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## 胃腸器疾患における画像検査の意味：専門医からのメッセージ

### Significance of Imaging Examinations in Gastrointestinal Diseases: A message from an Imaging Specialist

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[Slide 1] Jill's talk provided us with details about the immune system in dogs and at quite a scientific level, perhaps a little difficult for lay people. She talked about incorporating cholostrum in puppy food which enhances the local and systemic immune system. This session is co-sponsored by Nestle Purina PetCare and is about the nutrition of pet animals, and the effect of GI tract health on systemic health.

[Slide 2] (Those who are not doctors please raise your hands). Although I am not a nutrition expert like Dr. Sako, who is a world renowned nutritionist, I am a radiology specialist so I would like to talk about the significance of imaging tests in the field of the GI tract. So my theme is 'GI tract diseases and why veterinarian doctors perform regular examinations'. The fees can be very expensive so you might wonder why in some cases the veterinarian cannot cure a GI disease. I will explain this from my perspective as a radiology specialist.

[Slide 3] There are a great many GI tract diseases if you define them as 'any state where the GI tract is not normal'. It depends on the cause and, for example, the previous speaker explained about the layer of microflora becoming irregular or the immune system which can become over-insensitive and abnormal. For example I myself have suffered ulceritis colonitis which is said to often occur in Japanese males who live in the United States.

In terms of symptoms, nausea and diarrhea are the easiest to recognize. But defining diarrhea is not clear. Differentiating diarrhea from a 'soft stool' or a 'different color stool' is not clear. Usually a stool is brown but sometimes you find yellowish, whitish or sometimes blackish stool coloring. Such turbulence in the immunity system, as

well as infections, causes GI tract problems. So when a dog with diarrhea is brought to our clinic we must consider how to recognize the differences and have the different classifications in our minds.

[Slide 4] One way or another diarrhea is a strong indication of a disease in the GI tract. When gut health is compromised all sorts of symptoms appear, especially diarrhea and vomiting. In the case of the intestines, diarrhea seems to be more common than vomiting but I would like people here to understand that when a consultation is needed by a patient, especially a primary (GP) veterinarian then the owner needs to choose which. For example, Dr. Kline said that we can often guess the cause if it is already known that the particular dog in question ate something unusual, such as wrapping paper or coffee beans, and that the gut is making noises for this reason. If it were my patient, I would suggest that we simply observe the situation and, even if the dog has diarrhea, simply refrain from giving any food except water. If this kind of assumption can be made then caring for, mitigating or terminating the symptoms would be the objective of the treatment. When the stomach is upset I am almost sure that it can be cured spontaneously because the mucous of the intestine turns over within a week or just a few days. (Dr. Kline said 3 days). When I was a child I often used to go to the doctor with diarrhea. The doctor would scold me saying that I must have eaten something bad and instruct me not to eat any food except for water. By day three I was usually able to resume eating with no digestion problems. So if you are confident that a problem has been cured spontaneously you may not need a lot of medicine or care.

However, if the etiology is unclear or cannot be identified then it becomes a real problem. In that case you need about one week of treatment to try and eliminate the cause. From a specialist's viewpoint we know that, empirically, if an animal has a severe problem then it is often better to

perform a radiological test, even if it does cost 30 ~ 50,000 yen. The dog might have eaten something very hazardous and, if that is so, then an ultrasonic examination or x-ray examination will find out what was eaten. If an elderly dog has blood in its feces then an ultrasonic exam, x-ray or sometimes a CT may be required. If we know the etiology then a treatment strategy can be established. There are a variety of treatment methods and data for reference. Diagnostic data should be collected in order to choose the best course of therapy.

If the animal is healthy and no GI tract problem is found then that is the best result, but a vet should consider possible etiologies. Assessing the prognosis of the disease is also important, whether it is something easily cured or whether it is terminal. An animal in the terminal stage cannot be saved so we recommend that it be allowed to pass its final days of life in a peaceful way, just like a hospice for human beings. So, correct diagnostic data and prognosis judgment are needed.

