

ANORECTAL MANOMETRY DIAGNOSTIC INTERPRETATION GUIDANCE



A BRIEF LESSON ON
ANORECTAL PHYSIOLOGY
AND INTERPRETATION OF
DIAGNOSTIC RESULTS

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Introduction

Why Anorectal Manometry?

Anorectal Manometry testing is performed to evaluate the **function** of the anorectum in the process of defecation. It is a study utilized to identify patterns of abnormalities in muscular strength using pressure sensors on a catheter inserted into the anus and rectum. Thus, using a catheter placed into the rectum, the operator can manipulate the volume in the balloon, and the sensors on the catheter can sense the pressure. This pressure then translates to muscle strength/weakness.

Think of this real-world example: You are a mechanic, and the patient is coming to you stating there is a problem with their car; it's not working properly. The patient will state the problem (symptoms) the car (anorectum) is experiencing. Your job, as the mechanic (clinician) is to identify the problem using a diagnostics test (anorectal manometry) and perform a check on each component of the engine (anorectum). Once you identify the parts of the machine that are working/not working properly, then you can recognize a pattern which fits with the clinical problem and make appropriate recommendations.

In clinical terms, it is important to recognize that anorectal manometry is simply a tool. It should never replace clinical judgement. As in other aspects in medicine, 80-90% of the clinical diagnosis is made with the appropriate clinical history. Physical examination, diagnostic testing, etc. only makes up the additional 10-20% of the diagnosis. Thus, when incorporating anorectal manometry into your practice, it is very important not to abandon your clinical judgement when deciding as to what the diagnosis is; never rely solely on the results of a test. If the test doesn't make sense, disregard the results. Clinical history always trumps a test result.

For example, in the field of medicine, we have a tool (EKG). This is simply a tool. We use this tool for various clinical reasons (chest pain, shortness of breath, palpitations). Let's take this example of chest pain. You have 2 clinical scenarios for doing an EKG for chest pain:

- 1) A young, healthy, 20 year old girl with documented history of uncontrolled anxiety, comes to the hospital with acute, substernal, pressure like, non-radiating, chest discomfort associated with palpitations after breaking up with her boyfriend.

You obtain an EKG.

- What do you think is going on with this patient? [*clinical history is everything!]
- What do you expect to find on the EKG testing?
- What recommendations would you make based on the findings?
 - What if the EKG is normal?
 - What if the EKG is abnormal?

2) An elderly, 80 year old, veteran, with history of hyperlipidemia, poorly controlled type II diabetes, hypertension, and longtime smoking, comes to the hospital with sudden, acute, substernal, pressure like, non-radiating, chest discomfort with associated diaphoresis, nausea, and dyspnea. You obtain an EKG.

- What do you think is going on with this patient? [*clinical history is everything!]
- What do you expect to find on EKG testing?
- What recommendations would you make based on the findings?
 - What if the EKG is normal?
 - What if the EKG is abnormal?

The point to make here is, all diagnostic testing in medicine is just that-- **a TOOL**. It should **never** replace good clinical history and sound judgement. The tests we have available should only be used as a data point to confirm or refute our hypothesis. We should never entirely rely on the results of a single test. And, if the data does not fit with the clinical history, then either further testing should be done, or the aberrant data should be disregarded.

The practical implication of this is:

1. Set the stage when performing anorectal manometry. Is the test being done for constipation? For fecal incontinence? For routine pre-operative evaluation? This will help determine what you are looking for in the results of the testing. In the example above, are you doing the EKG for chest pain (looking for signs of MI? looking for tachycardia in an anxious patient?), shortness of breath (looking for PE?), palpitations (looking for arrhythmia?) or routine pre-operative reasons (expecting it to be normal?).
2. Use the tool to help you identify what you think is actually going on. In the example above, look for tachycardia in the young girl who may be having a panic attack. Look for ST elevations/depressions for the elderly veteran who may be having an MI.

3. Disregard any signals that don't make any sense. What if the young girl has ST depressions? Would you send her straight to an invasive test with risks (e.g. cardiac catheterization)? What if the elderly veteran has a normal EKG? Does that mean he does not have an MI?
4. Make recommendations based on clinical history, sound judgement, utilizing data that fits, while disregarding data that does not fit. Maybe give the young girl an anxiolytic and monitor her response. Maybe give the veteran an ASA, put him on oxygen, give him some morphine, administer nitroglycerine, and consult a cardiologist for potential acute coronary syndrome.

