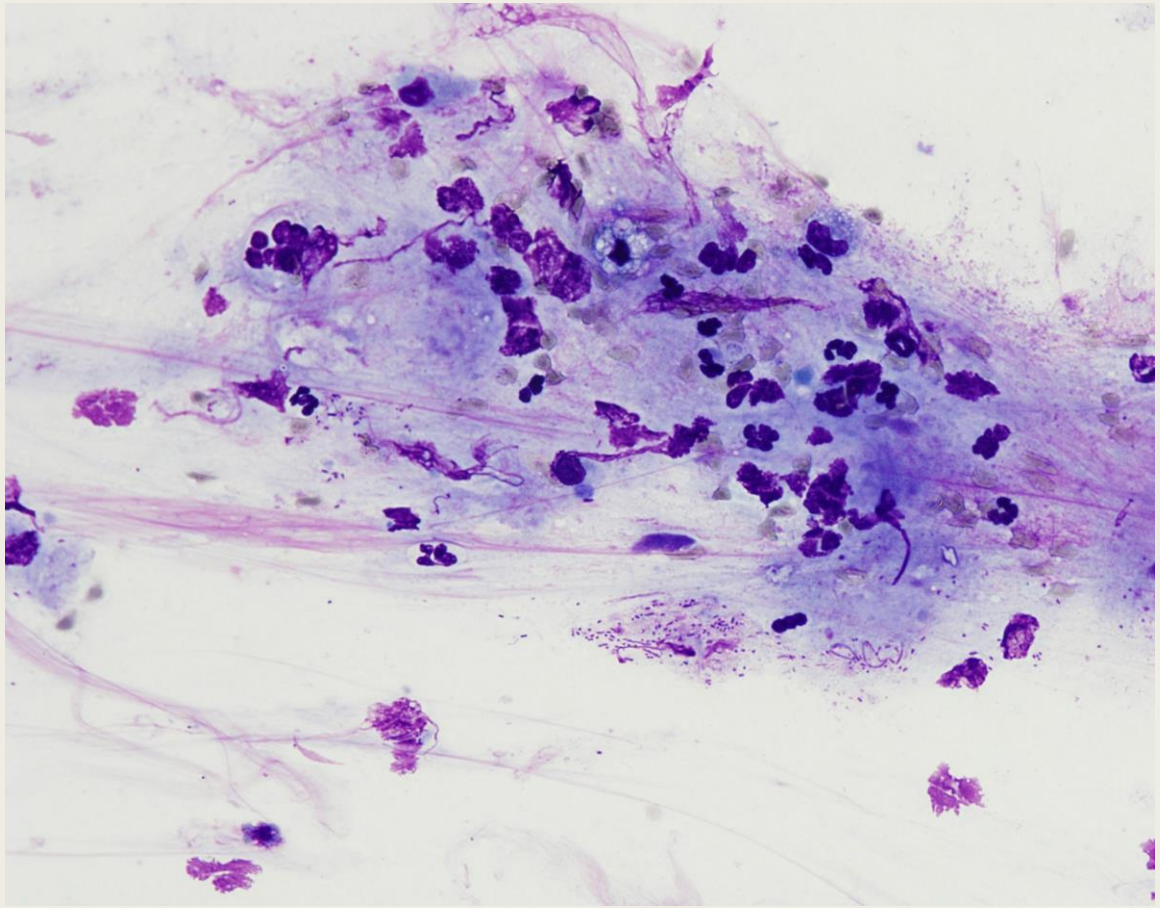


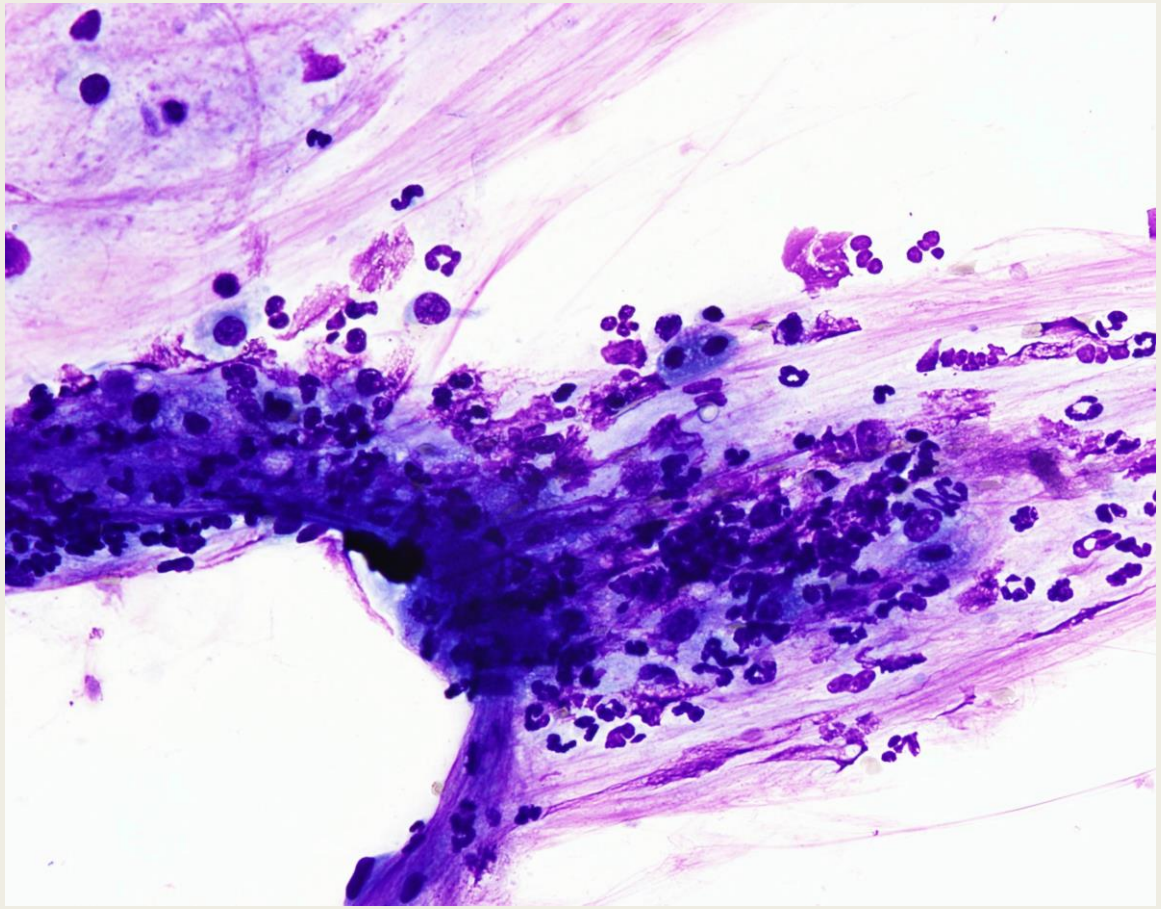
Lung Window Axial Image



Lung Window MPR Image

Bronchial lavage



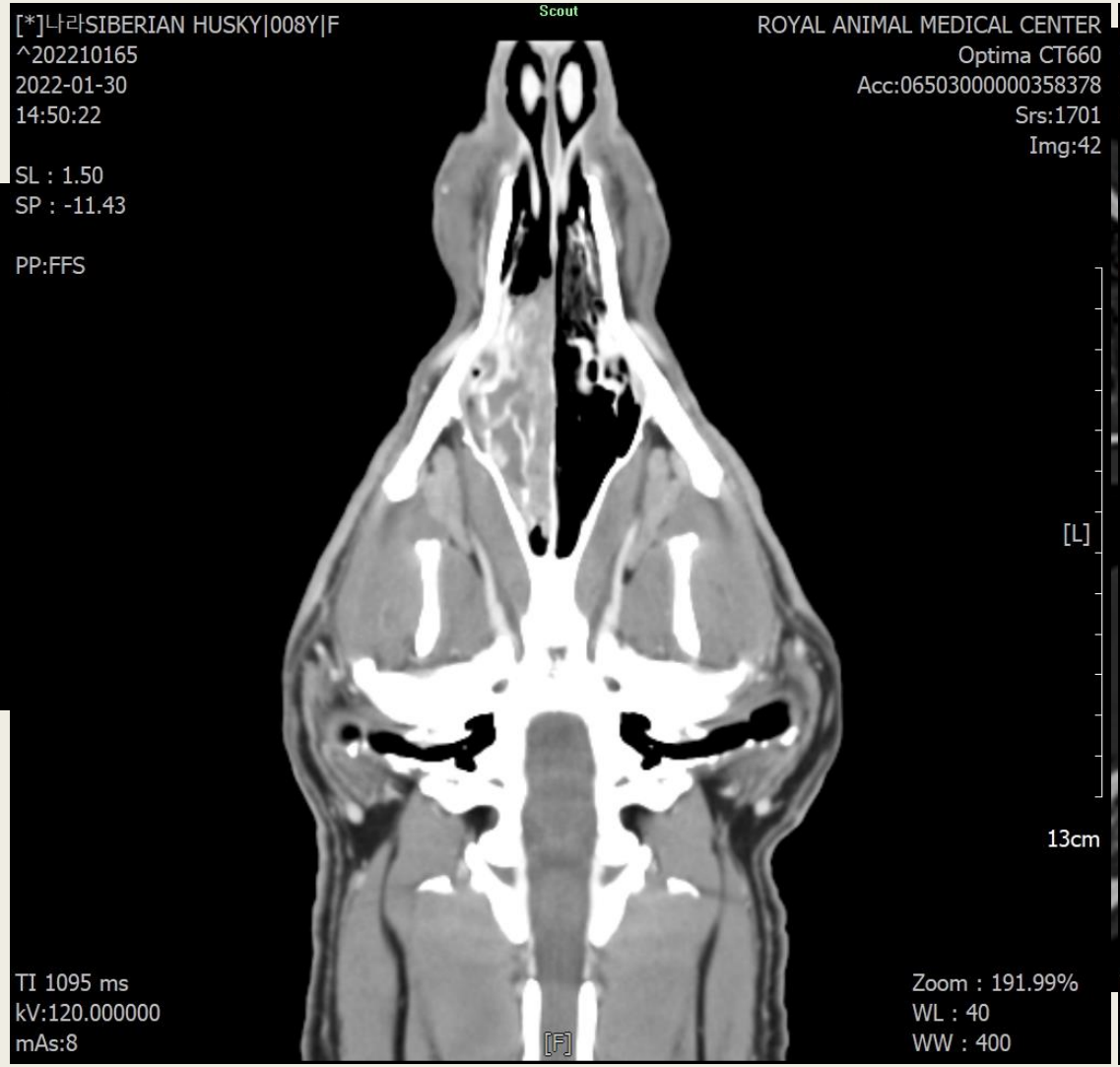


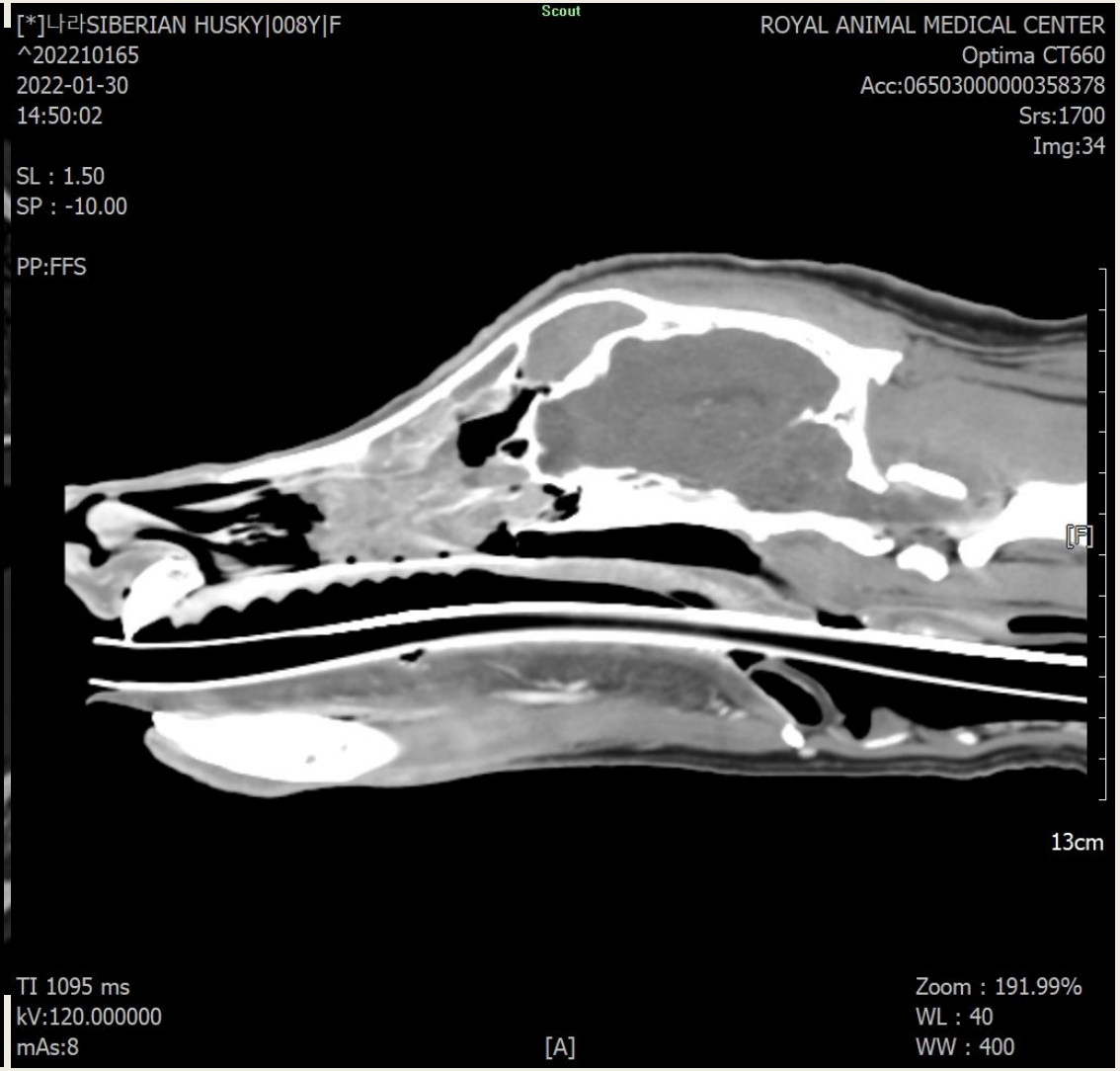
- neutrophilic inflammation, bacterial and fungal infection.

증례 2

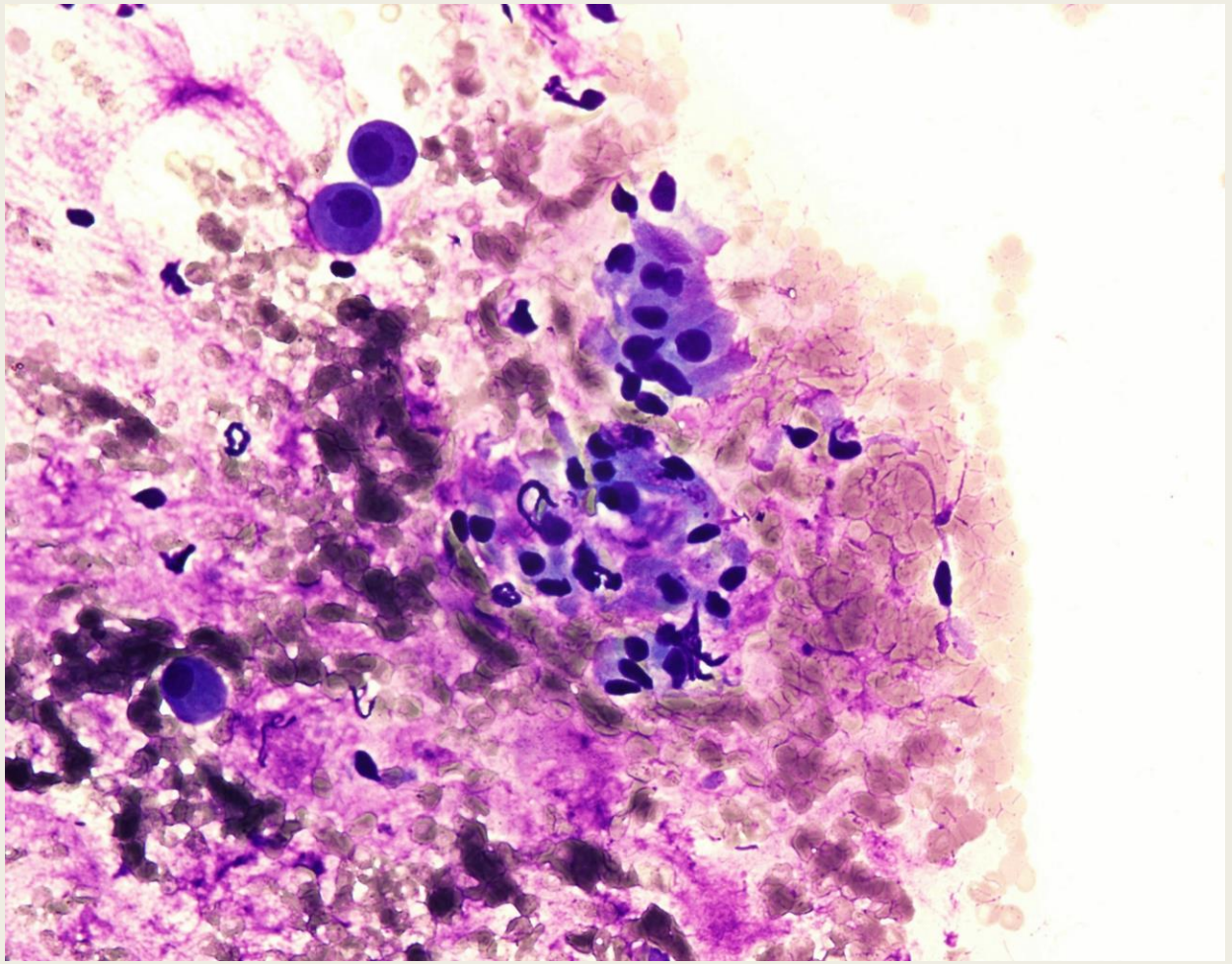
- Siverian Husky, SF, 9Y, 26kg
- CC
  - *지역병원에서 지속적인 비강 삼출물로 항생제 처방*
  - *비엽 진단후 지속적인 투약을 실시하였으나 치료 반응이 없고 출혈까지 관찰됨.*

비강 수준의 CT가로 단면 영상





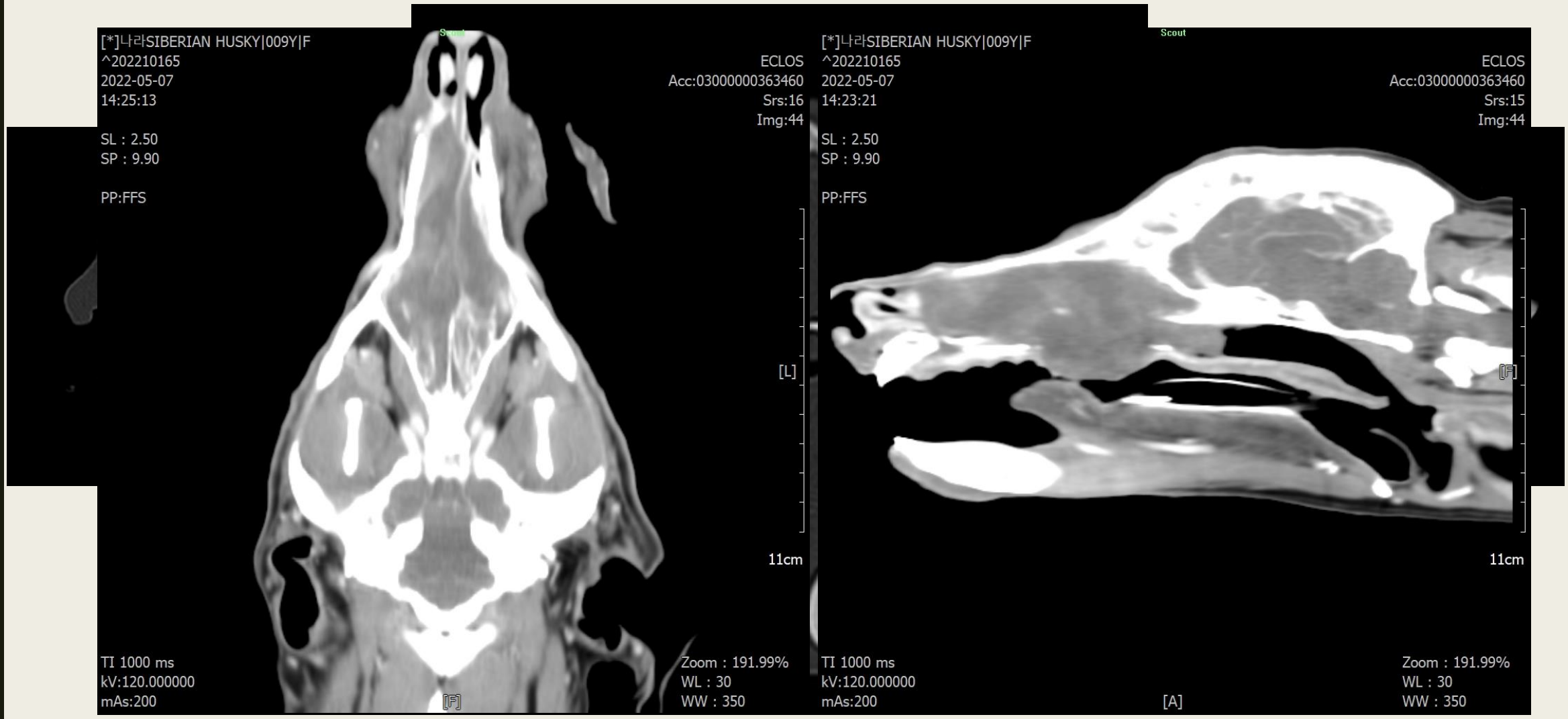
Cytobrush(1차 세포학 검사)

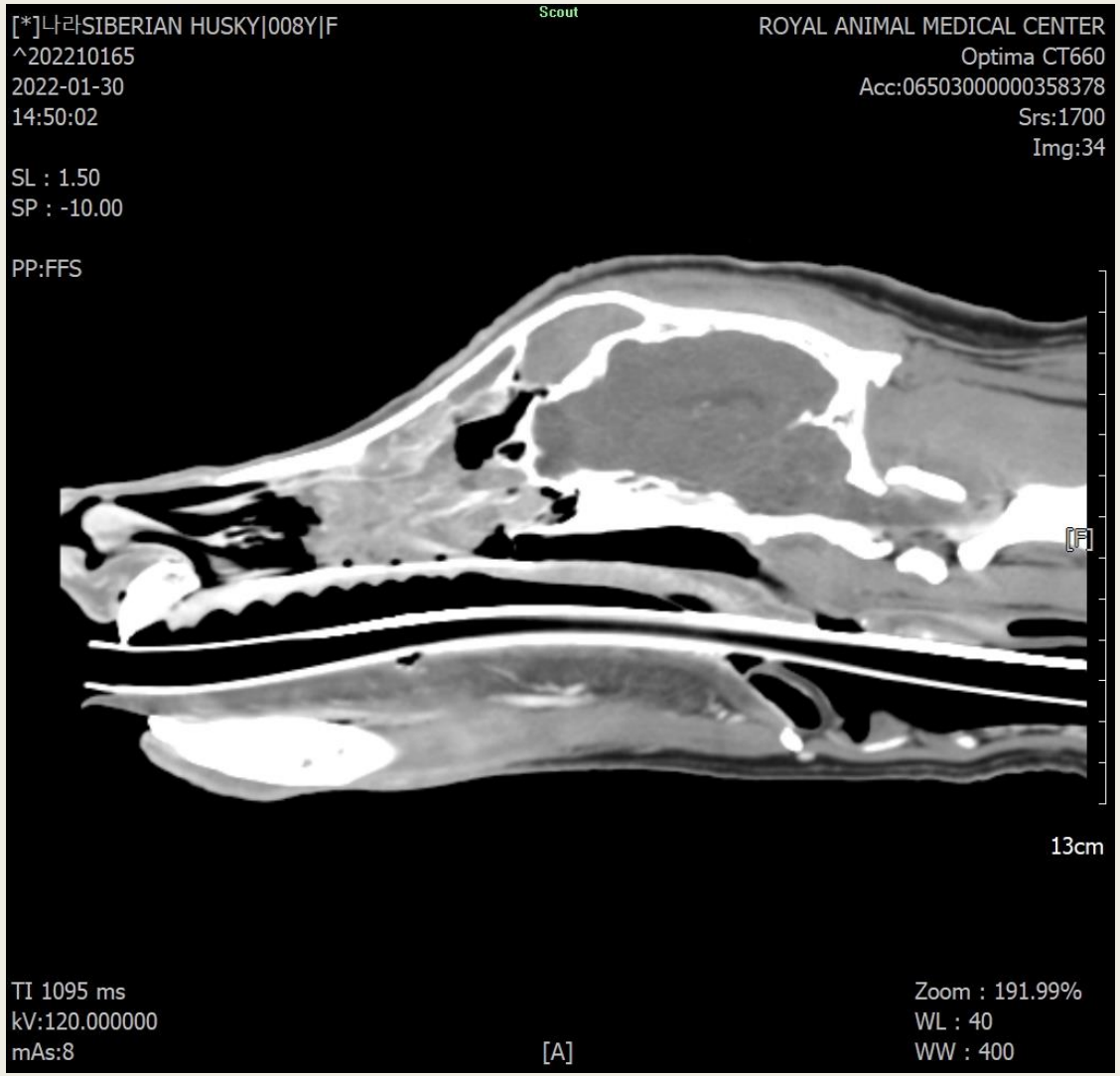


Cytobrush(1차 세포학 검사)

- hyperplasia

4개월 후 재 검사 영상


[*]나라SIBERIAN HUSKY|009Y|F
^202210165
2022-05-07
14:25:13
SL : 2.50
SP : 9.90
PP:FFS
ECLOS
Acc:03000000363460
Srs:16
Img:44
[L]
11cm
TI 1000 ms
kV:120.000000
mAs:200
[F]
Zoom : 191.99%
WL : 30
WW : 350
Scout
[*]나라SIBERIAN HUSKY|009Y|F
^202210165
2022-05-07
14:23:21
SL : 2.50
SP : 9.90
PP:FFS
ECLOS
Acc:03000000363460
Srs:15
Img:44
[F]
11cm
TI 1000 ms
kV:120.000000
mAs:200
[A]
Zoom : 191.99%
WL : 30
WW : 350


Scout
[*]나라SIBERIAN HUSKY|008Y|F
^202210165
2022-01-30
14:50:02
ROYAL ANIMAL MEDICAL CENTER
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Acc:06503000000358378
Srs:1700
Img:34
SL : 1.50
SP : -10.00
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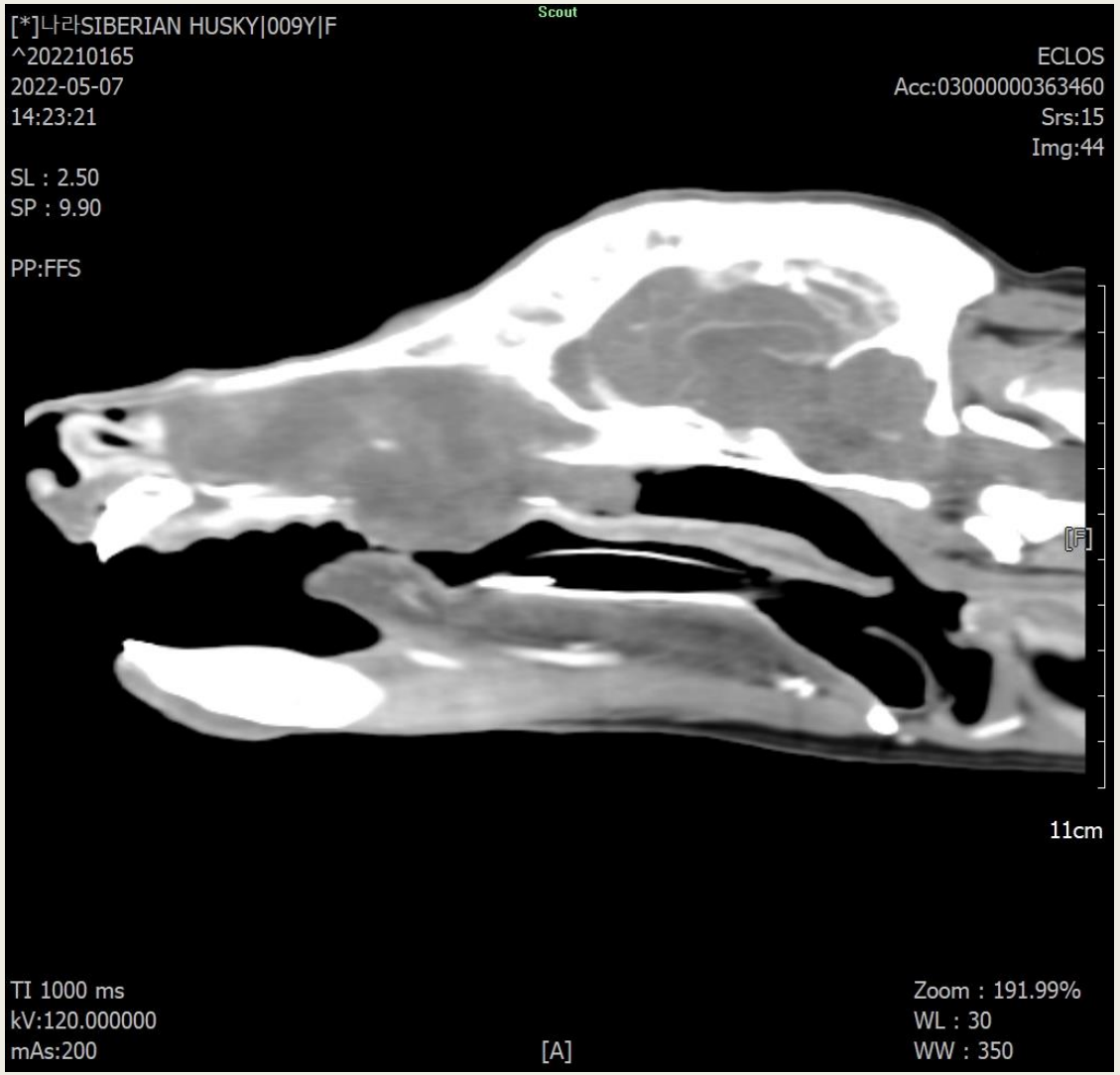
[F]
13cm
TI 1095 ms
kV:120.000000
mAs:8
[A]
Zoom : 191.99%
WL : 40
WW : 400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ECLOS
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11cm
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[A]
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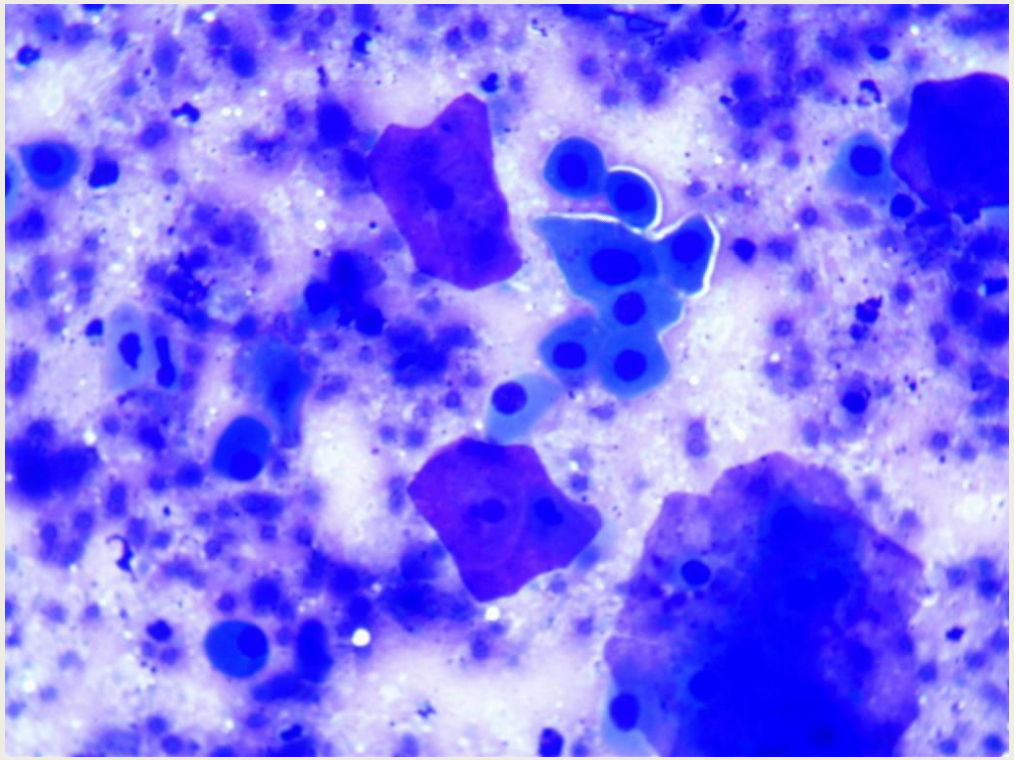
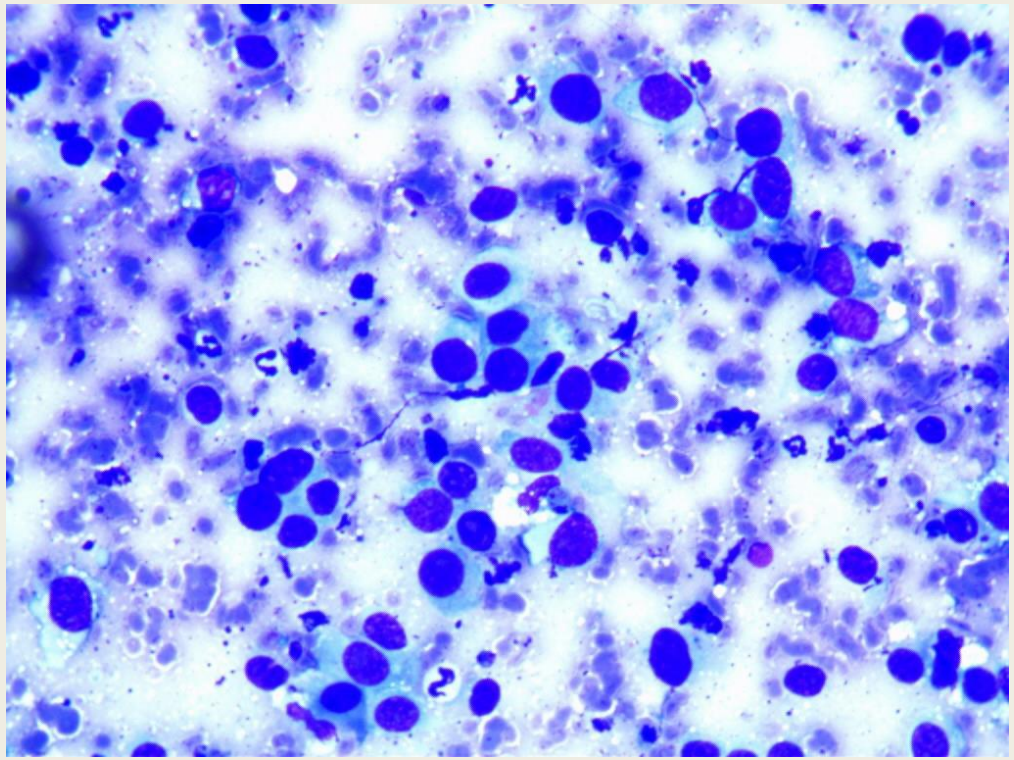
WL : 30
WW : 350

Cytobrush(2차 세포학 검사)





Cytobrush(2차 세포학 검사)

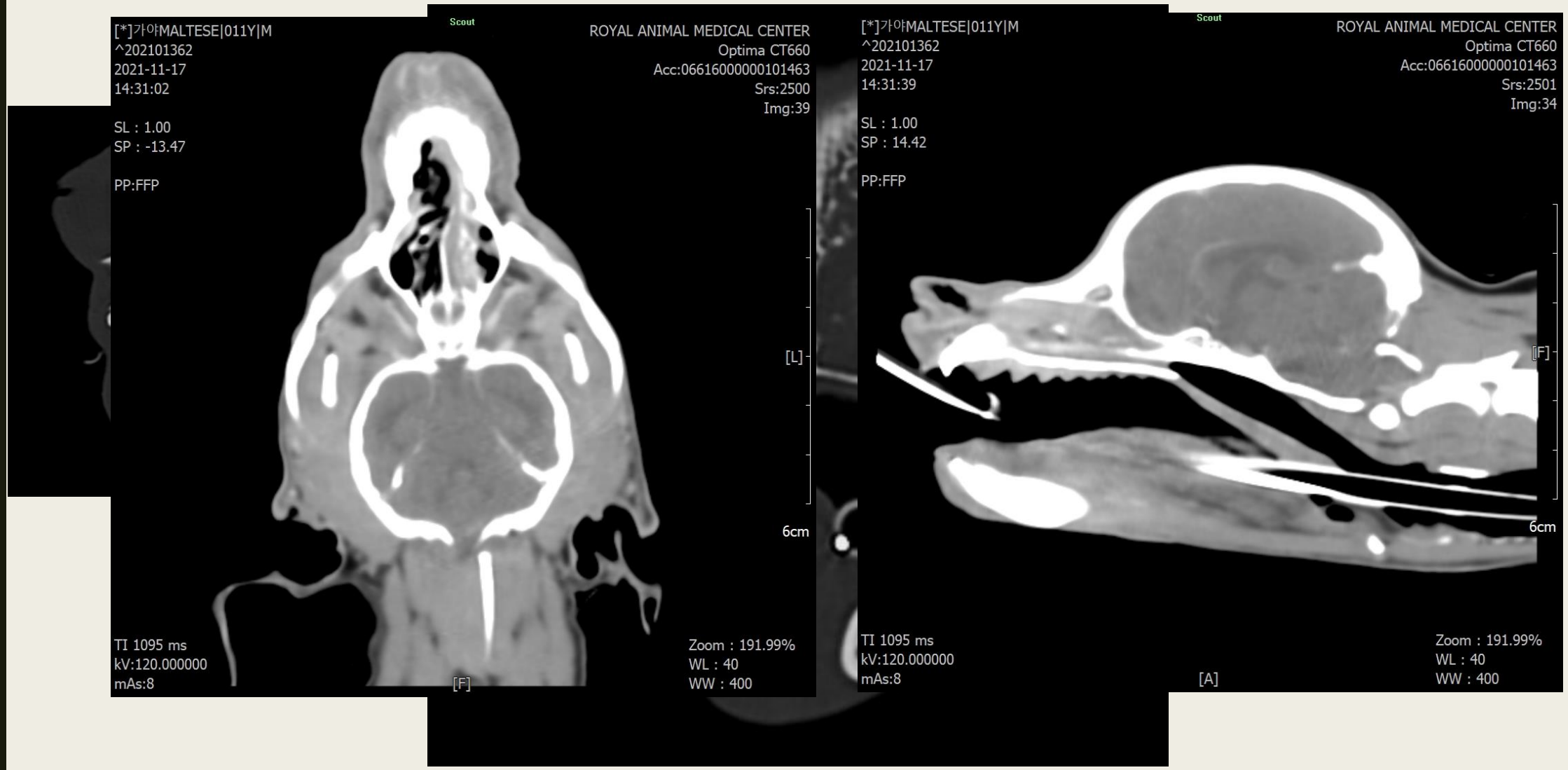
- nasal carcinoma

증례 3

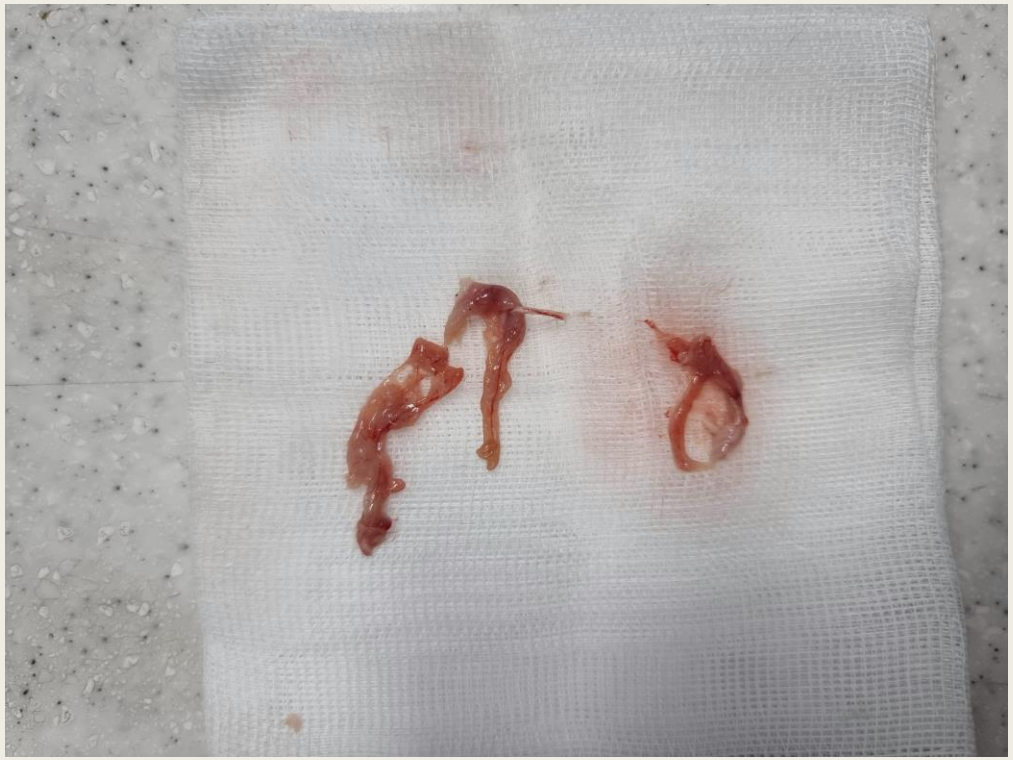
- Maltese, CM, 11Y, 2.8kg

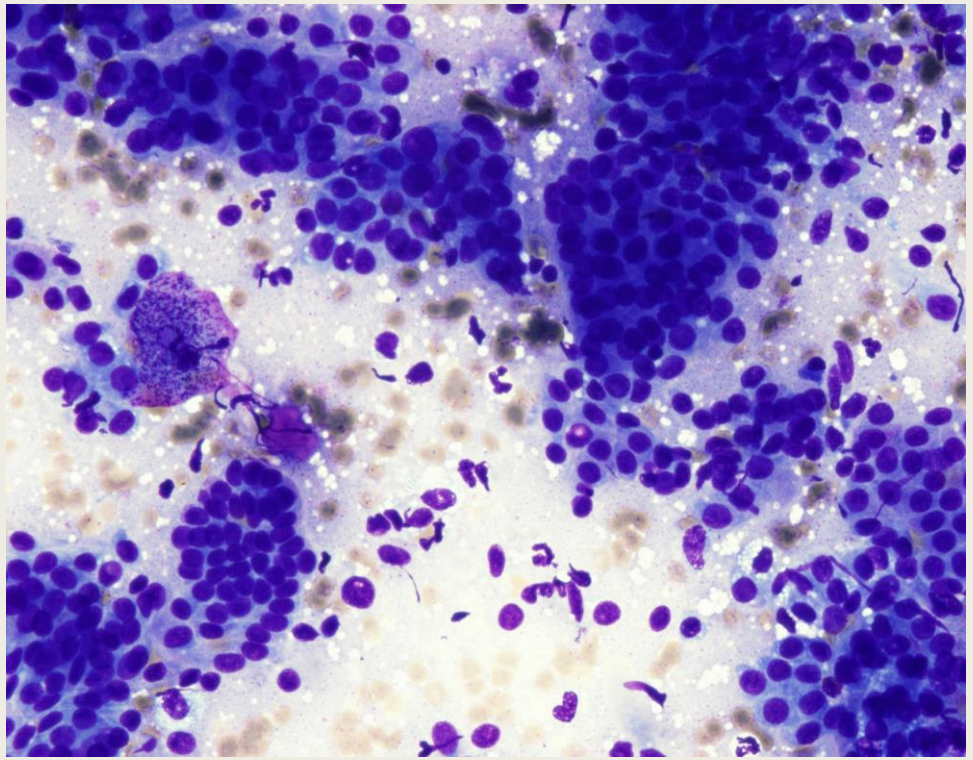
- CC
  - *본원내원전 지역병원에서 비출혈 관련 진료*
  - *지역병원에서 CT 검사와 세포학 검사 실시*
  - *특이 소견 없음 진단*
  - *9개월 경과후 본원 내원*

비강 수준의 CT가로 단면 영상



Cytobrush(세포학 검사)





Cytobrush

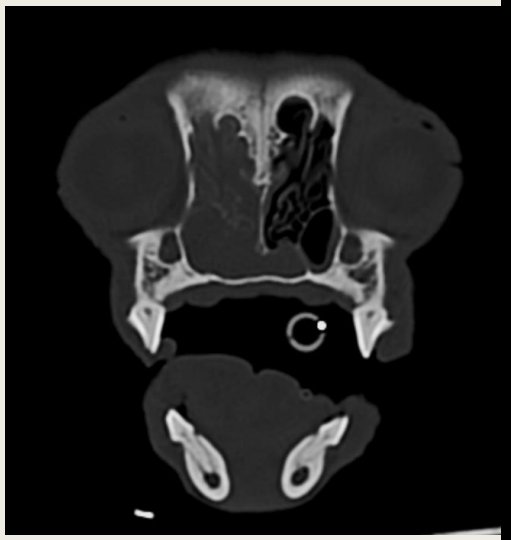
- well differenatiated carcinoma

증례 4

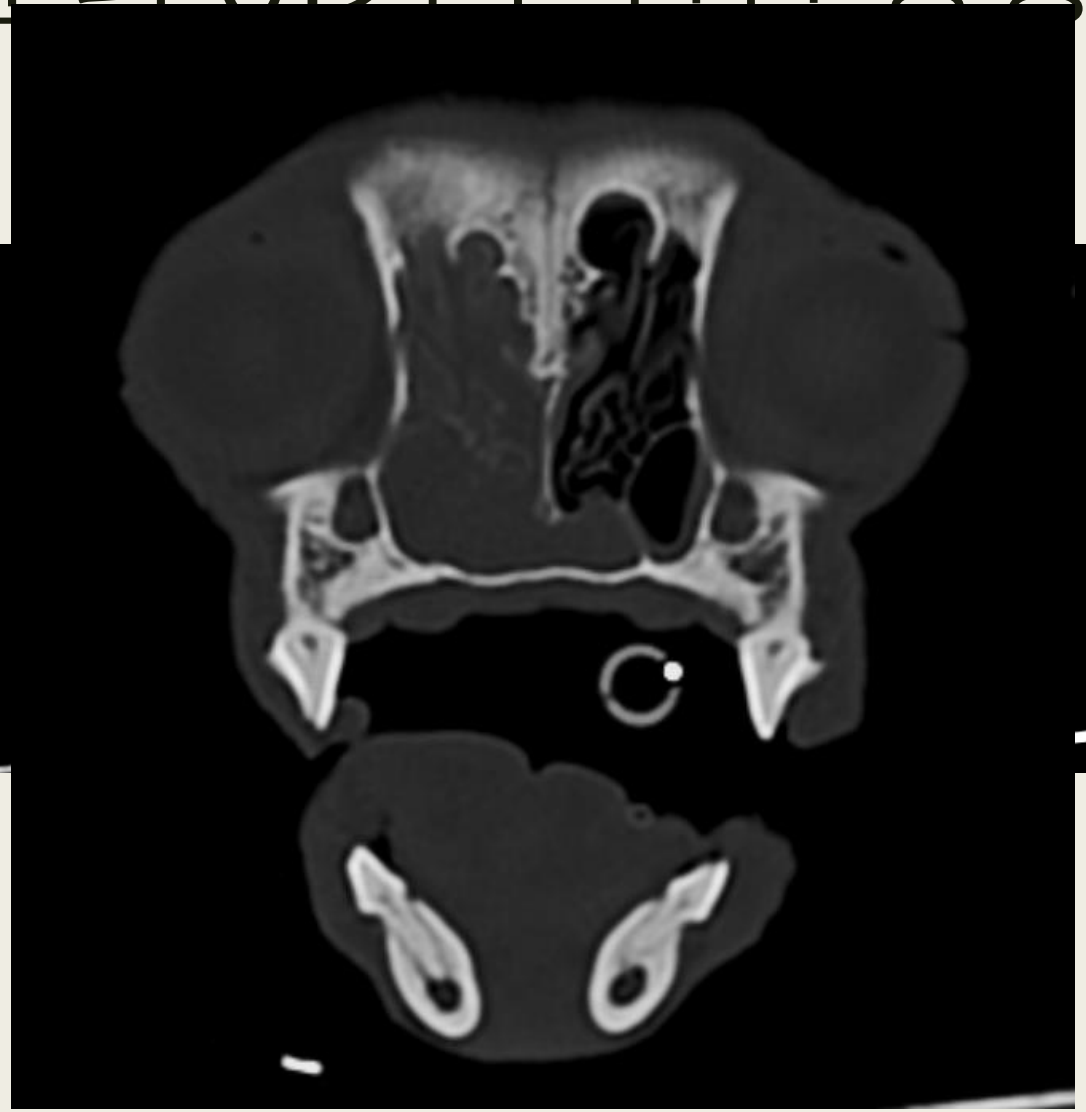
- Maltese, CM, 12Y, 2.7kg

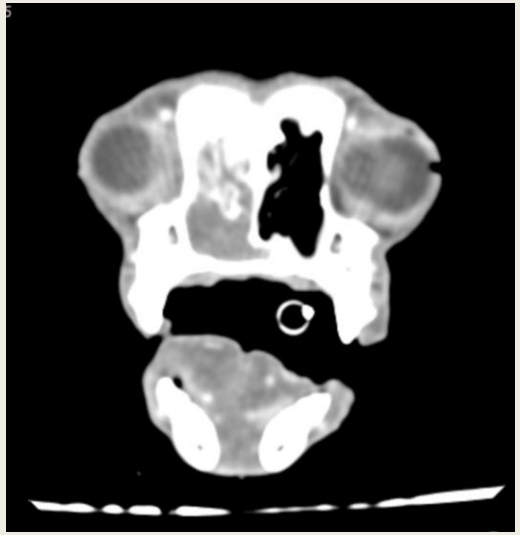
- CC
  - *약2개월전 부터 비강 삼출물때문에 잠 자기 힘들어함.*
  - *투약후에도 임상증상 개선이 관찰되지 않고 호흡을 힘들어함.*