[Slide 5] Vomiting is a reflex behavior triggered by the brain in response to certain causes. These include the over-stimulation of saliva, swallowing too much saliva, relaxation of the esophageal sphincters or the stomach. Sometimes in the evening, especially after 11pm around Kobe, you see older or middle-aged men who have had too much to drink, and they vomit. If the vomited food enters the bronchi it could cause pneumonia. [Slide 6] This is a list of the mechanisms of vomiting.

[Slide 7] Dogs often vomit after eating something wrong. For example my own dog Mishy is a wire-haired dachshund and she ate two of my favorite pork dumplings (Horai 551 brand) which I really wanted to eat. Mishy had diarrhea and vomiting so the cause was very obvious. In most cases the vomiting itself is not a serious problem. But sometimes it could be related to a problem in the lungs, food poisoning or even a psychological upset (such as being separated from a human companion or other animal that was very close to the dog). We cannot identify etiology clearly without examinations. There is medicine to stop vomiting but it is only symptomatic treatment. You can stop the vomiting but sometimes that vomiting is not a negative thing, for example if there is something stuck in the throat. A vet might initially

give the animal an injection to stop the vomiting. But if that same dog is brought back two or three days later only then may he discover something stuck in the throat which needs surgery. Clearly that is not a good situation.

[Slide 8] Normally the word “signalment” refers to the shape of the dog, its age, whether it is male, female, neutered or not – all these should be checked. For example, within dogs, dachshunds at the age of 3 or 4 can suffer from lymphoma. Most dog breeds of this age do not suffer lymphoma but in the case of dachshunds it is known that young age lymphoma can appear as a disease in the stomach and intestines. So if it is a young dachshund and the vet touches something thick around the wall of the colon then it is advisable to perform an x-ray and an echo test. If there is a swelling on the lymph gland or colon wall it is necessary to inject a needle and examine the cells extracted. If it is something abnormal we need to treat. If it is found early it is lucky because the disease can almost always be cured. It is very important to collect the animal’s disease history and that is why vets usually ask owners many questions. This is only because the vet wants to identify the etiology as correctly as possible. I usually ask about the number of family members, their house layout, what room is used for what, what kinds of smells are around. It may seem rude but I even ask if the house has cockroaches because the housewife may use a cockroach killer and the dog may have been accidentally poisoned.

So the history of illness and of course the physical examination is still needed. If I touch the dog and feel something strange I wonder what I should do. All these procedures are necessary. We vets first give a preliminary diagnosis before performing a detailed examination or tests that involve using technology. In the case I mentioned about the pork dumplings the cause was a simple upset so it was not necessary to spend money. But sometimes some owners don’t use this common sense. An owner may simply tell me that his dog was vomiting when he came back home last night and was still not well this morning. In fact, something may have happened one week earlier. The dog may have licked something unusual left by a carpenter who visited to do some refitting work. When I hear such information and if, when I perform a preliminary physical examination, I can give a basic diagnosis then I can tell the

owner if there is something wrong and I can suggest what it might be. However, I then have to say that the next stage of examinations will incur some costs. I ask the owner if this is OK. Actually, vets are not over-happy when owners don't have the money for the tests. But I think owners should feel free to ask the cost for such diagnostic examinations or tests. They should not hesitate to ask. There may be some differences between Kobe and Osaka city culture. In Osaka it is not considered impolite for the owner to ask how much something will cost. There are so many types of examination.

[Slide 9] This slide shows an approach to patients that might use an x-ray, ultrasonic, CT, blood test, urine test and other special tests. The all-inclusive cost would come to between 30~40,000 yen. The reason we perform all these tests is because we want to have a definitive diagnosis. However, the ultimate and definitive diagnosis requires a needle biopsy. If you do have to open up the stomach it will cost an additional 50~100,000 yen (in some cases). So a step by step approach is recommended to reach a definitive diagnosis.