Again, the point of this is to illustrate that anorectal manometry is an essential tool when treating patients with anorectal dysfunction and can provide powerful information (similar to an EKG in the field of Cardiology). However, at the end of the day, a good clinical history and sound clinical judgement is always necessary and cannot be replaced by a single diagnostic test.

Anatomy and Physiology of the Anorectum

The anorectum is made up of FOUR key components. Each component has within it, a neuromuscular unit. It is important to take a step back and understand what that means.

To have proper muscle function, you need to have an intact muscle and intact neural input. Meaning, the muscle must be without defect, and the electricity to that muscle needs to be working. If EITHER is diseased, then the end result will be dysfunction of that muscle. For example, if you cut, rip, or tear a muscle, it doesn't matter if the nerve is working, that muscle will not produce tension/pressure/work. Similarly, if the muscle is fine, but the nerve to that muscle is cut/diseased/paralyzed, then that muscle will not produce tension/pressure/work. Thus, for the muscle to produce a "pressure" you need to have an intact neuromuscular unit. If there is a myopathy or neuropathy (or both) then the result will be muscle dysfunction.

In anorectal manometry, the test checks for muscle pressure. In order to generate muscle pressure, you must have a functioning neuromuscular unit. So, this test can tell you if the muscle is working or not. It cannot tell you **why** the muscle is not working. To understand if this is myopathic or neuropathic you must rely on clinical history and/or other testing.

Let's look at the various components of the anorectum:

Internal Anal Sphincter (IAS)

External Anal Sphincter (EAS)

Puborectalis Muscle (PRM)

Rectal wall

RAIR

Internal Anal Sphincter: This muscle is made of **smooth muscle**, is innervated by the **autonomic nervous system**, and is considered **involuntary**. This means that any disease or drug that affects the smooth muscle will affect its function. Furthermore, any disease that affects the autonomic nervous system will result in muscle dysfunction. Patients do not have control over this muscle (can't squeeze or relax this muscle on command). This muscle strength corresponds to the **resting pressure** on the report.

External Anal Sphincter: This muscle is made of **skeletal muscle**, is innervated by the **pudendal nerve**, and is considered **voluntary**. This means that any trauma to the muscle will affect its function. Furthermore, any disease that affects the pudendal nerve will result in muscle dysfunction. Patients have control over this muscle (they can squeeze or relax on command). This muscle strength corresponds to the **squeeze pressure** on the report. It is important to note here that the external anal muscle "cups" the internal anal sphincter. Very similar to a cone in a cup. Thus, when you see below the **green balloon catheter** in the diagram, you can understand why the external sphincter pressure that is recorded **includes** the internal sphincter muscle pressure (again, due to the anatomy). Thus, the take home message here is that the pressure reading on the report for "squeeze pressure" which corresponds to the external anal sphincter pressure, can never be less than the resting pressure, which corresponds to the internal anal sphincter muscle.