비강 수준의 CT가로 단면 영상



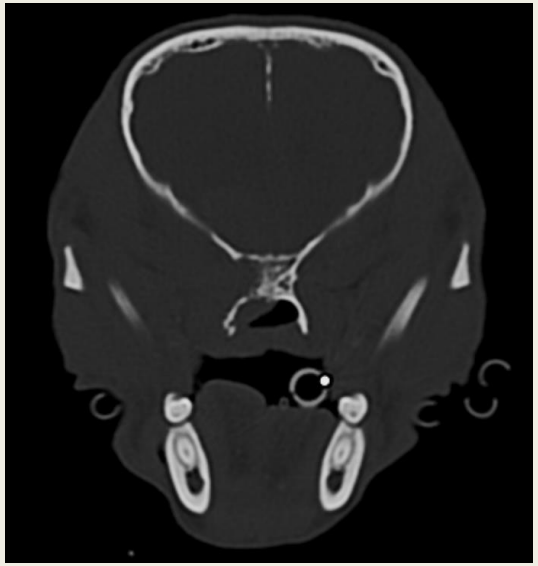
Bone window



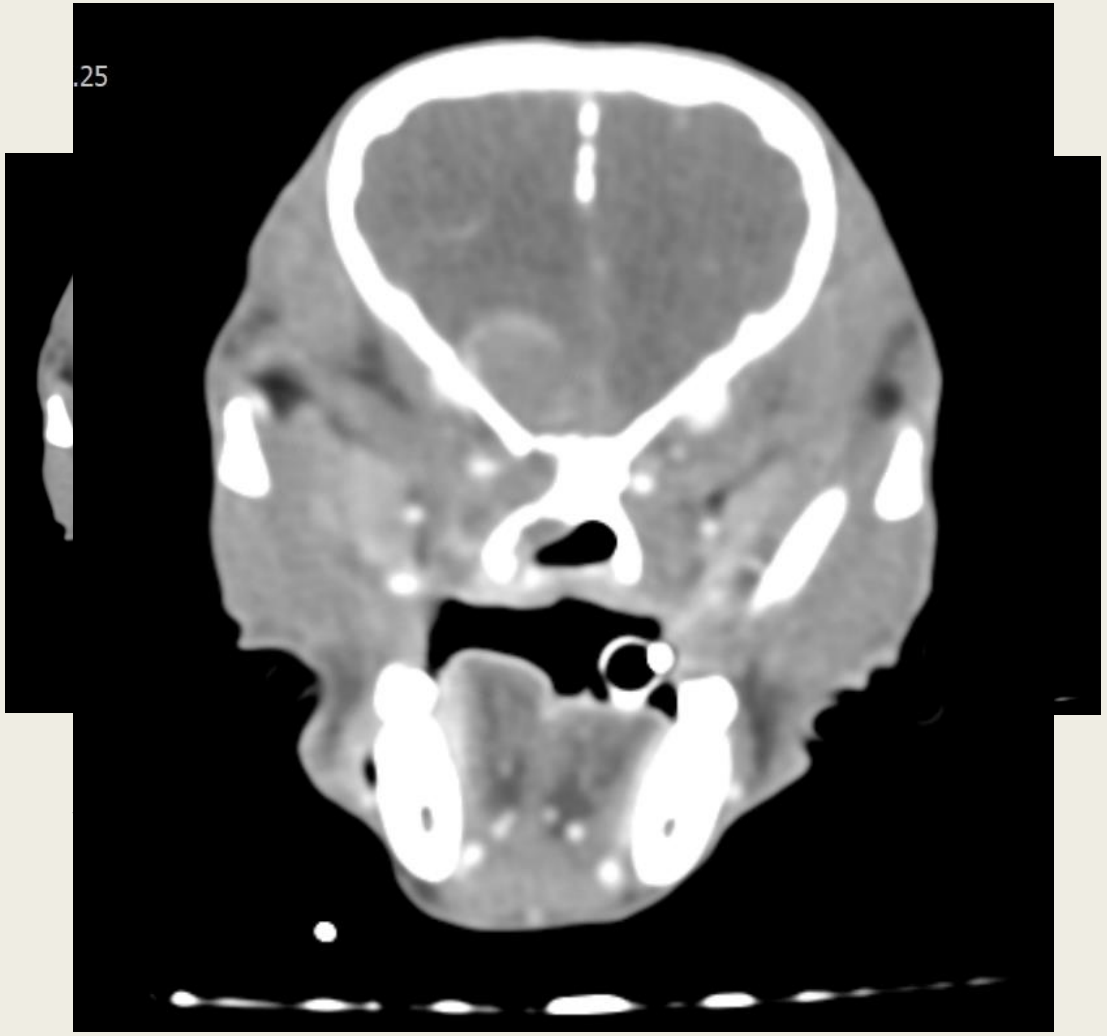


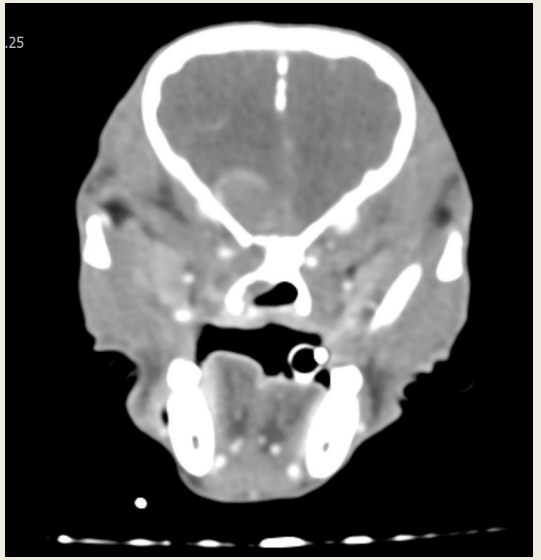
Delay phase

전두엽 수준의 CT가로 단면 영상



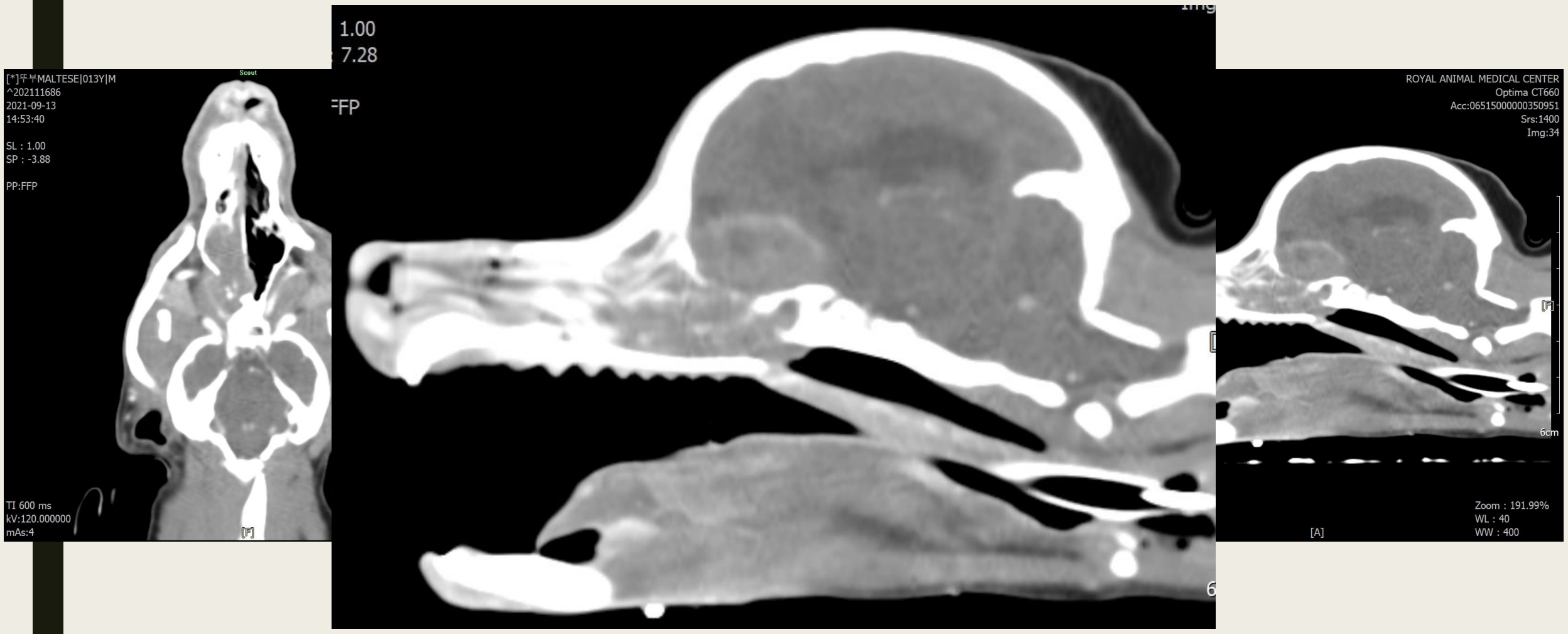
Bone window



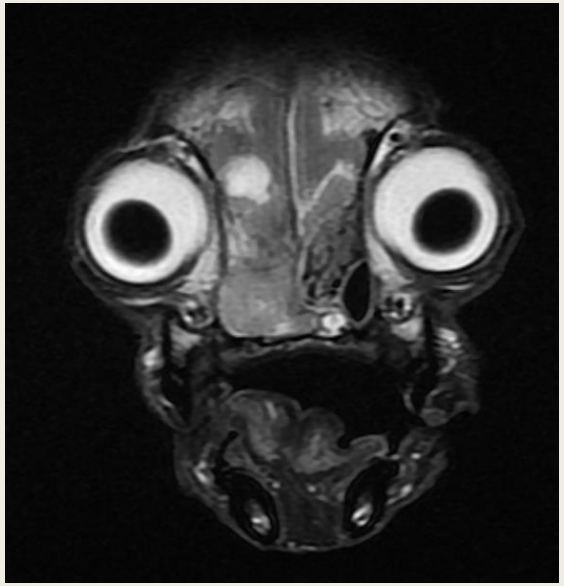


Delay phase

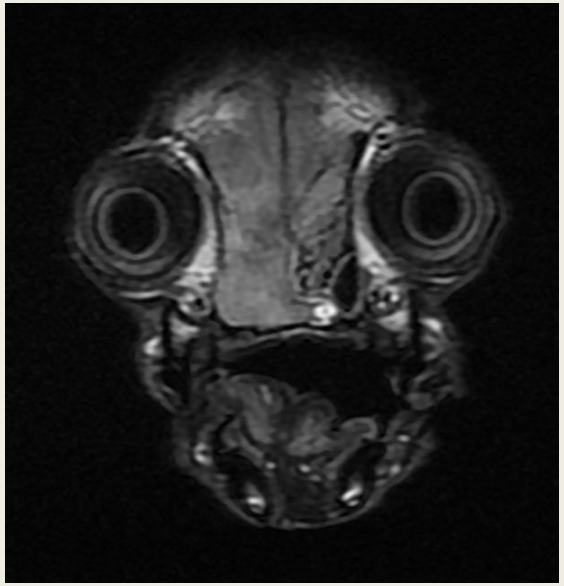
두개골 MPR 영상


[*]뚜부MALTESE|013Y|M
^202111686
2021-09-13
14:53:40
SL : 1.00
SP : -3.88
PP:FFP
Scout
TI 600 ms
kV:120.000000
mAs:4
[F]
1.00
7.28
FFP
ROYAL ANIMAL MEDICAL CENTER
Optima CT660
Acc:06515000000350951
Srs:1400
Img:34
6cm
Zoom : 191.99%
WL : 40
WW : 400
[A]

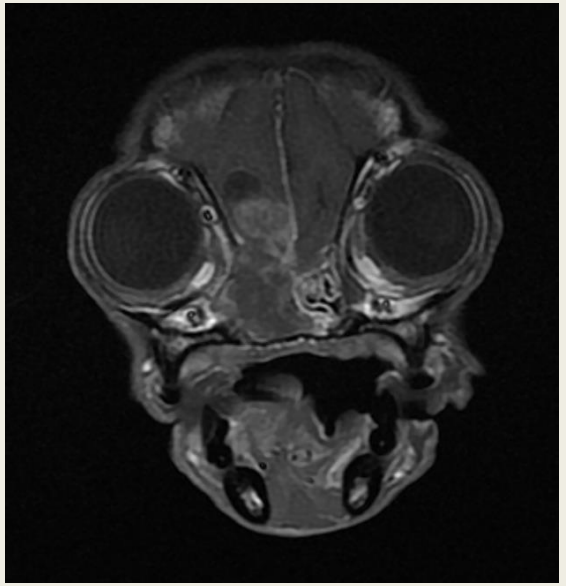
안구 수준의 MR 가로단면영상



T2W

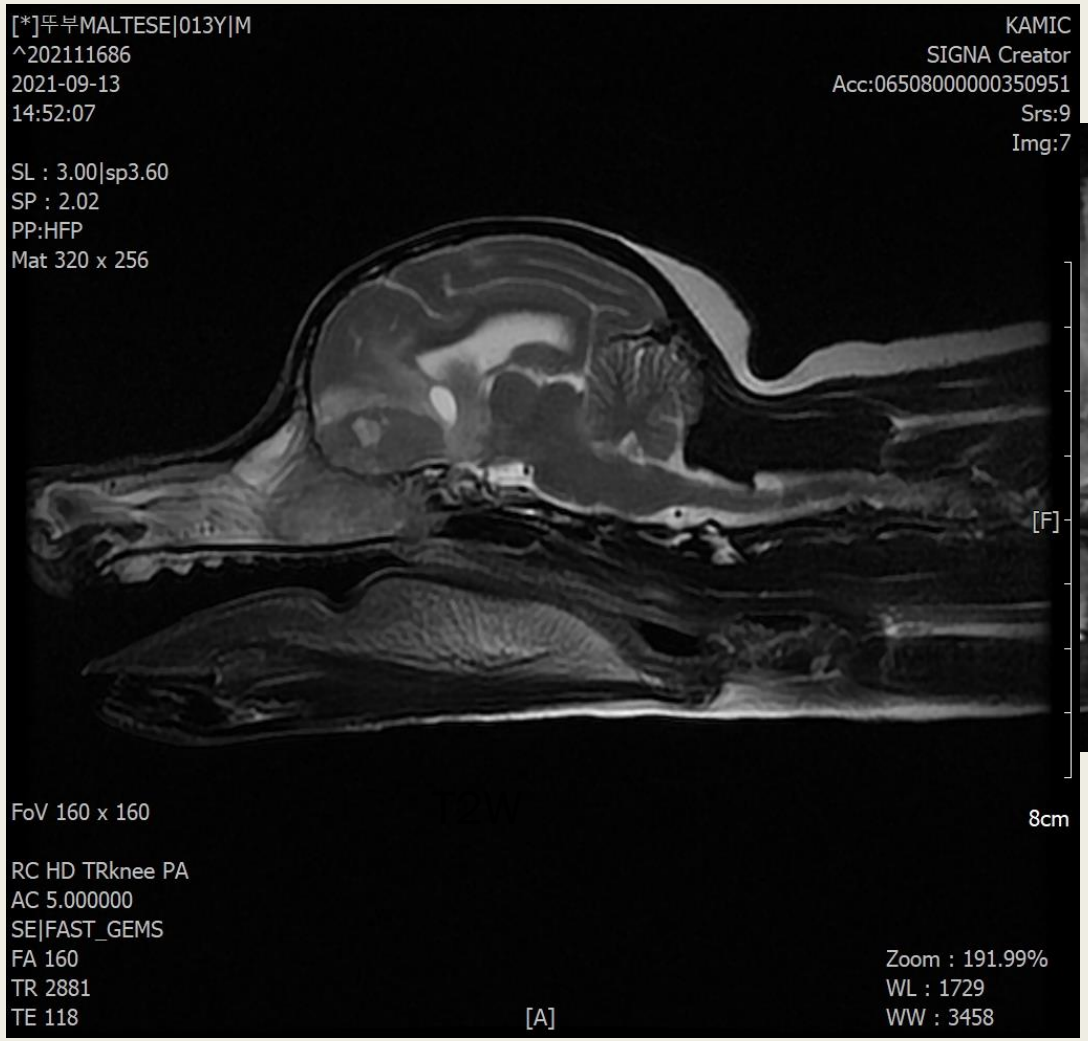


T1W



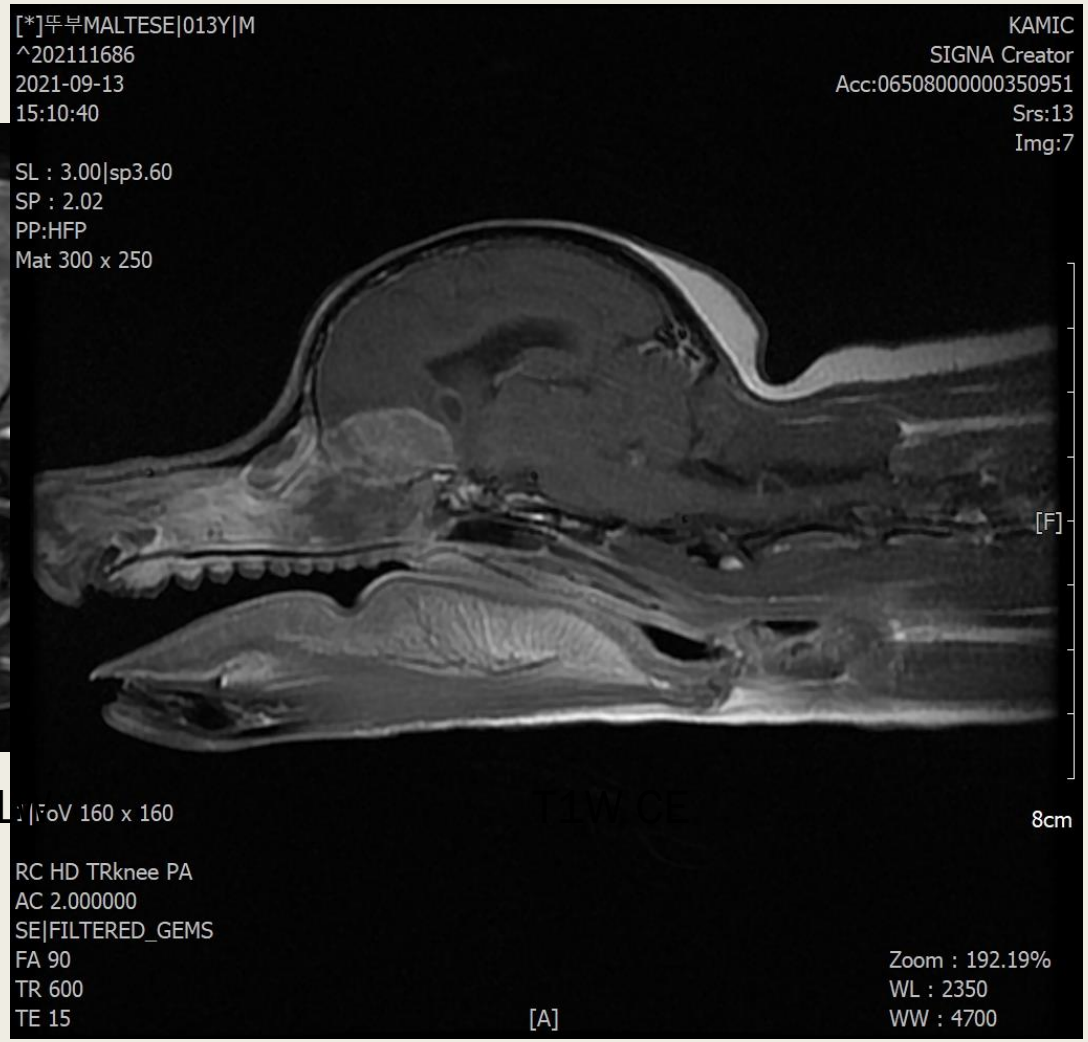
T1W CE

전두엽 수준의 MR 가로단면영상



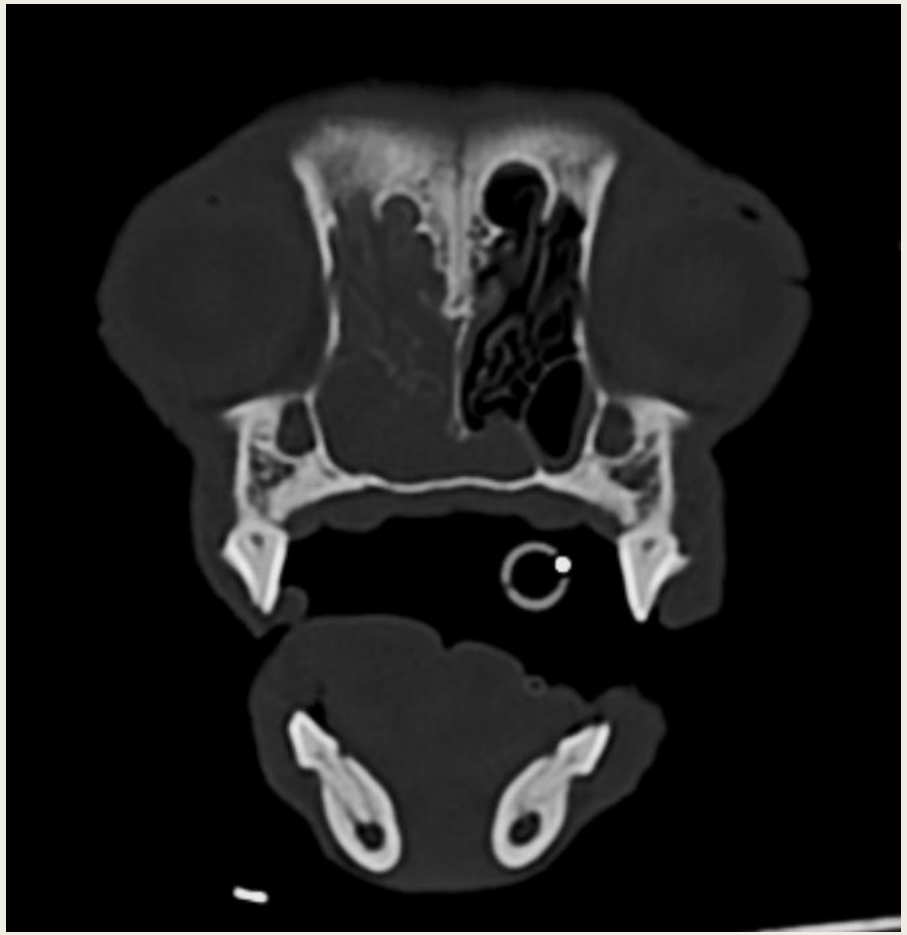
T2W

T1

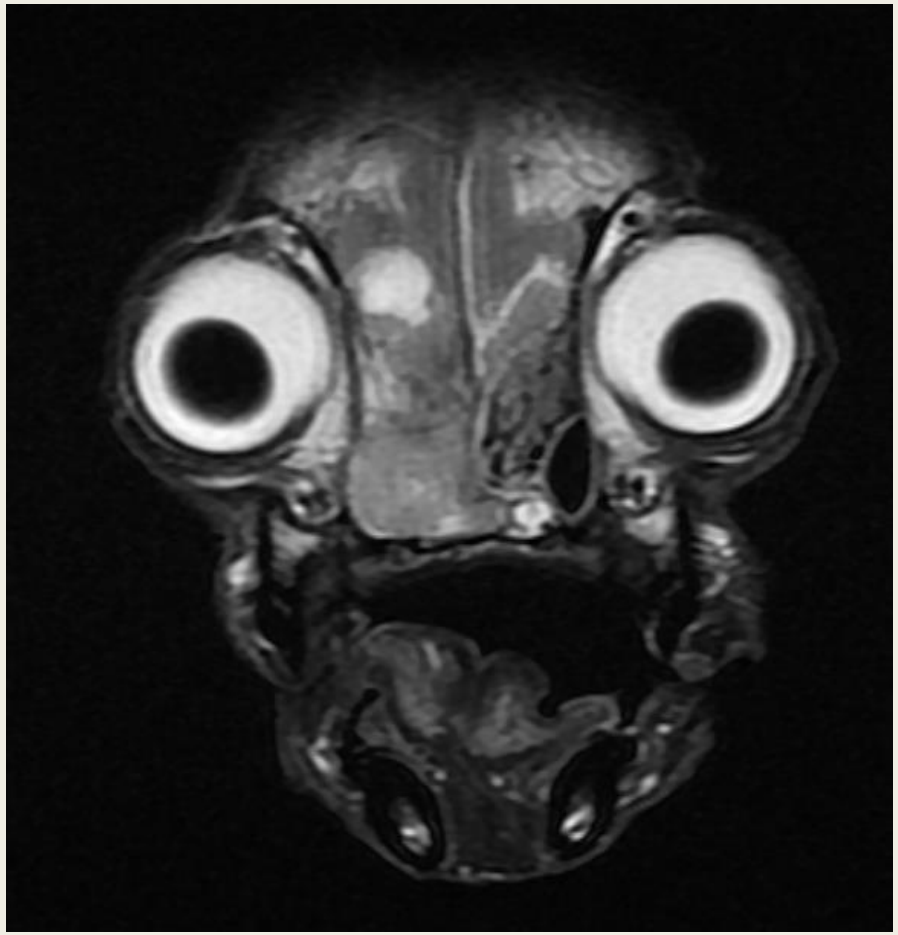


T1W CE

CT영상과 MR 영상의 비교(비강 수준)

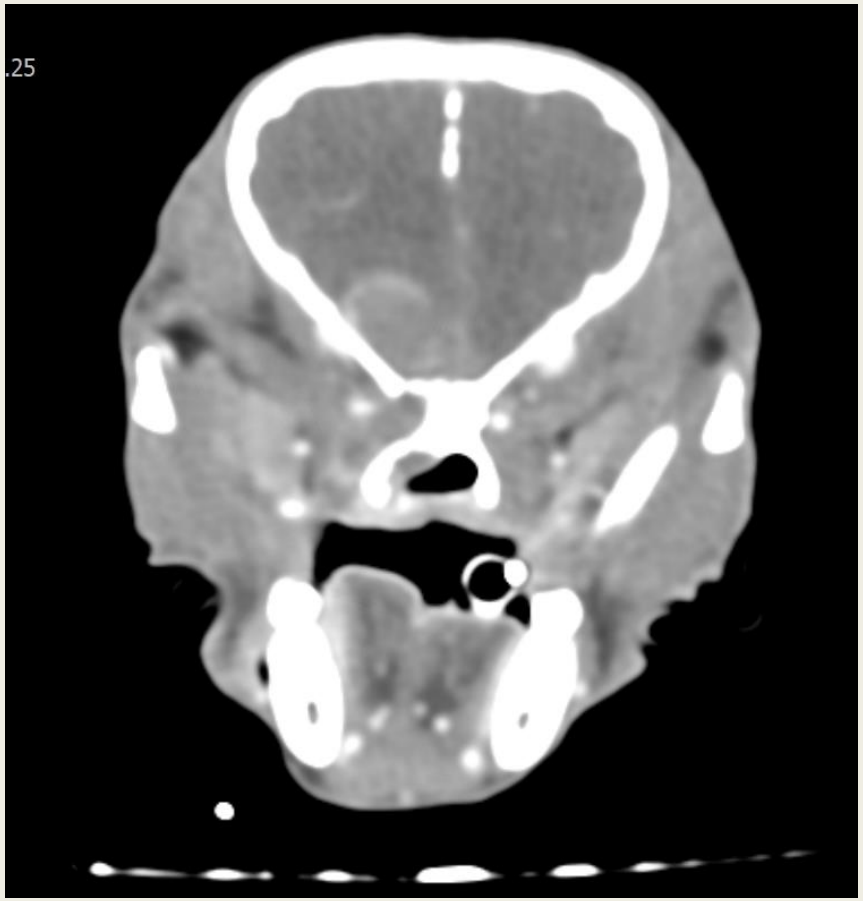


CT 영상

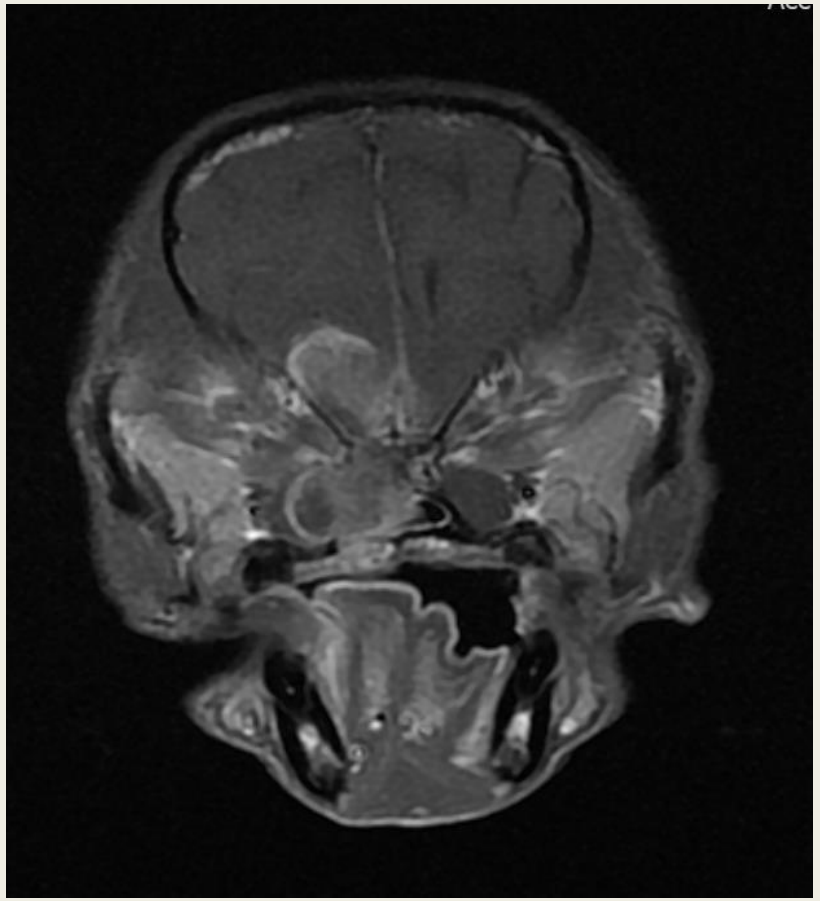


MR 영상

CT영상과 MR 영상의 비교(전두엽 수준)

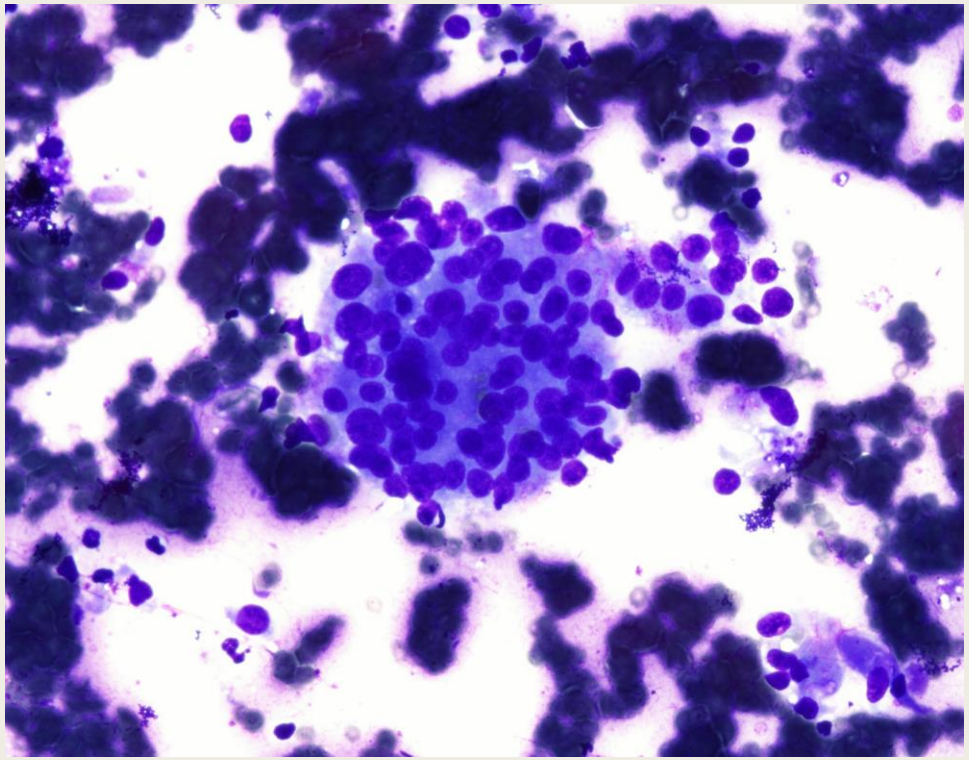


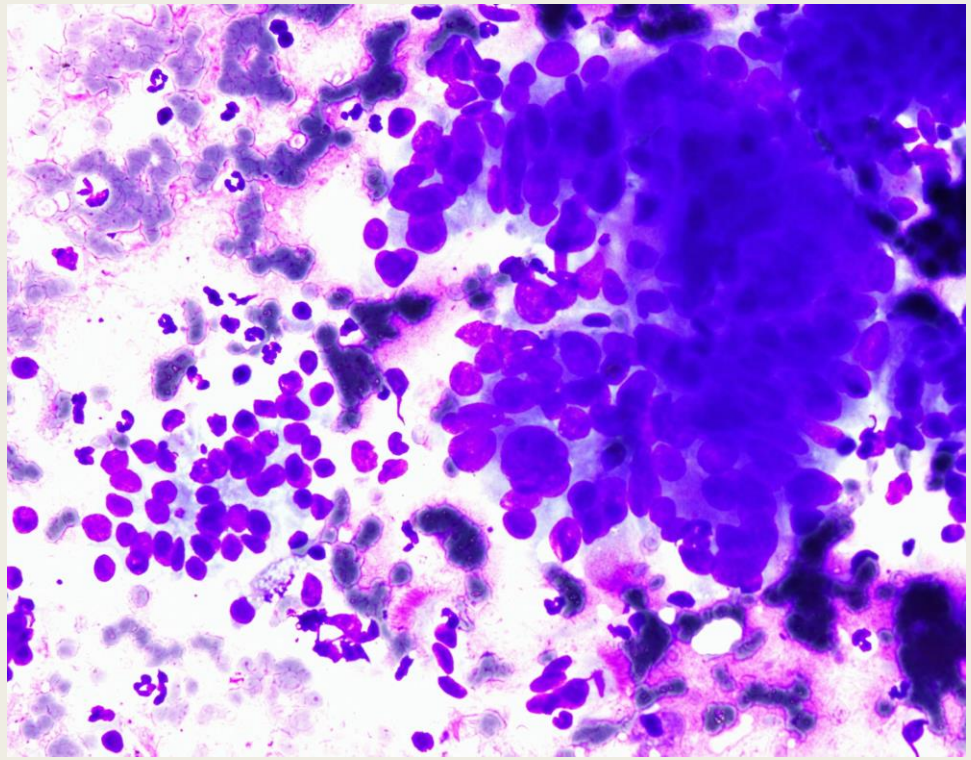
CT 영상



MR 영상

Cytobrush(세포학 검사)





- nasal carcinoma

결론

- CT 장비의 비강내 질환 진단의 장점
  - *비침습적 검사로 다양한 해부학적 소견을 제공*
    - Axial
    - MPR
    - 3D image
  - *수술 및 세포학 검사를 위한 정확한 해부학적 소견 제공*
  - *짧은 검사시간을 통한 환자의 안정성 확보*

ROYAL AMG
Animal Medical Group
로얄동물메디컬그룹

편측성 외안근염으로 진단된 두마리의 개에서 임상적 특징과 영상진단학적 소견

로얄동물메디컬센터 강동

한 성 영 원장

Clinical features and Diagnostic imaging findings of **Unilateral extraocular myositis** in two dogs

로얄동물메디컬센터 강동 한성영

Vet. Pathol. 26:510–512 (1989)

BRIEF COMMUNICATIONS

Canine Bilateral Extraocular Polymyositis

J. L. CARPENTER, G. M. SCHMIDT, F. M. MOORE,
D. M. ALBERT, K. L. ABRAMS, AND V. M. ELNER

This paper reports a bilateral polymyositis restricted to extraocular muscles, a pathologic change not previously reported in dogs. Two unrelated dogs manifested a distinctive syndrome of acute bilateral exophthalmos with extraocular myositis, confirmed either by surgical biopsy or by necropsy. One dog treated with corticosteroids showed a rapid resolution of clinical signs. The other dog was euthanized and necropsied. The clinical and pathologic findings are reported for these two dogs and five other dogs with identical clinical signs and response to treatment with corticosteroids.

Case 1

An 8-month-old, crossbred, male Golden Retriever was presented at Angell Memorial Animal Hospital for bilateral exophthalmos of 5 days duration. Physical examination revealed bilateral proptosis that was more apparent when the dog was alert than when he was inattentive. The intraocular

phocytic infiltrate. Foreign m
amination with polarized lig

Both necrosis and regenera
changes evidenced by centr
plasmic basophilia. Necroti
philic, granular, fragmented
crosis was revealed clear
hematoxylin stained sections
within areas of inflammation
sections stained with Masson'
No abnormalities were obs
vessels, nerves, or within gl

Occasional, small, randon
trated by lymphocytes, plas
sionally eosinophils were obs
in one focus in a trigemina
compatible with nematode la
pharyngeal nodes had follicu

pISSN 1598-298X / eISSN 2384-0749
J Vet Clin 33(1) : 62-64 (2016)
http://dx.doi.org/10.17555/jvc.2016.02.33.1.62

Journal of Veterinary Clinics
www.ksvc.or.kr

골든 리트리버의 외안근염 1례

유석종† · 유세종*† · 김휘율*†
유림 동물병원, *건국대학교 수의과대학 수의외과학 교실

Extraocular Myositis in a Golden Retriever Dog

Sukjong Yoo†, Saejong Yoo*† and Hwi-Yool Kim*†

Yoolim Animal Clinic, Seoul 137-909, Korea
**Department of Veterinary Surgery, College of Veterinary Medicine, Konkuk University, Seoul 143-701, Korea*

(Accepted: December 16, 2015)

Abstract : A 6 months old, 20.5 kg female Golden Retriever dog was presented with bilateral exophthalmos and no protrusion of the third eyelid. Based on the patient's history, clinical signs, physical examination and ophthalmologic examination, extraocular myositis (EOM) was diagnosed. The exophthalmos was reduced after 7 days and disappeared after 14 days of corticosteroids treatment. Discontinuation of corticosteroids treatment can lead to recurrence of EOM, but in this case there was no recurrence for 2 months. This is the first reported case of canine extraocular myositis in Korea.

Key words **:** extraocular myositis, golden retriever, dog.

Myositis

- Muscle (myo-), Inflammation (-sitis)
- Single or Group of muscles
- Group of muscles (masticatory muscles, extra-ocular muscles, polymyositis)
- Non-infectious, immue-mediated disease

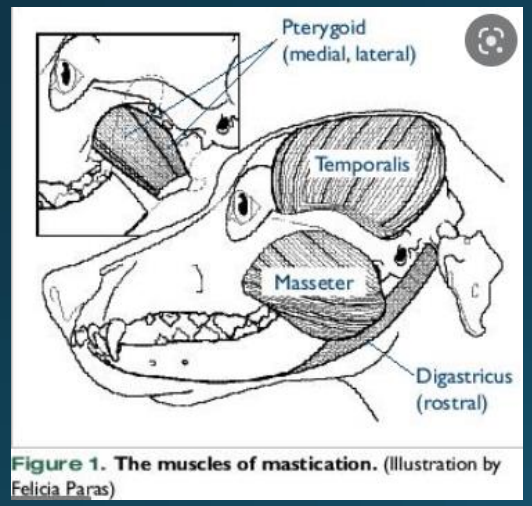
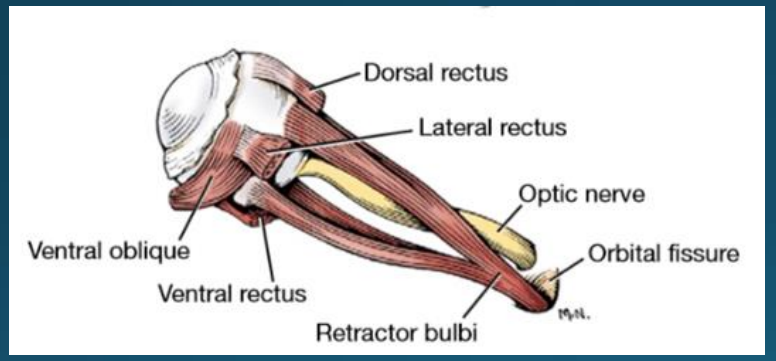
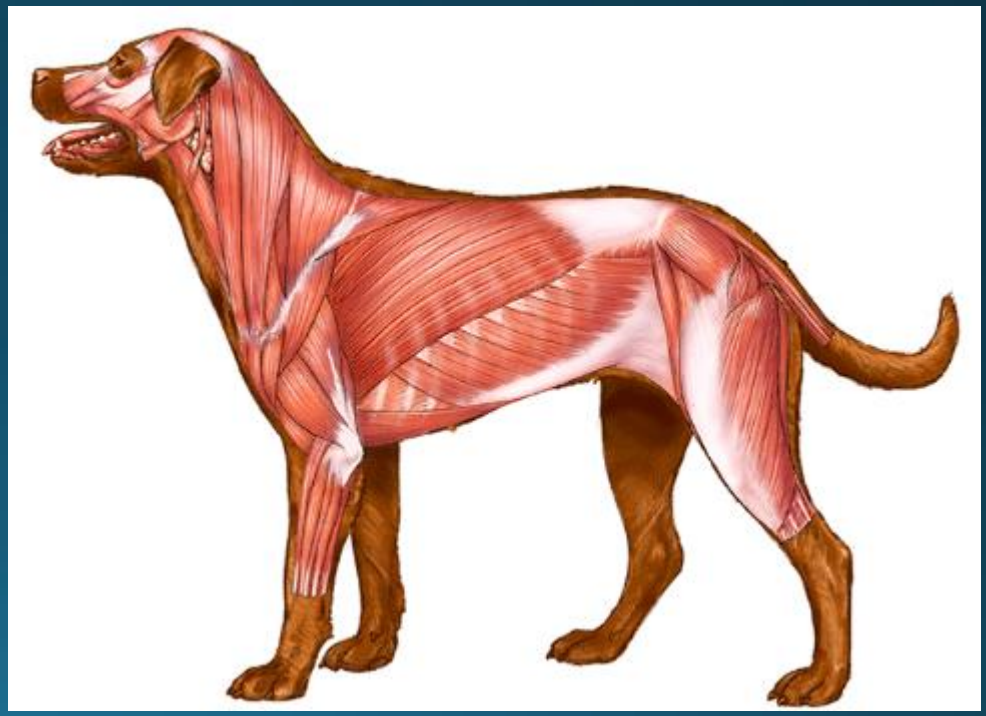
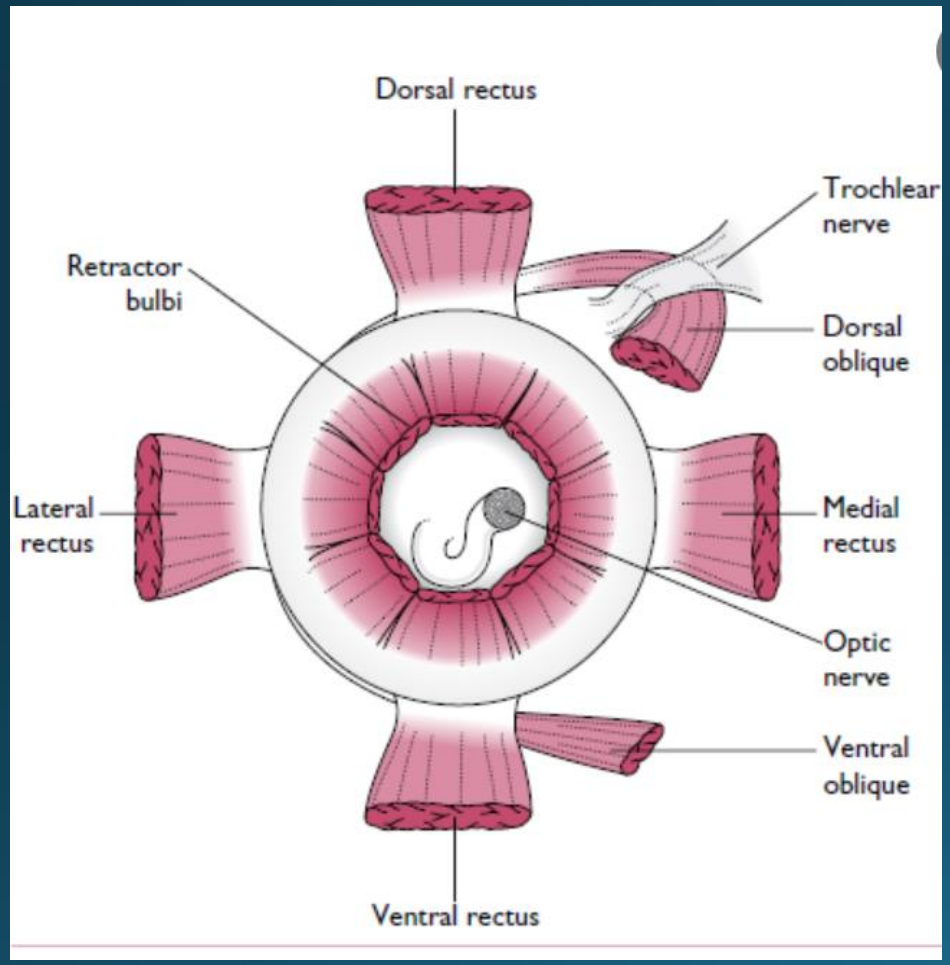


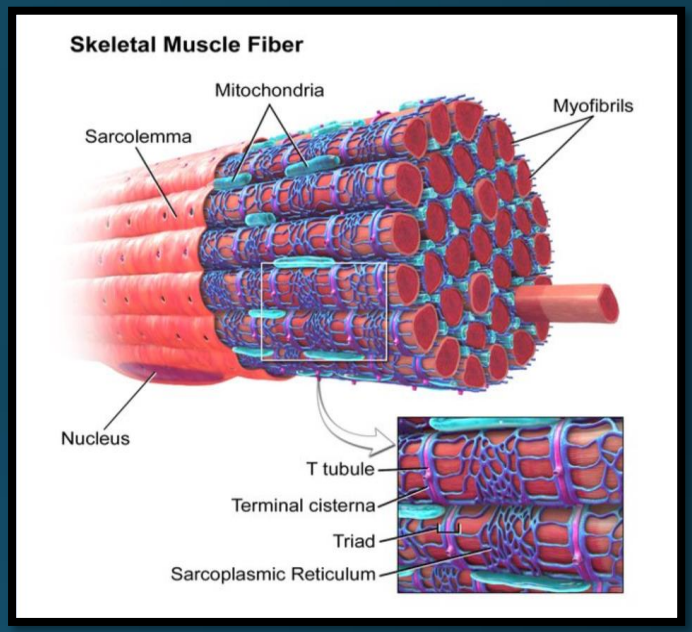
Figure 1. **The muscles of mastication.** (Illustration by Felicia Paras)

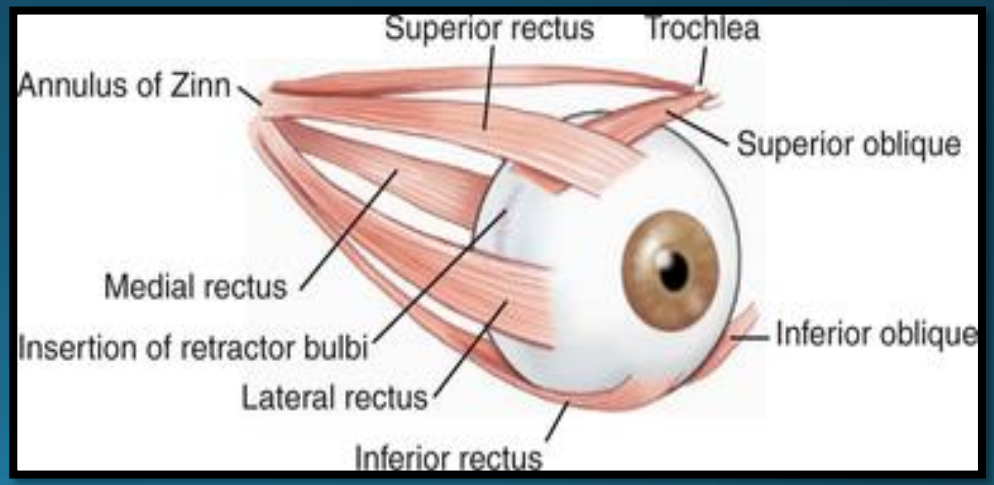




Extraocular muscles (외안근)





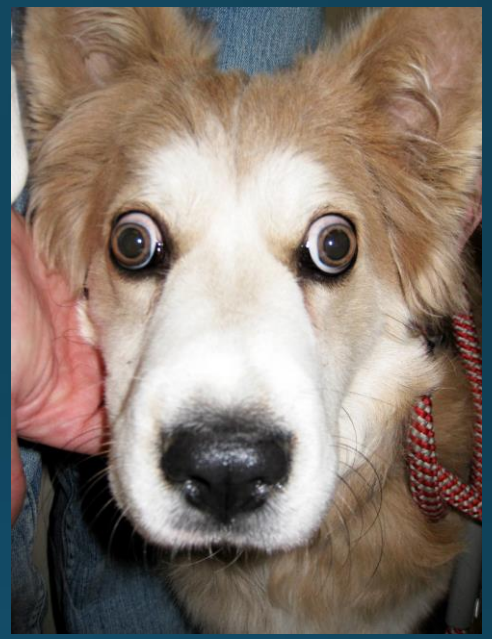


Modified from Prince JH, et al. [1960]: Anatomy and Histology of the Eye and Orbit in Domestic Animals. Charles C. Thomas, Springfield, IL.)