The starting point of illness could be an abnormality in the GI tract so owners should be aware of the importance of GI tract health. I use 'beef jerky' as an example because I am quite concerned about the ingredients and additives used. As I sometimes give my own pets the snacks that I eat, I only want to give them something that I myself can eat safely. So I don't give them beef jerky. I would like to show some case studies.

[Slide 10] I will now tell you about an eight-year-old, spayed, female housecat which had anemia and a loss of appetite for two weeks. The owner should have brought the cat to us one-week earlier because a loss of appetite is a big problem for animals. I myself have never had a serious disease so have never experienced loss of appetite, except once due to a throat polyp. I lost my appetite for 2 weeks but 2 weeks loss of appetite for cats is quite dangerous. If enough food and nutrition is not eaten after a GI tract disorder then lipidosis may occur. The liver may be damaged and this can be lethal. Even if a cat does not eat for only three days it is sometimes necessary to use a forced nutritional supply trans-nasally or by gastric tubing to

provide nutrition because lipidosis in cats is really dangerous. Or, as I learned in the USA, we may need to use a camera scope to the stomach and then insert a stomach tube to enable force-feeding until the first symptom eases. We do not want the animal to die.

The owner in this case said that the cat had been vomiting since the day before the illness and that there was some swelling or mass in the abdominal area. Overlooking the presence of a mass would be unforgivable for a vet. We vets are trained for that every day. I have lectured to young veterinarians often and I sometimes tell them to try to avoid behaving like typical human doctors. For example when a patient in Japan says that they have caught a cold not many doctors would look into the throat and carefully listen to the breathing sound. (Certainly my own doctor would not do that although I think he is a great expert regarding the colon, and if I ask him for something specifically he will do it. That is why I go to him). But it is difficult. American doctors (for humans) talk to the patient for at least 10 minutes before they prescribe antibiotics. They always check whether the patient has a throat virus using a simple examination kit. If the test is negative they will not prescribe antibiotics. I think that it is proper medical treatment. In Japan it is a bit different

[Slide 11] These are the x-ray results for the cat in question and this is the lateral view and on the right side is the spine posture. It may be difficult to see but there is something there. Here are the spine, hip-bone and ribs, and on the left extreme you can see part of the heart and liver. Behind the liver there is some kind of mass and the black part is just air inside the intestinal lumen. In this case the intestines, unusually, are positioned a little to the back so there is something between the liver and intestines. It may be either part of the spleen or stomach but it seems to be an abnormality of the stomach.

[Slide 12] A vet finding such an abnormal image would consider it to be either a tumor or a granuloma. Infectious diseases can be handled with medication as can a benign tumor. But a gastric carcinoma is not something we can cure easily so we have to identify that.

[Slide 13] In the past we would use a barium fluoroscopy

but there is no point in doing that as we cannot remove any cells for examination. Nowadays we use ultrasonic tests to identify such areas. Cats often eat strings which cause stomach problems and ultrasonic tests can easily identify if that is the case.

[Slide 14] This slide shows some images but on first glance it is difficult to understand what is being shown, (although it is understandable if you are a vet, so please excuse me). This is the gastric membrane of a cat and, under normal circumstances it is only four to five millimeters thick. This is a one-centimeter grid and the minimum scale is five millimeters. But in this cat you can see that the wall is between 1.5 to 2 centimeters. The gastric mucosa is far too thick. I did not know if this was lymphoma, carcinoma or granuloma, so a biopsy was needed.

[Slide 15] An endoscopy would have been another alternative but anesthesia would be needed. Needle biopsy on the other hand does not require anesthesia. So I would always use a needle first. In fact, a swelling of the lymph nodes was confirmed and the needle biopsy revealed that it was lymphoma. So a variety of tests were performed. In this case I was acting as secondary vet in the diagnosis, and had already been given some primary data. So within 1 to 2 hours I could make a diagnosis. Of course the tests can be expensive, costing about 20,000~30,000 yen (or even more), but the result is that a definitive differential diagnosis can be made.