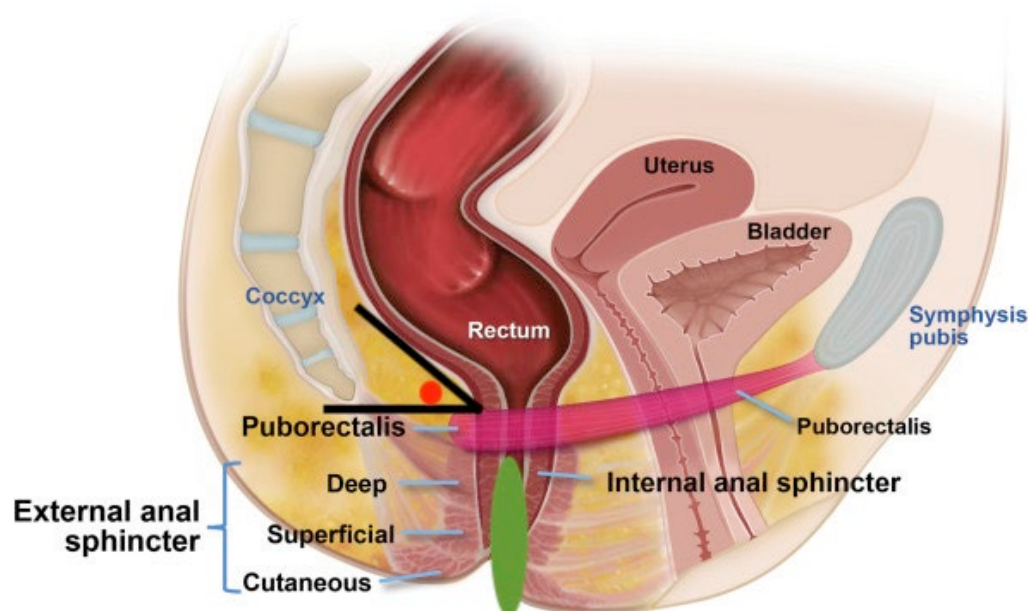
Puborectalis Muscle: This muscle is made of **skeletal muscle**, is innervated by branches of the **pudendal nerve**, and is considered **voluntary**. This muscle can be controlled by patients on command. This muscle originates from the pubis symphysis courses behind the rectum, and re-inserts back onto the pubis symphysis; essentially making a "sling" around the rectum. This muscle is responsible for maintaining the "**anorectal angle**". At rest, this muscle is "tight" making a "kink" in the rectum, thereby, preventing the rectum from being "straight" and allowing stool to pass through. The "kink" is an acute angle formed between the anal canal and the rectum, at rest. During defecation, this muscle relaxes and makes the angle more obtuse or "straight", thus allowing for easy passage of stool from the rectal compartment into the anal canal. See the angle below made by the two black lines and the angle denoted by the **red dot**.

Rectal Wall: The muscle we are referring to here is the **smooth muscle** layer of the rectal wall, innervated by the **entero-enteric & autonomic nervous systems**, and is considered involuntary. This means that any surgery to the rectum, disease or drugs that affect smooth muscle or autonomic nervous system will result in muscle dysfunction. The key to understand here is that the rectal wall has nerves within the smooth muscle wall (entero-enteric nervous system) which can detect "stretch". Thus means, when the rectum fills with stool, the muscle is stretched, and the nerves within the muscle (entero-enteric nerves) are "activated" and send an action potential to the spinal cord to signal the presence of stool within the rectal vault. Thus, the rectal wall is a key component to the first step in nerve signaling for the defecation process. It is also important to note here that for the nerve to "fire" there must be a "**dynamic**" stretching that occurs. Meaning, the

rectal wall must stretch abruptly in order to fire the signal. If this is done in a too slow and gradual manner, this gradual distension does not result in a "fire" in the signal. Instead, you get accommodation, which is the natural blunting of this signal.

RAIR: This stands for the recto-anal inhibitory reflex. This "circuit" is made up of the "afferent" signal and the "efferent signal". The afferent signal is the signal from the rectum to the spinal cord (telling the spinal cord that there is stool in the rectal vault). The efferent signal is the signal from the spinal cord to the internal anal sphincter (telling it to relax due to the presence of stool in the rectal vault which needs to be defecated). If either part of this circuit is disrupted, you end up with an "absent" RAIR. If the whole circuit is working properly, you get a "present" RAIR. Again, it is important to remember that accommodation, up to higher triggering volume, can result in the absence of the afferent signal, which would result in an "absent" RAIR. Similarly, any injury to the spinal cord can result in an "absent" RAIR. Finally, any disease which affects the nerves can result in an "absent" RAIR. Thus, an "absent" RAIR does not always mean Hirschsprung's disease. In fact, because Hirschsprung's disease is so low in prevalence in the adult population, if you detect an "absent" RAIR, it is more likely another cause (listed above) rather than true Hirschsprung's disease. Like getting a high gastrin level on a patient and thinking the patient has ZE syndrome. Probably not. Likely due to H. Pylori or PPI use. Because ZE syndrome itself is a rare disease.

Essentially, when you are looking at an anorectal manometry report, you are checking each of these components individually. Except, you cannot measure the puborectalis muscle pressure.