Extraocular Myositis (EOM: 외안근염)

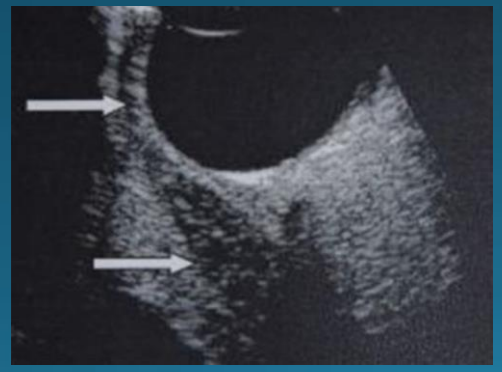
임상적 특징

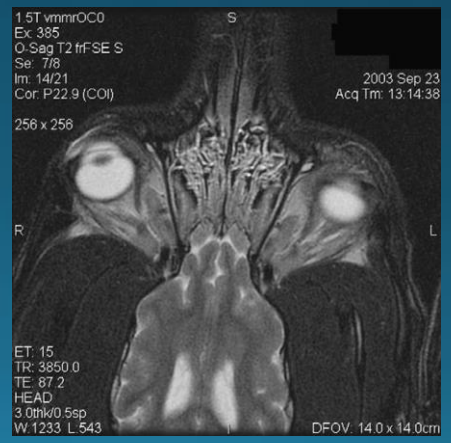
- RARE
- Larger Breed (Golden Retriever 2008)
- Young (6m-2yr)
- Female
- Exophthalmos without 3rd eyelid prolapse
- Lateral strabismus, Chemosis, Conjunctival hyperemia
- Mostly bilateral -> "Startled" expression
- Autoimmune disease
- Unknown pathogenesis
- Painless

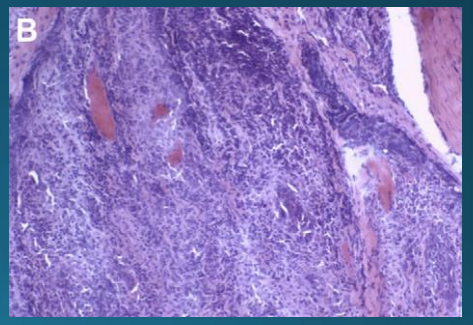


진단

- 임상적 특징
- 영상학적 특징 (US, CT, MRI)
- 조직검사







DDx

1. Masticatory muscle myositis (MMM)
2. Graves' disease (Hyperthyroidism)

Bilateral

3. Retrobulbar space occupying mass

Unilateral

: Tumor
: Abscess
: Hematoma
: Zygomatic salivary gland mucocele

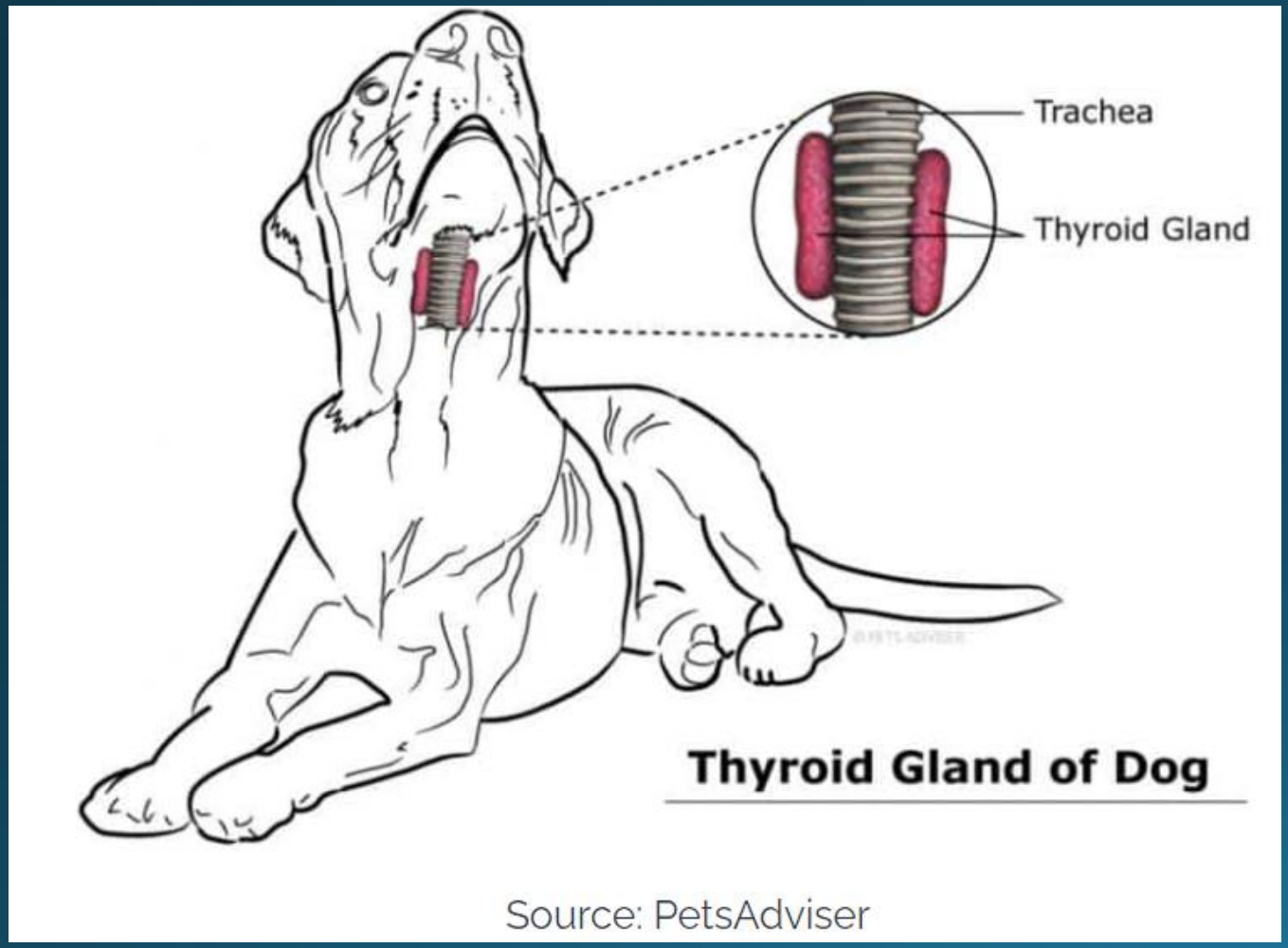
1. Masticatory muscle myositis (MMM)

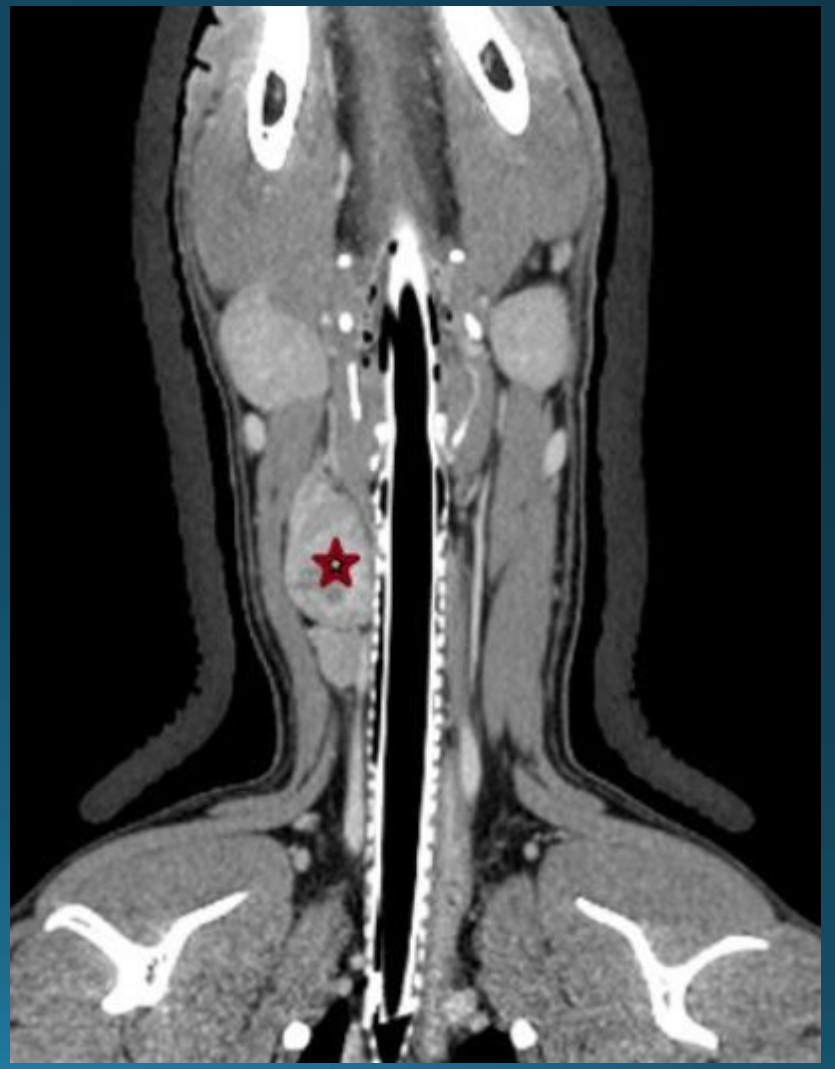
: 2M antibody assay

: Muscle biopsy

: Trismus

2. Graves' disease (Hyperthyroidism)





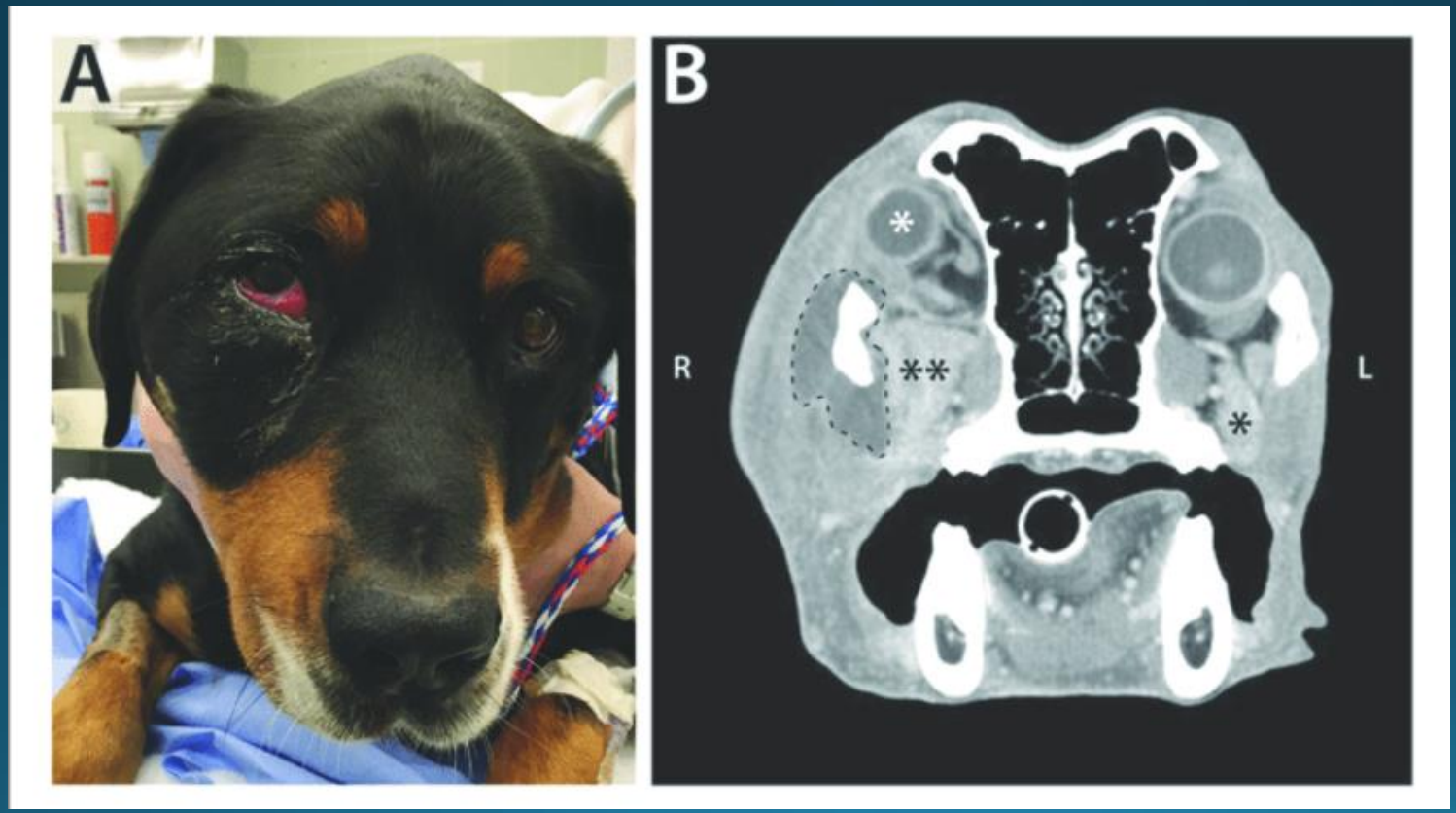
3. Retrobulbar space occupying mass

: Tumor

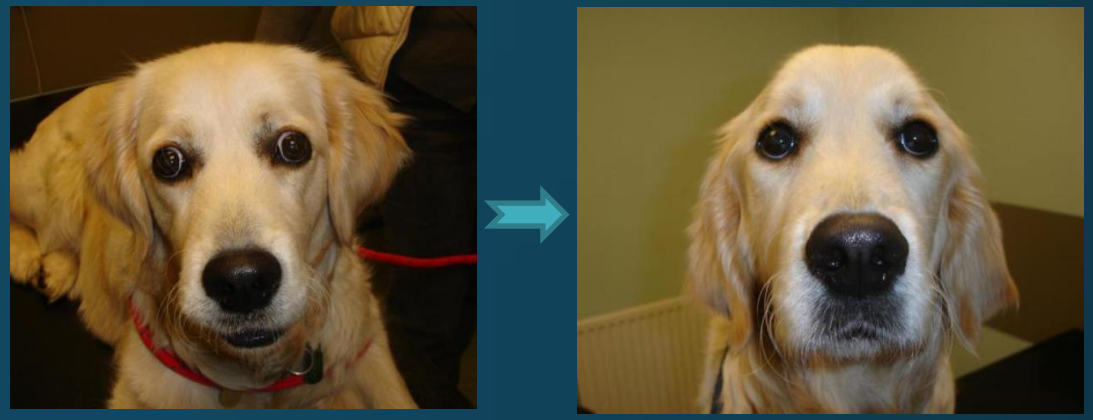
: Abscess

: Hematoma

: Zygomatic salivary gland mucocele



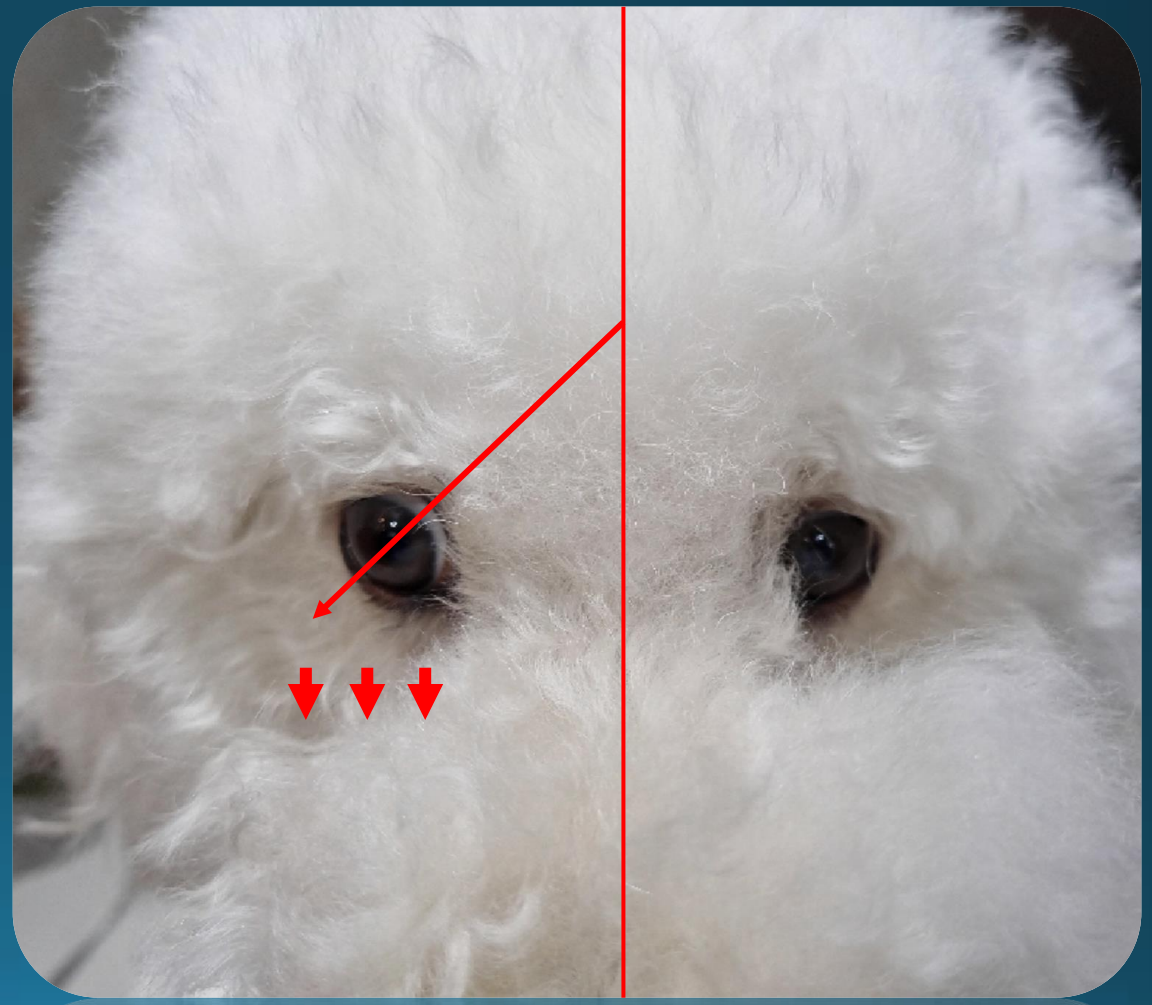
Treatment



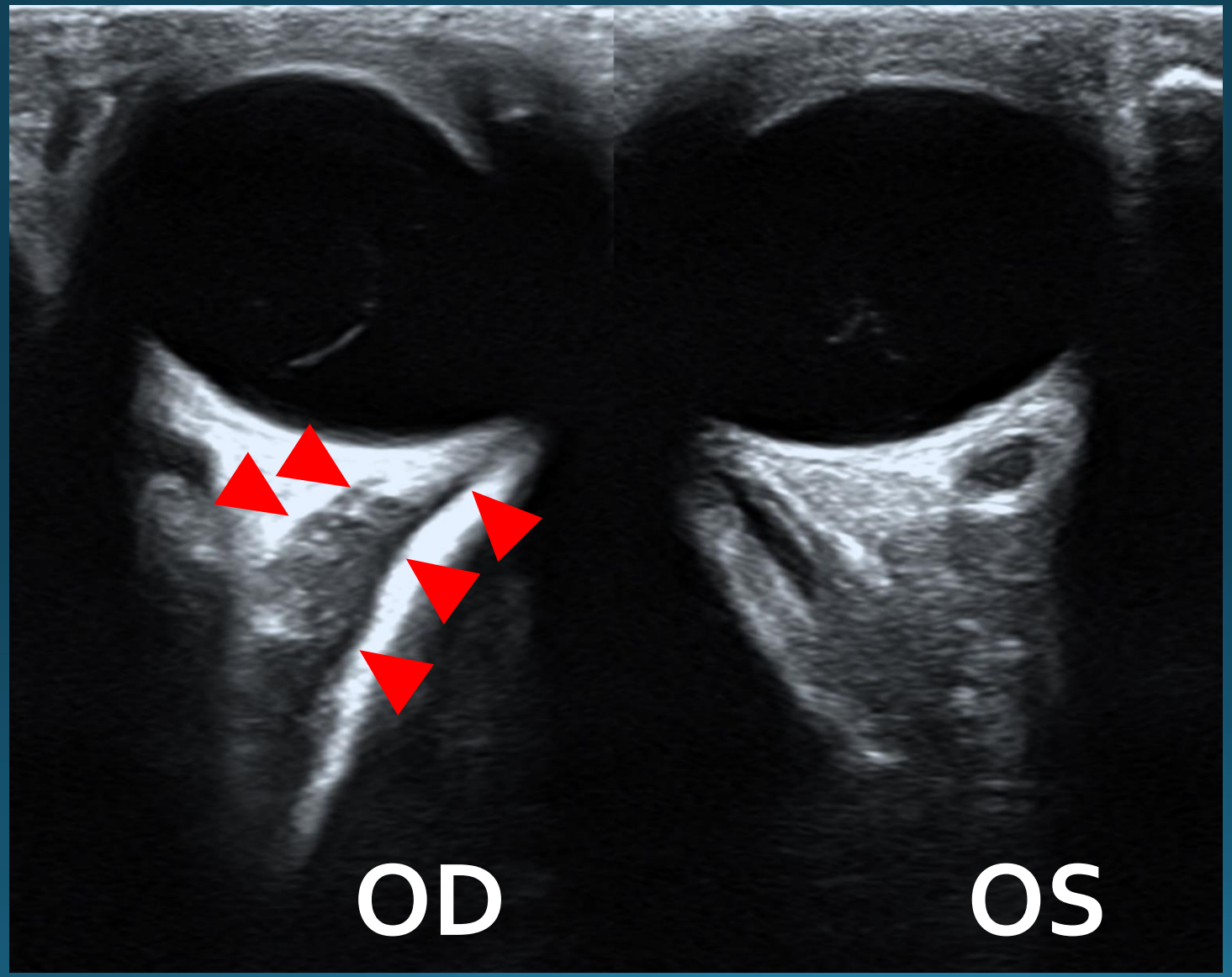
: 1~2 mg/kg
: Bid for days or 3 to 4weeks
: tapering dose over 2 months
: Azathioprine, Dexamethasone

CASE 1

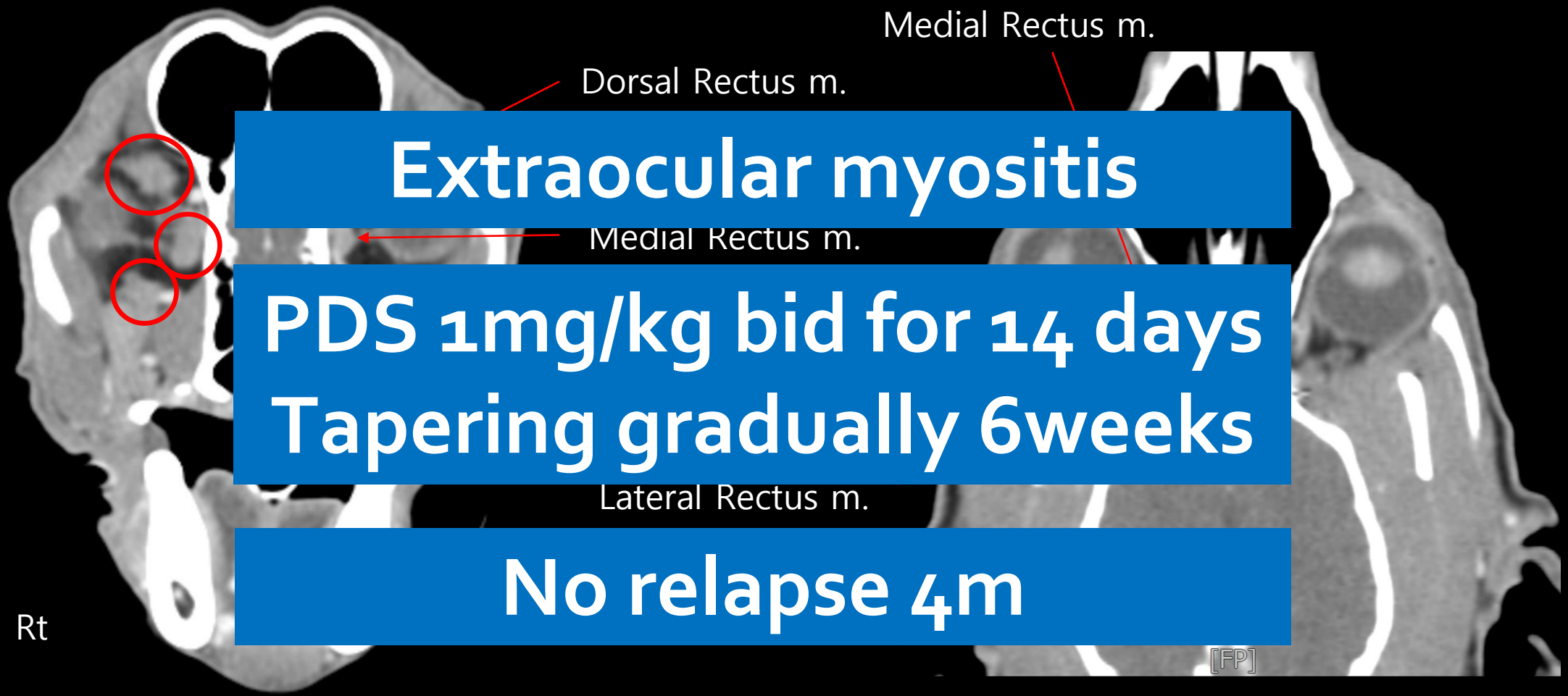
: Standard poodle
: 3yrs
: Castrated male
: 2 days
: OD Exophthalmos, strabismus
: Painless
: STT, IOP normal



Ultrasonography



CT (soft tissue window/Retrobulbar space level)



Extraocular myositis

PDS 1mg/kg bid for 14 days
Tapering gradually 6weeks

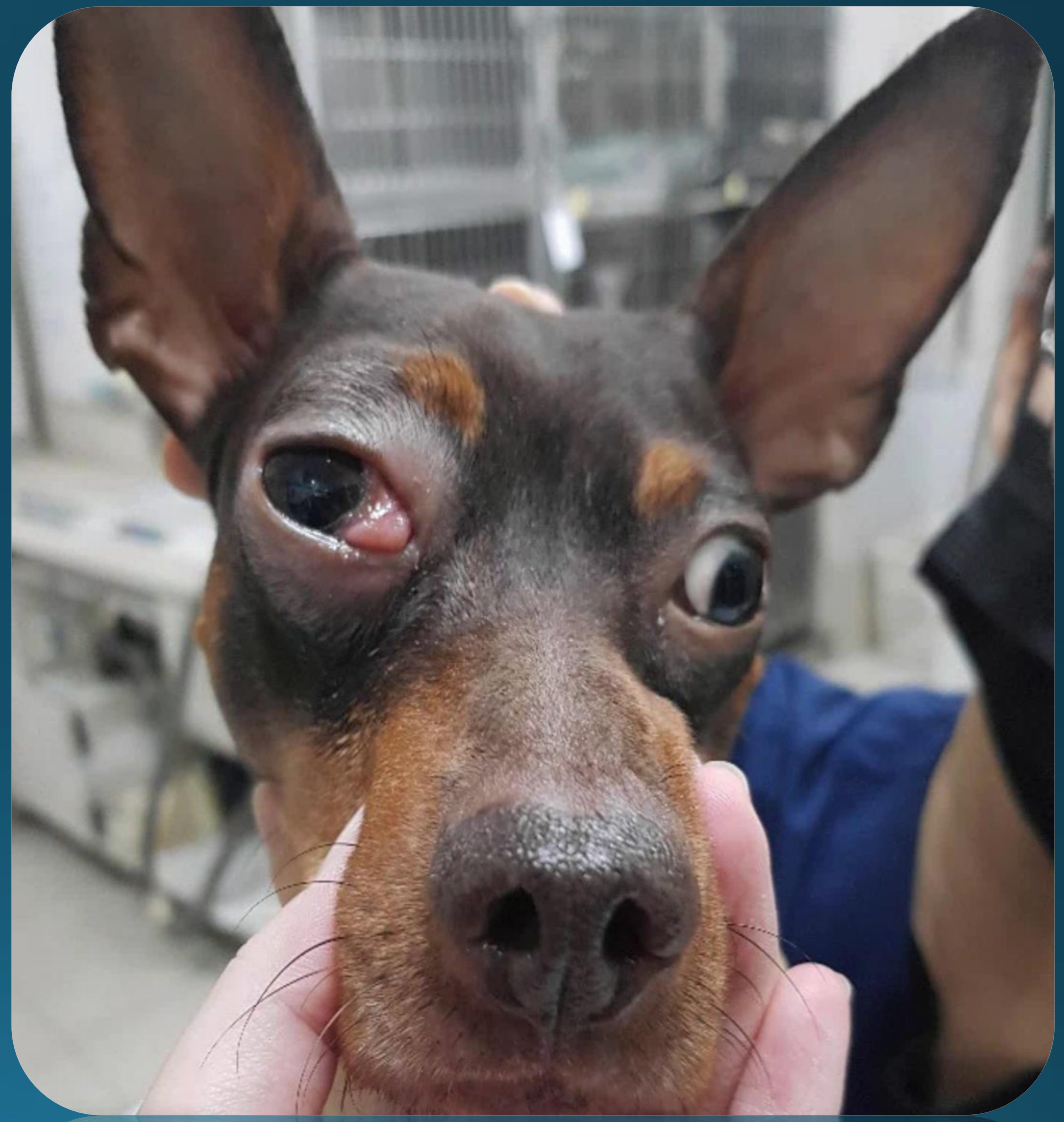
No relapse 4m

Transverse view

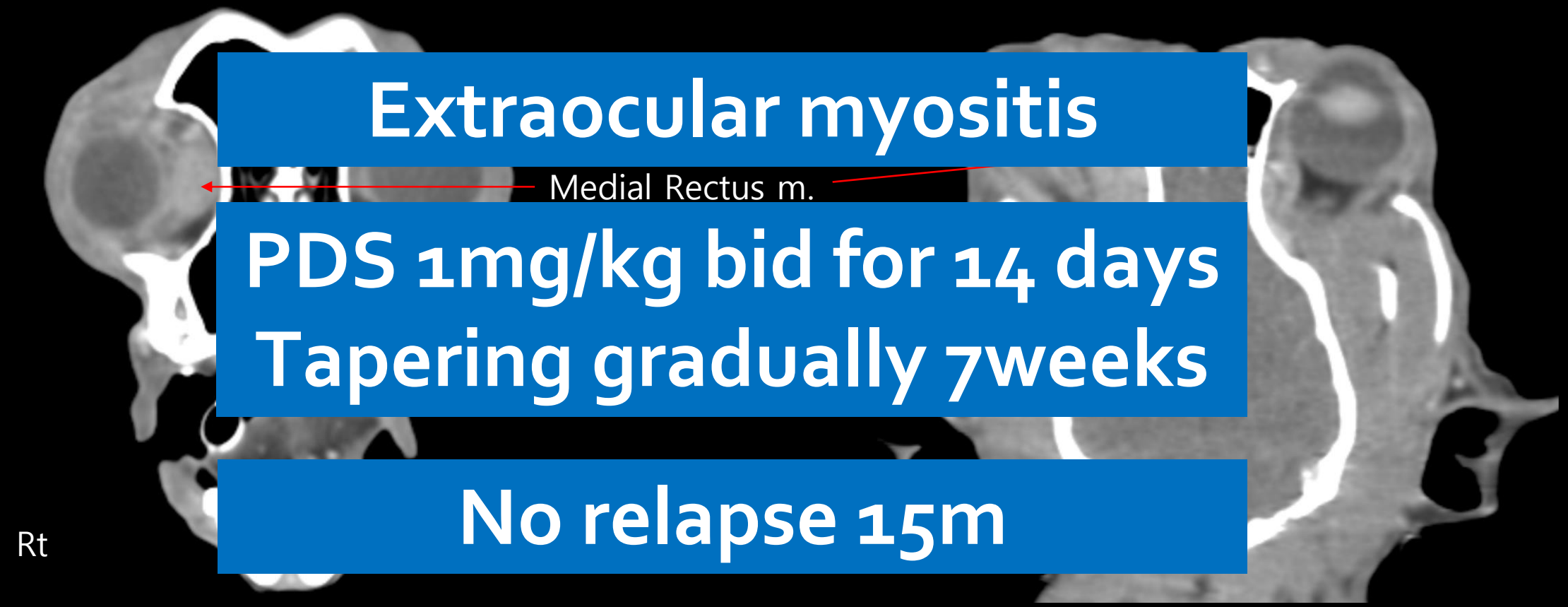
Dorsal MPR

CASE 2

: Miniature pinscher
: 6yrs
: Castrated male
: 3 days
: OD Exophthalmos, strabismus
Chemosis & 3rd eyslid prolapse
: STT, IOP normal



CT (soft tissue window/Retrobulbar space level)



Transverse view

Dorsal MPR

CASE summary

CASE	1	2
Breed	Standard poodle	Miniature Pinscher
Age	3y	6y
Gender	Castrated male	Male
Eye (Affected)	OD	OD
Duration (Days)	2	3
Clinical signs	Exophathalmos, ventrolateral strabismus	Exophathalmos, ventrolateral strabismus Chemosis, 3rd eyelid prolapse
Treatment	Prednisolone 1 mg/kg bid for 14 days, gradually tapered giving a total of 6weeks of treatment	Prednisolone 1 mg/kg bid for 14 days, gradually tapered giving a total of 7weeks of treatment
Outcome	No relapse (4 months)	No relapse (15 months)

DISCUSSION

1. 기존 보고들 과의 차이

: Bilateral vs Unilateral

: Female vs Male

: Large breed vs Small breed

: 3rd eyelid prolapse

2. CT advantage

: 안와 후방의 탁월한 영상화

: MRI 보다 촬영 시간이 짧고 저렴하다.

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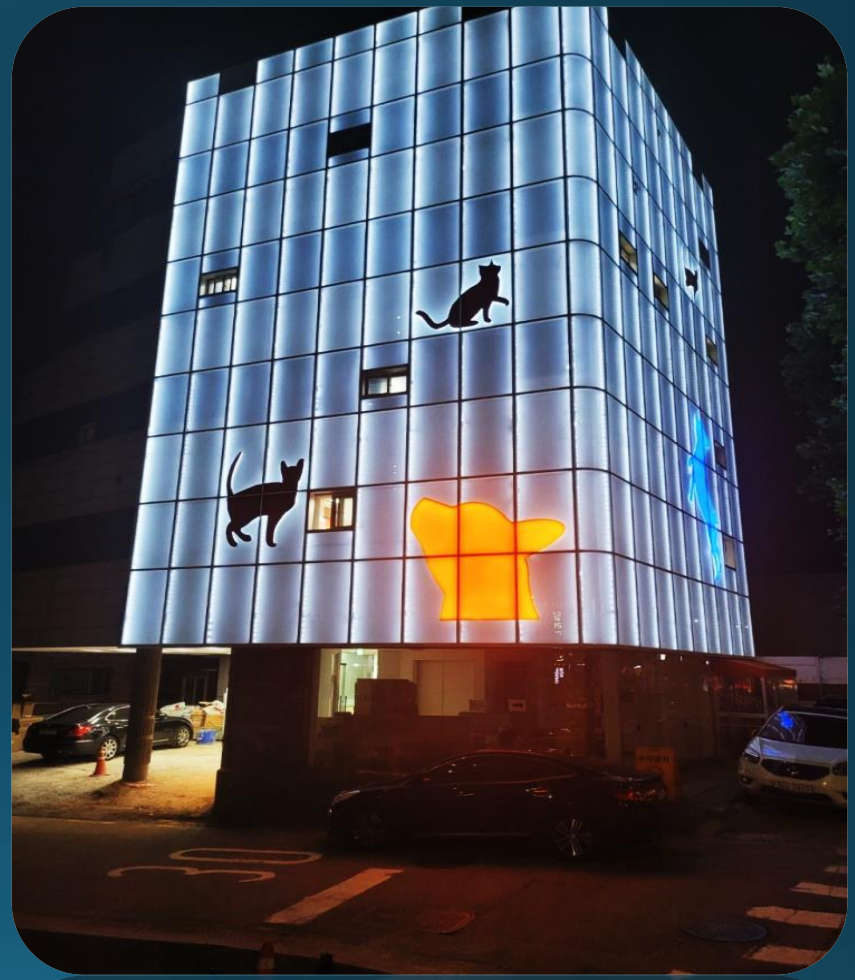


ROYAL AMG
Animal Medical Group
로얄동물메디컬그룹

개에서 흔하지 않은 소뇌질환 :
1. 지연성 소뇌위축
2. 부분 소뇌저형성

로얄동물메디컬센터 W
옹 성 민 원장

Uncommon cerebellar disease

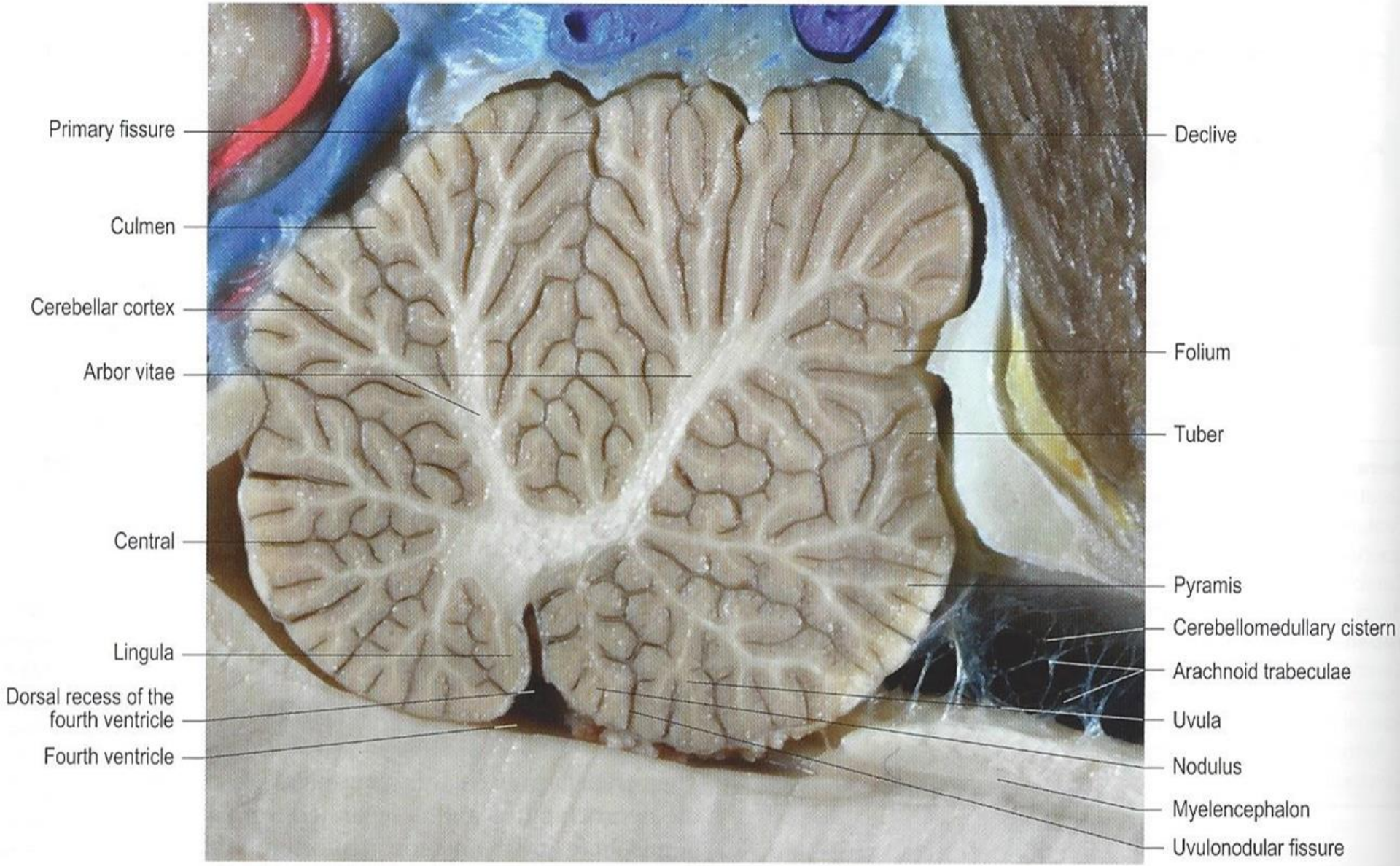
-Late onset cerebellar Abiotrophy
-Hypoplastic cerebellar Nodulus and Ventral uvula

동물메디컬센터W
옹성민

The cerebellum

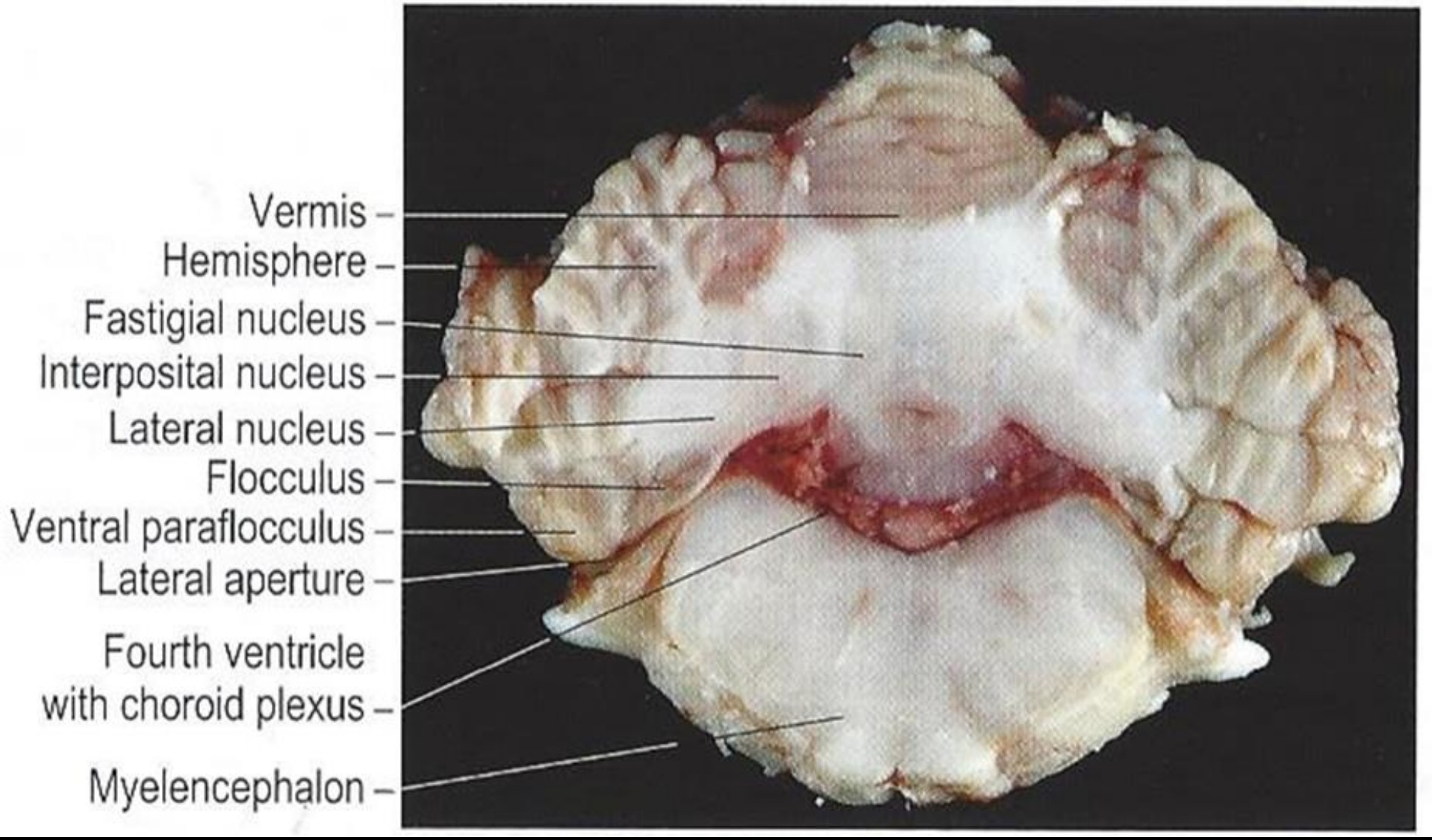
- The cerebellum is the head ganglion of the proprioceptive system.
- Comprises just 10% of the brain's volume but contains at least 50% of its neurons
- The function of cerebellum is to smooth and coordinate motor function for posture and movement.
- Cerebellum receives subconscious proprioceptive information from the body, limb and head.
- The sensory input is used to modify and coordinate muscle action for posture and movement

Anatomy & physiology



Veterinary neuroanatomy a clinical approach. Christine Thomason, specimen courtesy of Mr. Allan Nutman, IVABS, Massey University