[Slide 16] This is another example, a 10 year-old female shepherd dog. 10 years is a long life for shepherd dogs and usually their longevity is less than ten. Symptoms included a soft stool with some blood loss and a decreased appetite. In any case, even a slight change in health should be noted, for example any difference in the dog's condition during summer and winter. I often ask the owners about the health of their dog during the course of the summer (if the dog is brought in at that time). If the dog had not been so fine it might mean that the animal had already been sick for many months. I don't blame owners because they would not notice certain changes as significant.

[Slide 17] This is another x-ray image and similar to the previous case. It shows a liver and empty stomach and

there is a mass which can be seen here. This is the intestinal lumen. This mass is strange. A normal animal does not have this – we should only be able to see intestinal lumen. [Slide 18] But in this lateral view image, expanded and enlarged, the mass has grown huge so there is obviously something. We could not just let the dog go home without doing anything but it was a 10 year-old shepherd dog.

[Slide 19] If this was a malignant tumor the owner would not want the dog to undergo any invasive procedures, although it is one option. So we performed an ultrasonic exam and this shows the mass. The black area shows the lumen was very small and had narrowed so exploratory open surgery was performed. [Slide 20] A benign tumor was found within the smooth muscle of one part of the intestine. Of course it was costly but there was a tumor, but a benign tumor, in the cecum.

So the owners should ask whatever they want to clarify. Owners should be friends with their local vet otherwise it is difficult for vets to make a decision. It is especially difficult for a younger vet to have a frank talk with an owner who is much older than he or she. I remember when I was 22 years old and had just graduated. (I am now 54 and look like this so if you can imagine that when I was actually 22 I probably looked more like 17 or 18). At the time I had no nurses helping me and was by myself manning the reception. An owner came in and asked where the vet was. He didn't recognize me as the vet. Subsequently I was often not sure how to talk to more elderly owners. Now I can ask owners to speak frankly, give their opinions and to ask questions to their veterinarian. It is easier for us to cope with an animal's problem when we know what the owners want. The shepherd dog I was talking about was operated on but I have not seen it since so cannot say how it turned out.

[Slide 21] Here is another example, a 13 year-old spayed female. This Westie dog had had colonitis for two years which is too long. I myself had colonitis for three to four year when I was in the United States and had to take medicine. Now I am back in Japan and it is cured so I am very lucky. But when I was over there, unless I took medicine the bleeding was so bad I could hardly cope. In such situations you really must go and see a specialist. My throat was the same. When I was a high school student I

played soccer as goalkeeper and used to have a very loud voice that could be heard at the other side of the pitch. But after I had had colonitis my voice had become much quieter. Eventually I went to a specialist and he found a polyp which has been removed, (although I am still worried about it). But I digress and need to return to the story of the Westie!

The dog was spending many hours sleeping. We should not assume that Westies usually sleep a lot. Loss of appetite for ten days and sleeping many hours every day can mean that the liver or kidney might be damaged. So I performed a ductile examination and found a tubular fecal mass. It was a huge mass in parts which the dog could not excrete. The dog was thought to have colonitis but a fecal mass is not usually formed this way.

[Slide 22] The diagnosis from an X-ray revealed an enlargement of the colon because of the fecal mass but there was no other abnormality. Then an ultrasonic test was also performed. As with the case of a cat the thickness of the colon wall is usually two to three millimeters but in this dog it was more than one centimeter. Despite the cost involved, this was an important finding. So a biopsy was performed which eventually revealed carcinoma of the colon. Unfortunately neither radiotherapy nor surgery is effective in such cases because the colon and large intestine does not have enough blood supply. As a result, recovery after resection of an intestinal tumor is often unsuccessful. Dogs usually do not become better and often die after the surgery. I had a good talk with the owner who did decide to decline the surgery, which I accepted. Instead I suggested that he give the dog something nice and see how long the dog could survive.

