

Sunday Fun Day 2 - GERD

DRIP 3

September 19, 2021

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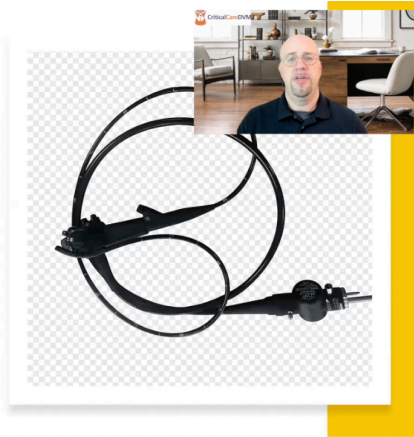
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Making a GER Dx

- Challenging due to:
 - Intermittent nature
 - Lack of overt pathognomonic clinical signs
 - Need for advanced diagnostic equipment
- More challenging to determine the cause of GER



OK, so here's the important question. How do we diagnose gastroesophageal reflux in our patients? And quite honestly by the strict definitions that we discussed earlier, it's challenging. Reflux isn't a constant phenomenon. Our patients are really good at hiding clinical signs of it. And we don't routinely perform esophageal impedance testing.

Certainly, esophagoscopy is quite easy to do, assuming you have the equipment and you've been appropriately trained in the technique. But as an internal medicine clinician, I think it's important to also state this point. As much as it can be challenging to definitively diagnose gastroesophageal reflux, I think it's more challenging to find the main cause of it in the first place.

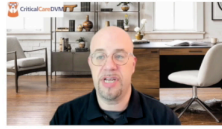
Compatible Clinical Signs



- **Regurgitation**
 - Ptyalism / Dysphagia
 - Weight loss
- **Hypo-/Anorexia**
 - Halitosis
- Tachypnea +/- dyspnea
- Nasal discharge
- Vocal change
- Restlessness / discomfort
- **Chronic non-productive coughing**

So in what ways could our patients tell us that they have GERD? What should be proverbial red flags for us as clinicians? Well, some of them are seemingly obvious. Regurgitation, ptyalism, drooling. But how often do you think about gastroesophageal reflux in patients that are presented to you for nasal discharge or for non-productive coughing? What about halitosis? Or the ever so specific weight loss?

One of my big takeaway points for spending this time chatting with you about gastroesophageal reflux today is simply to increase awareness, for you to add one more important differential to your list of possible diagnoses for your patient with some of these compatible albeit vague clinical signs.



- Bravo pH system studied in healthy dogs (n=7) and dogs with clinical signs attributed to GERD (n=22)
- All had esophagegastroduodenoscopy
- Reflux defined as pH <4 & owners pressed "clinical sign-button" when GERD clinical signs were noted by owners
- No difference between groups
- Poor correlation between clinical sign recognition and actual reflux

J Vet Intern Med 2014;28:1716-1723

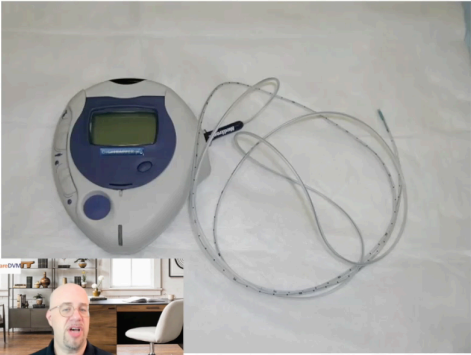
Wireless Ambulatory Esophageal pH Monitoring in Dogs with Clinical Signs Interpreted as Gastroesophageal Reflux

P.H. Kook, J. Kempf, M. Ruetten, and C.E. Reusch

So let's take a look at this canine study that highlights the frustration of clinical signs in patients with GERD. The investigators here studied seven healthy dogs and 22 client-owned dogs with clinical signs that were attributed to GERD. All of them underwent upper GI scoping and then a unique wireless system called the Bravo pH Monitoring System was placed in the distal esophagus.

The dogs were sent home and the owners were given digital buttons to push when they thought their dog was having clinical signs of GERD. They looked at the number of reflexes, the length of the reflux event, the fractional time spent at a pH less than four.

And you know what? There was no difference between the groups. So in short, this study highlighted the poor association between clinical signs in actual evidence of GERD.




- Capsules that transmit esophageal pH
- pH probes
- Impedance probes
 - Useful for neutral refluxate

Image credit: Dr. DV Wilson

And although we don't perform dual esophageal pH and impedance monitoring, which is what this equipment is here, it can be done in a couple of ways, actually.