Anatomy & physiology



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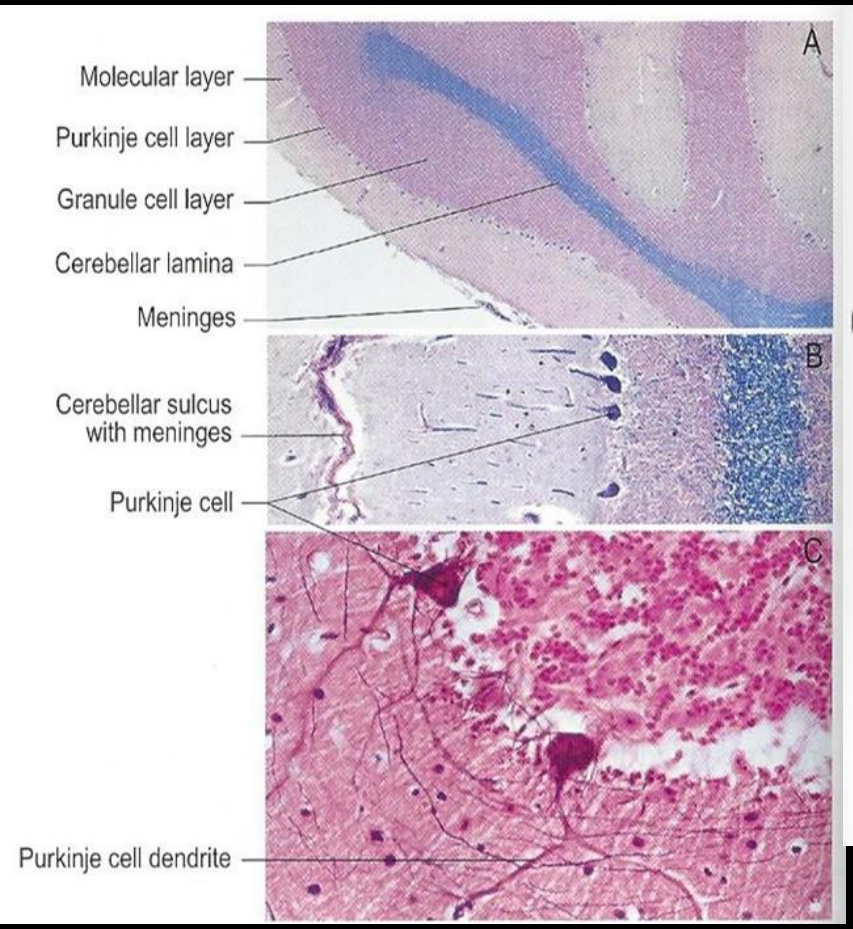
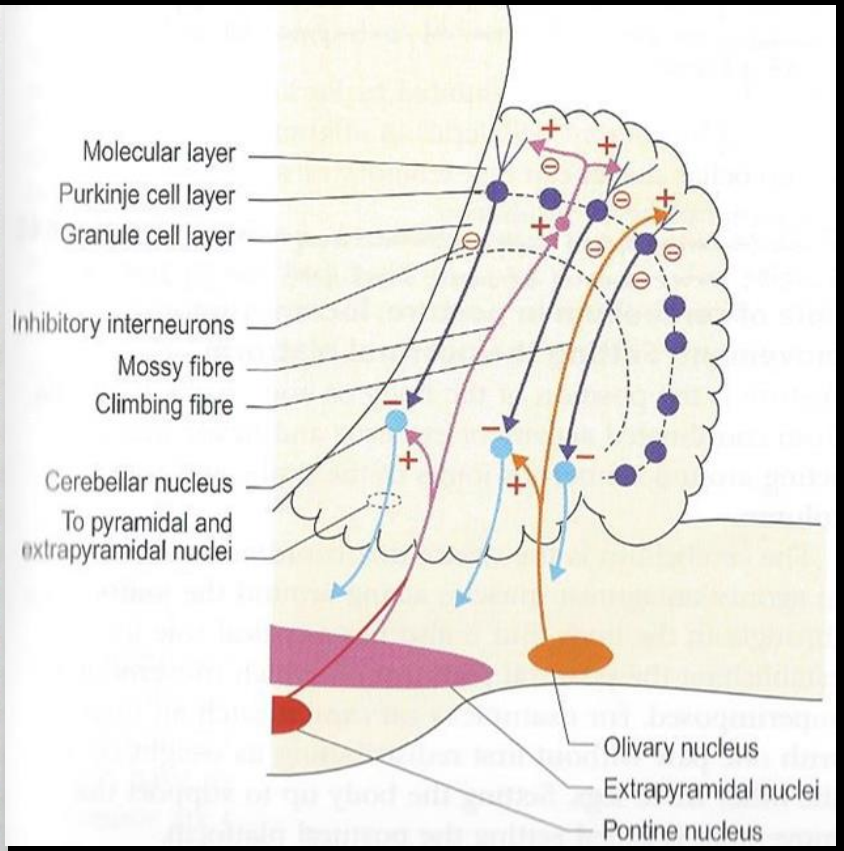
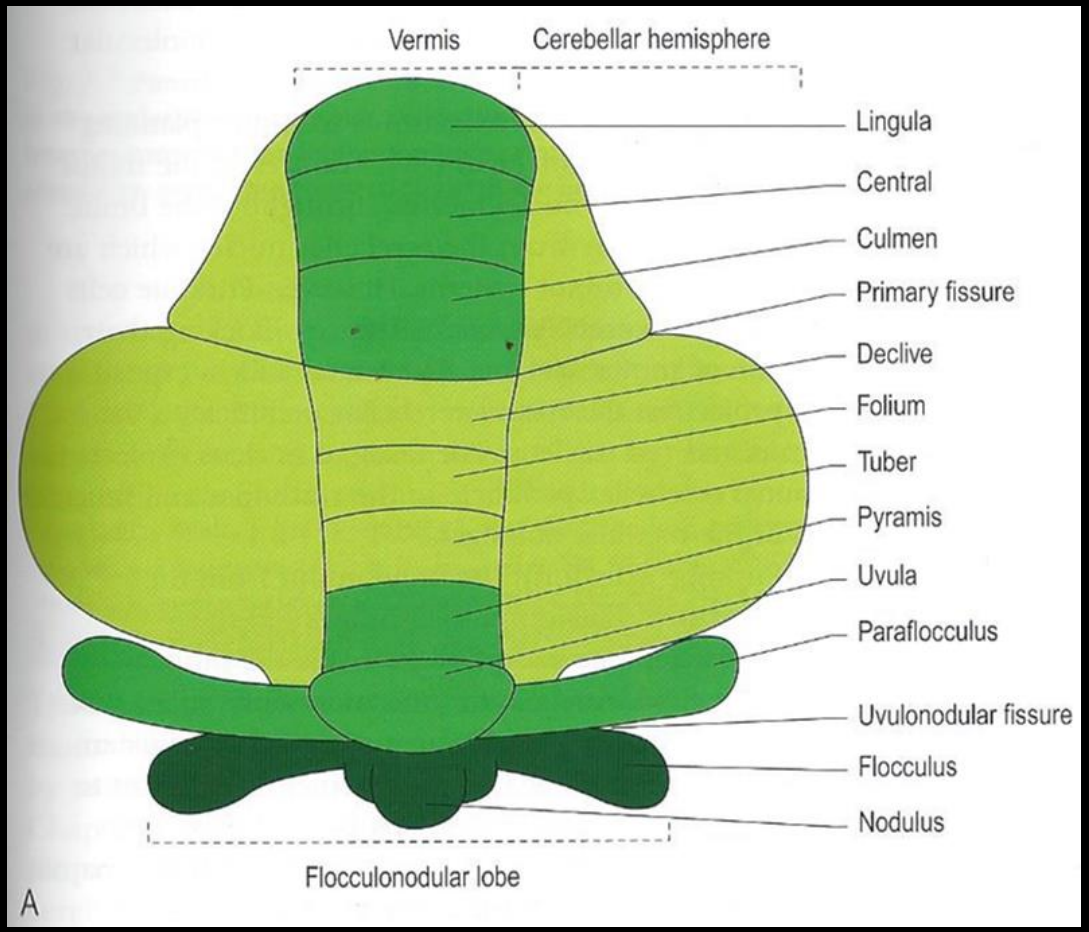




Veterinary neuroanatomy a clinical approach. Christine Thomason

Efferent fibres from cerebellar cortex are from Purkinje cells.
Purkinje cells are inhibitory and majority synapse on cerebellar nuclei, inhibiting them.
Cerebellar nuclei forms majority of efferent fibres from cerebellum, facilitatory to motor system.
Thus loss of cerebellar cortical output usually results in excess UMN activity

Anatomy & physiology



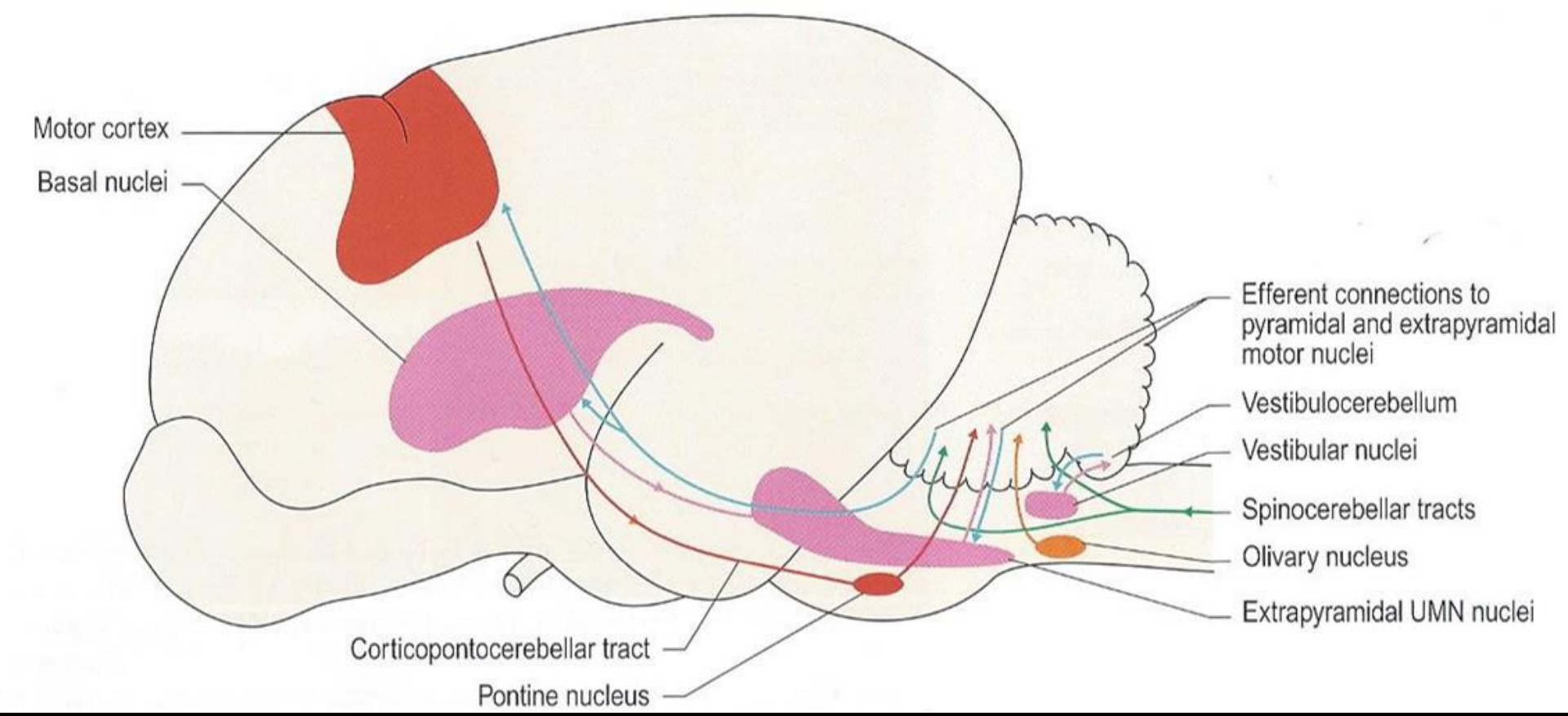
Veterinary neuroanatomy a clinical approach. Christine Thomason

Midgreen=spinocerebellum: comprises most of the vermis and paraflocculus. Major spinocerebellar afferent tracts terminate and coordinates truncal and limb movement

Dark green=vestibulocerebellum: flocculonodular lobe. Receives input from, and functions in conjunction with, the vestibular system to regulate equilibrium/balance and posture.

Light green=pontocerebellum: comprises the lateral hemispheres and caudodorsal vermis of the caudal lobe. Receives cerebral input via the pontine nuclei and regulates skilled movement.

Anatomy & physiology



Veterinary neuroanatomy a clinical approach. Christine Thomason

Anatomy & physiology

Veterinary neuroanatomy a clinical approach. Christine Thomason

Postural platform

Cerebellar dysfunction

Cerebellar lesion

-Inadequate processing of incoming proprioceptive information→ subconscious proprioceptive deficits

-Inadequate output for modulating motor activity→ excessive motor activity

Cerebellar dysfunction

1. Ataxia. Uncoordinated movement of trunk, limb, and neck. Reduced processing of proprioceptive input to cerebellum. Cerebellum doesn't know the position and state of body parts and can't coordinate postural and locomotory m.
2. Dysmetria. Abnormal rate, range or force of movement. Can't monitor subconscious proprioceptive input during movement, failure to regulate the rate, range, and force of movement.
3. Spasticity. Inadequate inhibition of UMN leads to excessive muscle tone.
4. Tremor. Failure to coordinate activity of the contracting agonist and relaxing antagonist m. acting
5. Vestibular sign. Inadequate vestibulocerebellar function results in reduced output from the cortex of vestibulocerebellum(inhibitory Purkinje cells). Usually excessive activity of the vestibular nuclei in brainstem.
6. Menace responsive deficits. Normal vision. Visual pathway connecting to CN7 nuclei for blinking via corticopontocerebellar tract or due to failure of cerebellar facilitation to forebrain motor cortex

Vestibular system

Vestibular system is the neural system that sets body equilibrium or balance.

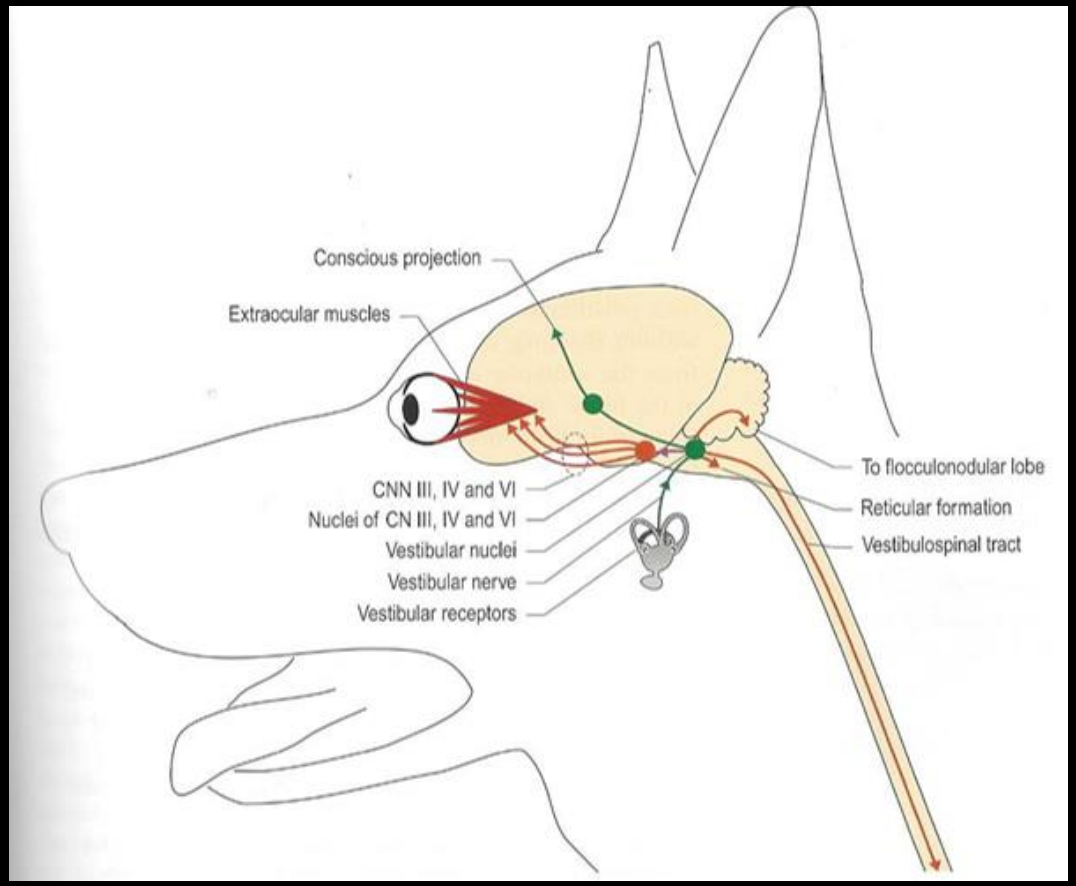
Stimulate ipsilateral extensor m. activity, inhibit antagonist m. and contralateral extensor m. in limbs, trunk and neck via UMN spinal cord track.

Rostrally causing extraocular m. contraction for eyeball position and movement via CN nuclei Ⅲ, IV, VI.

Send cerebellum about head proprioception for modulation of subconscious postural m. activity.

Send cerebrum about head proprioception for conscious awareness.

Connect to vomiting center of brainstem reticular formation



Veterinary neuroanatomy a clinical approach. Christine Thomason

-Peripheral component: vestibular component of inner ear
-Central component: vestibular nuclei, vestibulocerebellum, cranial spinal cord

Vestibular system

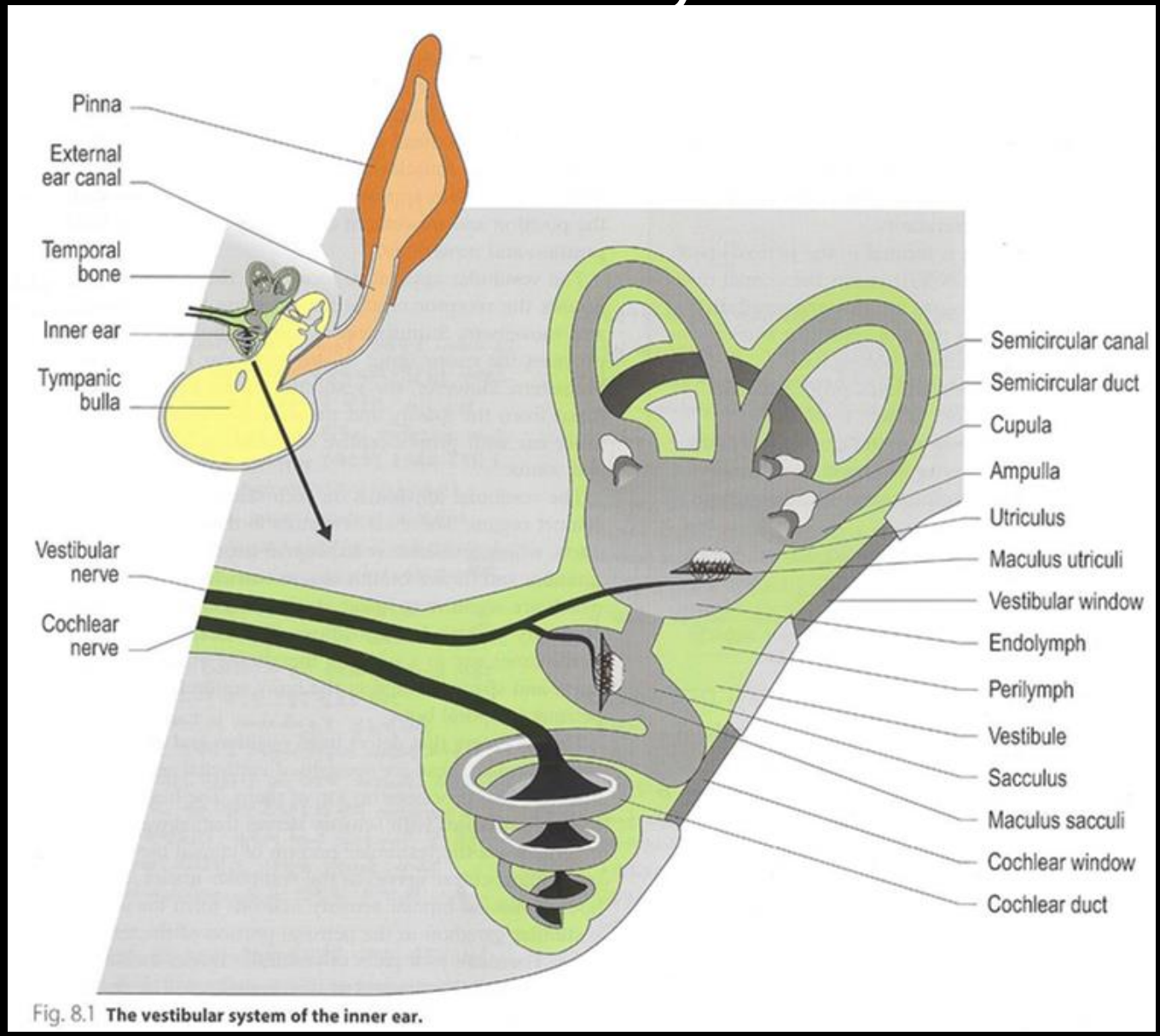
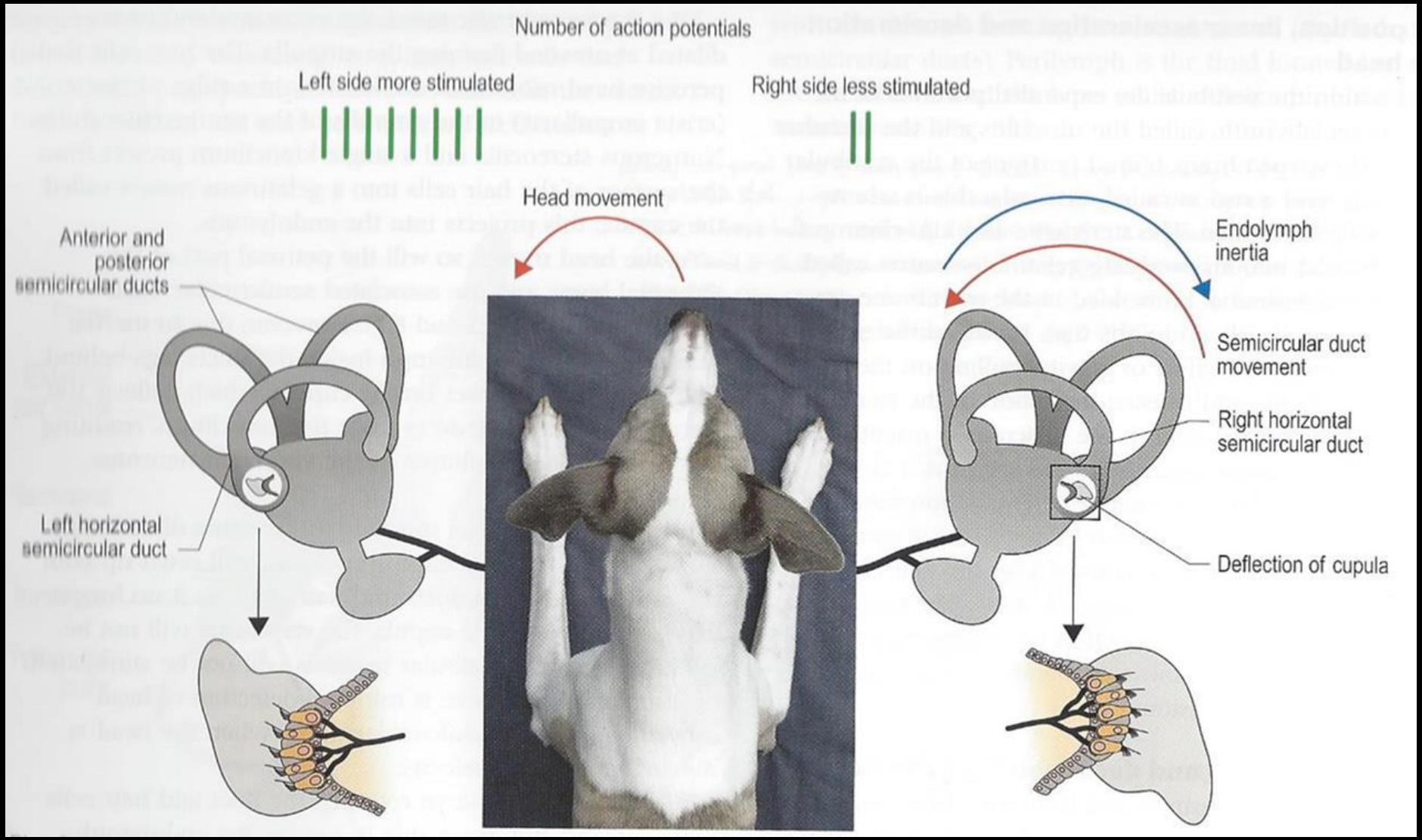


Fig. 8.1 **The vestibular system of the inner ear.**

Veterinary neuroanatomy a clinical approach. Christine Thomason



Veterinary neuroanatomy a clinical approach. Christine Thomason

Veterinary neuroanatomy a clinical approach. Christine Thomason

Vestibular dysfunction

Key point: brain interprets unmatched input form vestibular apparatus as indicating head movement

1. Right side lesion→ decreased input from right, sustained input from left→ greater left side input→ brain interpret unbalance input as left turning→ increased left extensor tone, decreased right muscle tone→ right head tilt, drift, circle, roll.

2. Abnormal output from vestibular nuclei to cerebellum→ coordination of limb position perturbed→ ataxic with wide or narrow based postures and uncoordinated movement.

3. Brain perceives animal turning to left→ rapid eyeball jerky movement to left.

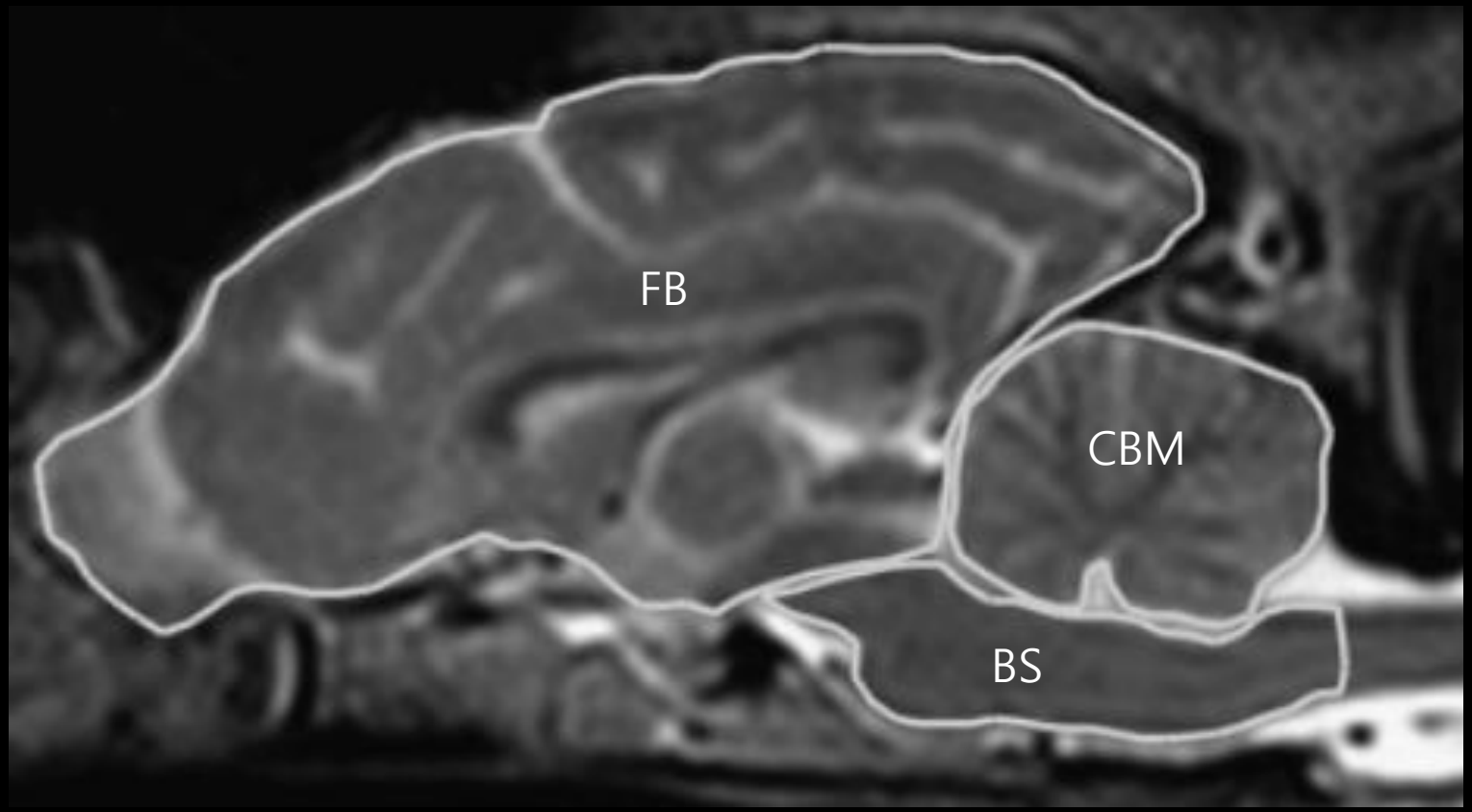
Background

DEVELOPMENT OF A MORPHOMETRIC MAGNETIC RESONANCE IMAGE PARAMETER SUITABLE FOR DISTINGUISHING BETWEEN NORMAL DOGS AND DOGS WITH CEREBELLAR ATROPHY

RYAN A. THAMES, IAN D. ROBERTSON, THOMAS FLEGEL, DIANA HENKE, DENNIS P. O'BRIEN, JOAN R. COATES, NATASHA J. OLBY

- 51 normal dogs(variable breeds), 13 cerebellar degenerative dogs
- LR breed 1-4 years(n=9), 5-10(n=10), 11-15(n=8)
- volume and area of forebrain, brainstem, cerebellum were calculated

Background



Forebrain: FB
BS: brainstem
CBM: cerebellum
TB: total brain

Background

TABLE 2. Mean and Standard Deviations (SD) of the Volumes and Mid-Sagittal Cross-Sectional Area (CSA) of the Cerebellum (CBM) and Cerebellum: Total Brain Ratio (CBM:TB) for three Different Age Groups of Labradors

	Labradors 1–4 years ($n=8$)		Labradors 5—10 years ($n=10$)		Labradors > 10 years ($n=8$)	
	Mean	SD	Mean	SD	Mean	SD
Volumes (cm^3)						
CBM	8.13	0.94	7.68	1.28	7.9	0.64
CBM:TB (%)	8.82	0.66	8.84	0.29	8.56	0.98
CSA (cm^2)						
CBM	4.4	0.3	4.16	0.097	4.28	0.18
CBM:TB (%)	15.12	0.95	14.53	0.52	14.58	0.92

Neither the mean mid-sagittal cross-sectional area of the cerebellum or the percent of brain occupied by cerebellum in mid-sagittal image

Background

TABLE 1. Mean and Standard Deviations (SD) of the Volumes and Mid-Sagittal Cross-Sectional Areas (CSA) of Total Brain (TB), Cerebellum (CBM), and CBM:TB Ratio for Groups in 5–10 Year Age Range

	Labradors		Beagles		Toy Breeds		Small Brachycephalic Breeds	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Volumes (cm^3)								
TB	88.11	2.671	74.84	6.35	50.96	5.63	46.01*	2.54
FB	74.29	12.56	62.6	6.03	42.96	4.83	37.75	2.08
BS	6.13*	0.86	5.032	0.44	3.43	0.23	3.72	0.26
CBM	7.68	1.28	6.71	1.52	4.56	0.85	4.54*	0.66
FB:TB (%)	84.12	1.6	83.55	1.69	84.30	1.11	82.07	1.22
BS:TB (%)	7.03*	1.1	6.76	0.81	6.78	0.56	8.083	0.315
CBM:TB (%)	8.84	0.29	9.67	0.32	8.91	0.3	9.86	1.242
CSA (cm^2)								
TB	28.82	0.62	23.98	1.57	17.96	0.62	17.79	0.74
FB	21.53	2.51	17.32	1.28	13.23	1.37	12.89	1.29
BS	3.13	0.16	2.75	0.21	1.96	0.29	2.05*	0.17
CBM	4.16	0.097	3.91	0.37	2.77	0.097	2.86	0.12
FB:TB (%)	74.55	2.06	72.21	1.79	73.68	1.19	72.34	2.09
BS:TB (%)	10.92	0.83	11.46	0.57	10.86	0.76	11.53	0.65
CBM:TB (%)	14.53	0.52	16.33	1.5	15.46	0.52	16.13	0.63

There is not a significant difference in the percentage of the brain occupied by an individual region between groups

Background

TABLE 3. Mean, Standard Deviations (SD) and Ranges of Brain Stem to Cerebellum Cross-Sectional Area (CSA of BS/CBM) and Cerebellum to Total Brain Cross-Sectional Area (CSA of CBM/TB) in the Normal Dogs, the Initial Group of Affected Dogs Evaluated, and the Complete Set of Affected Dogs

Group of dogs	CSA of BS/CBM% Mean (range ± SD)	CSA of CBM/TB% Mean (range ± SD)
Normal dogs (5–10 years)	**72.35**	**15.53**
$n = 35$	(56.78–85.22 ± 7.11)	(12.38–19.21 ± 1.58)
Affected dogs (excluding blinded samples)	**106**	**11.34**
$n = 13$	(96.46–131.76 ± 11.02)	(8.27–13.61 ± 1.59)

*Cut off value for cerebellar degeneration detection

BS/CBM 96.5%: Sensitivity 100%, specificity 100%

CBM/TB 13.6%: Sensitivity 96%, specificity 94%

Case 1

-2 years
-Standard Poodle
-Seizure event
-Ataxia
-Wide based stance

Case 1

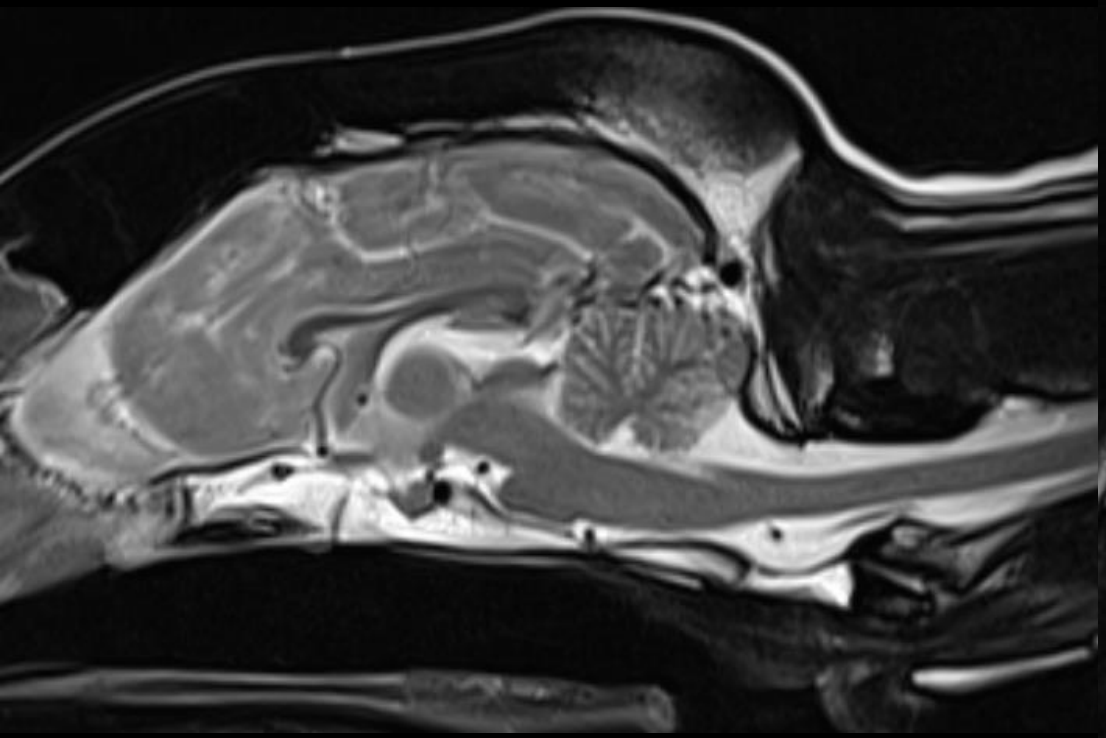
*Neurophysiologic exam
-Gait: ataxia, spasticity, intermittent ambulatory, wide-based stance
-Cranial nerve test: unremarkable
-Decreased postural reaction

*Neuroanatomic diagnosis
-forebrain(seizure), cerebellum or multi-lesional

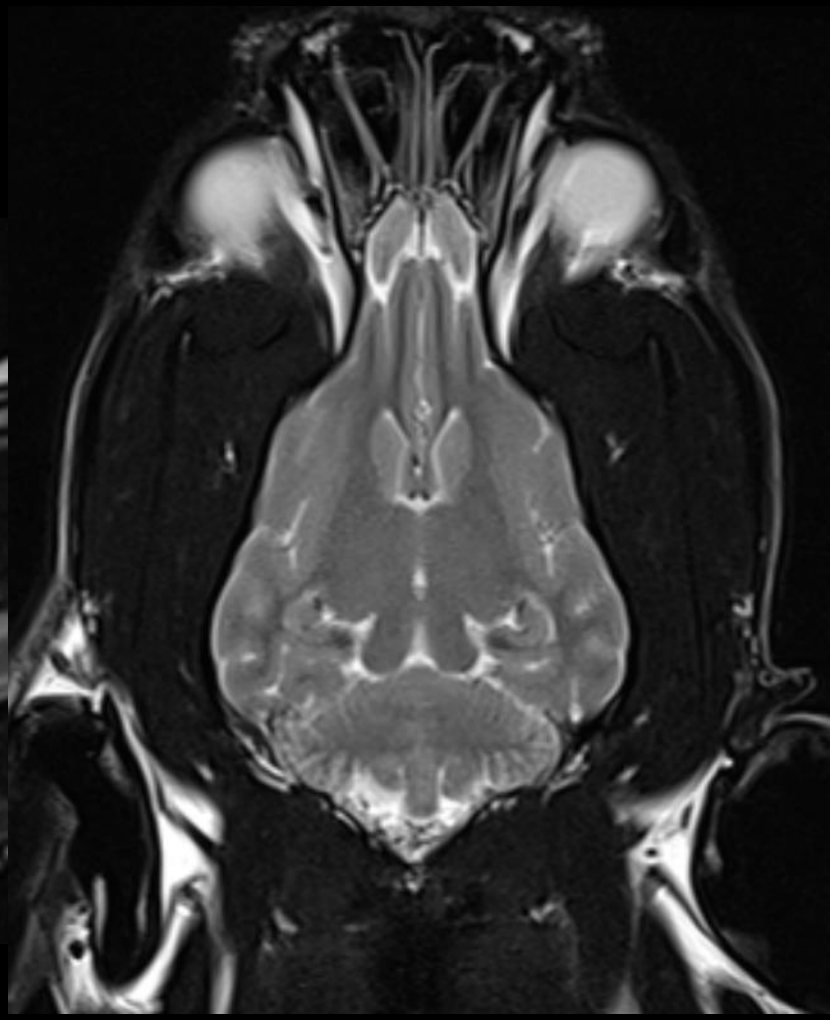
*Disease progression
-Acute onset progressive

*DDx
-Congenital, Infectious, Degenerative
-Cervical IVDD, Inflammatory
-Vascular accident, less likely neoplasia

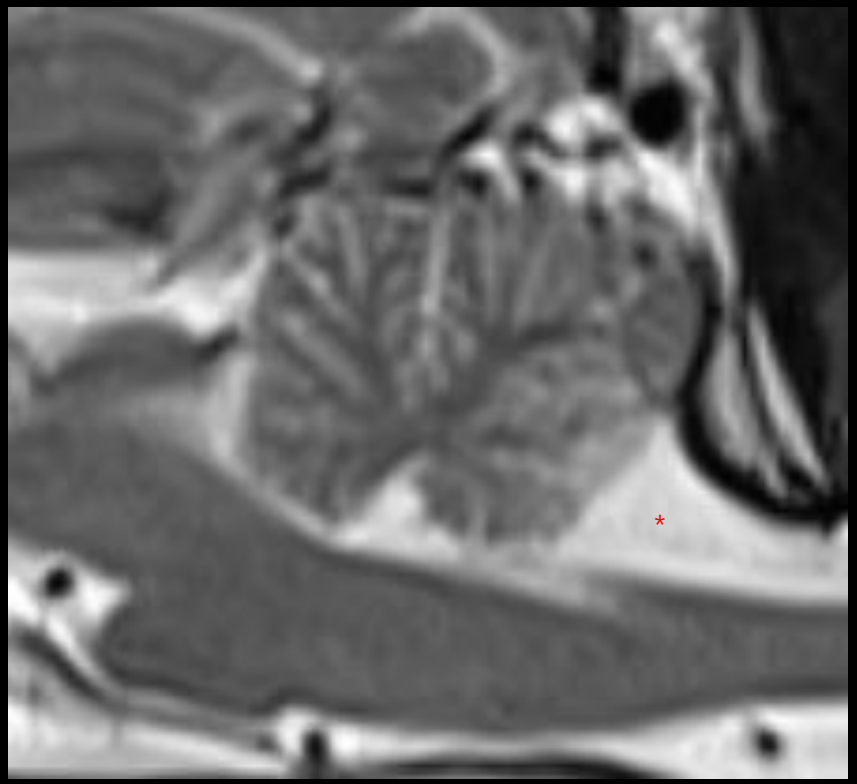
MR findings

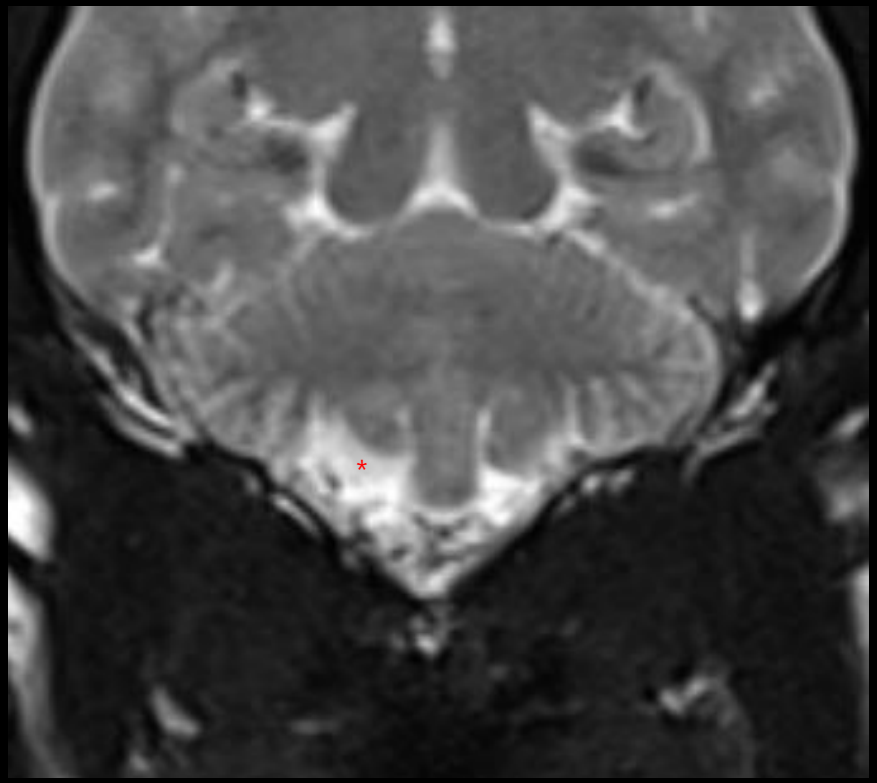


T2WI sagittal

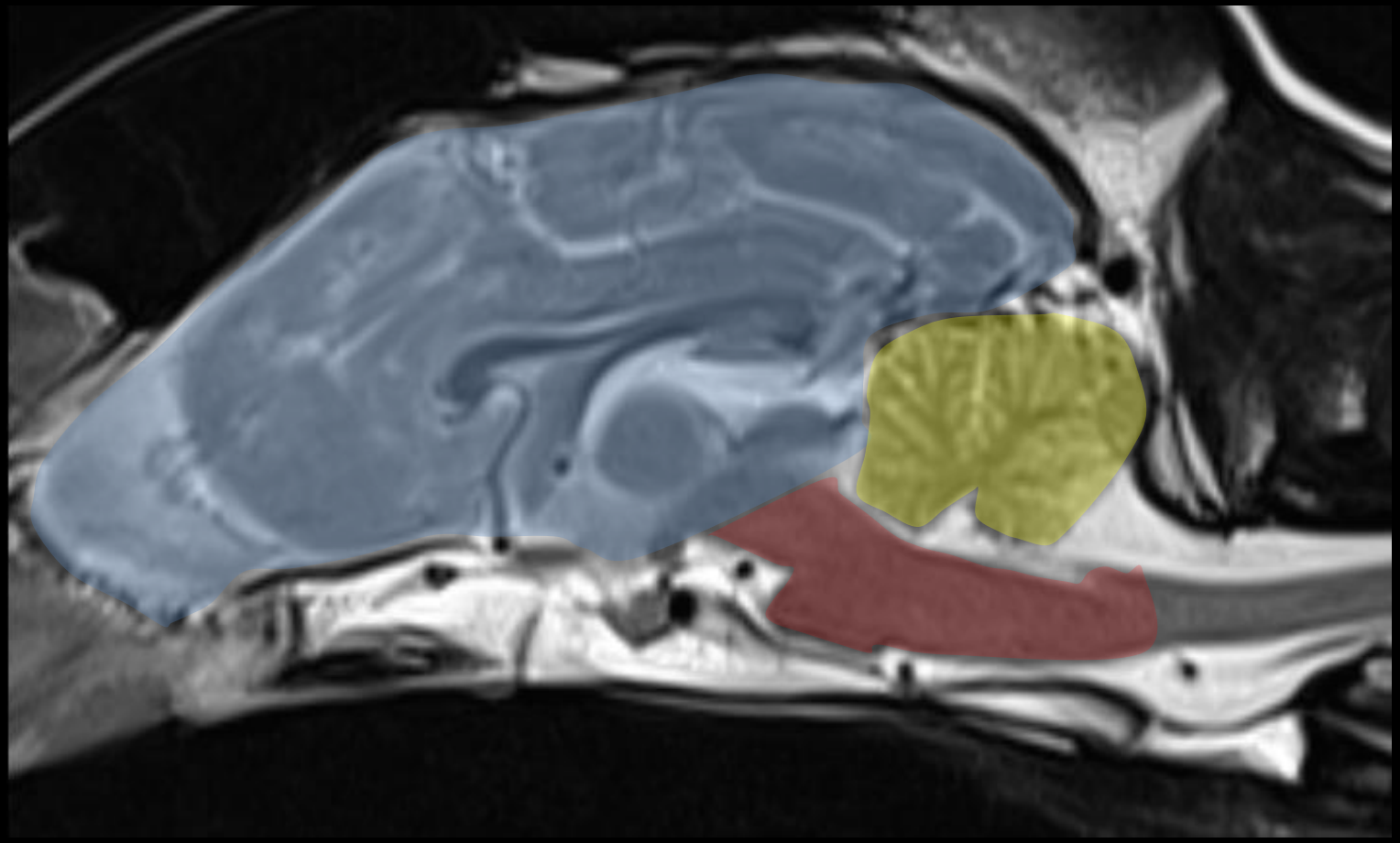


T2WI dorsal





-Subjectively, normal
-Fluid collection caudal to the cerebellum
-Dilated sulcus



Ratio of the cerebellum to total brain and of the brainstem to cerebellum mid-sagittal cross-sectional area was calculated

Total brain(TB), Cerebellum(CBM), Brainstem(BS), Forebrain(FB)

BS: CBM (%)- 95%

CBM: TB (%)- 10%

Cut-off value BS/CBM 96.5%: CBM/TB 13.6%:

TABLE 3. Mean, Standard Deviations (SD) and Ranges of Brain Stem to Cerebellum Cross-Sectional Area (CSA of BS/CBM) and Cerebellum to Total Brain Cross-Sectional Area (CSA of CBM/TB) in the Normal Dogs, the Initial Group of Affected Dogs Evaluated, and the Complete Set of Affected Dogs

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$n = 35$	(56.78–85.22 ± 7.11)	(12.38–19.21 ± 1.58)
Affected dogs (excluding blinded samples)	**106**	**11.34**
$n = 13$	(96.46–131.76 ± 11.02)	(8.27–13.61 ± 1.59)

→ Suggested that cerebellum was small

→ CSF Analysis: unremarkable
PCR: all negative
Culture: fungal/bacteria all negative

Tentative diagnosis: Cerebellar abiotrophy

Australian VETERINARY JOURNAL
THE JOURNAL OF THE AUSTRALIAN VETERINARY ASSOCIATION LTD
SMALL ANIMALS

CASE REPORT

Late-onset cerebellar abiotrophy in a Labrador Retriever

A Bertalan,[a*] EN Glass,[b] M Kent,[c] A De LaHunta[d] and C Bradley[e]

Case report A 5-year-old female spayed Labrador Retriever was examined for a hindlimb gait abnormality. Initial neurological examination was consistent with vestibular dysfunction. Over the course of 1 year, signs progressed to reflect cerebellar ataxia, vertical nystagmus and delayed postural reactions in all limbs. At the initial examination, subjective evaluation of magnetic resonance imaging scan of the brain was considered normal. Repeat imaging at 1 year after initial examination revealed a reduction in the size of the cerebellum. Retrospectively, the size of the cerebellum on the initial MRI was small when assessed using an objective measurement algorithm. Postmortem histopathological evaluation of the brain showed diffuse degeneration of Purkinje cell neurones with secondary granule cell loss in the cerebellum, in addition to pigment inclusions in brainstem neurones.