[Slide 26] The next step I could have suggested if the owner had decided to go ahead with the surgery would be a CT scan to determine the extent of resection needed. While some doctors usually perform an endoscopy or exploratory open surgery I myself don't perform this very much. [Slide 27] But in this case, considering the age of the dog, I did not propose these options. If I had been sure that the cancer was not malignant then one of them might have been an alternative.

So when intestinal health is compromised, symptoms occur

and the veterinarian should consider if the treatment to stop the symptoms alone is the right path or whether further tests are needed in order to make a definitive diagnosis. But even then a curative therapy may not be available. So, having thorough communication between the vet doctor and owner is indispensable.

Dogs themselves are not able to talk to us so we veterinarians must depend on the information we hear from the owners. I may instruct that a dog patient be given medication doses twice daily but if I know for a fact that the owner is not able to administer two doses per day then I have to change the medicine otherwise it will not be effective. So having good communication between both parties is essential for curing a dog with an intestinal health problem. Also, the vet needs to obtain informed consent. But before their dogs or cats ever become sick all owners should be responsible for maintaining their animal's health through appropriate feeding. There are a variety of sources for obtaining lots of useful information, for example from the internet, but I do urge people to be cautious when researching. There are products out there endorsed and recommended by people claiming to be veterinarians even though it might be false information. I also urge owners to have a close relation with their local veterinarian.

So with those last comments I will close my talk. If you have any questions I will be happy to answer. Thank you very much.

**胃腸器疾患における画像検査の意味：  
専門医からのメッセージ**

ワークショップ VII 『ペット動物の栄養学：腸の健康』

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【Slide 1】

**『嘔吐』って何ですか？**

- 反射行動
  - 唾液の亢進
  - 唾液の嚥下
    - 食道胃括約筋の弛緩
- えづき動作
  - 腹筋、横隔膜の収縮

【Slide 5】

**講演内容**

- 胃腸器疾患とは
- 獣医師のアプローチ法
  - 各種検査の意味
  - 画像検査の意味
- 腸の健康との関連

【Slide 2】

**嘔吐の病態生理**

- 喉頭蓋の閉鎖、呼吸停止
- 上部腸管と胃前庭部の収縮
- 食道胃括約筋の胸腔内移動
  - 吐出可能
- 咽頭鼻部の閉鎖
- 嘔吐完了

【Slide 6】

**胃腸器疾患とは**

- 山ほどあります
- 胃腸器が『正常ではない』状態
- 分類
  - 原因によって
  - 症状によって
  - 病態発生によって
- 獣医師が覚えやすいように

【Slide 3】

**嘔吐の原因**

- 胃腸と腹腔臓器の異常
  - 炎症、閉塞
- 全身性疾患
- 内分泌疾患
- 中枢神経系疾患
- 薬物と中毒
- 心理的
- 疼痛と外傷

【Slide 7】

**腸の健康が悪くなると**

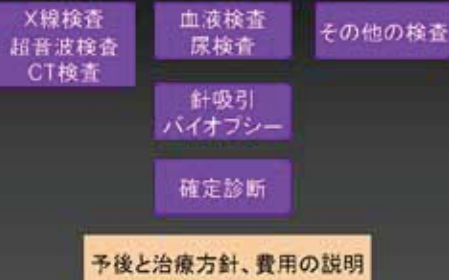
- いろいろな症状(下痢や嘔吐)が発生
  - 原因の推定
    - 『対症療法』
      - 『絶対に治る』が条件
  - 原因の確定
    - 『原因療法』
      - 最良の治療法の確立
  - 予後の判定

【Slide 4】

**胃腸器疾患の患者のアプローチ**

【Slide 8】

## 胃腸器疾患の患者のアプローチ



【Slide 9】

## 超音波検査か造影検査か

- 上部胃腸系造影法
  - 形態学的異常
  - 位置決定
  - 紐状異物
  - 時間と労力の問題
- 胃腸超音波検査
  - 正確な解剖と針吸引(細胞診)