Most of you have probably heard of and many may have even used the special capsules that we can pill our patients with that transmit esophageal pH information, but we obviously also have pH and impedance probes like the one pictured on your screen.

The sensor-tipped catheter is placed through the nose and fed into the esophagus, similar to how one would feed a nasal esophageal tube. So the tip of the catheter sits just proximally to the lower esophageal sphincter and remains to date, the gold standard for studying gastroesophageal reflux.



- Bravo pH Monitoring System
- Catheter-free
- 2 components
 - Small pH capsule the size of a gelcap that transmits data
 - Small wearable device that captures data
- Data downloaded to pH analysis software
- Only records pH data – no impedance data

A couple of slides earlier, we looked at a study of dogs that fit-- I'm going to stop this video just for a second, then I'll play it. Now we looked at a study that had dogs fitted with a Bravo pH Monitoring System.

Now, I suspect many of you have never heard of it or seen it in action. And while I don't have an animation of dogs and cats, I do have this one that I'm going to show you of a human patient. The process is essentially the same. So I'm going to play this video for you. There is no sound.

So what you just saw in the video was the placement of that Bravo pH Monitoring System. It's commonly used in you and me, in humans to document gastroesophageal reflux because the capsule is placed by esophagoscopy and then the patient wears a data capturing device that records only pH information.

Gastric perforation following endoscopic removal of a Bravo pH capsule in a cat

M Katherine Tolbert, Adesola Odunayo, Linden E Craig

First Published March 13, 2015 | Case Report | [Find in PubMed](#) | [Check for updates](#)
<https://doi.org/10.1177/1098612X15576588>



The Bravo pH Monitoring System has been used in cats, albeit infrequently. And at least in this case report, the removal of the capsule was associated with perforation of the stomach. So we still have some learning to do.

GER Morbidity



- Refluxate can be **acidic**, alkaline, or neutral in pH
- Consists of gastric acid and/or bile
- Tissues in contact with refluxate become inflamed, edematous, and/or ulcerated
- Primary cause of reflux is relaxation of LES associated with injectable & inhaled anesthetic agents

Why do we even care about gastroesophageal reflux? Put simply because it contributes to morbidity in our patients. And remember, refluxate doesn't have to be acidic. It can be alkaline. It can even be neutral.

But upon contact with refluxate, tissues readily become inflamed and edematous. And with severe reflux, tissues can become ulcerated. So where do we run into gastroesophageal reflux the most? Of course, it's during anesthesia. Both injectable and inhalant neither is immune, because these agents readily induce relaxation of the lower esophageal sphincter.

Our Patient Has GER...Now What?



- Signalment
 - Brachycephalic dogs
 - Somali cats
- Review drug history
 - Antibiotics (clindamycin, doxycycline), bisphosphonates, Ca²⁺ channel blockers, beta blockers
- Review history of recent sedation and/or anesthesia
- Physical examination
- Diagnostic testing

So how do we diagnose gastroesophageal reflux in our patients? It's always cliché when I say this out loud, but it's true. The first step is to thoroughly review your patient's history. All of it. Look at the signalment. Is your patient in over-represented breed, like a Brachycephalic dog or a Somali cat?

Look at drug history. Look for recent episodes of sedation or recent anesthesia events. Perform that complete physical exam. And let me put in a huge, huge plug here for auscultating not just the chest, but also the abdominal cavity. Listening for borborygmi and peristalsis is important.

And obviously, a complete physical exam may reveal some clues, and certainly a logical diagnostic investigation will hopefully be fruitful.

Regurgitation Ddx



- **Esophagitis**
 - Esophageal obstruction
 - Esophageal stricture
 - Esophageal diverticulum
 - Primary megaesophagus
- **Myasthenia gravis**
 - Systemic lupus erythematosus
- Toxicity
- Polyneuropathy
- Polymyopathy
- Dysautonomia
- Hypoadrenocorticism
- Pyloric outflow obstruction
- **Anesthesia**

When I think about common causes of regurgitation, the list that's on your screen is what comes to mind for me.

And even after all these years that I've been in practice, I still make out problem lists and all the associated differentials. It helps me work through my patient's issues. And if you think such a process would help you, then I encourage you to re-embrace the process to which we were all introduced in veterinary school. But of these, esophagitis, myasthenia gravis, and anesthesia are the top three that I see in my practice.