Conclusion The clinical history and clinicopathological data are consistent with late-onset cerebellar abiotrophy, which has not previously been described in this breed.

Keywords cerebellar abiotrophy; cerebellar cortical degeneration; ceroid lipofuscinosis; dogs; Labrador Retrievers; Purkinje neurone degeneration

Abbreviations CA, cerebellar abiotrophy; CSF, cerebrospinal fluid; MRI, magnetic resonance imaging; T1/T2WI, T1-/T2-weighted image

Aust Vet J 2014;92:339–342 doi: 10.1111/avj.12211

Cerebellar abiotrophy

Cerebellar hypoplasia: Cerebellar development fail due to infectious, genetic or toxic insult occurred in utero.

Cerebellar abiotrophy: Neurodegenerative disorder. Premature death of differentiated neurons due to intrinsic metabolic dysfunction.
cerebellar cortical degeneration.

Diagnosis: Degeneration of Purkinje neurons on histological evaluation

Cerebellar abiotrophy

Normal at birth, affected animals over weeks to months progressively develop dysmetria due to lack of inhibitory Purkinje neurons input to the cerebellar and vestibular nuclei.
→vestibular ataxia, balance loss, dysmetria, nystagmus

Abiotrophy is suspected to be autosomal recessive. A genetic basis has only been established in specific breeds
(Coton de Tulear, Beagle, Finnish Hound)

① early (24-weeks of age)
② intermediate (51-6 weeks of age)
③ late-onset (5 months or older)

Case 2

-1.8 years, C.male
-Pomeranian
-head tilt/leaning gait when excited

Case 2

Case 2-1

Case 2-2

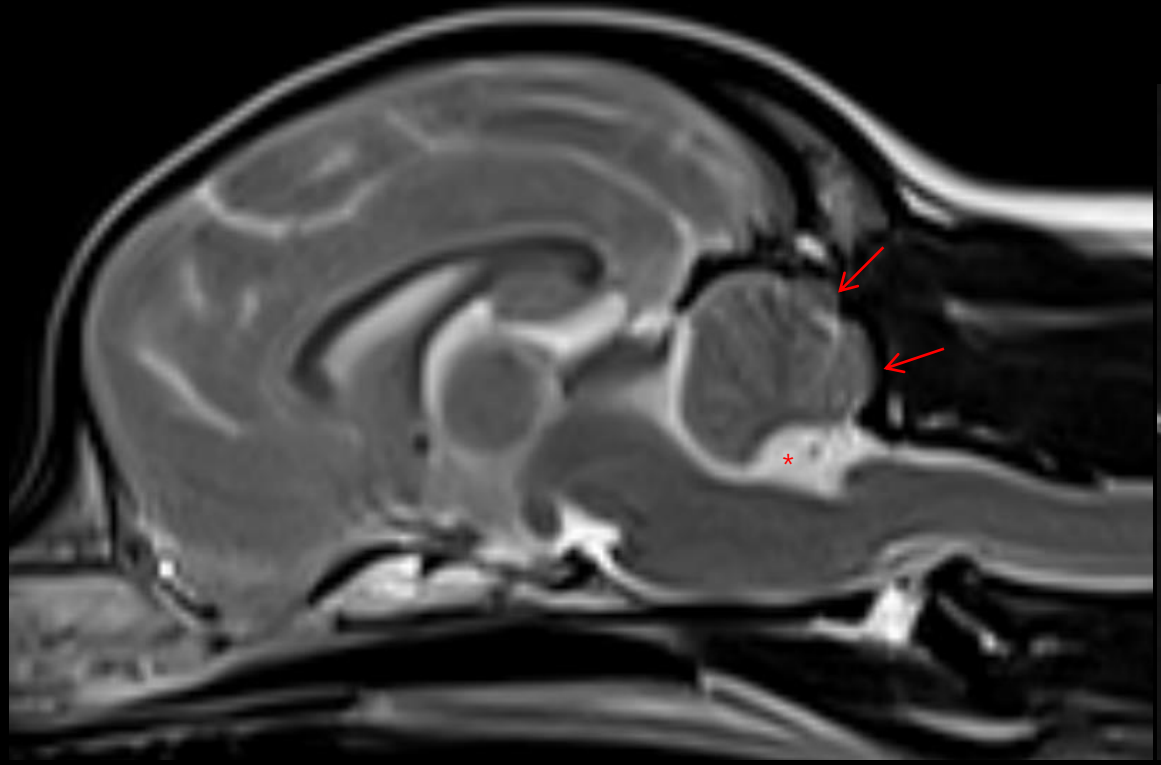
*Neurophysiologic exam
-Gait: head tilt when turning, almost normal straight position
-Cranial nerve test: unremarkable
-postural reaction: unremarkable

*Neuroanatomic diagnosis
-Vestibular component

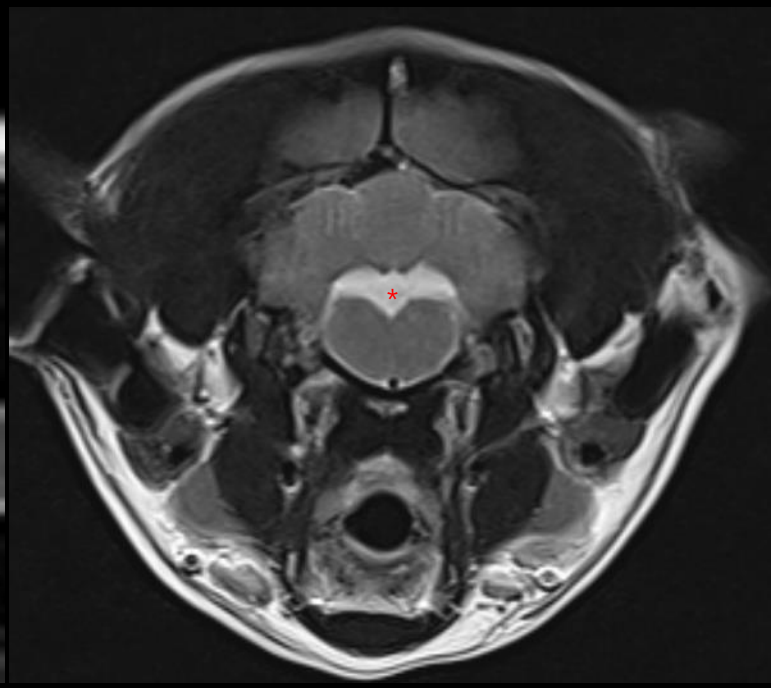
*Disease progression
-Chronic non progressive

*DDx
-Congenital, Degenerative, Otitis media/interna
-Compulsive disorder

MR findings



T2WI sagittal



T2WI transverse

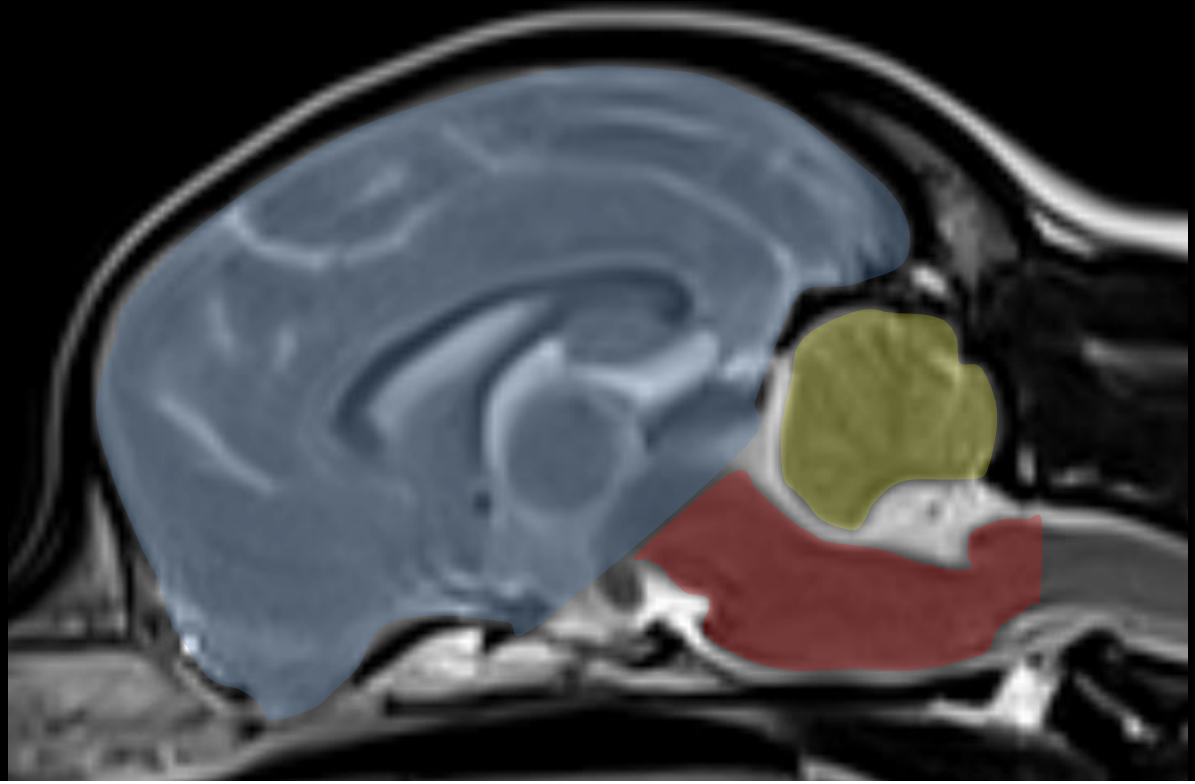


TABLE 3. Mean, Standard Deviations (SD) and Ranges of Brain Stem to Cerebellum Cross-Sectional Area (CSA of BS/CBM) and Cerebellum to Total Brain Cross-Sectional Area (CSA of CBM/TB) in the Normal Dogs, the Initial Group of Affected Dogs Evaluated, and the Complete Set of Affected Dogs

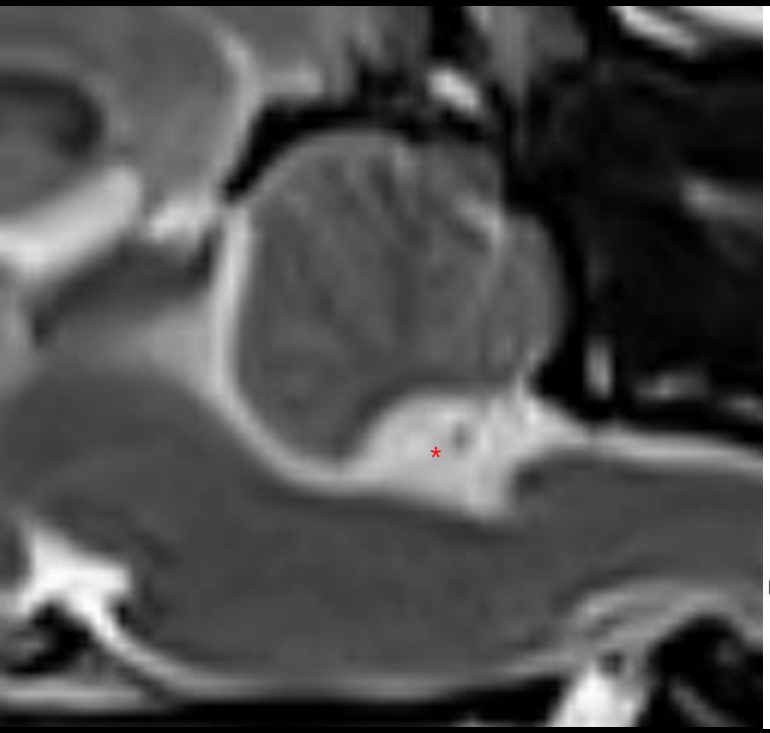
Group of dogs	CSA of BS/CBM% Mean (range ± SD)	CSA of CBM/TB% Mean (range ± SD)
Normal dogs (5–10 years)	**72.35**	**15.53**
$n = 35$	(56.78–85.22 ± 7.11)	(12.38–19.21 ± 1.58)
Affected dogs (excluding blinded samples)	**106**	**11.34**
$n = 13$	(96.46–131.76 ± 11.02)	(8.27–13.61 ± 1.59)

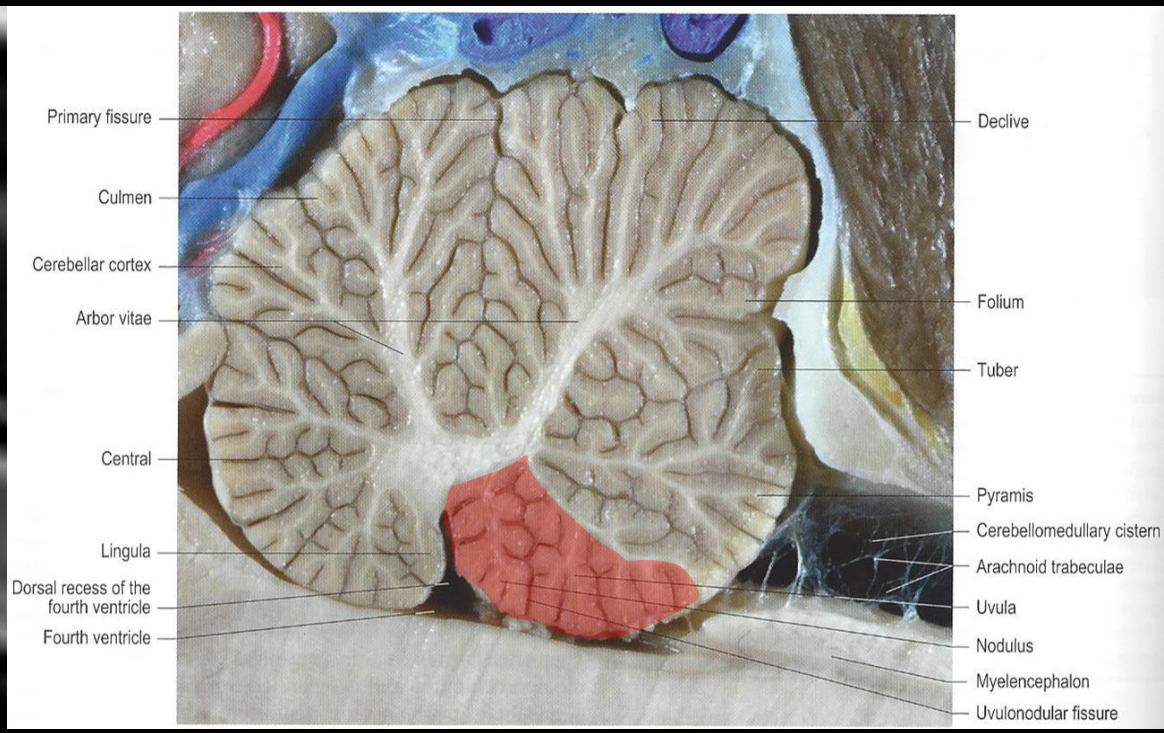
CBM:TB 7.5%

BS:CBM 148%

→ Small cerebellum

MR findings





Nodulus and ventral uvula of cerebellum are absent.

Tentative diagnosis: hypoplastic cerebellar nodulus and ventral uvula

Head Tilting Elicited by Head Turning in Three Dogs with Hypoplastic Cerebellar Nodulus and Ventral Uvula

Shinji Tamura[1], Yuya Nakamoto[2,3,4], Takashi Uemura[2] and Yumiko Tamura[1]*

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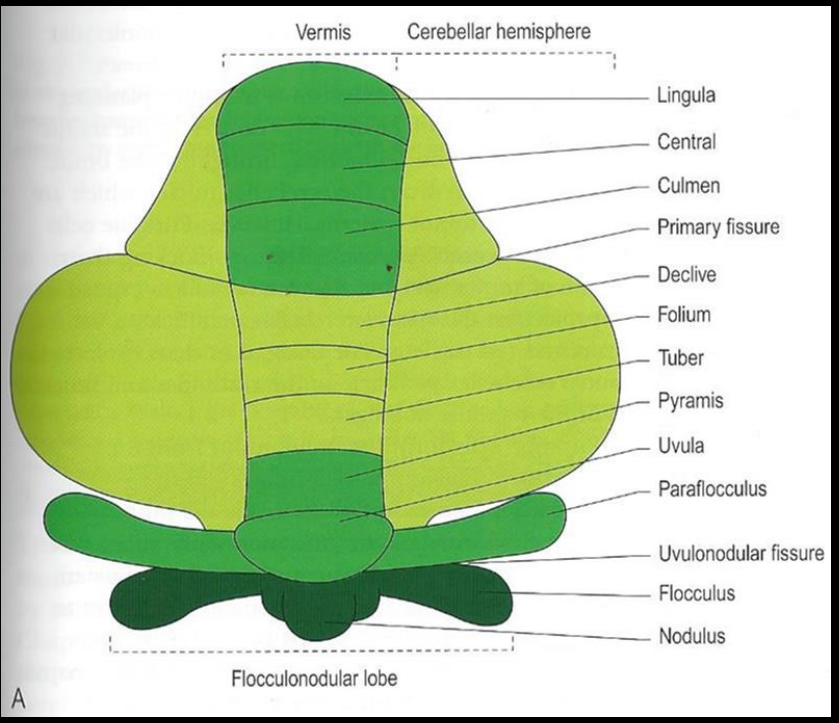
The nodulus and ventral uvula (NU) of the cerebellum play a major role in vestibular function in humans and experimental animals; however, there is almost no information about NU function in the veterinary clinical literature. In this report, we describe three canine cases diagnosed with presumptive NU hypoplasia. Of them, one adult dog presented with cervical intervertebral disk disease, and two juvenile dogs presented with signs of central vestibular disease. Interestingly, an unusual and possibly overlooked neurological sign that we called "positioning head tilt" was observed in these dogs. The dogs were able to turn freely in any direction at will. The head was in a level position when static or when the dog walked in a straight line. However, the head was tilted to the opposite side when the dog turned. Veterinary clinicians should be aware of this neurological sign that has not been reported previously, and its application in lesion localization in dogs.

Keywords: cerebellar, nodulus, ventral uvula, dog, positioning head tilt

Hypoplastic cerebellar nodulus and ventral uvula



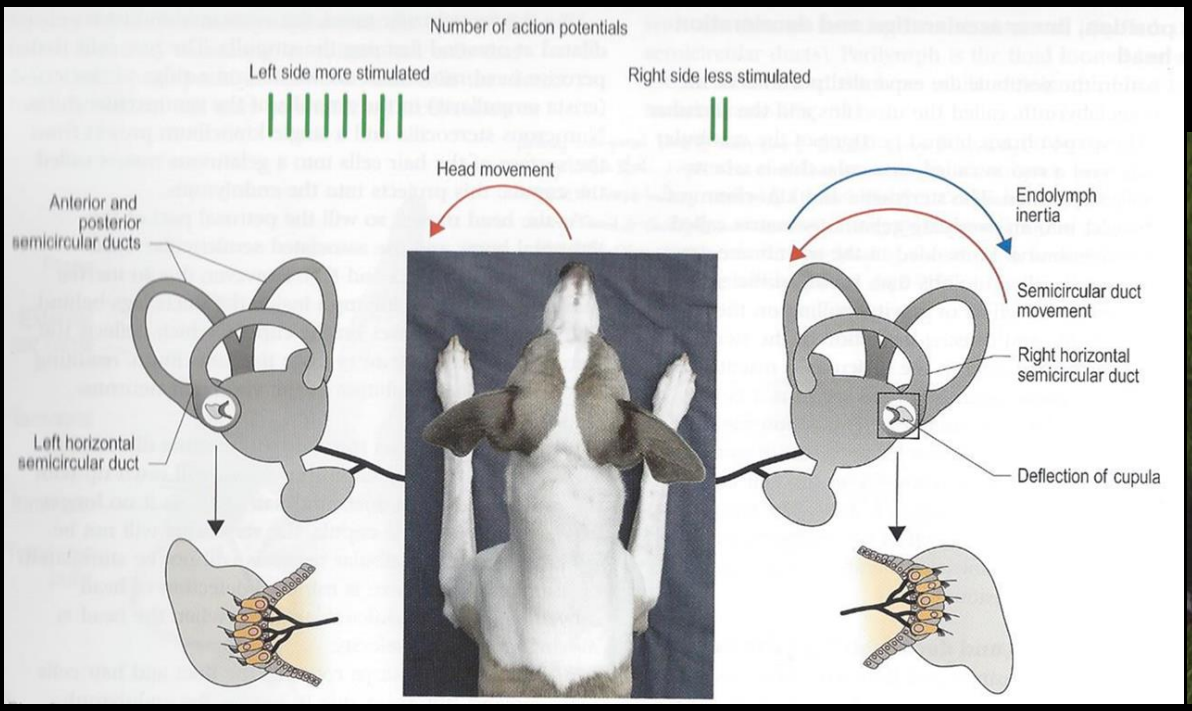
Flocculonodular lobe=vestibulocerebellum

Responsible for maintenance of equilibrium and coordination of head and eye movement.

Neurologic signs are more minor.

"positioning head tilt"

Hypoplastic cerebellar nodulus and ventral uvula



Veterinary neuroanatomy a clinical approach. Christine Thomason

Vestibulocerebellum use information about head proprioception in conjunction with proprioceptive input from neck, trunk, limbs via vestibular nuclei to modify and coordinate motor output from UMN centres to maintain whole body.

Turning to left → shift distribution of body mass to left → increased extension on left → reduced extension on right → minimize weight transfer to left

NU coordinate this system by inhibition of stimulation of vestibular nuclei in order to maintain head position.

Because inhibition was absent, head was tilted to opposite side from turning direction

Conclusion

- To quantify cerebellar area, not subjectively may provide useful tool to diagnose small cerebellum.
- Due to clinical signs of NU hypoplasia may be minor, clinician may consider this sign a peculiarity or compulsive disorders.
- Clinicians should be aware of “positioning head tilt” and its application in lesion localization in dogs.

reference

1. Veterinary neuroanatomy A clinical approach. Christine Thomson. 2012, SAUNDERS.
2. Development of a morphometric MRI parameter suitable for distinguishing between normal dogs and dogs with cerebellar atrophy, RYAN A. THAMES, et.al, 2010
3. Late-onset cerebellar abiotrophy in a Labrador retriever, A Bertalan, 2014
4. Head tilting elicited by head turning in three dogs with hypoplastic cerebellar nodulus and ventral uvula, Shinji Tamura, et.al, 2016

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난치성/재발성 만성 피부염의 접근법

로얄동물메디컬센터 본원

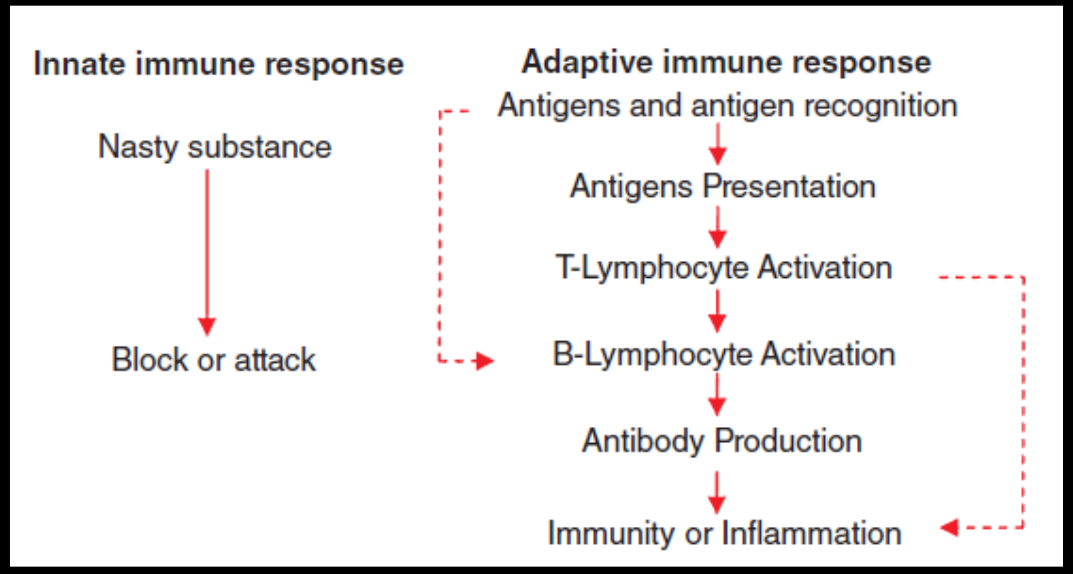
이 재 희 원장

How I treated to refractory/recurrent chronic dermatitis

Royal Animal Medical Center
LEE JAE HEE

Cutaneous immunity

- Characterised by the activation of the innate and adaptive immune system via the production of pro-inflammatory cytokines



Acute vs chronic

- Acute inflammation
  - Rapidly in response to a trigger, such as an allergen, the sun, or an infection.
  - Acute inflammation doesn’t cause permanent tissue damage.
-
- Chronic inflammation
  - Long-lasting inflammation that develops when the immune system releases sustained responses within the body
  - Lead to chronic disease and tissue damage
  - Symptoms aren’t always visible

Variable skin inflammatory condition

- Infection
  - Bacterial, fungal, and viral
- Immune system dysfunction
  - Immune cells to mistakenly attack your body's own healthy cells
  - Red, patchy skin lesions to develop
-
- Allergic reaction
  - Overreacts when it senses a foreign substance and sends cells to attack the invader
  - Foods, medications, and pollen
  - Redness, urticaria/hives, and inflammation
  - Contact dermatitis

Variable skin inflammatory condition

- Gut condition
  - Gut-skin balance
  - Imbalanced gut microbiome are linked to skin inflammation and chronic inflammatory skin conditions
-
- Photosensitivity
  - Extreme sensitivity to sunlight
  - Certain medications, including some antibiotics and diuretics
  - Red, inflamed, and burned after only minimal UV radiation exposure
-
- Injury or wound
  - Cuts, scrapes, burns, and surgical wounds

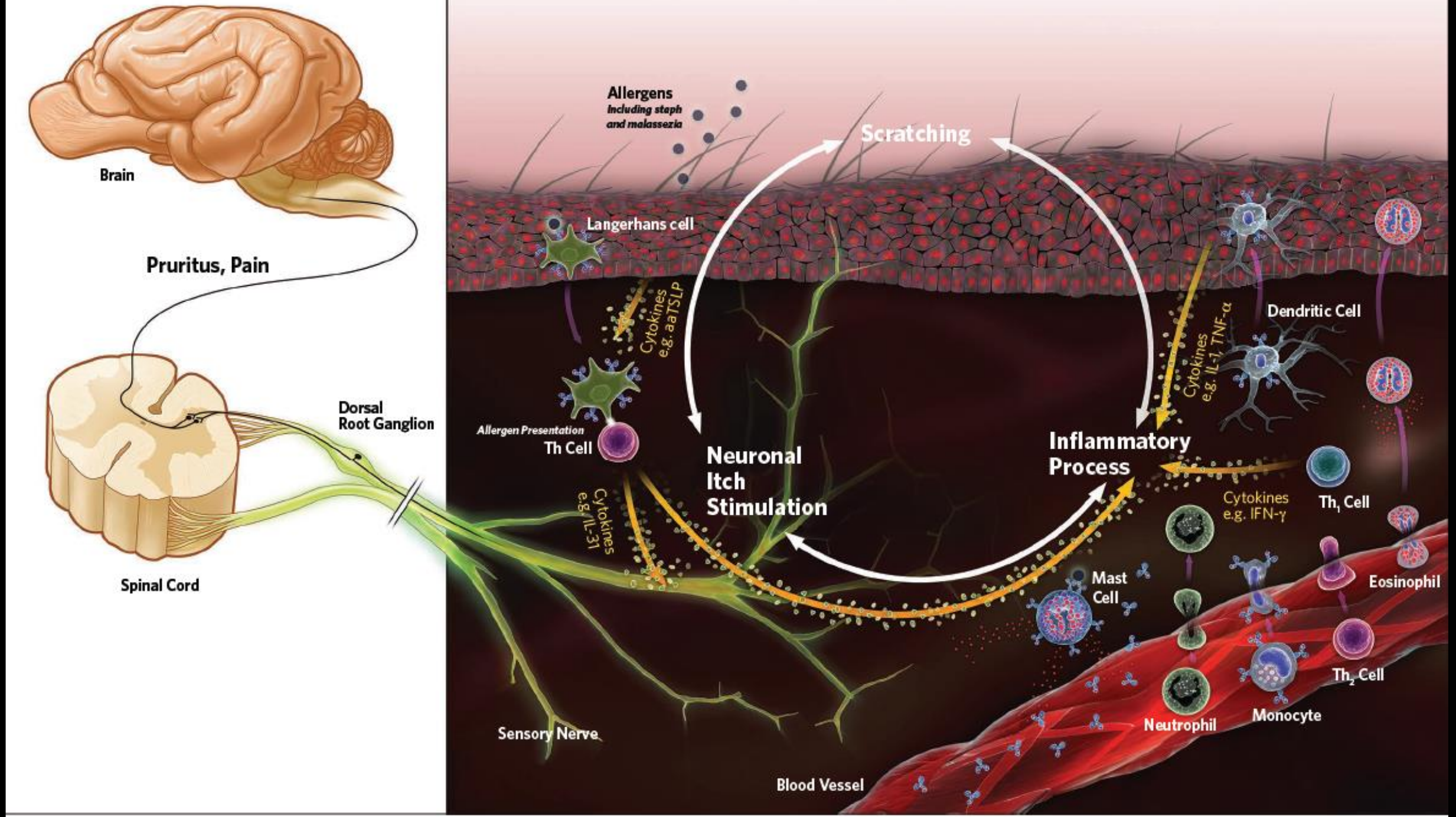
Cytologic morphology

Table 2-8 Cytologic Diagnosis from Stained* Smears

Finding	Diagnostic Consideration
Neutrophils, degenerate	Bacterial infection
Neutrophils, nondegenerate	Sterile inflammation (e.g., canine allergy, pemphigus, subcorneal pustular dermatosis, linear IgA pustular dermatosis), irritants, foreign body reaction
Eosinophils	Ectoparasitism, endoparasitism, feline allergy, furunculosis, eosinophilic granuloma, feline eosinophilic plaque, mast cell tumor, pemphigus, sterile eosinophilic folliculitis, sterile eosinophilic pustulosis
Basophils	Ectoparasitism, endoparasitism, feline allergy
Mast cells	Ectoparasitism, feline allergy, mast cell tumor (poorly stained with Diff-Quik)
Granulomatous lymphocytes, macrophages, and plasma cells	Infectious (especially furunculosis) versus sterile (e.g., foreign body, sterile granuloma syndrome, metatarsal fistulae, and sterile panniculitis)
plasma cells	fistulae, and sterile panniculitis)
Pyogranulomatous neutrophils, lymphocytes, macrophages and plasma cells	Same as for granulomatous
Eosinophilic granulomatous cells	Furunculosis, ruptured keratinous cyst, eosinophilic granuloma
Plasma cells	Plasma cell pododermatitis, plasmacytoma
Acanthocytes	Few: any inflammatory dermatosis Many: pemphigus, dermatophytosis
Bacteria	Intracellular: infection Extracellular only: colonization
Yeast, peanut-shaped	Common: *Malassezia* spp. Rare: *Candida*, *Cryptococcus*, *Blastomyces*, and others
Fungi, spores, hyphae	Dermatophytes or saprophytic fungi
Atypical or monomorphous population	Clumped and rounded: epithelial neoplasia Individual round cells: round cell tumors (mast cells, histiocytes, lymphocytes, plasma cells, melanoma, transmissible venereal tumor) Individual elongated: mesenchymal neoplasia

Table 1-14 Mediators of Pruritus

Pruritogenic Mediator	Source(s)	Receptors	Comments
Acetylcholine (ACh)	Nerve fibers, keratinocytes, lymphocytes, melanocytes, fibroblasts, endothelial cells	Nicotinergic and muscarinergic ACh receptors	Causes pruritus in atopic dermatitis
Calcitonin gene–related peptide (CGRP)	Sensory nerve fibers	CGRP receptors	Sensitizes receptor endings; keratinocyte and endothelial cell proliferation
Corticotropin-releasing hormone	Hypothalamus	Keratinocytes, mast cells	Induces mast cell release of cytokines, histamine, tumor necrosis factor (TNF)-α, and vascular endothelial growth factor
Endocannabinoids	Neurons and keratinocytes	Cannabinoid receptors	Antipruritic in the skin
Endothelins	Endothelial cells and mast cells	Endothelin receptors (ET-A, ET-B)	Directly pruritic (burning itch)
Endovanilloids	Heat, acidosis, eicosanoids, histamine, bradykinin, extracellular adenosine triphosphate, prostaglandins, various neurotrophins	Transient receptor, potential vanilloid 1 receptor	Induce pain and itch, affect epidermal proliferation and differentiation
Histamine	Sensory fibers, mast cells	Histamine receptors H1R to H4R	H_1 and H_4 agonists stimulate flare, H_1 agonists induce itch
Interleukin (IL)-2	T cells		Causes pruritus
IL-31	Helper T cells and macrophages	Gp 130–like receptor, oncostatin M receptor	Causes pruritus, increased expression in atopic dermatitis
Kallikreins, proteases	Leukocytes, keratinocytes, mast cells, endothelial cells, and platelets	Protease-activated receptors, tryptic enzymes	Pruritic through protease-activated receptor 2
Kinins	Endothelial cells	Bradykinin receptors B1R, B2R	Induce pain in normal skin, itch in sensitized skin
Leukotriene B_4	Leukocytes, mast cells	Leukotriene receptors	Induces itch and inflammation
Neurokinin A	Nerve fibers	Tachykinin receptors	Upregulates keratinocyte nerve growth factor expression
Nerve growth factor	Keratinocytes, mast cells, fibroblasts, eosinophils	Tyrosine receptor kinase A (tyrosine kinase receptor type 1)	Peripheral sensitization, potentiates itching, upregulates TRPV1
Opioids	Neurons, keratinocytes, and mast cells	μ-, κ-, δ-Opioid receptors	μ-Opioid is pruritic at spinal level, κ-opioids are antipruritic
Pituitary adenylate cyclase–activating polypeptide	Nerve fibers, lymphocytes, dermal endothelial cells	VPAC receptors	Vasodilation, immunomodulation, pain
Pro-opiomelanocortin	Melanocytes, keratinocytes, endothelial cells, Langerhans cells, mast cells, fibroblasts, monocytes, macrophages	Melanocortin receptors	Antagonizes proinflammatory cytokines, induces histamine release from mast cells, inhibits nuclear factor κB
Prostaglandin E_2	Nerve fibers, keratinocytes, mast cells	Prostanoid receptors	Causes pruritus
Substance P	Sensory nerve fibers and keratinocytes	Neurokinin 1 receptor	Priming of mast cells, causes pruritus in some species by histamine-dependent and histamine-independent mechanisms
Thromboxane A_2	Keratinocytes and nerve fibers		Causes pruritus
Tryptase	Mast cells	Protease-activated receptor 2	Causes pruritus
Vasoactive intestinal peptide	Sensory nerve fibers, Merkel cells	VPAC receptors	Vasodilation, histamine release from mast cells


Brain
Pruritus, Pain
Dorsal Root Ganglion
Spinal Cord
Allergens
Including staph and malassezia
Scratching
Langerhans cell
Cytokines e.g. aaTSLP
Allergen Presentation
Th Cell
Neuronal Itch Stimulation
Cytokines e.g. IL-31
Sensory Nerve
Blood Vessel
Cytokines e.g. IL-1, TNF-α
Dendritic Cell
Inflammatory Process
Cytokines e.g. IFN-γ
Th1 Cell
Mast Cell
Eosinophil
Th2 Cell
Neutrophil
Monocyte

Skin biopsy_general considerations

- One of the most powerful tools in dermatology
  - Clinician; carefully selected, procured, and preserved the specimens
  - Pathologist; carefully processed, perused, and interpreted the specimens

> However, despite their diagnostic value, skin biopsies are often not performed or are done relatively late in the diagnostic workup. In other cases, skin biopsy findings are unrewarding because of poor specimen selection, poor technique, or both

- Most cost-effective test to recommend to the client

Skin biopsy_general considerations

- The final diagnosis should be made by the clinician, who correlates all the relevant findings of a case, not by the pathologist
  - The biopsy contributes to those findings; it does not replace a thorough history, physical examination, or other ancillary test results

Skin biopsy_When_general guidelines

- Obviously neoplastic or suspected neoplastic lesions
- Persistent ulcerations
- Major diseases most readily diagnosed by biopsy (e.g., follicular dysplasia, zinc-responsive dermatosis, sebaceous adenitis, dermatomyositis, immune-mediated skin disease)
- Dermatosis that is not responding to apparently rational therapy
- Any dermatosis that in the experience of the clinician is unusual or appears serious
- Vesicular dermatitis
- Any suspected condition for which the therapy is expensive, dangerous, or sufficiently time consuming to necessitate a definitive diagnosis before beginning treatment

Skin biopsy_When_general guidelines

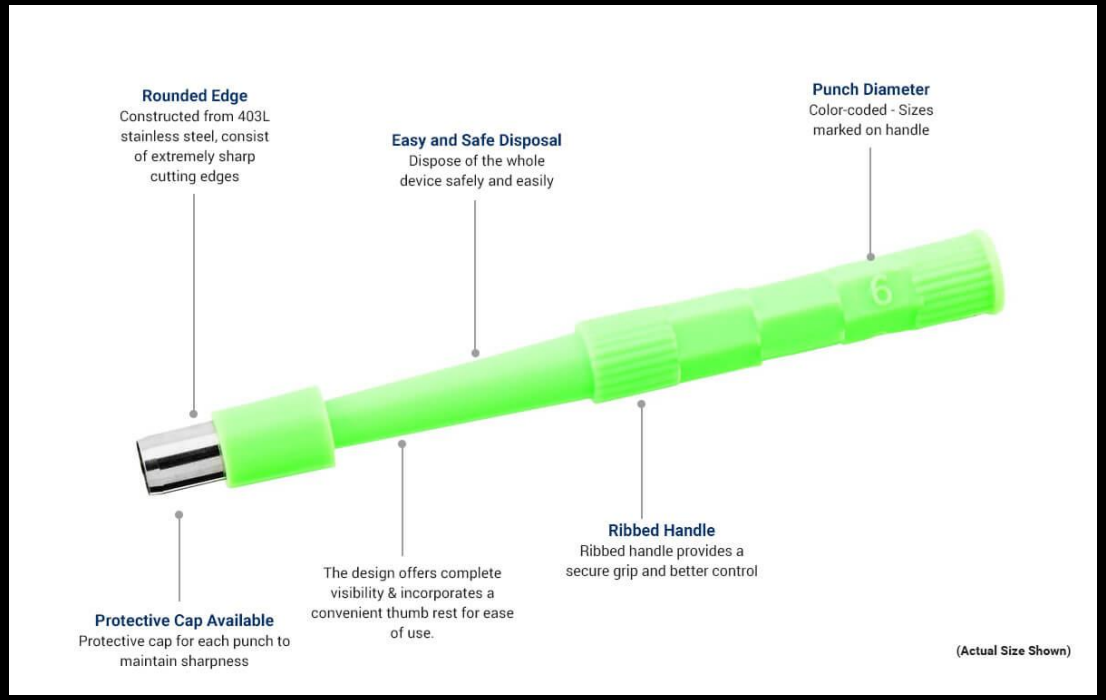
- This early intervention
  - Obviate nonspecific masking and misleading changes due to chronicity, administration of topical and systemic medicaments, excoriation, and secondary infection
  - Allows more rapid institution of specific therapy, thus reducing permanent disease sequelae (scarring, alopecia), the patient's suffering, and additional costs to the owner.

Skin biopsy_What_general guidelines

- Pick lesions and subtle changes they suspect will show diagnostic changes
  - Pigmentary incontinence
  - Distribution of lesions is unusual for the suspected disease
  - Fluid-filled lesions or oozing lesions

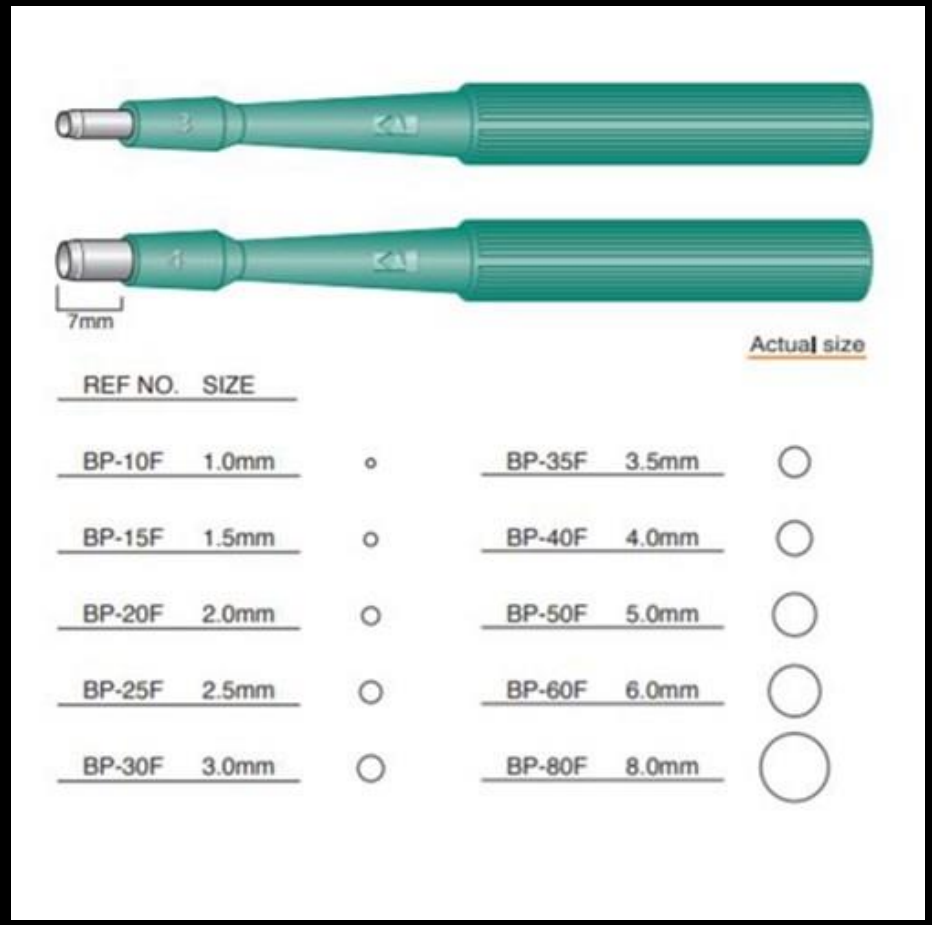
Skin biopsy_How_general guidelines

- In general
  - 6 mm biopsy device
  - Occasional 4 mm biopsy device
  - Local anesthetic (1%-2% lidocaine)



Skin biopsy_How_general guidelines

- Macule, pustule, papule, or small lesion should be centered in the biopsy specimen
- The clinician must also realize erythema and color changes
- Small lesions such as papules and pustules may no longer be grossly visible
- Biopsy punch should be rotated in only *one* direction



Skin biopsy_How_general guidelines

- Excisional biopsy
  - Larger lesions
  - Vesicles, bullae, and pustules (the rotary and shearing action of a punch may damage the lesion)
  - Suspected disease of the subcutaneous fat (punches often fail to deliver adequate samples of diseased fat)

Case_1

- CC
  - Chronic dermatosis
  - Generalized crusts/scales
- 13 years old
- Neutered male Yorkshire Terrier
- HPI
  - 7 months
  - Erythema and oozing after trimming
  - Chronic progression

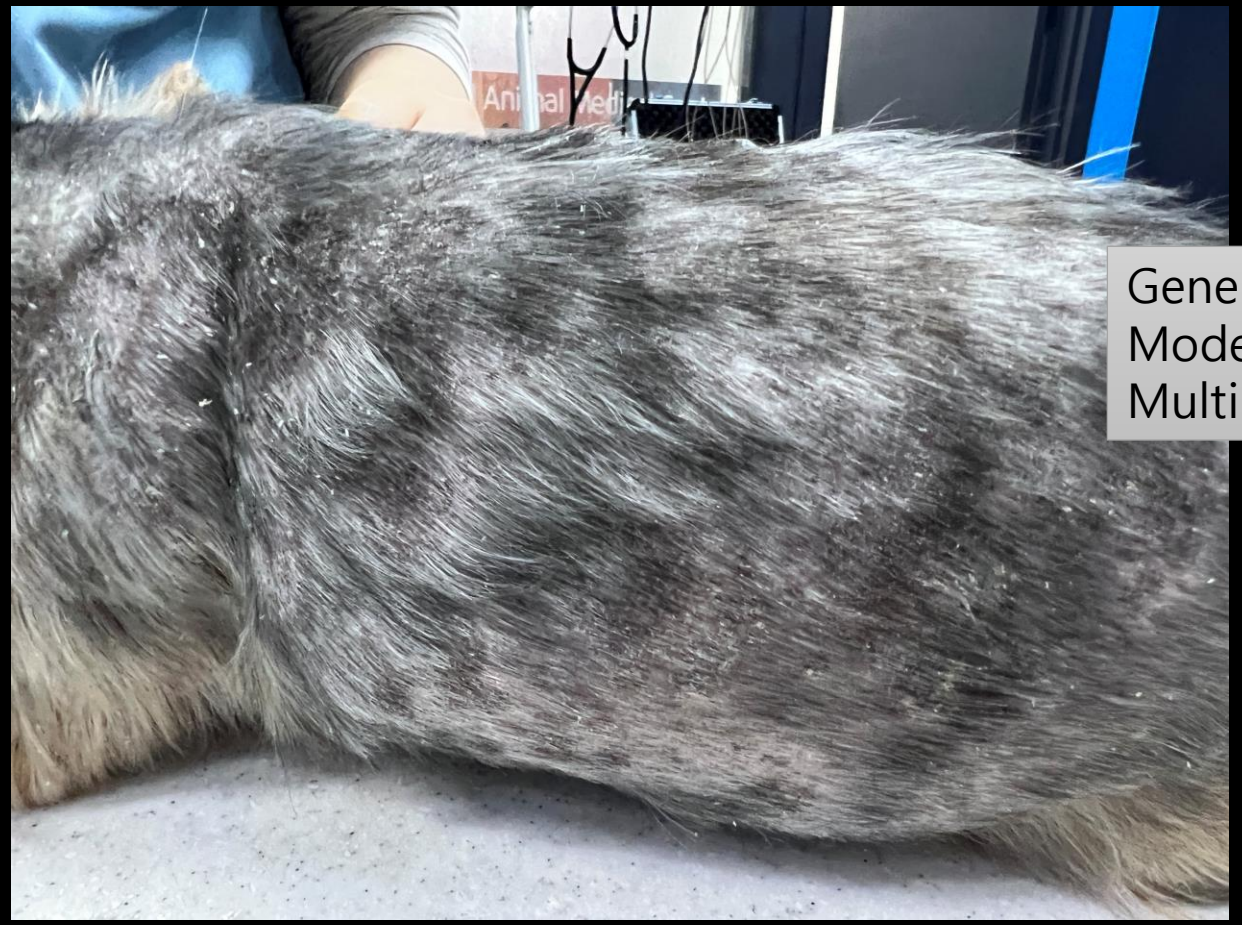
Case_1

item	result	reference	item	result	reference
WBC	15.05	6-17 K/uL	ALB	2.9	2.3-3.9 g/dL
RBC	6.20	5.5-8.5 M/uL	Total protein	6.7	4.9-7.2 g/dL
HCT	44.3	37-55 %	ALT	58	3-50 U/L
PLT	86	200-500 K/uL	ALP	240	20-155 U/L
cTnI	0.14	0-0.2 ng/ml	Amylase	2287	388-1007 U/L
proBNP	< 500	0-900 pmol/L	Lipase	360	5-90 U/L
CRP	7.6	0-10 mg/L	BUN	21.0	5-30 mg/dL
cPLI	394.6	0-200 ng/ml	Cr	0.9	0.5-1.5 mg/dL
SDMA	16.2	1-14 ug/dl	TG	178	21-116 mg/dL

Case_1

item	result	Reference	item	result	reference
Na	147	144-160 mmol/L	USG	1.024	
K	4.7	3.5-5.8 mmol/L	Blood	-	
Cl	120	109-122 mmol/L	Bilirubin	Trace	
BE(B)	-1.4	-2.0-3.0 mmol/L	Ketone	-	
Anion gap	9	10-20 mmol/L	Glucose	+	
Lactate	2.2	0.5-2.5 mmol/L	Protein	++	
pH	7.4	7.31-7.46	UP/UC ratio	1.25	0-0.5
HCO3 (P)	23.1	21-28 mmol/L			
iCa	1.32	1.16-1.4 mmol/L			

Case_1_dermatologic physical examination



Generalized scales/crusts
Moderate seborrhea
Multi regional hyperpigmentation

Case_1_dermatohispathologic exam

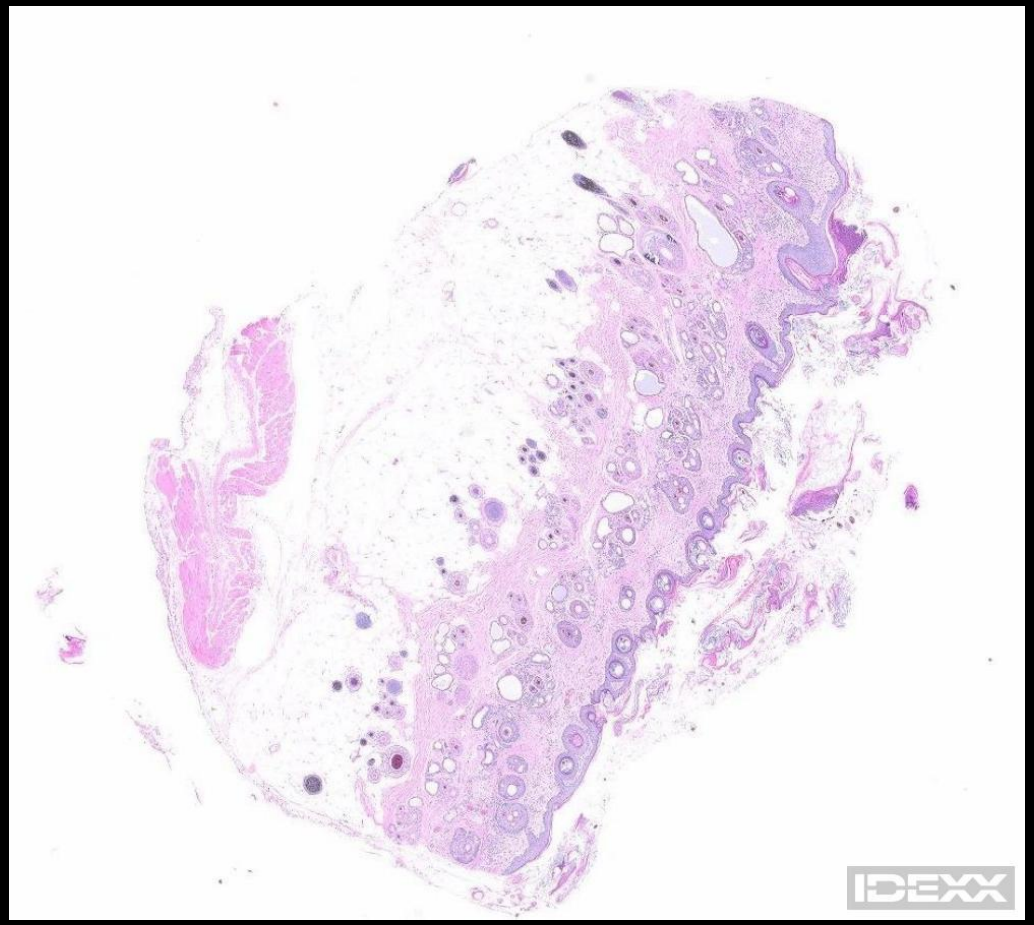
MICROSCOPIC DESCRIPTION:
The dermis is expanded by many lymphocytes and plasma cells that surround adnexa and coalesce. Many hair follicles contain many pale hyphae within the hair shafts and are surrounded by arthrospores. There is epithelial hyperplasia, hyperkeratosis and neutrophilic pustules.