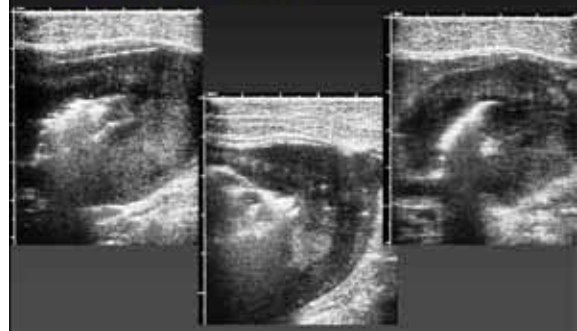
【Slide 13】

161403

- シグナルメント
  - 8歳、避妊メス、家猫
- 稟告、身体検査所見
  - 貧血
  - 2週間の食欲不振
  - 昨日から嘔吐
  - 腹部の触診で塊状病変

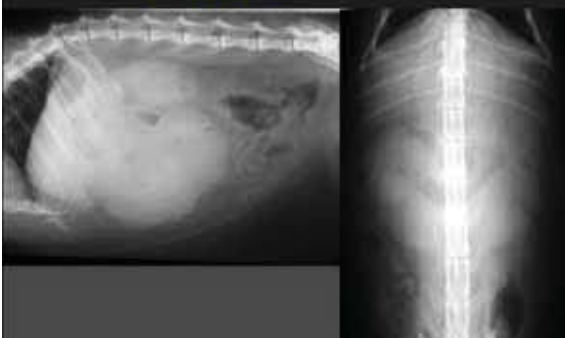
【Slide 10】

## 超音波検査所見



【Slide 14】

## レントゲン所見



【Slide 11】

## 超音波診断

- 胃壁の肥厚(>6mm)
- 層構造の消失
- リンパ節腫脹
- 鑑別診断=浸潤性疾患
  - 腫瘍
  - 肉芽腫性疾患
- 細胞診=リンパ腫



【Slide 15】

## レントゲン診断

- 前腹部の塊状病変
- 左右側面像
  - 胃腸管の異常
- 胃の病変の疑い
  - 上部胃腸系造影検査
  - 腹部超音波検査

【Slide 12】

## 10歳、メス、シェパード

- 軟便
- 便に血が混じる
- 食欲低下
- 触診時に痛がる

【Slide 16】



【Slide 17】

161326

### 13歳、避妊メス、ウェスティ

- 2年間にわたる結腸炎
- 10日間にわたる食欲不振
- 嗜眠傾向
- 触診による塊状物
- レントゲン検査の実施

A ㊦: :w:w: : A



A ㊦: :w:w: : A



A ㊦: :w:w: : A

### レントゲン診断

- 軟部組織の陰影の塊状物
- 腸管？
- 腹部超音波検査
  - 塊状病変
  - 多重エコー
  - 腸管の異常

A ㊦: :w:w: : A

### レントゲン診断

- 糞塊による結腸の拡張
- それ以外は異常なし
- 鑑別診断
  - 結腸の狭窄症
  - 浸潤性疾患
  - 結腸の運動機能異常
  - 次のステップ??

A ㊦: :w:w: : A

### 10歳、メス、シェパード

- 試験的開腹術
- 盲腸の平滑筋腫

A ㊦: :w:w: : A

### 超音波所見

A ㊦: :w:w: : A



### 超音波診断

- 非常に肥厚した結腸壁
- 5層構造の消失
- 鑑別診断
  - 浸潤性疾患
  - 針吸引結果＝腺癌
- 飼い主は治療を辞退

【Slide 25】

### 次のステップの検討

- 結腸の造影検査
  - 準備が面倒
  - 良い結果は期待薄
  - 位置の確認以外は意味なし
- CT検査法
  - 総合的な判断
  - 麻酔とコスト

【Slide 26】

### 次のステップの検討

- 内視鏡検査
  - 生検による確定診断
  - 全身麻酔
- 開腹術
  - 侵襲度がかかなり高い
  - 事前に細胞診

【Slide 27】