MICROSCOPIC INTERPRETATION:
Numerous intrafollicular dermatophytes with moderate lymphoplasmacytic dermatitis, epithelial hyperplasia, hyperkeratosis and neutrophilic crusts

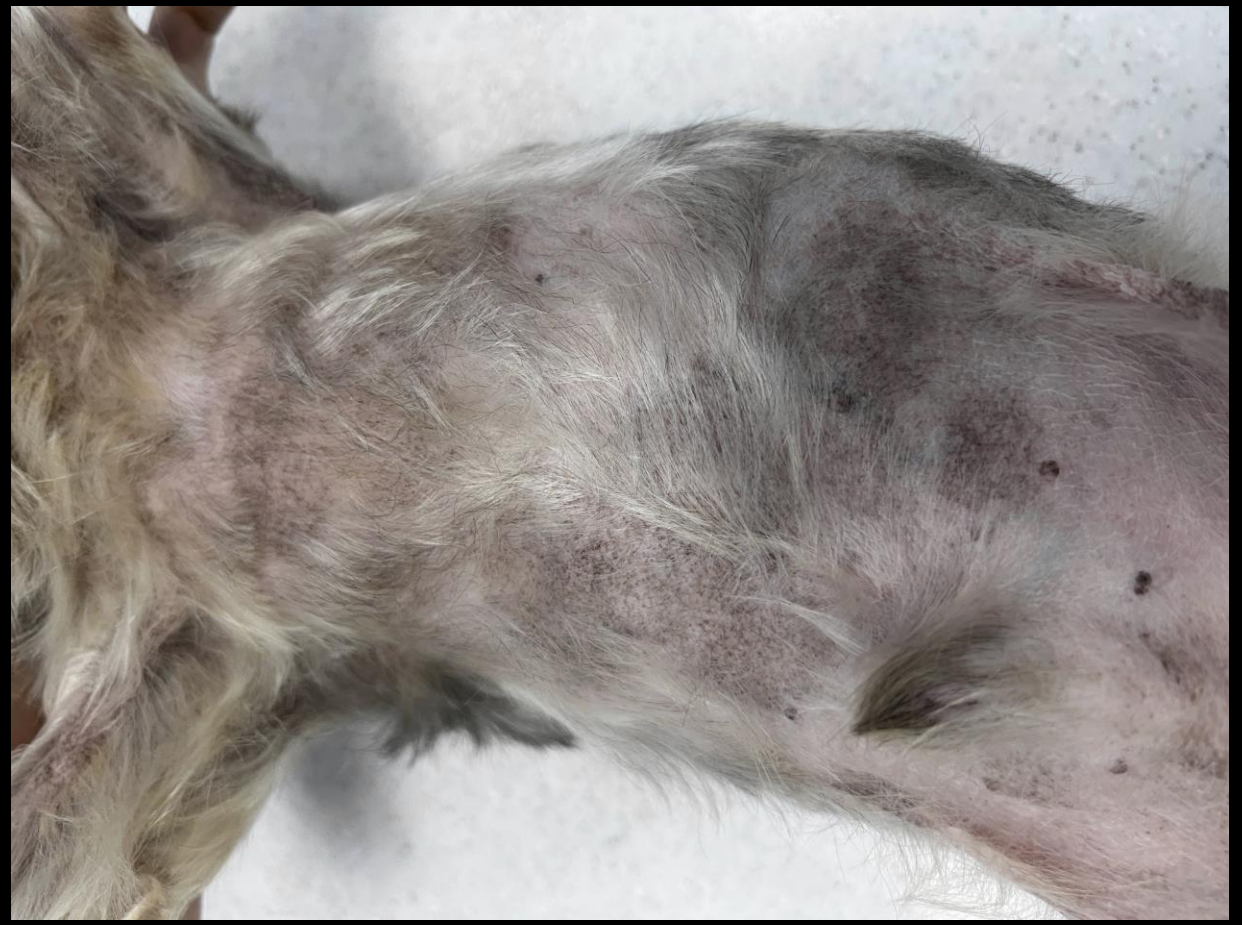
COMMENTS:
This biopsy report has been completed by a member of the dermatopathology team, as requested.

Dermatophytosis is a common zoonotic disease, and one of its clinical presentations in the dog is nodular dermatophytosis (kerion). Because the infection is located within the dermis, routine diagnostic tests such as a Woods lamp examination, microscopic examination of hair shafts for fungal elements and fungal culture can yield negative results. It is clinically characterized by single or less commonly multiple erythematous, alopecic, dome-shaped, exudative nodules. Canine dermatophytosis is most commonly caused by Microsporum canis, Trichophyton mentagrophytes and Microsporum gypseum. Transmission occurs via direct contact or by fomites contaminated with hair or scale from affected cats or dogs. Generalized dermatophytosis has been reported in a few Yorkshire Terriers that did not respond fully to the treatment for ringworm. The dogs all had an underlying disease such as diabetes mellitus, leishmania or ehrlichia.

Case_1_dermatohispathologic exam

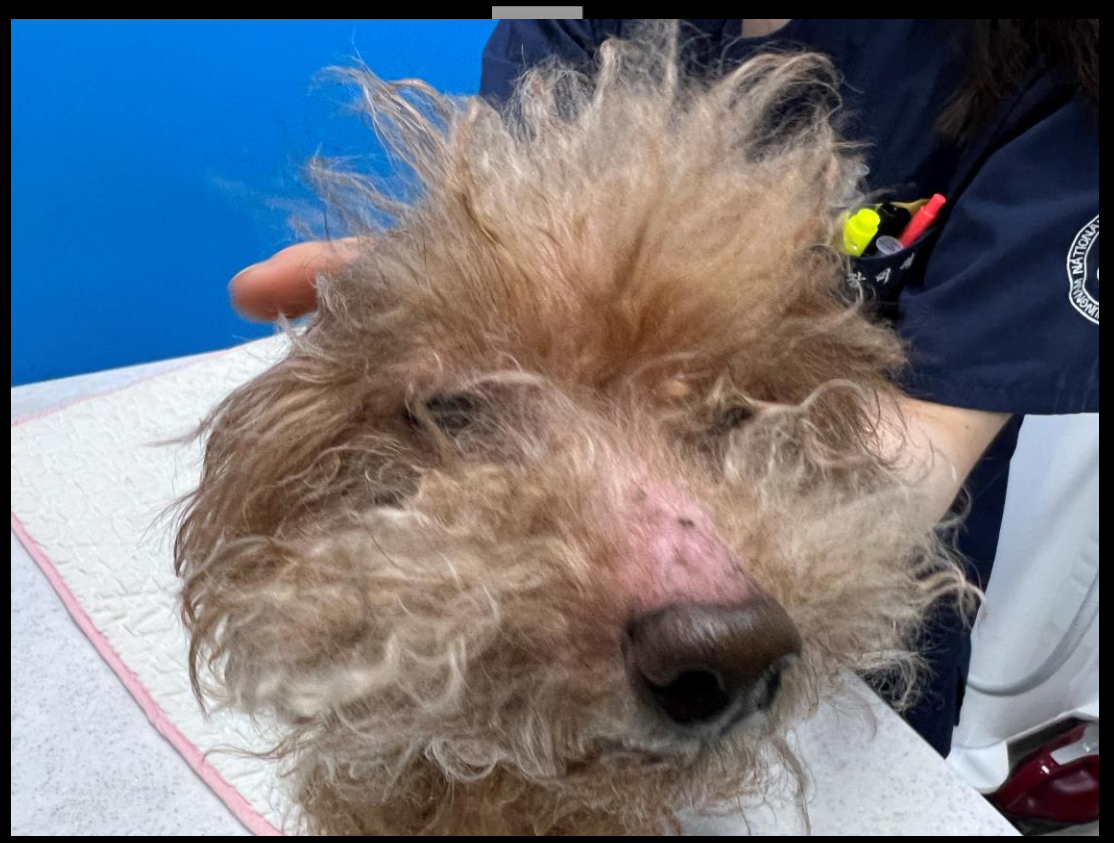


Case_1_follow up



Case_2

- CC
  - Chronic dermatosis with pruritus
  - Generalized crusts/scales
- 9 years old
- Neutered male Poodle
- HPI
  - More 10 months
  - Regional alopecia and pigmentation
  - Yellow scales/crust
  - Chronic progression



Case_2

- Onset symptoms
  - Moderate pruritus (especially head shaking)
  - Regional alopecia in bilateral ear pinna
- Initial therapy
  - Oclacitinib
  - Lokivetmab

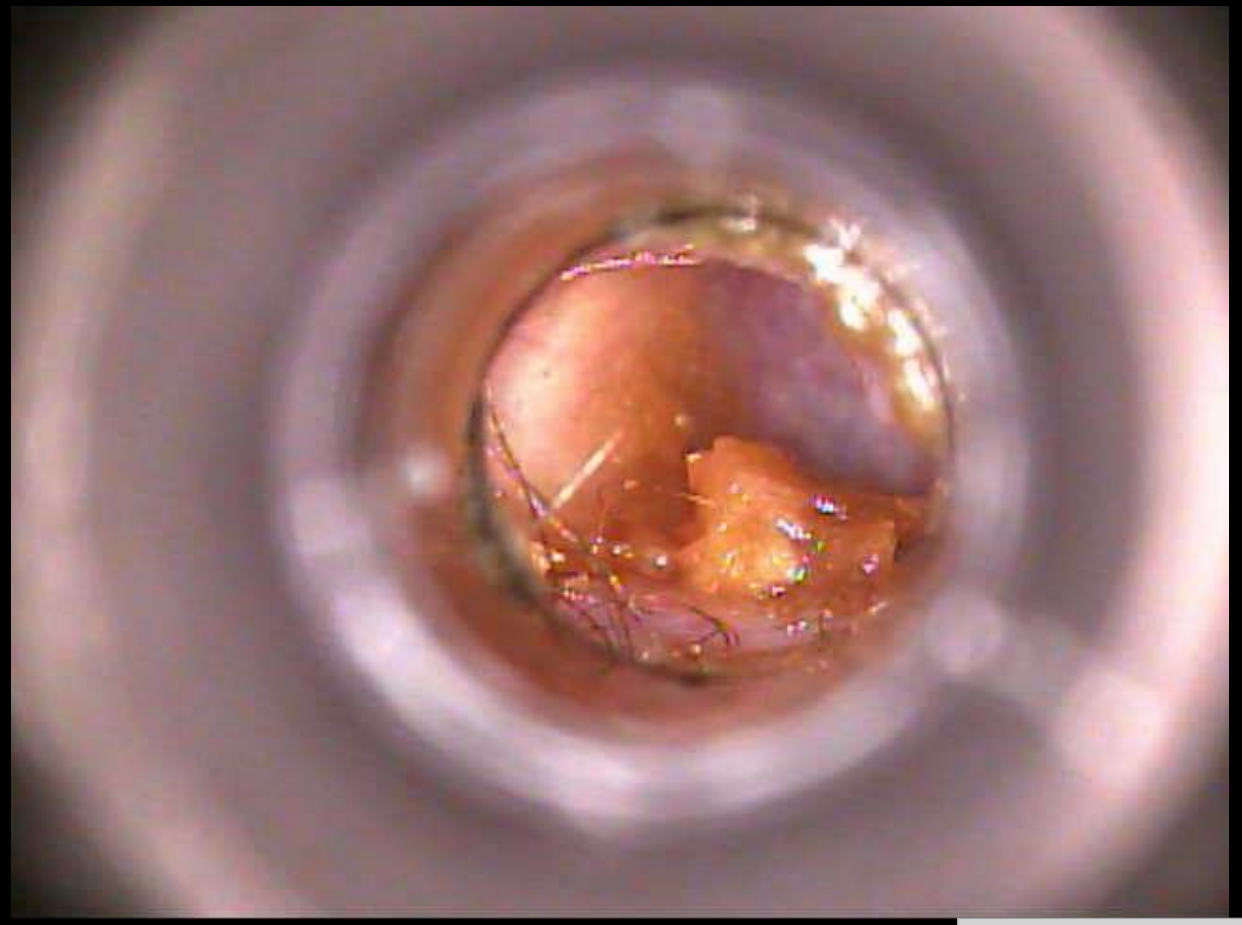
Case_2

item	result	reference	item	result	reference
WBC	15.7	6-17 K/uL	ALB	2.6	2.3-3.9 g/dL
RBC	5.23	5.5-8.5 M/uL	Total protein	6.3	4.9-7.2 g/dL
HCT	36.8	37-55 %	ALT	20	3-50 U/L
PLT	526	200-500 K/uL	ALP	59	20-155 U/L
cTnI	0.03	0-0.2 ng/ml	Amylase	614	388-1007 U/L
proBNP	< 500	0-900 pmol/L	Lipase	225	5-90 U/L
CRP	32.4	0-10 mg/L	BUN	9.9	5-30 mg/dL
cPLI	147.7	0-200 ng/ml	Cr	0.4	0.5-1.5 mg/dL
SDMA	<10	1-14 ug/dl	TG	27	21-116 mg/dL

Case_2

item	result	Reference	item	result	reference
Na	145	144-160 mmol/L	USG		
K	4.4	3.5-5.8 mmol/L	Blood		
Cl	117	109-122 mmol/L	Bilirubin		
BE(B)	0.2	-2.0-3.0 mmol/L	Ketone		
Anion gap	9	10-20 mmol/L	Glucose		
Lactate	0.6	0.5-2.5 mmol/L	Protein		
pH	7.466	7.31-7.46	UP/UC ratio		0-0.5
HCO3 (P)	23.3	21-28 mmol/L			
iCa	1.2	1.16-1.4 mmol/L			

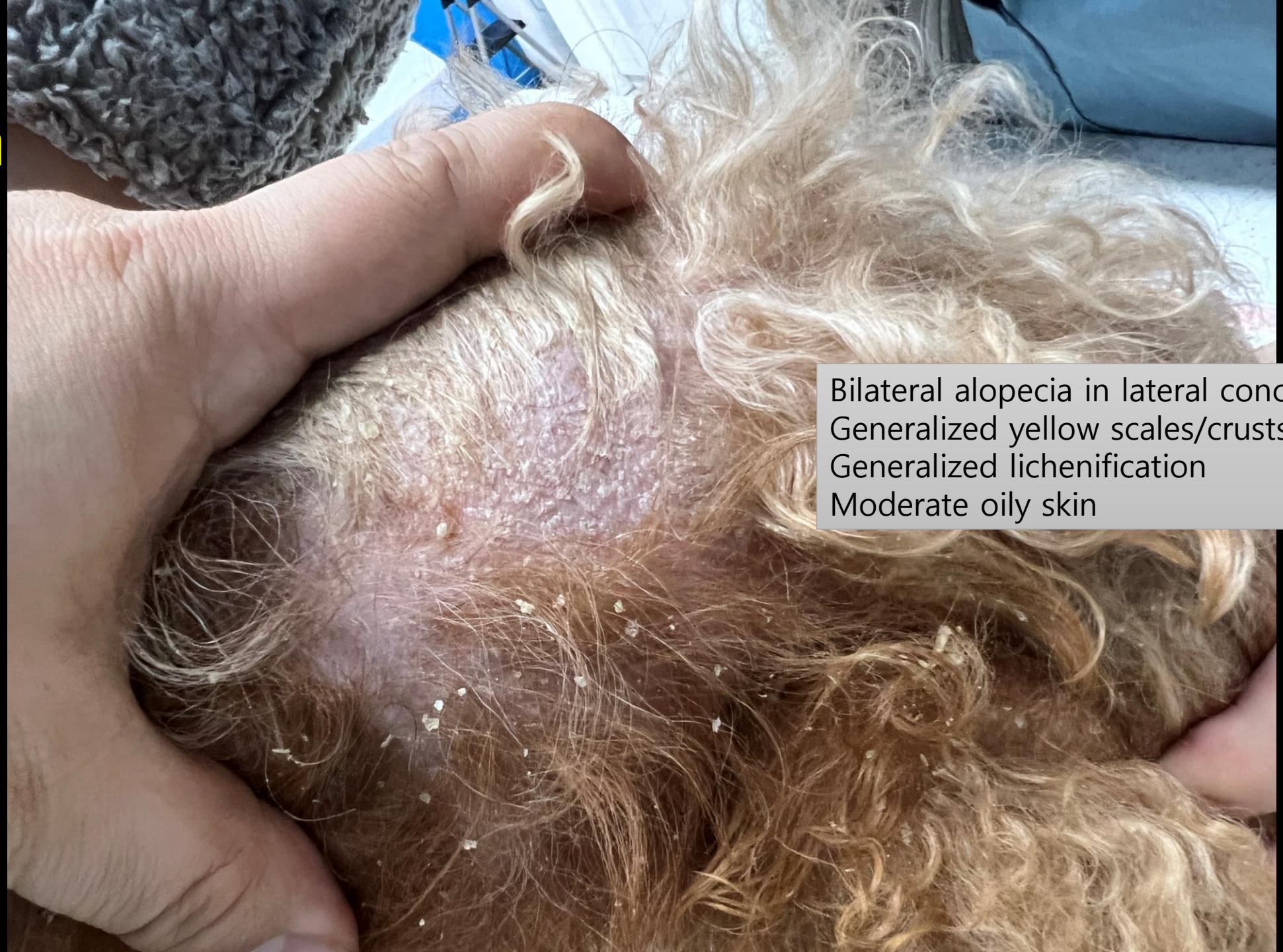
Case_2_Dermatologic physical exam_otic



Bilateral light brown cerumen
Generalized erythema and mild stenosis

Case_2_Dermatologic physical exam

Ca



Bilateral alopecia in lateral concave aspects
Generalized yellow scales/crusts
Generalized lichenification
Moderate oily skin

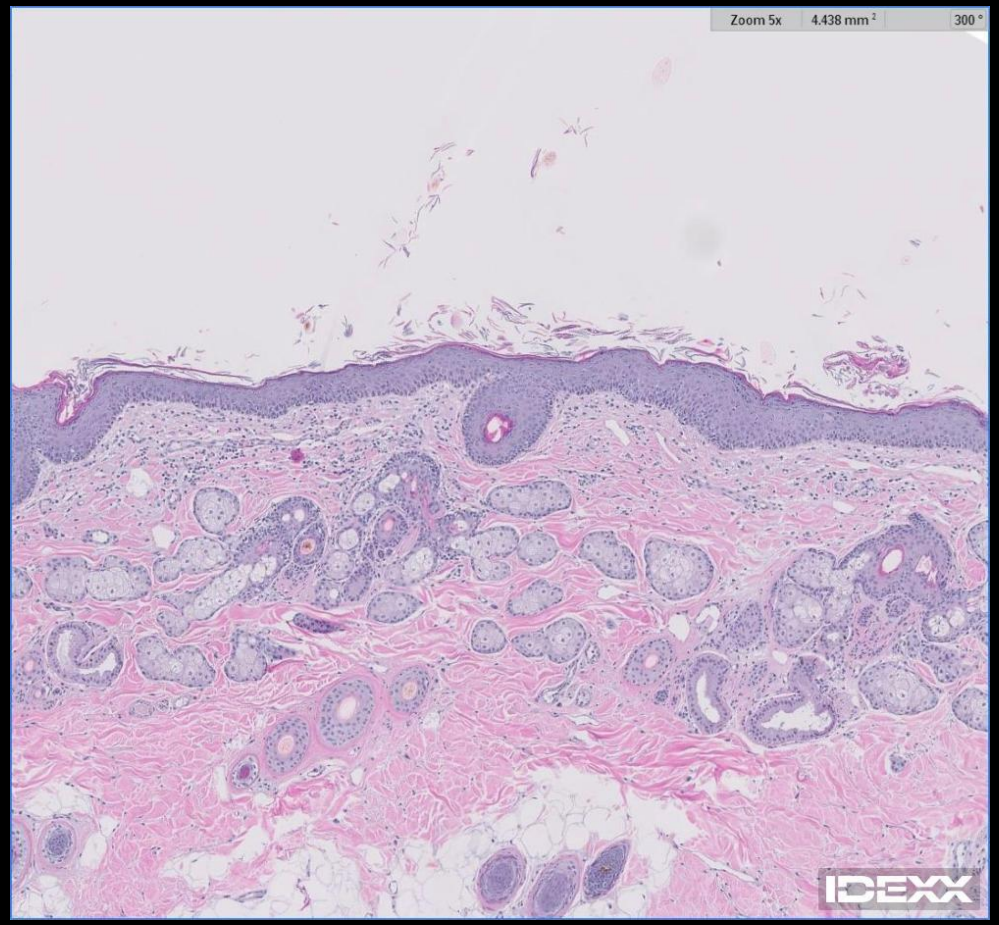
Case_2_dermatohispathologic exam

MICROSCOPIC DESCRIPTION:
Numerous sections from 4 submitted punch biopsies of haired skin are evaluated at multiple histologic levels. These all display a similar histologic pattern. These skin sections are lined by moderately to severely hyperplastic epidermis, with slight to moderate mixed parakeratosis and orthokeratosis. There are occasional foci of mild serocellular crusting. Pilosebaceous units appear prominent, particularly sebaceous glands. The superficial dermis is infiltrated by moderate numbers of plasma cells, lymphocytes, eosinophils, fewer neutrophils and histiocytes, and increased mast cells. There is sometimes very mild exocytosis of individual inflammatory cells, particularly lymphocytes, into the epidermis. These infiltrate the basal cell layer and the stratum spinosum.

MICROSCOPIC INTERPRETATION:
Severe, chronic, hyperplastic, pleocellular (lymphoplasmacytic, eosinophilic, histiocytic, neutrophilic) superficial perivascular dermatitis with mild serocellular crusting and hyperkeratosis/parakeratosis

COMMENTS:
The observed pattern of chronic dermatitis has features most consistent with chronic allergic skin disease, with secondary superficial pyoderma. Malassezia infection is also a common secondary process and is best excluded by skin cytology. Common allergic causes include flea, food, and atopic allergy. These often share common histologic features, and further clinical investigation is typically required to determine the exact allergic trigger(s). These can include evaluation of response to flea control, diet trial, allergy testing, etc. Bacterial culture and sensitivity may be of benefit in control of secondary pyoderma.

Case_2_dermatohispathologic exam



Case_2

No	검사일자	결과(Class)	Total Ige Titer
		0 1 2 3 4 5 6	
1	2022/3/15		1.841

1.0 이하 : Normal, 1.0~2.0 : Increased, 2.0~3.0 : Mild, 3.0~4.0 : Moderate, 4.0~5.0 : severe, 5.0 초과 : Very Severe.
* 개체 및 연령, 기타 condition 에 따라 혈청 내에 존재하는 Ig E 값에 차이가 있을 수 있음

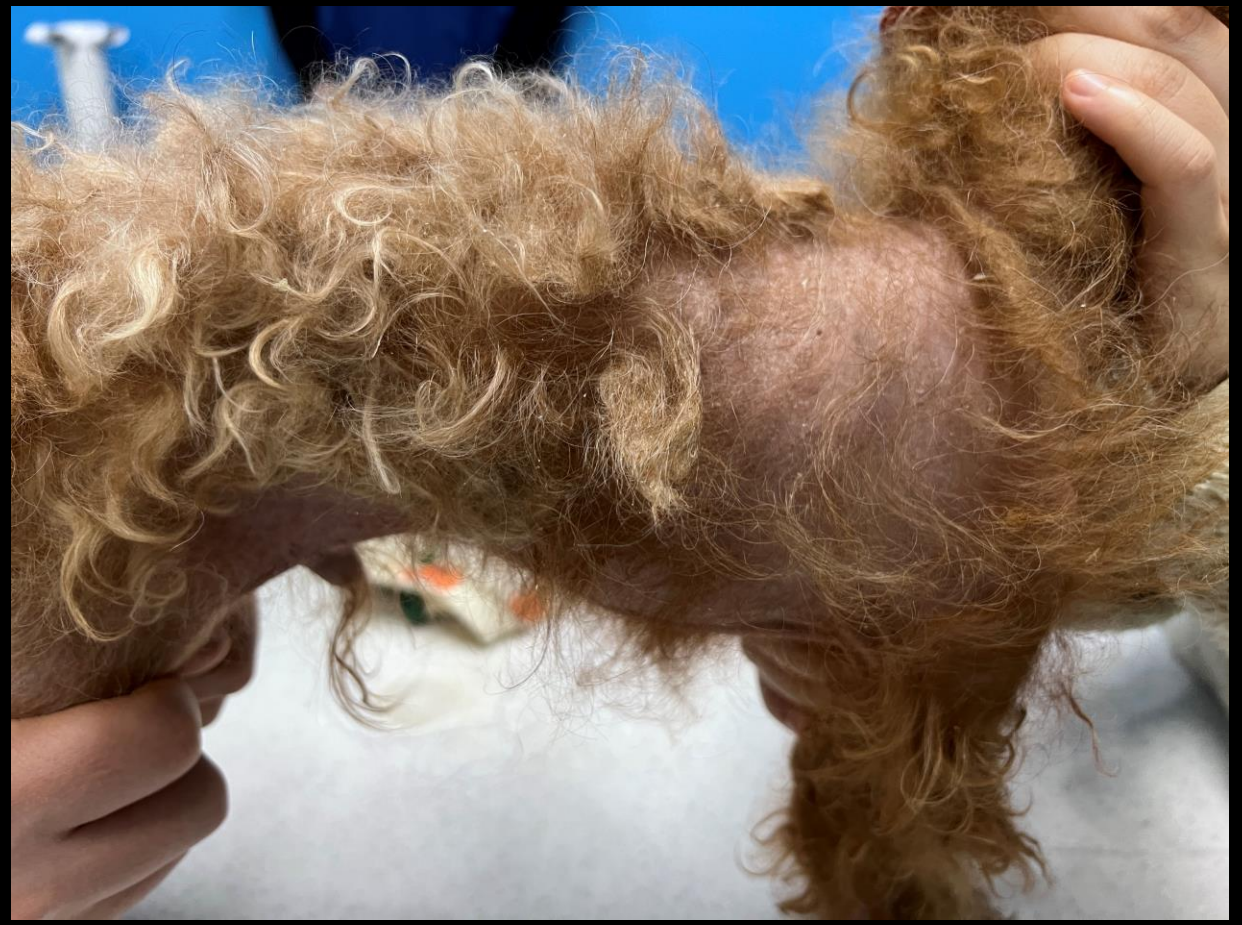
Case

Code	검사결과	배양세균
BAC ID-A (호기성)	Growth	Staphylococcus pseudintermedius

BAC-AST A1 - "Staphylococcus pseudintermedius"

No	항생제명	결과	MIC농도
1	ICR test		
2	Cefoxitin Screen test		
3	Clindamycin	S	0.25
4	Erythromycin	S	0.50
5	Amikacin	S	2.00
6	Cefalotin	S	2.00
7	Amoxicillin/Clavulanic Acid	S	2.00
8	Doxycycline	S	4.00
9	Florfenicol	S	4.00
10	Minocycline	S	4.00
11	Chloramphenicol	S	8.00
12	Trimethoprim/Sulfamethoxazole	S	10.00
13	Nitrofurantoin	S	16.00
14	Cefpodoxime	I	4.00
15	Gentamicin	I	8.00
16	Marbofloxacin	R	-
17	Cefovecin	R	-
18	Pradofloxacin	R	-
19	Benzylpenicillin	R	-
20	Oxacillin	R	-
21	Enrofloxacin	R	-

Case_2_follow up



Case_2

Special consideration

- Don't be scared
- Even if there is no accurate diagnosis, the current major inflammation can be confirmed
- You must let them know before treatment that a biopsy can be performed several times

ROYAL AMG
Animal Medical Group
로얄동물메디컬그룹

개에서 면역매개성질환(IMHA, IMT 등)의 치료에 glucocorticoid를 꼭 투여해야 하는가?

로얄동물메디컬센터 W

한 만 길 원장

개에서 면역매개성질환(IMHA, IMT 등)의 치료에 glucocorticoid를 꼭 투여해야 하는가?

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동물메디컬센터 W

Immune-mediated diseases in dogs and cats

- **IMHA** (Immune-mediated hemolytic anemia)
  - ✓PIMA (precursor-targeted immune-mediated anemia)
- **IMT** (Immune-mediated thrombocytopenia)
- Immune-mediated polyarthritis
- Myasthenia gravis
- **IBD** (Inflammatory bowel disease)
- Immune-mediated skin disease: pemphigus
- **GME** (Granulomatous meningoencephalitis)
  - ✓MUE (Meningoencephalitis of unknown etiology
- **Keratoconjunctivitis sicca**, "Dry Eye"
- **Glomerulonephritis**

Treatment of immune-mediated disease

- **Corticosteroids**
  - ✓Prednisolone / dexamethasone
- **Calcineurin inhibitors**
  - ✓Cyclosporine / tacrolimus
- mTOR inhibitors
  - ✓Sirolimus / everolimus
- **IMDH inhibitors**
  - ✓Azathioprine / leflunomide / mycophenolate
- Janus kinase inhibitors
  - ✓Tofacitinib
- Biologics (rituximab)
- Monoclonal antibodies (daclizumab)

- ✓ **Glucocorticoid**
- ✓ **Cyclosporine (CsA)**
- ✓ **Azathioprine**
- ✓ **Mycophenolate mofetil (MMF)**
- ✓ **Leflunomide**
- ✓ **IVIG (immunoglobulin G)**

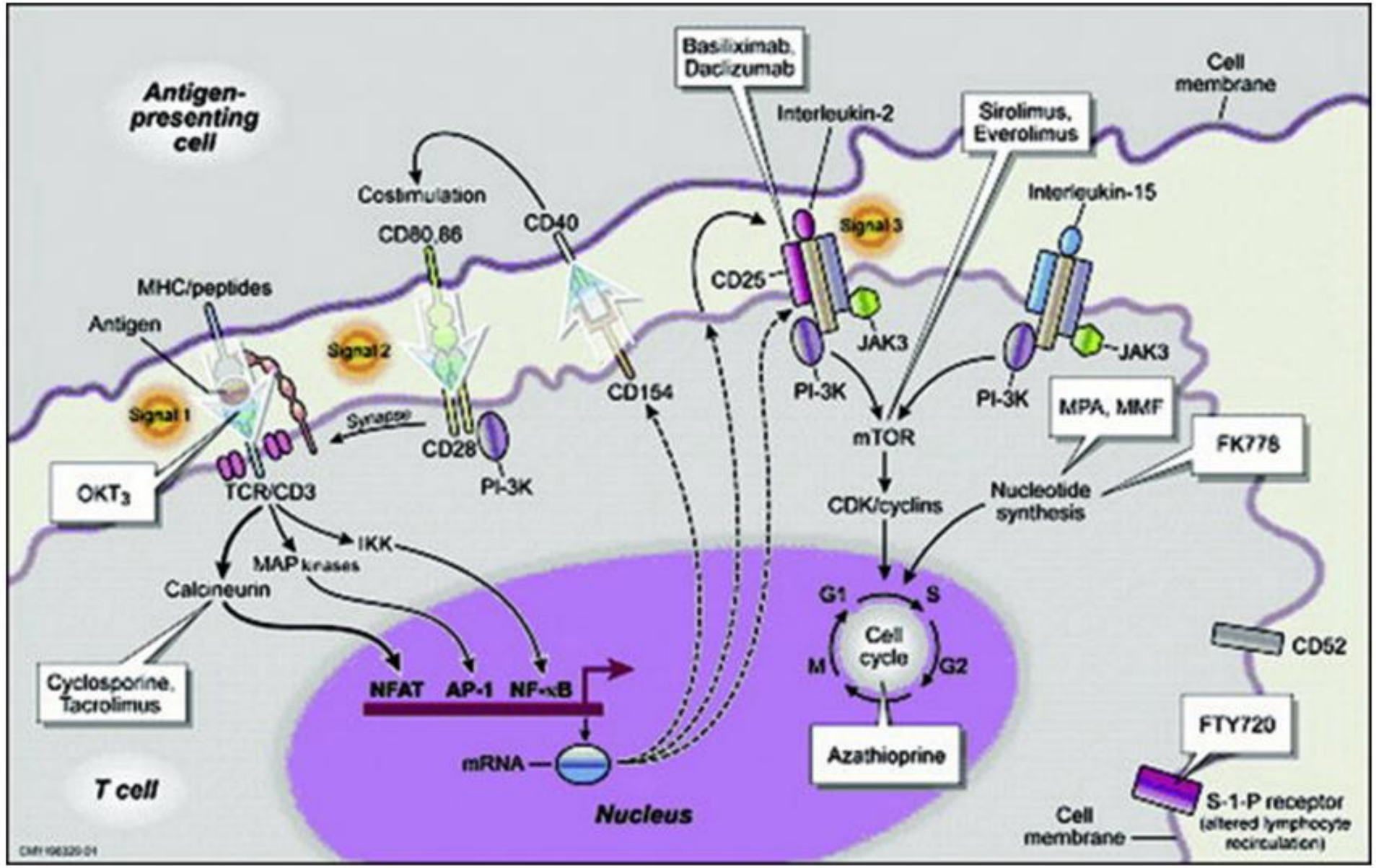
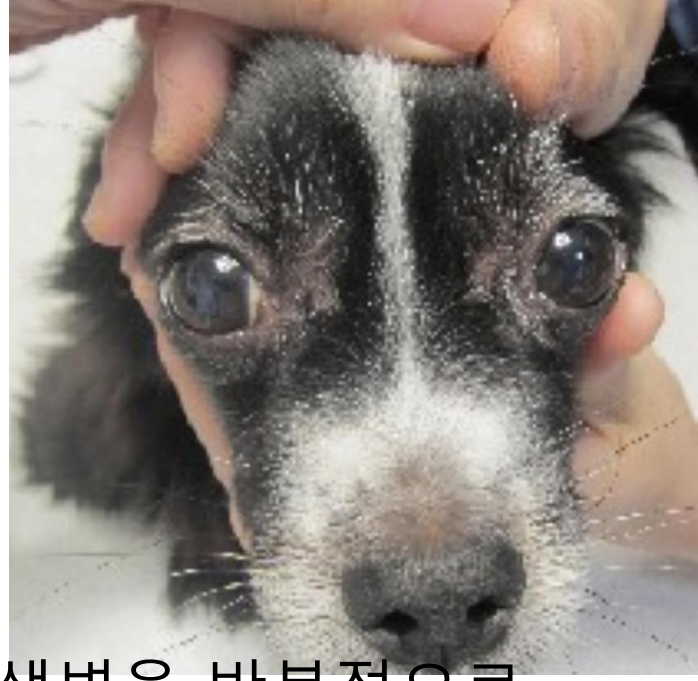


Fig. 1. Immunosuppression in liver transplantation. The activation of a T lymphocyte (via 3-signal pathway) by an antigen-presenting cell. Specific sites targeted by the calcineurin inhibitors (tacrolimus and cyclosporine A) are included, showing inhibition of interleukin 2 (IL-2) production. Monoclonal antibodies (basiliximab, daclizumab) target the IL-2 receptor, whereas OKT3 targets the T-cell receptor. Sirolimus, mycophenolic acid, mycophenolate mofetil, azathioprine, and FK778 interfere with the proliferative phase in the cell cycle. Novel agent FTY720 alters lymphocyte trafficking/homing patterns through modulation of cell surface adhesion receptors, inducing a lymphopenic effect. (*From* Post DJ, Douglas DD, Mulligan DC. Immunosuppression in liver transplantation. Liver Transplant 2005;11(11):1308; with permission.)



- **8.4kg, 9yrs, CM, Mixed dog, 팅 (2020/10/8)**
- CC: 기력소실로 기립불능 상태로 내원.
- History
  - ✓7월7일 (2개월전) IMHA로 진단하고
    - 9일동안 입원치료.
    - 수혈 3회. 리브감마 투여.
  - ✓PU/PD와 검은색변을 보다가 PU/PD개선, 정상변과 검은색변을 반복적으로.
  - ✓PDs 1.5 mpk bid, MMF 10 mpk bid로 처방 중.
  - ✓빈혈개선되지 않음. 9/25일 HCT 20.91%, 9/30일 HCT 22.61%
- 신체검사
  - ✓황달, 구강점막은 중등도 창백, 스스로 기립불능, 사지근육 위축.
- HCT 21%, reti# 173.6 (5.85%), WBC 29.77, PLTs 1,065
- Alb 2.0, Tbil 3.31, ALP 1284, GGT 1624, ALT 265, cPL 1945, CRP 3.2

Description	Reference	Unit	2020-10-11	2020-10-08
WBC_a	5.2 - 13.9	K/uL	45.62	29.77
RBC_a	5.7 - 8.8	M/uL	2.06	2.97
HGB_a	12.9 - 18.4	g/dL	5.5	7.4
HCT_a	37.1 - 57.0	%	16.0	21.8
MCV_a	58.8 - 71.2	fL	77.7	73.5
MCH_a	20.5 - 24.2	pg	26.5	25.0
MCHC_a				
RDW_a				
PLT_a				
MPV_a				
PDW_a				
PCT_a				
HDW_a				
CHCM_a				
CH_a				
NEUT(#)_a				
LYMPH(#)_a				
MONO(#)_a				
EOS(#)_a				
BASO(#)_a				
LUC(#)_a	0.0 - 0.3	K/uL	0.53	0.52
NEUT(%)_a	42.5 - 77.3	%	86.7	84.5
LYMPH(%)_a	11.8 - 39.6	%	6.4	5.5
MONO(%)_a	3.3 - 10.3	%	5.5	8.0
EOS(%)_a	0.0 - 7.0	%	0.1	0.1
BASO(%)_a	0.0 - 1.3	%	0.1	0.1

Description	Reference	Unit	2020-10-11	2020-10-08
RETIC(#)_a	8.4 - 129.3	K/uL	231.3	173.6
RETIC(%)_a	0.1 - 2.0	%	11.21	5.85

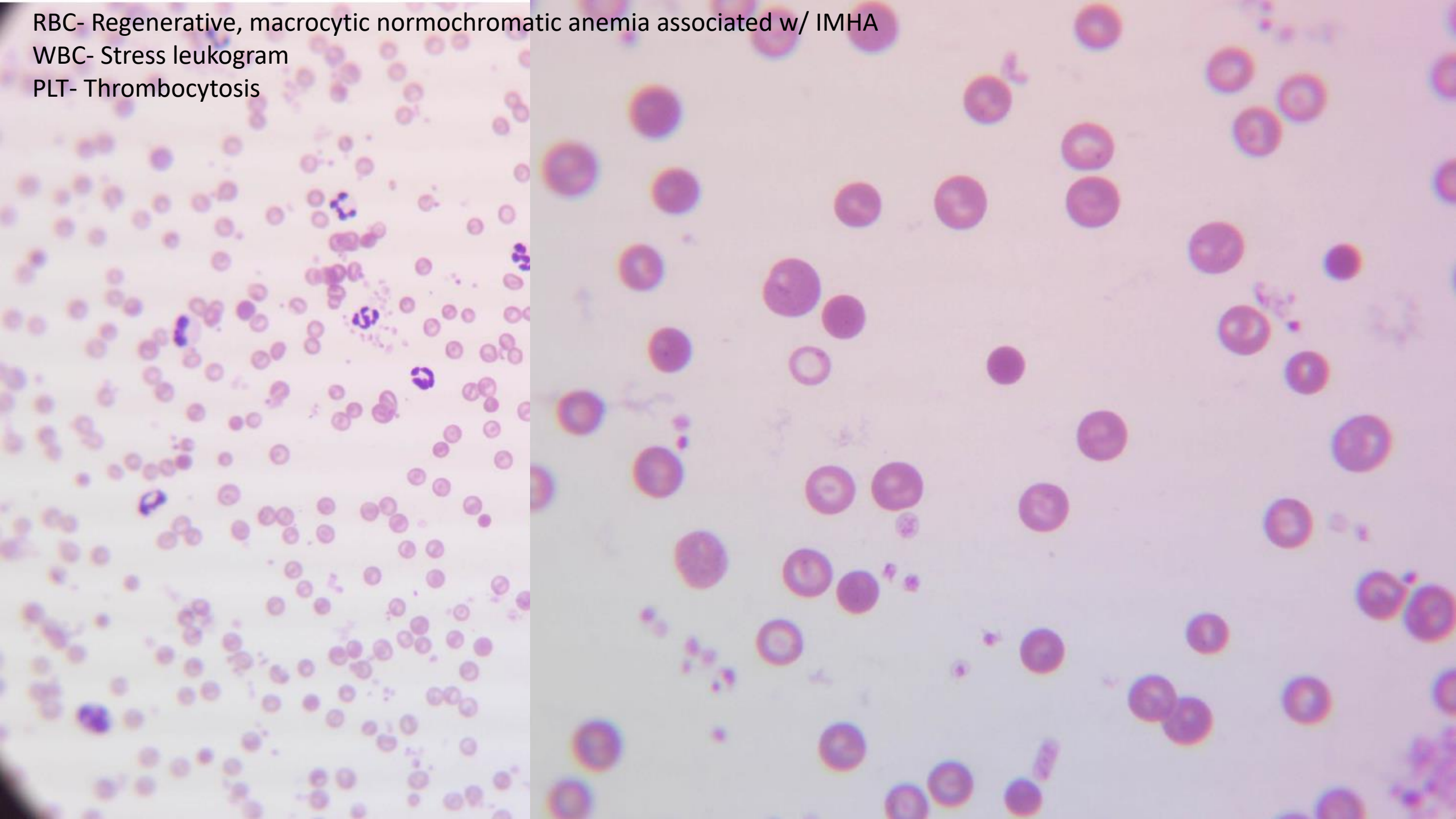
Description
PT 신 _CG02NV
APTT 신 _CG02NV
FIBRINOGEN 신 _CG0
D-dimer
D-dimer_V200

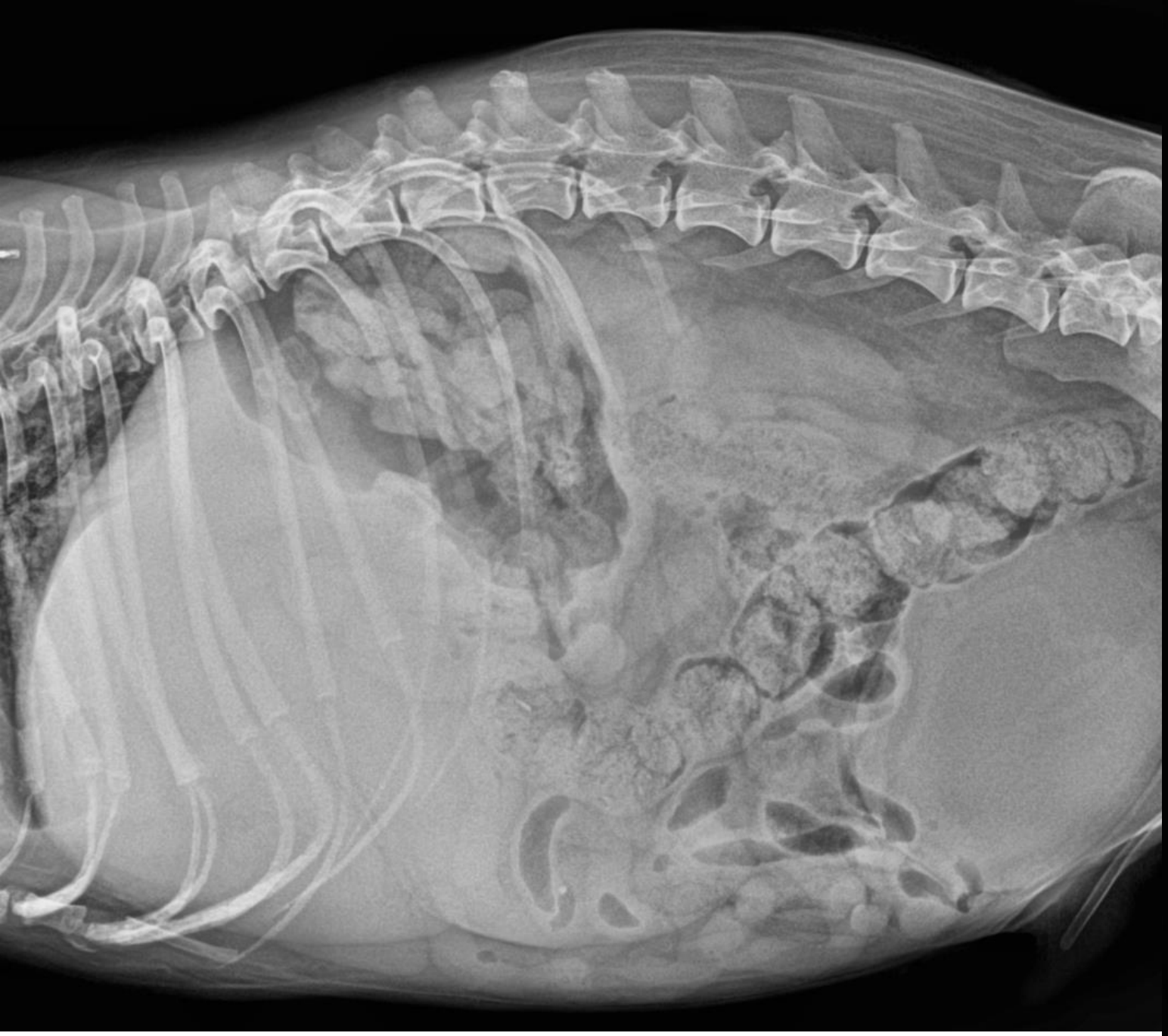
Description	Reference	Unit	2020-10-08
Albumin*	2.3 - 3.9	g/dl	2.0

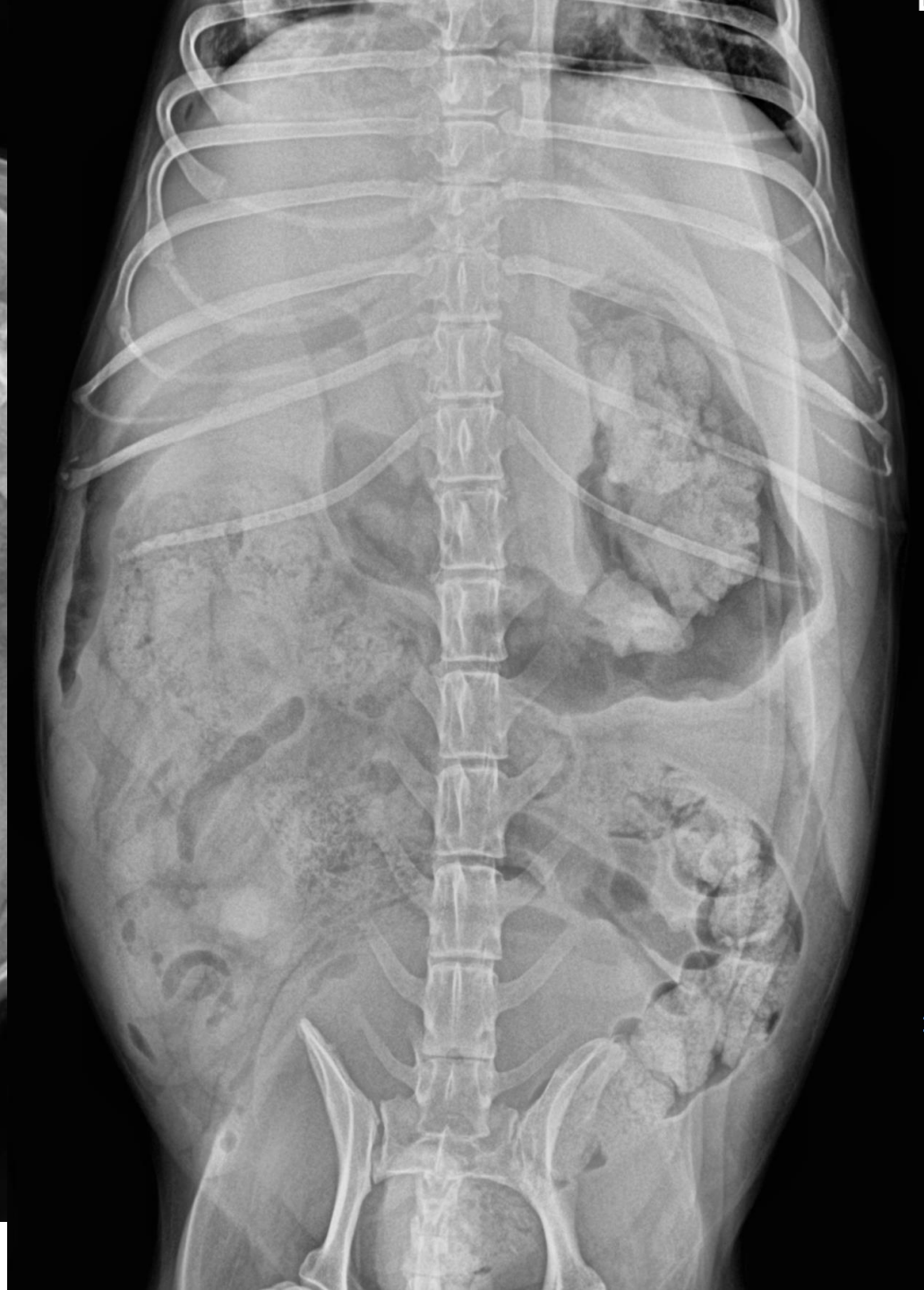
Description	Reference	Unit	2020-10-08
Na_i300_정맥	144 - 152	mmol/L	140
K_i300_정맥	3.9 - 5.1	mmol/L	3.8
Cl_i300_정맥	110 - 119	mmol/L	103
iCa_i300_정맥	1.16 - 1.40	mmol/L	1.19
HCO3-_i300_정맥	21.0 - 28.0	mmol/L	26.8
pH_i300_정맥	7.310 - 7.460		7.449
PCO2_i300_정맥	27.0 - 50.0	mmHg	38.6
PO2_i300_정맥	24 - 48	mmHg	166
Hematocrit_i300_정맥	32 - 55	%	35
Hemoglobin_i300_정맥	13.5 - 17.5	g/dL	10.9
BE_i300_정맥	-2.0 - 3.0	mmol/L	2.6
Anion gap_i300_정맥	10 - 20	mmol/L	14
SO2_i300_정맥		%	100

NH3(Ammonia)	0 - 98	umol/L	
lactate	0.5 - 2.5	mmol/L	3.6
A/G RATIO		RATIO	0.52
BUN/CREAT RATIO		RATIO	45.8

RBC- Regenerative, macrocytic normochromatic anemia associated w/ IMHA
WBC- Stress leukogram
PLT- Thrombocytosis







(2020/10/8)

- **IMHA**
- **Steroid-induced hepatopathy**, 쿠싱증후군....

- 처방전
  - ✓PDs 1 mpk bid 3 days. -> 0.25 mpk
  - ✓Leflunomide 3 mpk sid
  - ✓Rivaroxaban 2 mpk bid
  - ✓UDA, silymarin, lefotil, 사메탑 등
  - ✓알마겔 (위장관보호제)
  - ✓Esomeprazole, famotidine, gabapentin, 소화제, metronidazole

✓의뢰병원에서 관리
✓2021/2/17 HCT 40.1%
✓2021/9/27 HCT 41.7%
✓2022/5/24 투약중지. 상태 양호.

- HCT 21.8% -> 16% (일후); but no blood transfusion.

- No MRI scan (기립불능 때문에 MR검사필요한 상황이었으나)

- IMHA와 같은 면역매개성 질환의 환자의 치료에 꼭 glucocorticoid를 투여해야 할까요?

- Glucocorticoid + 다른 면역억압제
  - ✓Glucocorticoid : prednisolone (PO), dexamethasone (IV or SC)
  - ✓다른 면역억압제
    - Azathioprine
    - Cyclophophamide (CTX)
    - Cyclosporin A (CsA)
    - Mycophenolate mofetil (MMF)
    - Leflunomide
    - Human immunoglobulin G (IVIG, 리브감마)

Glucocorticoid 부작용

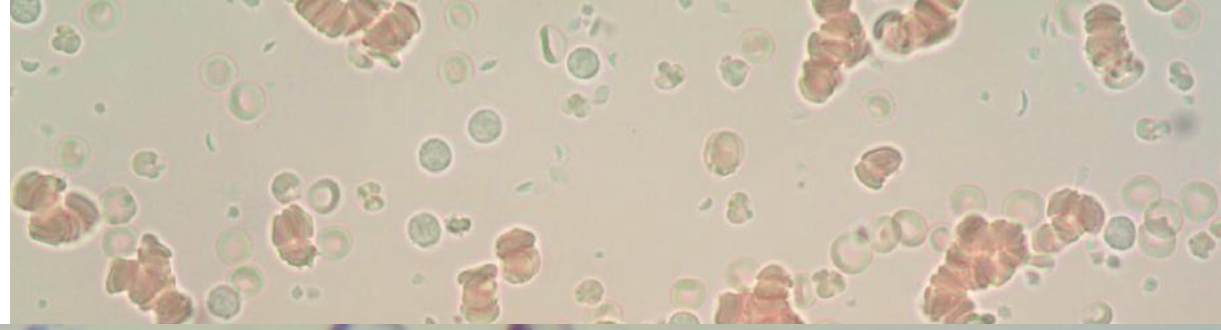
- PU/PD
- Polyphagia
- 체중증가
- Panting, tachycardia: 호흡성 알칼리증
- **위장관 출혈 : erosion, ulcer, melena**
- Vomiting, diarrhea
- 피부변화: 피부가 얇아지고, 털의 윤기가 없어지며, 대칭성 탈모
- 간수치의 상승
- 췌장염 ? (고용량)
- 당뇨, 고혈당
- 근육 위축과 행동변화 등.

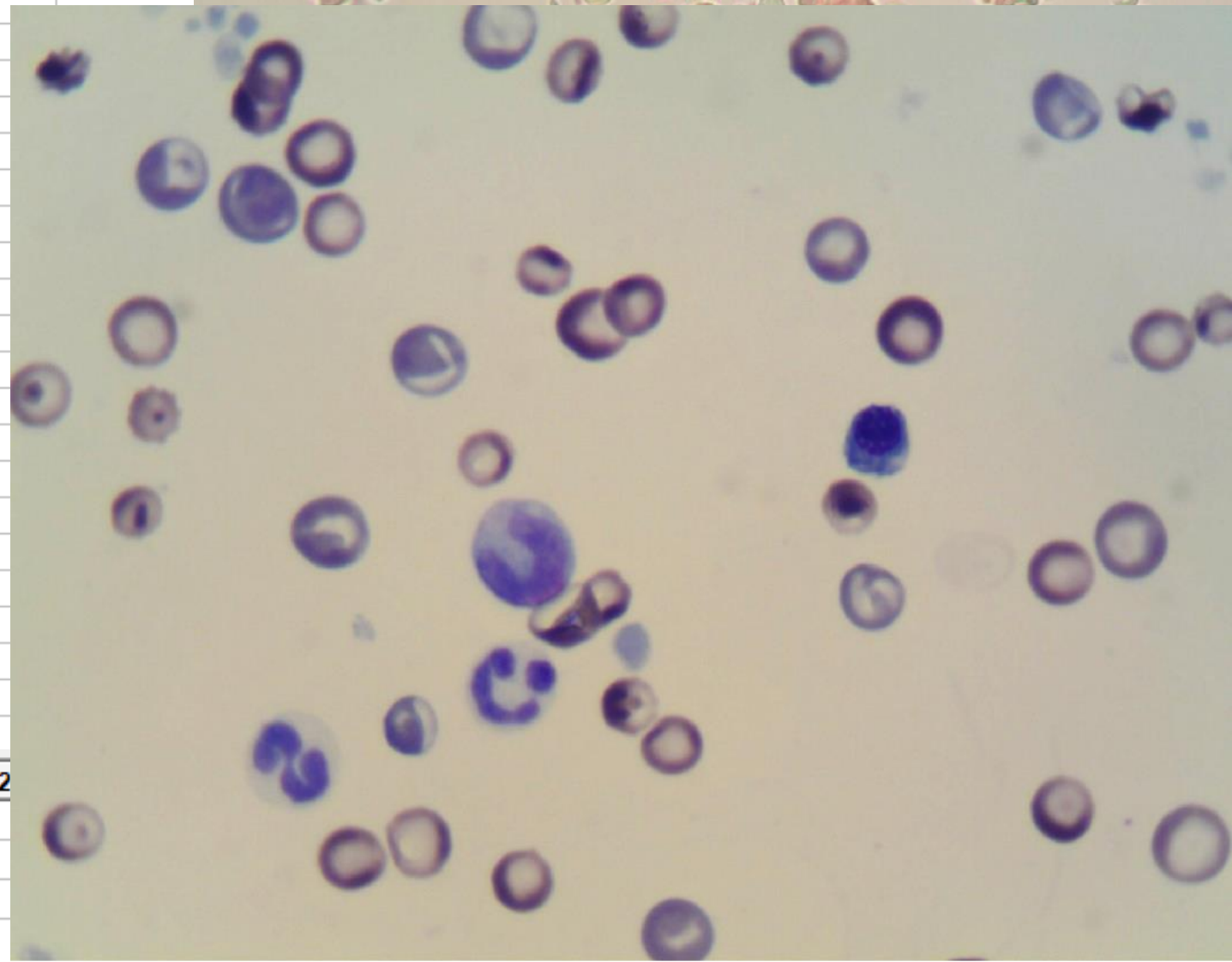
- 36.7kg, 6yrs, CM, Labrador Retriever, 칸 (2022/2/15)
  - ✓황달과 빈혈:
  - ✓Tbil 3.5, **HCT 2.6% ?** (Hb 5.6 g/dl),
  - ✓Anemia PCR test; all negative.

Donor

Description	Reference	Unit	2022-		02-15	2022-02-15
WBC_a	5.2 - 13.9	K/uL	13.49	7.63		37.87
RBC_a	5.7 - 8.8	M/uL	11.84	6.98		1.68
HGB_a	12.9 - 18.4	g/dL	26.8	15.3		3.9
HCT_a	37.1 - 57.0	%	76.9	42.7		13.1
MCV_a	58.8 - 71.2	fL	64.9	61.2		78.0
MCH_a	20.5 - 24.2	pg	22.6	21.9		23.1
MCHC_a	31.0 - 36.2	g/dL	34.9	35.8		29.6
RDW_a	11.9 - 14.5	%	10.3	10.6		20.7
PLT_a	143.3 - 400.0	K/uL	118	139		198
MPV_a	7.0 - 11.0	fL	9.8	10.6		19.2
PDW_a	40.6 - 65.2	%	63.3	54.9		60.2
PCT_a	0.1 - 0.4	%	0.12	0.15		0.38
HDW_a	1.4 - 2.1	g/dL	1.95	2.01		3.91
CHCM_a	31.0 - 35.7	g/dL	32.3	32.2		30.7
CH_a	20.5 - 24.2		21.0	19.7		23.5
NEUT(#)_a	3.9 - 8.0	K/uL	9.35	5.34		28.96
LYMPH(#)_a	1.3 - 4.1	K/uL	2.66	1.64		5.95
MONO(#)_a	0.2 - 1.1	K/uL	0.52	0.33		1.85
EOS(#)_a	0.0 - 0.6	K/uL	0.83	0.28		0.20
BASO(#)_a	0.0 - 0.1	K/uL	0.09	0.01		0.05
LUC(#)_a	0.0 - 0.3	K/uL	0.05	0.02		0.84
NEUT(%)_a	42.5 - 77.3	%	69.3	70.0		76.5
LYMPH(%)_a	11.8 - 39.6	%	19.7	21.5		15.7
MONO(%)_a	3.3 - 10.3	%	3.9	4.3		4.9
EOS(%)_a	0.0 - 7.0	%	6.1	3.6		0.5
BASO(%)_a	0.0 - 1.3	%	0.6	0.2		0.1
LUC(%)_a	0.0 - 3.0	%	0.4	0.3		2.2

Description	Reference	Unit	2022-02
RETIC(#)_a	8.4 - 129.3	K/uL	403.9
RETIC(%)_a	0.1 - 2.0	%	24.10
CHr_a	24.5 - 28.6	pg	24.9





➢Non-spherocytic IMHA로 진단.

- ➢Blood transfusion
  - ✓DEA 1.1형 농축적혈구 (2팩)
  - ✓전처치: chlorpheniramine
- ➢Dexamethasone 0.3 mg/kg (10mg) sid IV for 3 days.
- ➢Human immunoglobulin G, 0.5g/kg (총 18g; 6병 x 3g/60ml)
- ➢Marbofloxacin
- ➢Dalteparin 100 U/kg bid SC

Description	Reference	Unit	2022-02-22	2022-02-18	2022-02-17	2022-02-16	2022-02-16	2022-02-16	2022-02-15	2022-02-15	2022-02-15
WBC_a	5.2 - 13.9	K/uL	5.36	10.70	18.40	17.41	14.58	24.70	13.49	7.63	37.87
RBC_a	5.7 - 8.8	M/uL	5.19	3.85	3.77	3.44	12.14	2.38	11.84	6.98	1.68
HGB_a	12.9 - 18.4	g/dL	12.3	9.0	8.7	7.8	25.3	5.5	26.8	15.3	3.9
HCT_a	37.1 - 57.0	%	36.4	26.3	26.0	23.6	77.4	17.4	76.9	42.7	13.1
MCV_a	58.8 - 71.2	fL	70.2	68.2	68.9	68.6	63.8	73.4	64.9	61.2	78.0
MCH_a	20.5 - 24.2	pg	23.6	23.5	23.0	22.7	20.8	22.9	22.6	21.9	23.1
MCHC_a	31.0 - 36.2	g/dL	33.7	34.5	33.4	33.1	32.7	31.2	34.9	35.8	29.6
RDW_a	11.9 - 14.5	%	16.6	19.1	18.7	17.7	12.1	17.3	10.3	10.6	20.7
PLT_a	143.3 - 400.0	K/uL	174	166	158	135	81	147	118	139	198
MPV_a	7.0 - 11.0	fL	17.0	17.6	19.0	20.0	10.2	17.5	9.8	10.6	19.2
PDW_a	40.6 - 65.2	%	62.5	62.7	63.1	60.0	90.3	63.3	63.3	54.9	60.2
PCT_a	0.1 - 0.4	%	0.30	0.29	0.30	0.27	0.08	0.26	0.12	0.15	0.38
HDW_a	1.4 - 2.1	g/dL	2.79	3.02	2.81	2.54	2.55	2.70	1.95	2.01	3.91
CHCM_a	31.0 - 35.7	g/dL	30.8	31.7	31.4	30.8	30.7	30.3	32.3	32.2	30.7
CH_a	20.5 - 24.2		21.5	21.4	21.5	21.1	19.6	22.2	21.0	19.7	23.5
NEUT(#)_a	3.9 - 8.0	K/uL	2.68	9.15	14.49	13.34	10.75	19.56	9.35	5.34	28.96
LYMPH(#)_a	1.3 - 4.1	K/uL	1.80	1.11	2.58	2.98	2.62	3.50	2.66	1.64	5.95
MONO(#)_a	0.2 - 1.1	K/uL	0.56	0.34	0.89	0.63	0.64	0.89	0.52	0.33	1.85
EOS(#)_a	0.0 - 0.6	K/uL	0.29	0.01	0.10	0.16	0.39	0.13	0.83	0.28	0.20
BASO(#)_a	0.0 - 0.1	K/uL	0.01	0	0.01	0.03	0.15	0.04	0.09	0.01	0.05
LUC(#)_a											4
NEUT(%)_a											5
LYMPH(%)_a											7
MONO(%)_a											
EOS(%)_a											
BASO(%)_a	0.0 - 1.3	%	0.1	0	0	0.1	1.0	0.2	0.6	0.2	0.1
LUC(%)_a	0.0 - 3.0	%	0.4	0.8	1.8	1.6	0.2	2.3	0.4	0.3	2.2

Description	Reference	Unit	2022-02-22	2022-02-18	2022-02-17	2022-02-15
RETIC(#)_a	8.4 - 129.3	K/uL	184.7	199.9	213.0	403.9
RETIC(%)_a	0.1 - 2.0	%	3.56	5.19	5.65	24.10
CHr_a	24.5 - 28.6	pg	23.6	25.2	25.2	24.9

- 2022/2/18 (입원 4일째)
  - ✓HCT 26.3%, reti 199.9 K/ul, CRP 41.2 mg/L, Tbil 0.43 mg/dl
  - ✓Leflunomide 80mg (2mpk, 4정) sid (evening),
  - ✓Marbofloxacin 60mg sid (아침),
  - ✓UDCA 200mg bid, lefotil 25mg bid, esomeprazole 40 mg bid,
  - ✓rivaroxaban 20mg bid, 5 days.
  - ~~✓PDs는 빼고 (1mg/kg = 36mg = 7.2 T)~~

Description	Reference	Unit	2022-04-27	2022-03-30	2022-03-16
WBC_a	5.2 - 13.9	K/uL	6.39	6.31	4.55
RBC_a	5.7 - 8.8	M/uL	8.03	7.55	7.42
HGB_a	12.9 - 18.4	g/dL	17.4	16.6	16.0
HCT_a	37.1 - 57.0	%	54.6	54.6	54.7
MCV_a	58.8 - 71.2	fL	68.1	72.3	73.7
MCH_a	20.5 - 24.2	pg	21.7	22.0	21.6
MCHC_a	31.0 - 36.2	g/dL	31.8	30.5	29.3
RDW_a	11.9 - 14.5	%	12.2	11.7	12.6
PLT_a	143.3 - 400.0	K/uL	132	177	177
MPV_a	7.0 - 11.0	fL	9.8	9.7	12.0
PDW_a	40.6 - 65.2	%	75.3	68.6	63.8
PCT_a	0.1 - 0.4	%	0.13	0.17	0.21
HDW_a	1.4 - 2.1	g/dL	2.04	1.81	1.82
CHCM_a	31.0 - 35.7	g/dL	31.5	30.6	30.2
CH_a	20.5 - 24.2		21.5	22.2	22.3
RETIC(#)_a	8.4 - 129.3	K/uL	31.2	35.8	58.0
RETIC(%)_a	0.1 - 2.0	%	0.39	0.47	0.77
CHr_a	24.5 - 28.6	pg	25.7	25.5	25.3
NEUT(#)_a	3.9 - 8.0	K/uL	3.40	3.45	2.28
LYMPH(#)_a	1.3 - 4.1	K/uL	2.17	2.08	1.68
MONO(#)_a	0.2 - 1.1	K/uL	0.37	0.26	0.20
EOS(#)_a	0.0 - 0.6	K/uL	0.44	0.52	0.39
BASO(#)_a	0.0 - 0.1	K/uL	0	0	0
LUC(#)_a	0.0 - 0.3	K/uL	0.01	0	0
NEUT(%)_a	42.5 - 77.3	%	53.1	54.6	50.1
LYMPH(%)_a	11.8 - 39.6	%	33.9	32.9	36.8
MONO(%)_a	3.3 - 10.3	%	5.8	4.2	4.4
EOS(%)_a	0.0 - 7.0	%	6.9	8.2	8.6
BASO(%)_a	0.0 - 1.3	%	0	0	0
LUC(%)_a	0.0 - 3.0	%	0.1	0.1	0.1

- HCT 유지.
- 재생성(reti#)는 정상으로 회복

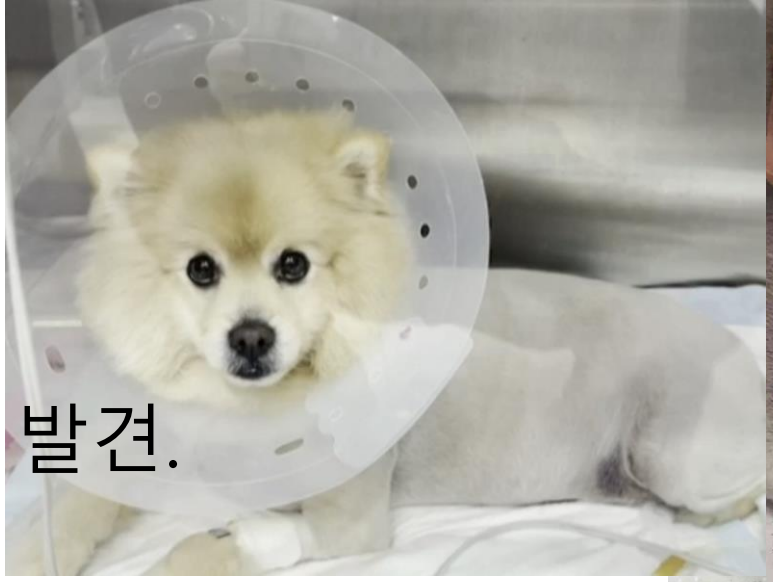
- Leflunomide
  - ✓80mg → 60mg → 40mg
- UDCA
- Rivaroxaban (자렐토)
  - ✓20mg bid → 20mg sid.

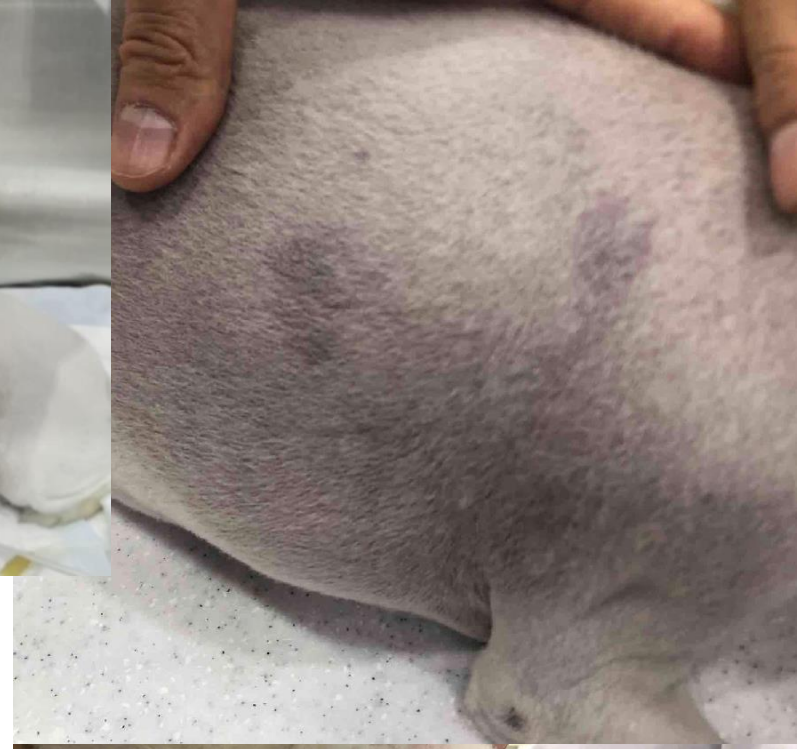
Description	Reference	Unit	2022-04-27	2022-03-16	2022-02-22	2022-02-17	2022-02-16
Albumin*	2.3 - 3.9	g/dl	2.9	2.9	2.5	2.4	2.3
ALP*	20 - 155	U/L	30	83	333	519	160
ALT(GPT)*	3 - 50	U/L	31	15	50	66	15
Amylase*	388 - 1007	U/L	1351	1553	1443	716	727
AST(GOT)*	10 - 37	U/L	33	25	26	70	25
T.Bil*	0.1 - 0.7	mg/dl	0.24	0.11	0.18	0.43	0.40

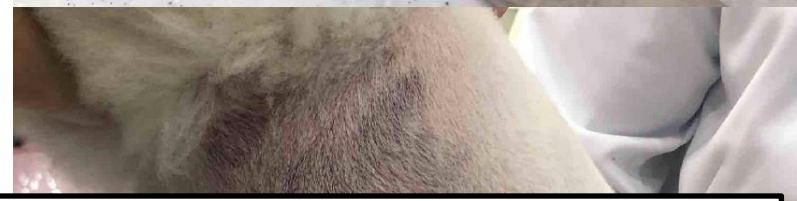
Description	Reference	Unit	2022-04-27	2022-03-16	2022-02-22	2022-02-17	2022-02-16	2022-02-15
PT 신 _CG02NV	7.4 - 8.8	seconds						9.1
APTT 신 _CG02NV	12.0 - 28.0	seconds						26.8
FIBRINOGEN 신 _CG02NV	150 - 350	mg/dL						573
D-dimer	0 - 0.3	mg/L						
D-dimer_V200	0 - 0.3	mg/L	<0.1	<0.1	<0.1	0.2	0.2	<0.1

Lipase*	5 - 90	U/L	99	86	96	46	27
GGT*	4 - 25	U/L	3	4	4	2	1
Total protein*	4.9 - 7.2	g/dl	5.9	5.8	5.9	6.6	6.3
TG*	21 - 116	mg/dl	46	46	50	83	69
globulin*	2.6 - 3.3	mg/dl		2.9	3.4		4
NH3_arkray	0 - 60	umol/L		60		35	20
NH3(Ammonia)	0 - 98	umol/L	17				
lactate	0.5 - 2.5	mmol/L	1.4	2.8		1.0	1.6
A/G RATIO		RATIO		1	0.73		0.57
BUN/CREAT RATIO		RATIO		19.01	24.2		15.5

- **11.2kg, 7yrs, CM, 폼피치 (2021/11/21, 일)**
- 수요일에 미용.
- 토요일에 피부에 멍이 든 것 발견.
- 전반적인 상태 양호.



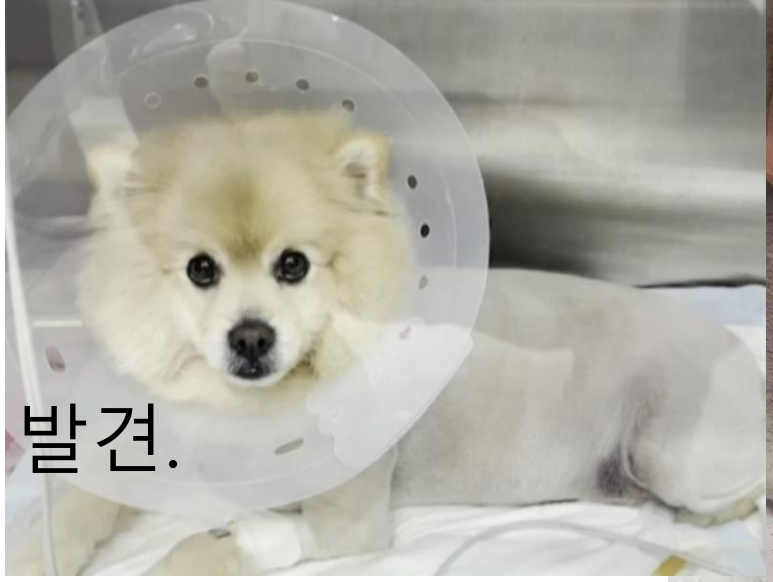


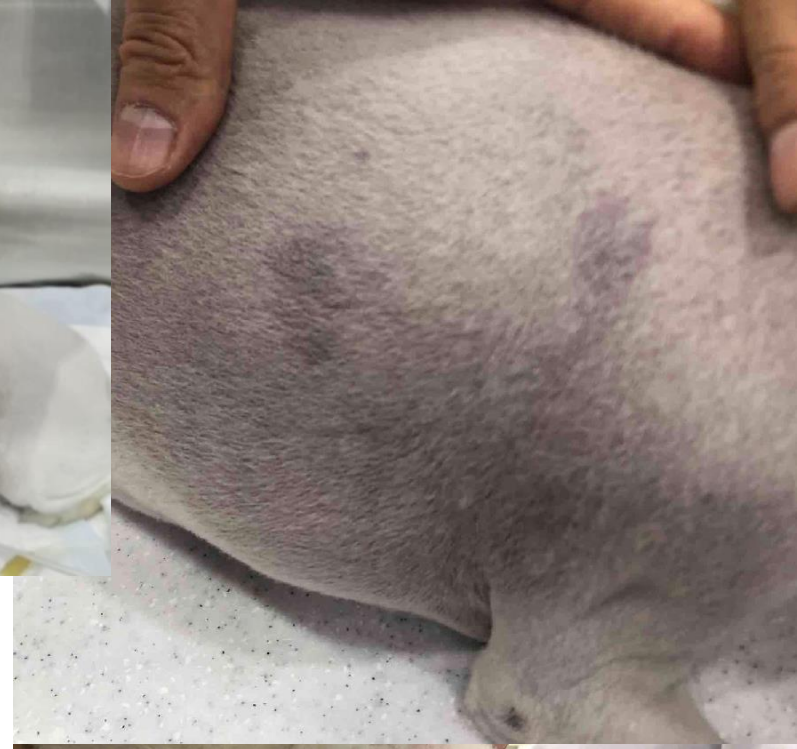


- HCT 54.0%, PLTs 11, CRP 1.0,
- Thrombocytopenia (IMT)

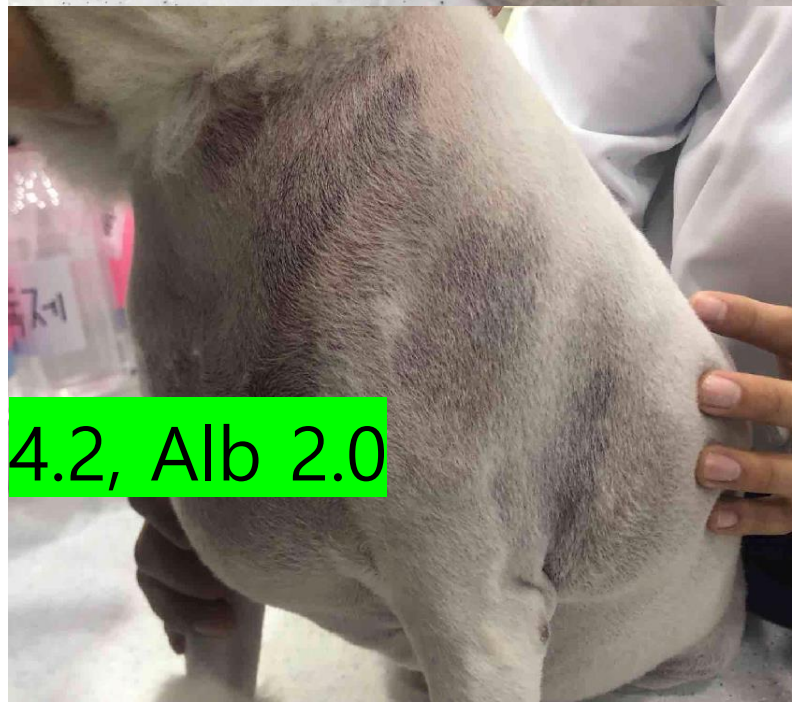
1. 혈소판의 소모: 중증의 급성출혈, DIC 등
2. 혈소판의 격리: 비장종대 splenomegaly
3. 혈소판의 파괴: IMT (면역매개성혈소판감소증), Babesia와 같은 주혈기생충 감염. SFTS감염증.
4. 혈소판의 생성 부족: 골수문제

- **11.2kg, 7yrs, CM, 폼피치 (2021/11/21, 일)**
- 수요일에 미용.
- 토요일에 피부에 멍이 든 것 발견.
- 전반적인 상태 양호.





- HCT 54.0%, PLTs 11, CRP 1.0,
- Thrombocytopenia (IMT)
- PDs 1mpk bid, leflunomide 4 mpk sid (저녁)
- 2일 후 검은색변, 알마게 처방.
- 4일 후, 검은색변 심해짐. HCT 20%, PLTs 11, TP 4.2, Alb 2.0
- IVIG 1 g/kg (4병), no 수혈. 3일 입원처치.



Description	Reference	Unit	2021-12-02	2021-11-28	2021-11-27	2021-11-26	2021-11-25	2021-11-21
WBC_a	5.2 - 13.9	K/uL	17.46	17.71	15.38	10.72	30.68	8.70
RBC_a	5.7 - 8.8	M/uL	2.94	2.42	2.66	2.89	3.10	8.21
HGB_a	12.9 - 18.4	g/dL	7.3	5.7	6.3	6.7	7.2	18.9
HCT_a	37.1 - 57.0	%	23.4	16.8	18.3	19.8	20.7	54.0
MCV_a	58.8 - 71.2	fL	79.7	69.7	68.8	68.7	66.9	65.8
MCH_a	20.5 - 24.2	pg	24.9	23.7	23.8	23.1	23.3	23.0
MCHC_a	31.0 - 36.2	g/dL	31.3	33.9	34.6	33.7	34.8	34.9
RDW_a	11.9 - 14.5	%	22.9	19.3	17.4	17.5		
PLT_a	143.3 - 400.0	K/uL	137	72	55	44		
MPV_a	7.0 - 11.0	fL	21.5	23.1	25.2	27.5		
PDW_a	40.6 - 65.2	%	60.6	60.8	53.6	46.5		
PCT_a	0.1 - 0.4	%	0.29	0.17	0.14	0.12		
HDW_a	1.4 - 2.1	g/dL	3.33	2.31	2.09	2.16		
CHCM_a	31.0 - 35.7	g/dL	31.3	33.3	33.1	32.5		
CH_a	20.5 - 24.2		24.6	23.1	22.7	22.4		
NEUT(#)_a	3.9 - 8.0	K/uL	6.58	10.35	8.10	5.71		
LYMPH(#)_a	1.3 - 4.1	K/uL	8.96	3.78	3.11	2.85		
MONO(#)_a	0.2 - 1.1	K/uL	1.14	2.81	3.40	1.57		
EOS(#)_a	0.0 - 0.6	K/uL	0.07	0.18	0.15	0.08		
BASO(#)_a	0.0 - 0.1	K/uL	0.32	0.10	0.08	0.09		
LUC(#)_a	0.0 - 0.3	K/uL	0.39	0.49	0.54	0.41		
NEUT(%)_a	42.5 - 77.3	%	37.7	58.5	52.6	53.3		
LYMPH(%)_a	11.8 - 39.6	%	51.3	21.3	20.2	26.6		
MONO(%)_a	3.3 - 10.3	%	6.6	15.9	22.1	14.6		
EOS(%)_a	0.0 - 7.0	%	0.4	1.0	1.0	0.8		
BASO(%)_a	0.0 - 1.3	%	1.8	0.5	0.5	0.8		
LUC(%)_a	0.0 - 3.0	%	2.2	2.8	3.5	3.9		

Description	Reference	Unit	2021-12-02	2021-11-28	2021-11-27	2021-11-26	2021-11-25	2021-11-21
RETIC(#)_a	8.4 - 129.3	K/uL	379.1	129.8	75.8	106.9	93.0	113.6
RETIC(%)_a	0.1 - 2.0	%	12.91	5.37	2.85	3.70	3.00	1.38
CHr_a	24.5 - 28.6	pg	27.5	29.1	29.5	29.2	27.7	24.3

- ✓ **Leflunomide 4 mpk sid (저녁)**
- ✓ marbofloxacin 2 mpk sid (저녁)
- ✓ UDCA, lefotil,
- ✓ Esomeprazole, famotidine,
- ✓ misoprostol
- ✓ rivaroxaban
- ✓ 알마겔

- ✓ No Prednisolone.

초진일: 2021/11/21

Description	Reference	Unit	2022-01-24	2021-12-09	2021-12-02
WBC_a	5.2 - 13.9	K/uL	10.35	13.05	17.46
RBC_a	5.7 - 8.8	M/uL	7.86	5.00	2.94
HGB_a	12.9 - 18.4	g/dL	16.5	12.0	7.3
HCT_a	37.1 - 57.0	%	52.2	38.5	23.4
MCV_a	58.8 - 71.2	fL	66.4	76.9	79.7
MCH_a	20.5 - 24.2	pg	21.0	24.1	24.9
MCHC_a	31.0 - 36.2	g/dL	31.6	31.3	31.3
RDW_a	11.9 - 14.5	%	13.4	16.7	22.9
PLT_a	143.3 - 400.0	K/uL	231	531	137
MPV_a	7.0 - 11.0	fL	14.5	12.2	21.5
PDW_a	40.6 - 65.2	%	68.0	66.3	60.6
PCT_a	0.1 - 0.4	%	0.34	0.65	0.29
HDW_a	1.4 - 2.1	g/dL	2.40	2.53	3.33
CHCM_a	31.0 - 35.7	g/dL	30.8	30.1	31.3
CH_a	20.5 - 24.2		20.5	23.1	24.6
NEUT(#)_a	3.9 - 8.0	K/uL	7.53	7.49	6.58
LYMPH(#)_a	1.3 - 4.1	K/uL	1.74	4.24	8.96
MONO(#)_a	0.2 - 1.1	K/uL	0.86	0.97	1.14
EOS(#)_a	0.0 - 0.6	K/uL	0.20	0.12	0.07
BASO(#)_a	0.0 - 0.1	K/uL	0	0.04	0.32
LUC(#)_a	0.0 - 0.3	K/uL	0.02	0.18	0.39
NEUT(%)_a	42.5 - 77.3	%	72.8	57.4	37.7
LYMPH(%)_a	11.8 - 39.6	%	16.8	32.5	51.3
MONO(%)_a	3.3 - 10.3	%	8.3	7.4	6.6
EOS(%)_a	0.0 - 7.0	%	1.9	0.9	0.4

Description	Reference	Unit	2022-01-24	2021-12-09	2021-12-02
RETIC(#)_a	8.4 - 129.3	K/uL	100.1	184.9	379.1
RETIC(%)_a	0.1 - 2.0	%	1.27	3.69	12.91
CHr_a	24.5 - 28.6	pg	24.6	24.3	27.5

- ✓ leflunomide 3 mpk sid (저녁)
- ✓ Marbofloxacin 2 mpk sid (저녁)
- ✓ UDCA, lefotil,
- ✓ Esomeprazole, famotidine,
- ✓ Misoprostol
- ✓ Rivaroxaban
- ✓ Amlodipine

- ✓ No Prednisolone.

초진일: 2021/11/21

Description	Reference	Unit	2022-03-24	2022-03-17	2022-03-14
WBC_a	5.2 - 13.9	K/uL	10.39	7.64	9.97
RBC_a	5.7 - 8.8	M/uL	7.13	7.38	7.53
HGB_a	12.9 - 18.4	g/dL	15.8	16.6	17.2
HCT_a	37.1 - 57.0	%	53.3	54.8	55.8
MCV_a	58.8 - 71.2	fL	74.7	74.3	74.2
MCH_a	20.5 - 24.2	pg	22.1	22.5	22.8
MCHC_a	31.0 - 36.2	g/dL	29.6	30.2	30.8
RDW_a	11.9 - 14.5	%	12.0	11.6	12.0
PLT_a	143.3 - 400.0	K/uL	183	171	21
MPV_a	7.0 - 11.0	fL	14.8	16.6	20.4
PDW_a	40.6 - 65.2	%	68.2	67.1	58.4
PCT_a	0.1 - 0.4	%	0.27	0.29	0.04
HDW_a	1.4 - 2.1	g/dL	1.82	1.86	1.82
CHCM_a	31.0 - 35.7	g/dL	29.8	29.9	30.4
CH_a	20.5 - 24.2		22.3	22.2	22.6
RETIC(#)_a	8.4 - 129.3	K/uL	143.5	136.2	141.8
RETIC(%)_a	0.1 - 2.0	%	2.01	1.85	1.88
CHr_a	24.5 - 28.6	pg	25.1	23.9	25.1
NEUT(#)_a	3.9 - 8.0	K/uL	7.14	3.35	7.45
LYMPH(#)_a	1.3 - 4.1	K/uL	1.81	2.51	1.22
MONO(#)_a	0.2 - 1.1	K/uL	1.14	1.37	0.90
EOS(#)_a	0.0 - 0.6	K/uL	0.28	0.36	0.39
BASO(#)_a	0.0 - 0.1	K/uL	0	0.02	0.01
LUC(#)_a	0.0 - 0.3	K/uL	0.01	0.02	0
NEUT(%)_a	42.5 - 77.3	%	68.7	43.9	74.8
LYMPH(%)_a	11.8 - 39.6	%	17.5	32.9	12.2
MONO(%)_a	3.3 - 10.3	%	11.0	18.0	9.0
EOS(%)_a	0.0 - 7.0	%	2.7	4.7	3.9
BASO(%)_a	0.0 - 1.3	%	0	0.3	0.1
LUC(%)_a	0.0 - 3.0	%	0.1	0.3	0

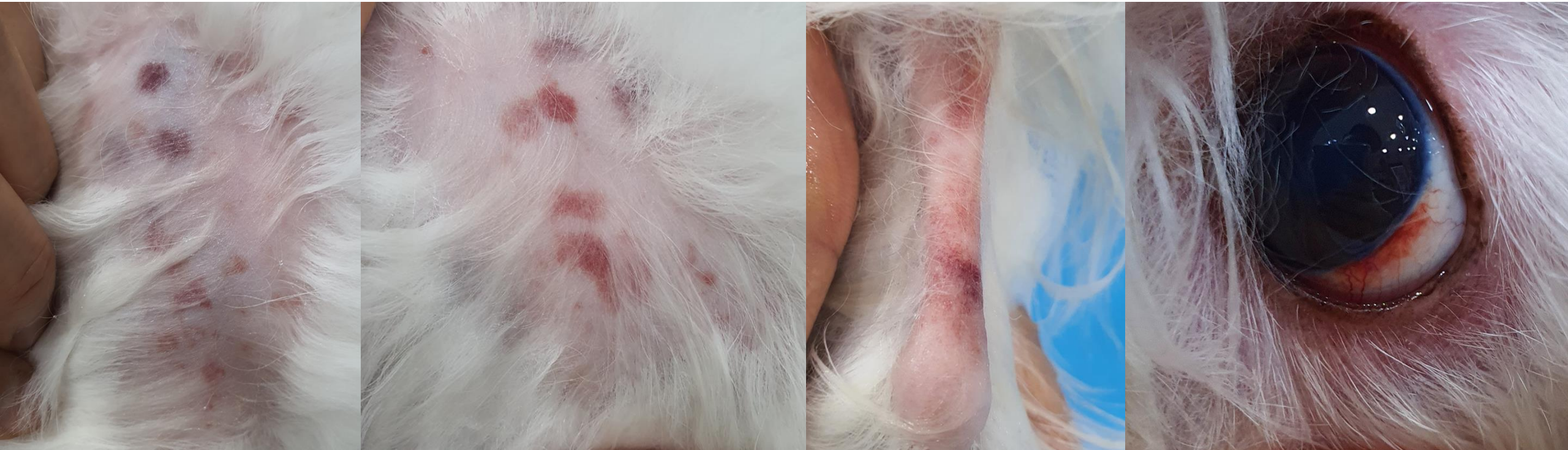
✓ 리브감마 주사 후

✓ leflunomide 4 mpk sid (저녁)
✓ marbofloxacin 2 mpk sid (저녁)
✓ UDCA, lefotil,
✓ Esomeprazole, famotidine,
✓ misoprostol
✓ rivaroxaban
✓ 알마겔

✓ No Prednisolone.

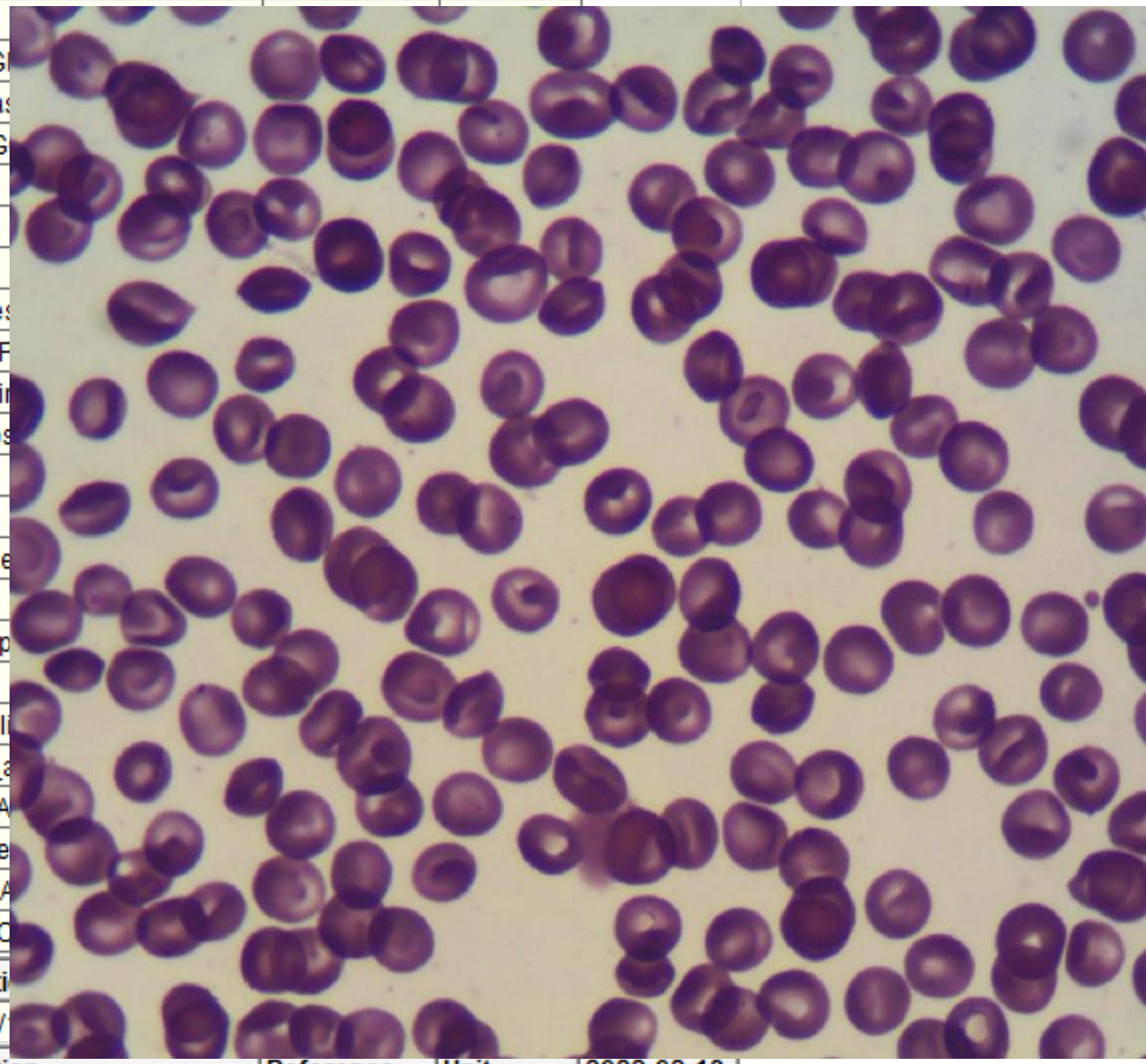
2022/3/17
✓ Leflunomide → Azathioprine

- **4kg, 10yrs, CM, Coton de Tulear (2022/2/13,일)**
- 금요일부터 피하출혈 관찰.
- 치아질환 때문에 항생제 6주 투여.
- 2017년8월경에 Addison's syndrome 진단. DOCP 주사 중.

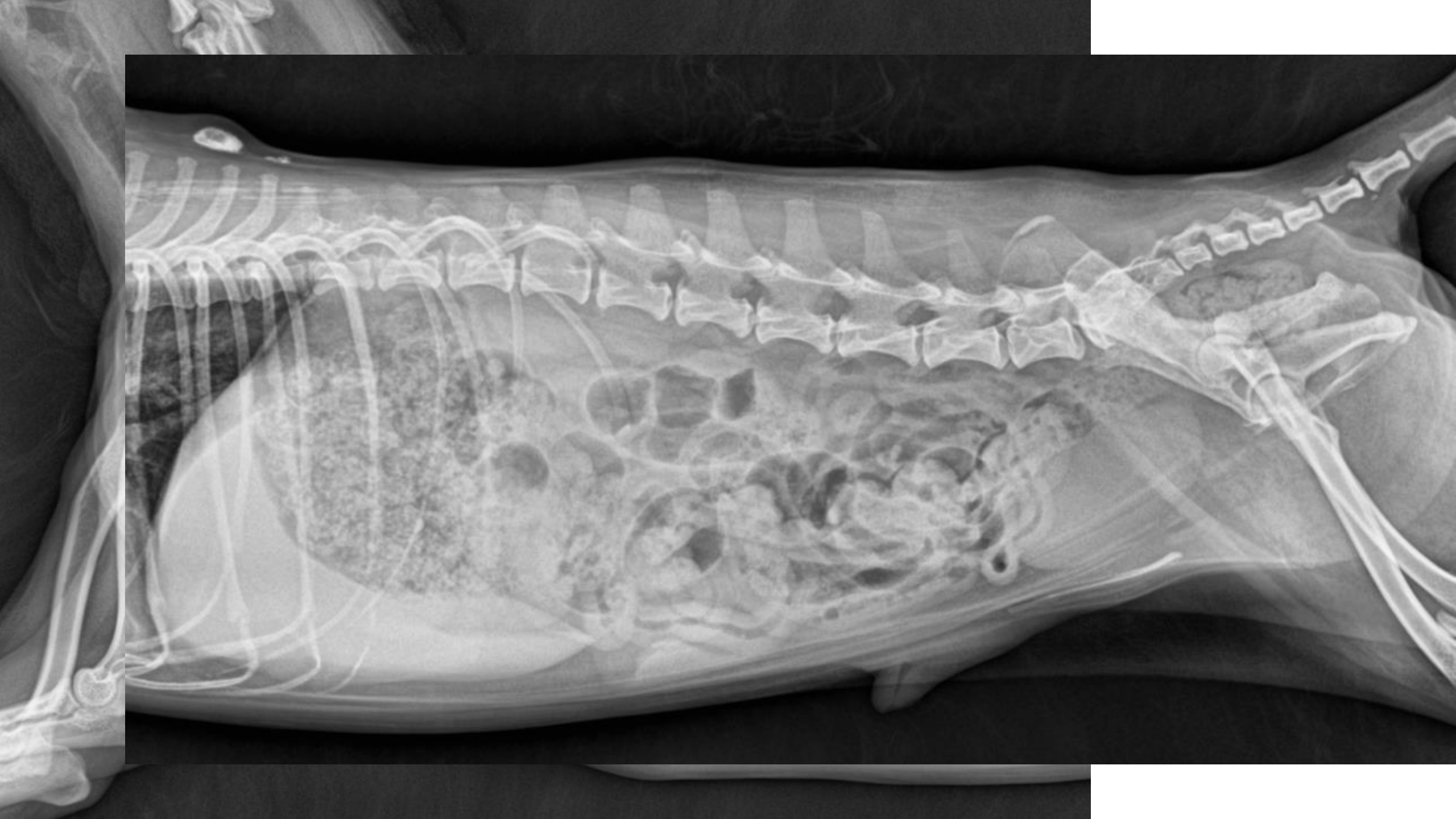


Description	Reference	Unit	2022-02-13
WBC_a	5.2 - 13.9	K/uL	6.11
RBC_a	5.7 - 8.8	M/uL	7.90
HGB_a	12.9 - 18.4	g/dL	16.8
HCT_a	37.1 - 57.0	%	47.5
MCV_a	58.8 - 71.2	fL	60.1
MCH_a	20.5 - 24.2	pg	21.2
MCHC_a	31.0 - 36.2	g/dL	35.3
RDW_a	11.9 - 14.5	%	13.5
PLT_a	143.3 - 400.0	K/uL	15
MPV_a	7.0 - 11.0	fL	21.3
PDW_a	40.6 - 65.2	%	49.2
PCT_a	0.1 - 0.4	%	0.03
HDW_a	1.4 - 2.1	g/dL	2.29
CHCM_a	31.0 - 35.7	g/dL	33.3
CH_a	20.5 - 24.2		20.1
NEUT(#)_a	3.9 - 8.0	K/uL	3.55
LYMPH(#)_a	1.3 - 4.1	K/uL	1.44
MONO(#)_a	0.2 - 1.1	K/uL	0.56
EOS(#)_a	0.0 - 0.6	K/uL	0.47
BASO(#)_a	0.0 - 0.1	K/uL	0
LUC(#)_a	0.0 - 0.3	K/uL	0.10
NEUT(%)_a	42.5 - 77.3	%	58.1
LYMPH(%)_a	11.8 - 39.6	%	23.5
MONO(%)_a	3.3 - 10.3	%	9.1
EOS(%)_a	0.0 - 7.0	%	7.6
BASO(%)_a	0.0 - 1.3	%	0.1
LUC(%)_a	0.0 - 3.0	%	1.6

Description	Reference	Unit	2022-02-13
Albumin*	2.3 - 3.9	g/dl	2.8
ALP*			
ALT(G			
Amylas			
AST(G			
T.Bil*			
BUN*			
Ca*			
Choles			
CK(CP			
Creatin			
Glucos			
Pi*			
LDH*			
Lipase			
GGT*			
Total p			
TG*			
globuli			
NH3_a			
NH3(A			
lactate			
A/G RA			
BUN/C			



Description	Reference	Unit	2022-02-13
Descripti			
cPL_V			
Description	Reference	Unit	2022-02-13
CRP_HA7020	0 - 10	mg/L	3.7



➢IMT (immune-mediated thrombocytopenia)

➢Treatment

- ✓리브감마 0.75 g/kg (3g/60ml) iv over 4 hr
- ✓Chlorpheniramine
- ✓Leflunoide 4 mpk sid,
- ✓Prednisolone 0.25 mpk sid (for Addison's syndrome)
- ✓Esomeprazole, marbofloxacin
- ✓Pro-digest, renozyme …

➢DOCP (Zycortal) 2.2 mg/kg SC q 25~28 days

Description	Reference	Unit	2022-05-11	2022-04-12	2022-03-31	2022-03-16	Reference	Unit	2022-03-03	2022-02-23	2022-02-16	2022-02-13
WBC_a	5.2 - 13.9	K/uL	3.94	5.19	3.97	10.81	5.2 - 13.9	K/uL	5.51	7.53	5.39	6.11
RBC_a	5.7 - 8.8	M/uL	7.37	7.73	7.42	6.91	5.7 - 8.8	M/uL	6.22	6.56	7.14	7.90
HGB_a	12.9 - 18.4	g/dL	16.6	16.6	15.9	14.9	12.9 - 18.4	g/dL	13.6	14.3	15.5	16.8
HCT_a	37.1 - 57.0	%	52.0	53.5	51.1	48.4	37.1 - 57.0	%	43.0	41.6	44.4	47.5
MCV_a	58.8 - 71.2	fL	70.6	69.2	68.9	70.1	58.8 - 71.2	fL	69.2	63.3	62.2	60.1
MCH_a	20.5 - 24.2	pg	22.5	21.5	21.5	21.6	20.5 - 24.2	pg	21.8	21.8	21.7	21.2
MCHC_a	31.0 - 36.2	g/dL	31.8	31.1	31.1	30.8	31.0 - 36.2	g/dL	31.5	34.4	34.9	35.3
RDW_a	11.9 - 14.5	%	12.1	11.9	12.4	12.8	11.9 - 14.5	%	14.3	12.4	12.4	13.5
PLT_a	143.3 - 400.0	K/uL	284	252	275	249	143.3 - 400.0	K/uL	331	266	131	15
MPV_a	7.0 - 11.0	fL	11.0	11.5	11.8	10.8	7.0 - 11.0	fL	10.9	10.5	12.2	21.3
PDW_a	40.6 - 65.2	%	69.7	73.0	66.5	72.6	40.6 - 65.2	%	63.9	62.9	71.2	49.2
PCT_a	0.1 - 0.4	%	0.31	0.29	0.32	0.27	0.1 - 0.4	%	0.36	0.28	0.16	0.03
HDW_a	1.4 - 2.1	g/dL	1.80	1.73	1.78	1.89	1.4 - 2.1	g/dL	2.10	2.27	2.35	2.29
CHCM_a	31.0 - 35.7	g/dL	31.2	31.5	31.8	31.0	31.0 - 35.7	g/dL	31.4	32.1	32.6	33.3
CH_a	20.5 - 24.2		22.0	21.8	21.9	21.8	20.5 - 24.2		21.8	20.4	20.3	20.1
RETIC(#)_a	8.4 - 129.3	K/uL	97.7	47.0	46.3	47.9	3.9 - 8.0	K/uL	3.80	5.51	3.78	3.55
RETIC(%)_a	0.1 - 2.0	%	1.33	0.61	0.62	0.69	1.3 - 4.1	K/uL	1.09	1.01	1.11	1.44
CHr_a	24.5 - 28.6	pg	25.0	25.8	25.7	25.6	0.2 - 1.1	K/uL	0.47	0.69	0.43	0.56
NEUT(#)_a	3.9 - 8.0	K/uL	2.35	3.46	2.40	8.99	0.0 - 0.6	K/uL	0.13	0.28	0.06	0.47
LYMPH(#)_a	1.3 - 4.1	K/uL	0.89	0.91	1.04	1.13	0.0 - 0.1	K/uL	0	0	0	0
MONO(#)_a	0.2 - 1.1	K/uL	0.48	0.41	0.32	0.57	0.0 - 0.3	K/uL	0	0.03	0.01	0.10
EOS(#)_a	0.0 - 0.6	K/uL	0.21	0.41	0.21	0.11	42.5 - 77.3	%	69.1	73.2	70.2	58.1
BASO(#)_a	0.0 - 0.1	K/uL	0	0	0	0	11.8 - 39.6	%	19.8	13.4	20.6	23.5
LUC(#)_a	0.0 - 0.3	K/uL	0	0.01	0.01	0	3.3 - 10.3	%	8.6	9.2	7.9	9.1
NEUT(%)_a	42.5 - 77.3	%	59.6	66.7	60.4	83.2	0.0 - 7.0	%	2.4	3.8	1.0	7.6
LYMPH(%)_a	11.8 - 39.6	%	22.6	17.5	26.2	10.5	0.0 - 1.3	%	0.1	0	0	0.1
MONO(%)_a	3.3 - 10.3	%	12.3	7.8	8.0	5.2	0.0 - 3.0	%	0	0.4	0.2	1.6
EOS(%)_a	0.0 - 7.0	%	5.4	7.8	5.2	1.0						
BASO(%)_a	0.0 - 1.3	%	0	0	0.1	0						
LUC(%)_a	0.0 - 3.0	%	0.1	0.1	0.1	0						

결론

- 면역매개성 질환은 진단이 중요함.
- 면역억압제 처방
  - ✓Prednisolone
  - ✓Azathioprine, CsA, MMF, leflunomide
  - ✓Immunoglobulin G (IVIG: 리브감마)
  - ✓2개 이하로 조합해서 처방.

- 3~6개월 처방 후 투여 중지 고려.
- Prednisolone 을 과다 또는 장기 처방하면 steroid-induced hepatopathy발생 주의
- IVIG와 leflunomide 처방으로 면역매개성 질환 관리

The End

발표를 경청하여 주셔서 감사합니다.

질문이 있으면 질문해 주세요.

ROYAL AMG
Animal Medical Group
로얄동물메디컬그룹

고관절탈구에서 고관절 관통핀의 적용

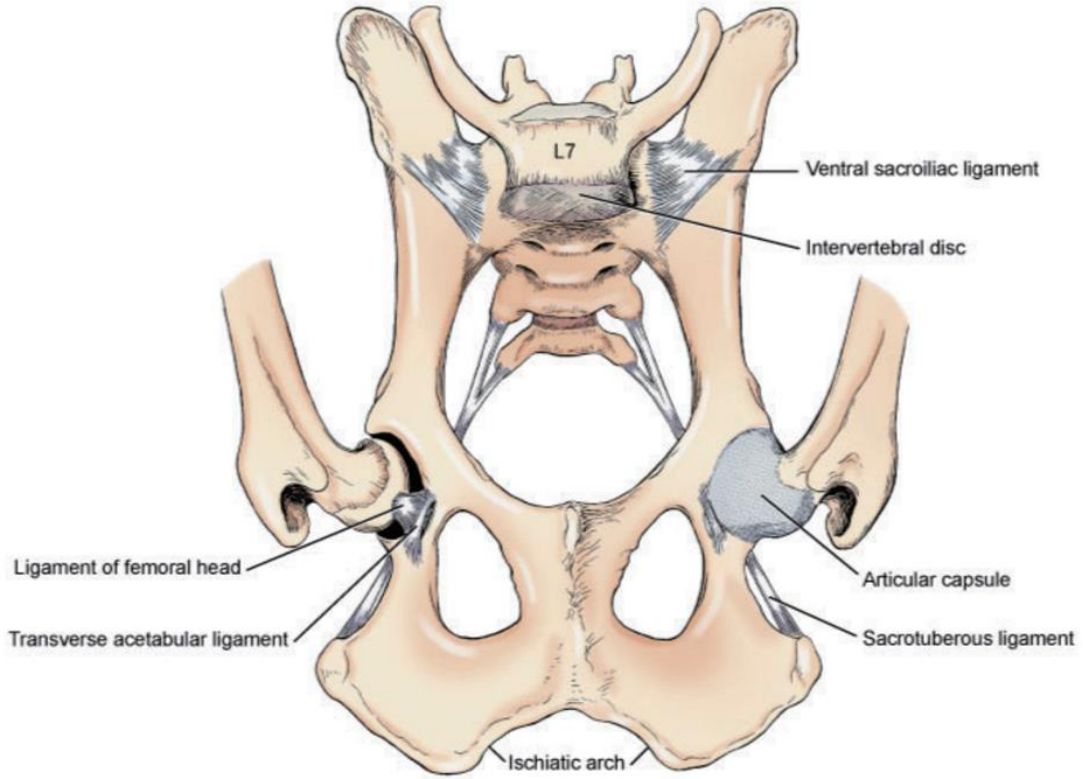
로얄동물메디컬센터 본원

김 세 훈 원장

COXOFEMORLA JOINT TRANSARTICULAR PINNING

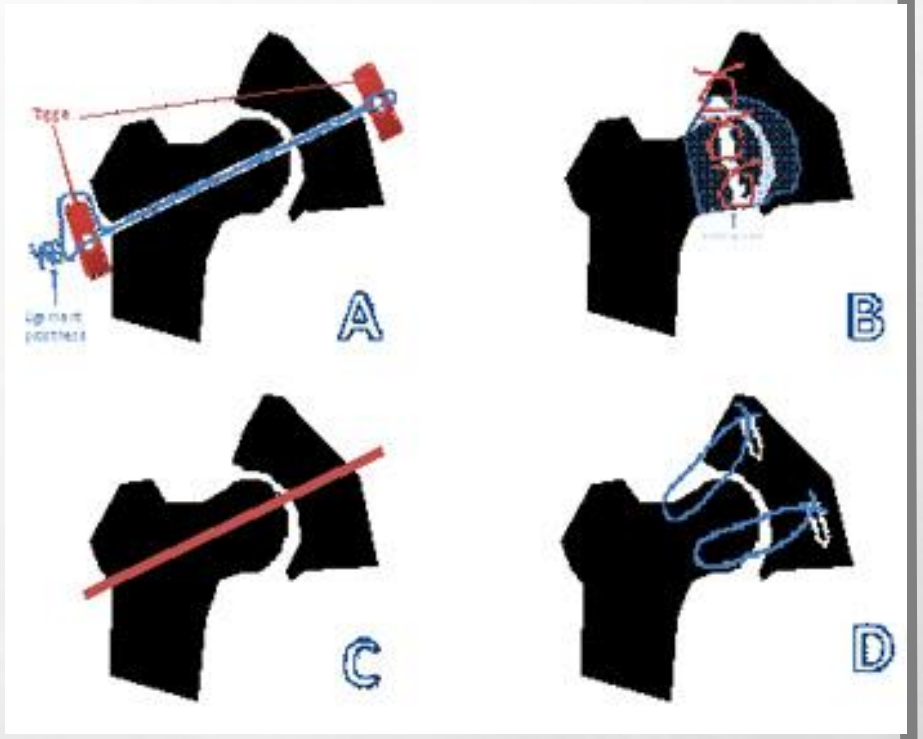
INTRODUCTION

- **COXOFEMORAL JOINT (CJ)**는 **FEMORAL HEAD**와 **ACETABULUM**이 관절 구조를 이루고 있습니다.
  - **CJ** 는 다시 **GREATER, LESSER,** 그리고, **THIRD TROCHANTER** 로 나뉠 수 있습니다.
  - **LIGAMENT OF FEMORAL HEAD** 와 **ARTICULAR CAPSULE**과 같은 근육과 인대들은 **ACETABULUM**과 **FEMORAL HEAD** 사이에 안정성을 유 지 시켜줍니다.
  - 따라서 **LIGAMENT OF FEMORAL HEAD**와 **ARTICULAR CAPSULE**에 손상을 입게 되면, **CJ**의 **LUXATION**이 일어날 가능성이 높아집니다.



From Evans HE, de Lahunta A: Miller's anatomy of the dog, ed 4, St Louis, in press, Saunders/Elsevier.
Tobias and Johnston: Veterinary Surgery: Small Animal

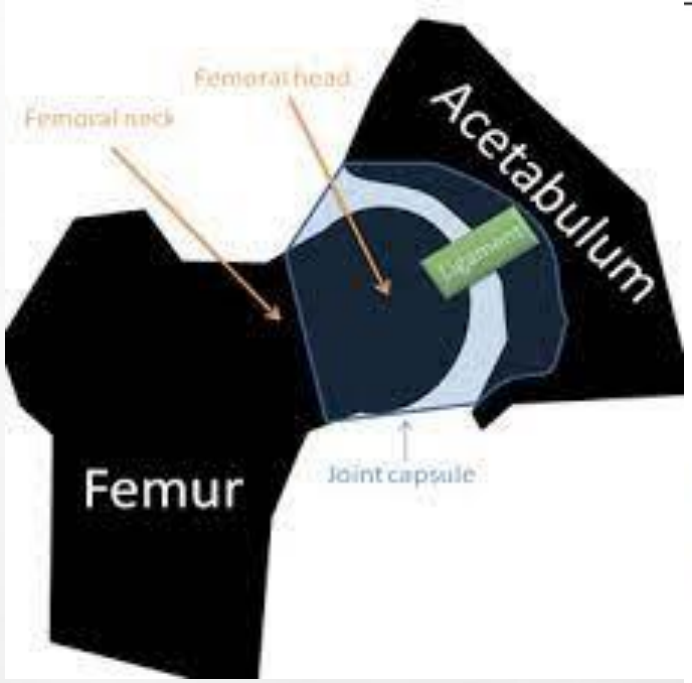
- **CJ**의 **LUXATION**을 교정 하는 방법
  - **CLOSED METHODS**
    - **EHMER SLING, HOBBLES, ISCHIOILIAL PINNING(DE VITA PIN), EXTERNAL FIXATORS**
    - **CJ**의 관절낭을 절개하지 않고서, 탈구를 정복
    - 매우 높은 재발률
  - **OPEN METHODS**
    - **CAPSULORRHAPHY, PROSTHETIC CAPSULE TECHNIQUE, TRANSPOSITION OF THE GREATER TROCHANTER, TP, TOGGLE ROD STABILIZATION, FASCIA LATA LOOP STABILIZATION, TRANSPOSITION OF THE SACROTUBEROUS LIGAMENT, EXTRA ARTICULAR ILIOFEMORAL SUTURE, SURGICAL STABILIZATION OF VENTRAL LUXATIONS, FEMORAL HEAD AND NECK EXCISION ARTHROPLASTY, TRIPLE PELVIC OSTEOTOMY, AND TOTAL HIP ARTHROPLASTY, TRANSARTICULAR PINNING(TP)**

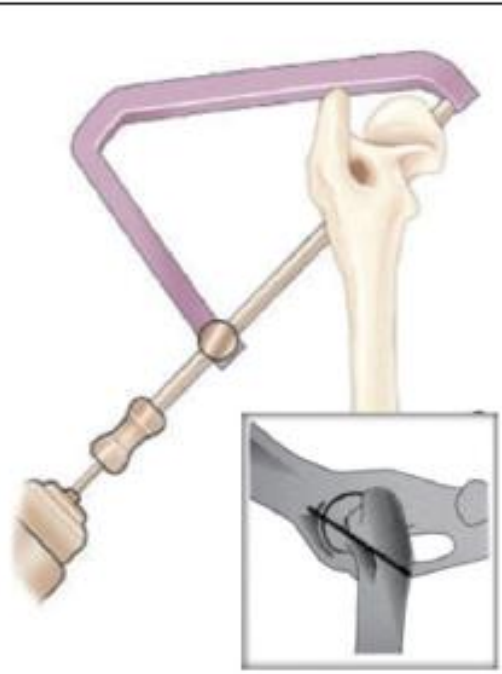


- 이 글의 목적은 고관절 탈구 환자들에게 **OPEN METHODS** 중에서, **TP**를 적용 해보고 예후를 관찰 하는 것입니다.

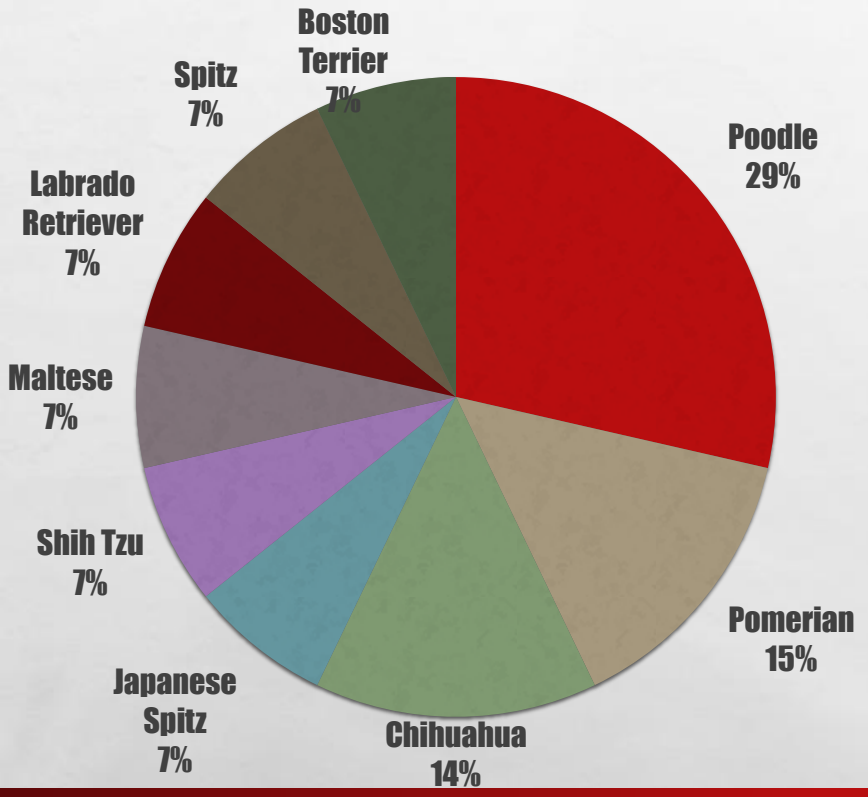
INTRODUCTION

- **TRANSARTICULAR PINNING (TAP) ON COXOFEMORAL JOINT**
  - **THIRD TROCHANTER**에서 **FOVEA CAPTIS FEMORIS**로 **ANTEGRADE**하게 **PIN**을 **DRILLING**
  - 골반강 안으로 **5MM** 이상 삽입
- **LIGAMENT OF FEMORAL HEAD + ARTICULAR CAPSULE**
  - 구조적 안정성 유지
- **OPEN REDUCTION/ CLOSED REDUCTION**
- **COMPLICATION**
  - **PIN MIGRATION**

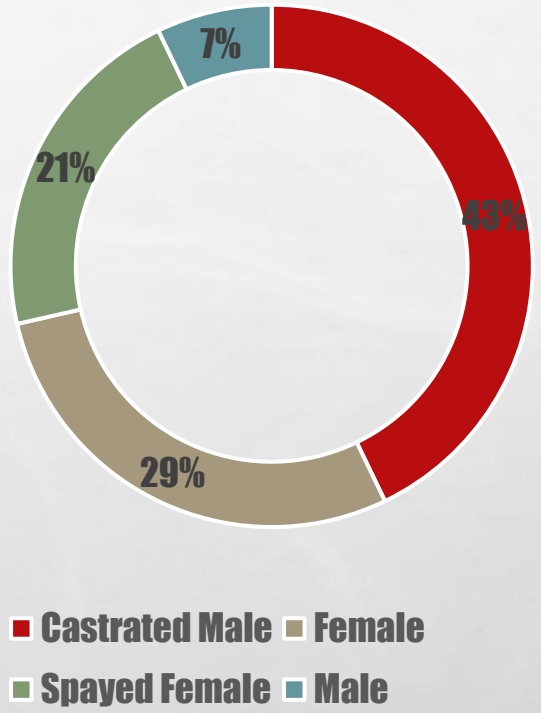




CASE STUDY



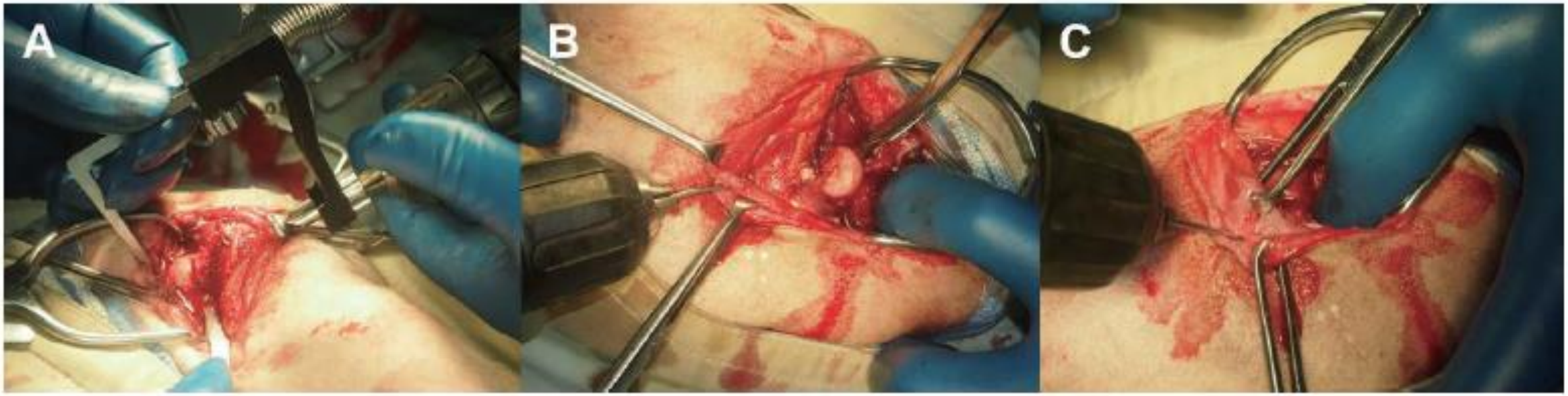
Poodle	4
Pomerian	2
Chihuahua	2
Japanese Spitz	1
Shih Tzu	1
Maltese	1
Labrado Retriever	1
Spitz	1
Boston Terrier	1



Castrated Male	6
Female	4
Spayed Female	3
Male	1

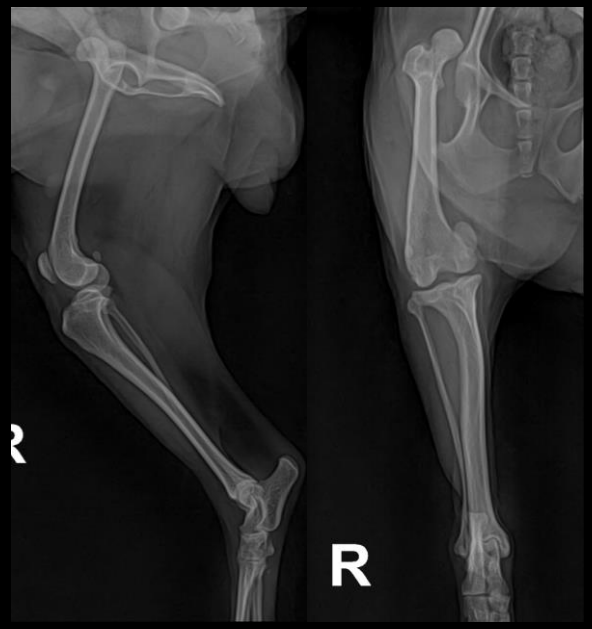
나이: 평균 **5**살, 몸무게: 평균 **5kg**

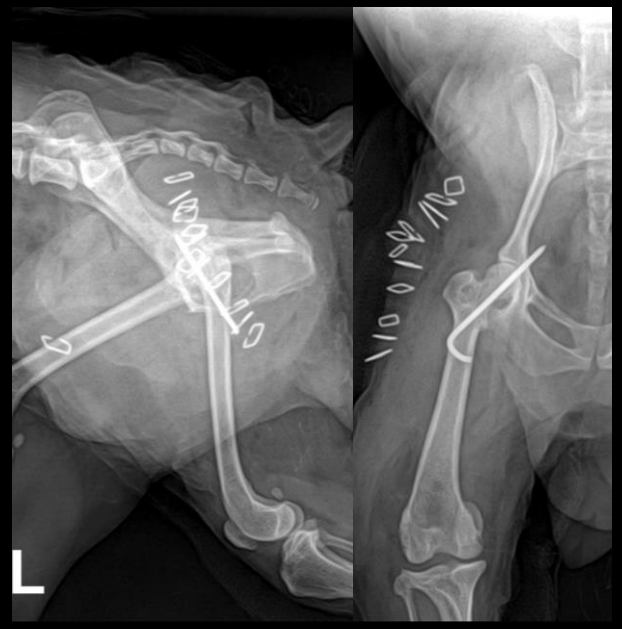
SURGERY

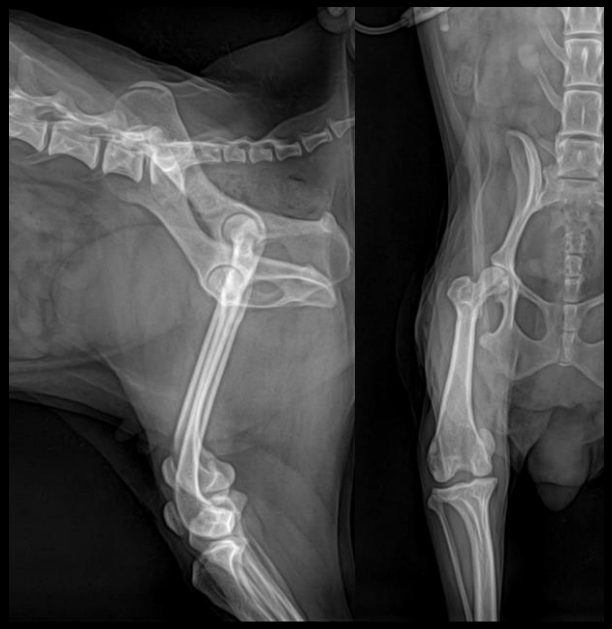


(A), a pin (Kirschner wire) was advanced toward fovea capitis from the third trochanter normogradely using drill guide. (B), the femoral head was apposed to normal position. (C), Drive the pin into the medial wall of the acetabulum.

CASE 1_10435975 곰지

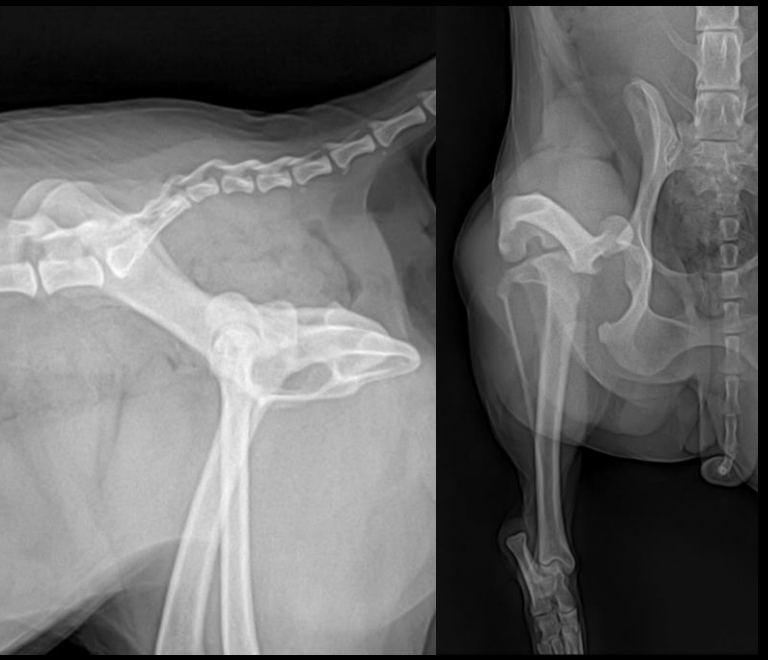


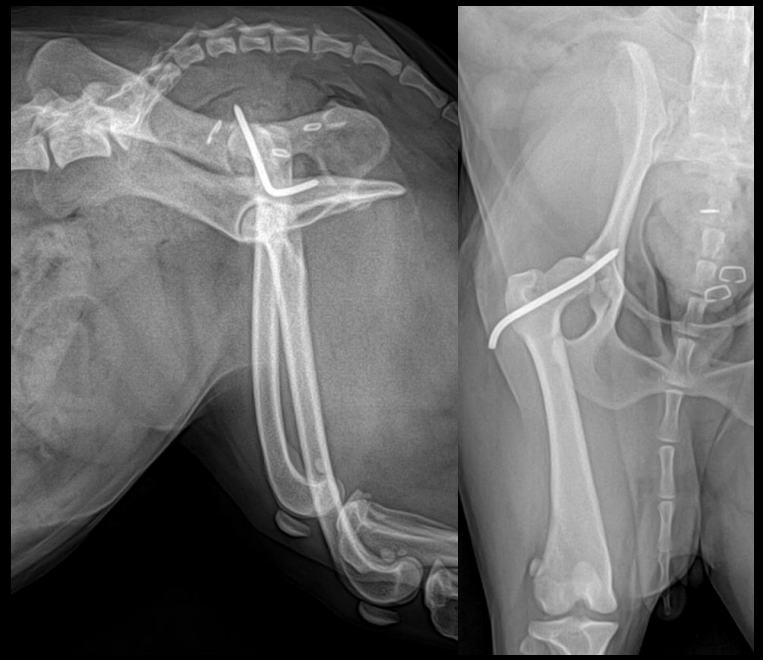


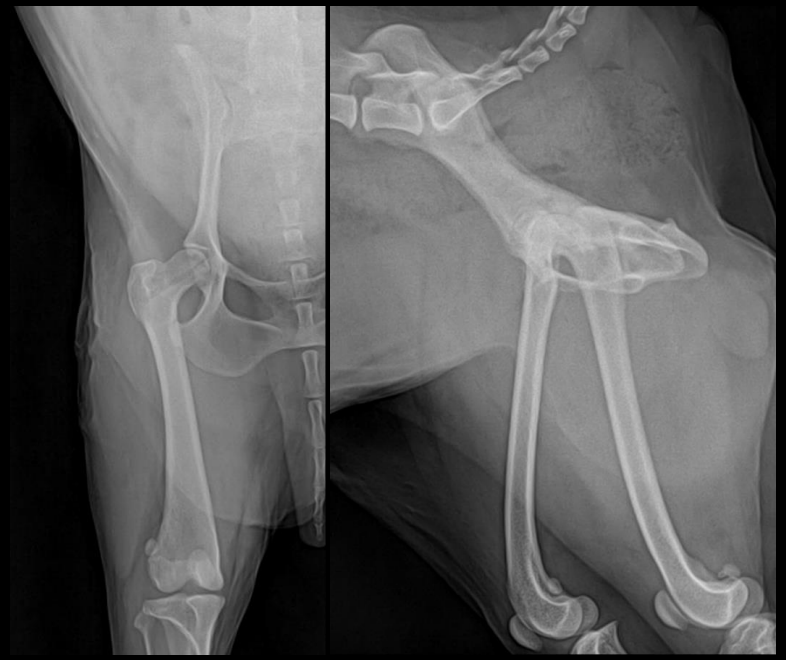


술 후 28일 pin 제거

CASE 7_31757853 줄리

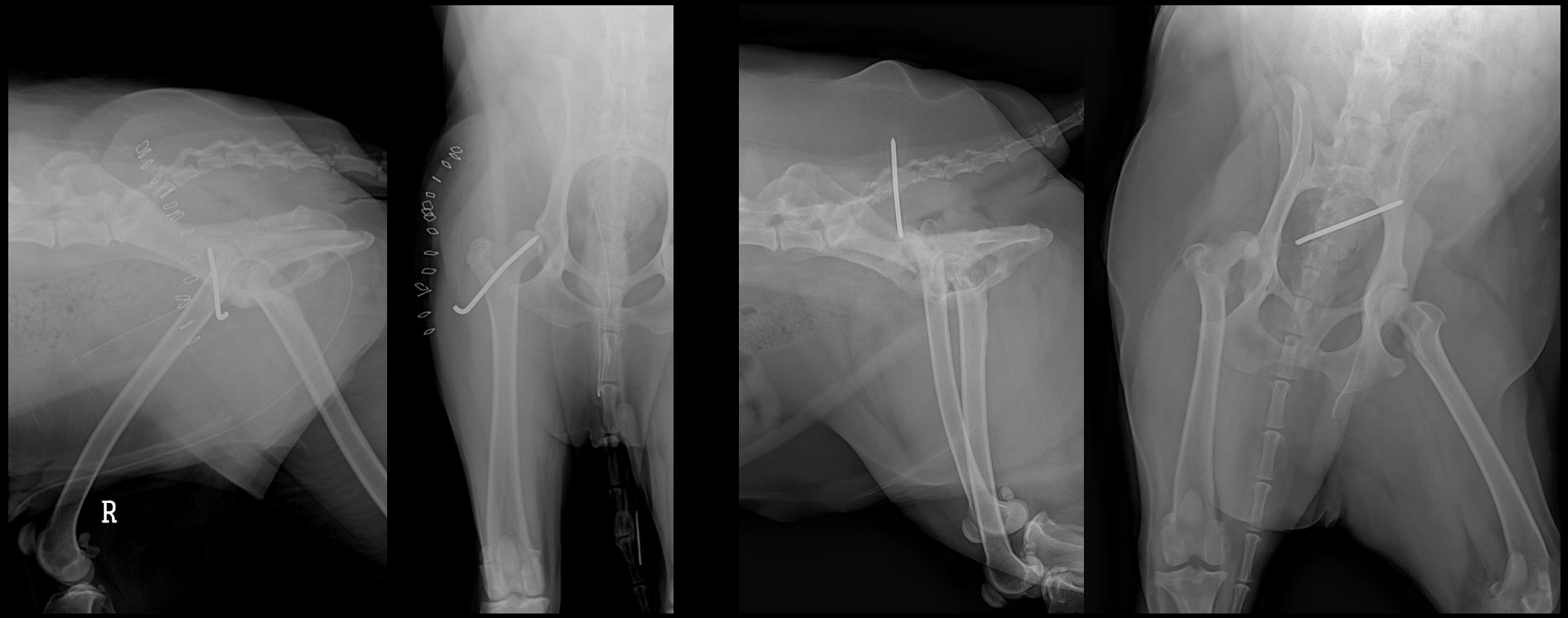






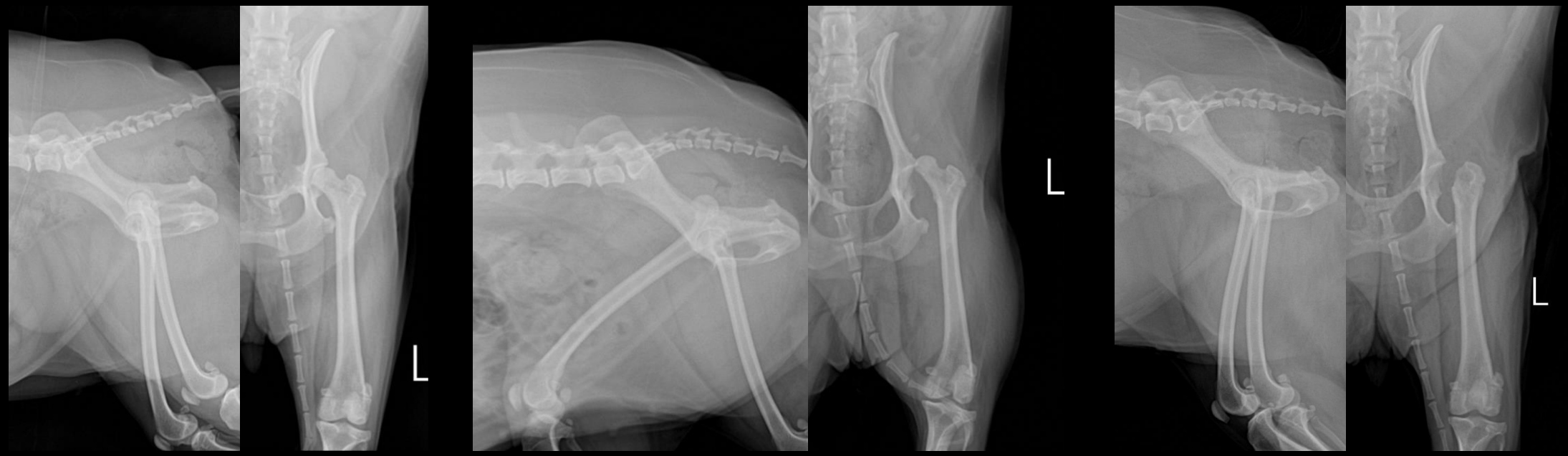
술 후 **10**일, **pin** 제거

PIN MIGRATION



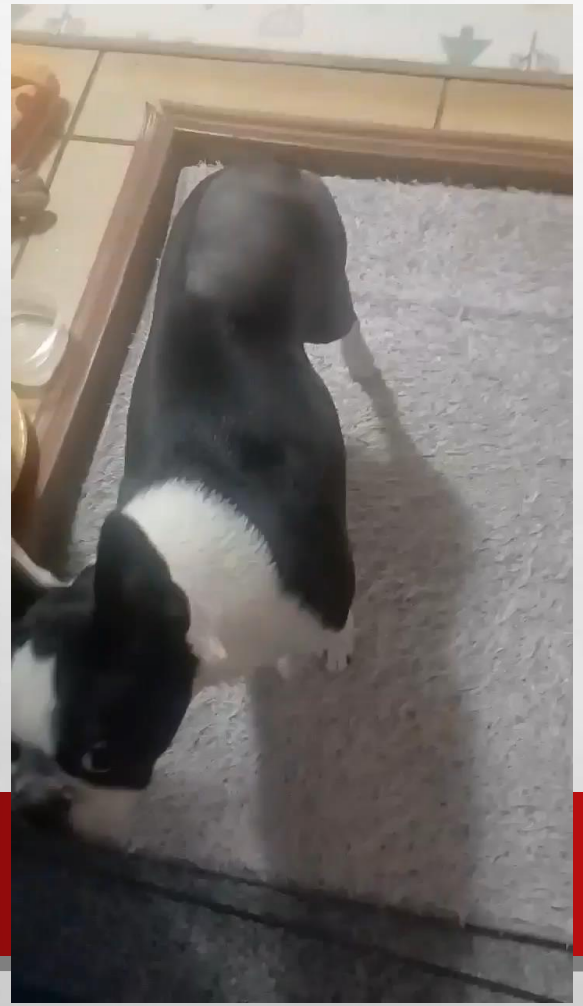
Case 9_10435375 해리

DISLOCATION AGAIN, AFTER REMOVAL OF TAP



Case 11_31757029 흰둥이, 술 후 **41**일, **pin** 제거

PROGNOSIS (A WEEK AFTER SUGERY)



RESULTS

- 핀제거: 평균 **31**일
- 재탈구: **4/14 (28.6%) => FHNO 2 CASES**
- **PIN MIGRATION => A CASE**

DISCUSSION

- 몸무게가 많이 나갈 수 록 탈구에 대한 정복률은 낮아지고 소형견일수록 예후는 좋습니다 **(HUNT AND HENRY JR 1985).**
  - **40** 마리의 개 중 **40%**가 **20KG**이 넘기 때문에, 소형견 에서의 정복률은 **80%** 이상이 될 것으로 생각됩니다.
- **TP** 는 **PIN MIGRATION** 과 같은 **COMPLICATION**이 있었음에도 불구하고, 비교적 좋은 예후를 보였습니다.
- 관절의 안정성을 교정해주는 많은 방법들 중에서, **TP** 는 고관절 탈 구 환자에 적합한 방법입니다
  - 고난이도의 테크닉을 요구하지 않습니다
  - 특별한 기구나 장비가 필요하지 않습니다
  - 관절면에 대한 손상을 최소화 할 수 있습니다
- 수술에서 가장 중요 한 예후 결정인자는 **TP POSITION**의 정확도입니다. 이는 관절의 가동 각도를 정상에 가깝게 유지 시켜줍니다.
- 결론적으로 **TP** 는 외상성 고관절 탈 구 환자에게 적합한 방법입니다.
  - **TP** 는 **REDUCIBLE**한 **COXOFEMORAL JOINT LUXATION**에서, 관절낭이 긴장력을 가지기 전 까지, 일시적으로, **FEMUR**와 **ACETABULUM**사이의 힘을 지탱해 줄 수 있는 좋은 방법이라고 생각 됩니다.