Defecation Process

Now that you understand the anatomy and what each part of the engine does, let's quickly look at how the engine "works". During this time, I want you to envision a tube of toothpaste, held upside down, with the tube kinked.

Steps for defecation

1. Stool enters the rectum (**toothpaste enters the tube**)
2. The presence of stool in the rectum causes the rectal wall to stretch
3. This dynamic stretch results in an action potential firing from the rectal wall to the spinal cord (**AFFERENT SIGNAL**)
4. The spinal cord then sends a signal to the internal anal sphincter muscle, telling it to relax (**EFFERENT SIGNAL**) (**the nozzle of the toothpaste gets wider**)
5. Now, the patient has stool in the rectum, and the internal anal sphincter muscle is relaxed. The patient has a choice to make:
 - a. If the patient wants to defecate, then they must do the following:
 - i. Relax the external anal sphincter (**unscrew the tube's cap**)
 - ii. Straighten the anorectal angle by relaxing the puborectalis muscle (**straighten the tube**)
 - iii. Increase intra-abdominal pressure/rectal pressure high enough to overcome the anal canal pressure (**squeeze on the toothpaste tube hard enough to generate a pressure higher than the nozzle pressure with the cap unscrewed to release the toothpaste**)
 - b. If the patient does NOT want to defecate, then they must do the opposite:
 - i. Tighten the external anal sphincter (**screw the cap on tighter**)
 - ii. Kink the anorectal angle by tightening the puborectalis muscle (**kink the tube more**)
 - iii. Decrease intra-abdominal pressure/rectal pressure low enough so as to not to overcome the anal canal pressure (**relax the grip on the toothpaste tube enough that the pressure in the tube is lower than the nozzle pressure with the cap screwed on tightly to keep the toothpaste in the tube**)

So, when a patient tells you they have "constipation" they are essentially telling you that they can't get the toothpaste out of the tube. If they tell you, they have "fecal incontinence" they are telling you that the toothpaste is leaking out the tube. You can use the anorectal manometry to test the strength and function of the various components of the anorectum to figure out what is wrong.

Limitations of Anorectal Manometry Testing

So, now you know the concept. You understand the anatomy and physiology involved. You understand the process of how defecation works. You understand how to apply this test. It is now important to know, what the anorectal manometry CAN do and what it CANNOT.

The anorectal manometry CAN:

- Tell you if the IAS is tight or loose (RESTING PRESSURE)
- Tell you if the EAS is tight or loose (SQUEEZE PRESSURE)
- Tell you whether the RAIR is present or not (RAIR)
- Tell you if the patient has normal rectal sensation, blunted rectal sensation, or visceral hypersensitivity (BALLOON VOLUMES)

The anorectal manometry CANNOT:

- Measure the anorectal angle (which checks the function of the puborectalis muscle)
- Tell you if the patient has a neuropathy or myopathy
- Tell you if the patient has coordinated defecation**

Remember, the anorectal manometry test checks for pressure and sensation only.

So what other tests are available?

Balloon Expulsion Testing: This checks for coordination of defecation. In order to perform this test, the clinician inserts a warm, water filled balloon with 50cc of water/saline (50cc air fill may also be used but water is preferred). Then the patient goes to the bathroom and tries to "defecate" the balloon out. If they can accomplish this under 2 minutes (usually just takes under 1 minute), then they "pass". If they cannot, then they "fail".

Defecography: This checks for internal/external anatomy (e.g. rectocele, etc.) and can identify rectal prolapse. It has the added value of being able to measure the anorectal angle formed by the PRM at rest and during defecation. Thus, it is an anatomic and functional test of the anorectum. It is performed by Radiology.

Endoscopic Ultrasound: Checks anatomy/integrity of the IAS, EAS, and rectal wall. Since this is essentially a flexible sigmoidoscopy, the rectal wall can also be examined for diseases such as proctitis, etc. This test is usually performed by Interventional Gastroenterologists.

Pudendal Nerve EMG: Checks for pudendal nerve function to the EAS, PRM. This test is usually performed by trained physical therapists and can be readily found at your local spinal cord injury center.

** You can get a sense of the defecation process using the gradients on the report. However, in order to formally study defecation, especially if in doubt, then a formal balloon expulsion testing is required.

Reading A Report

In a separate section, you will find a reporting document which compiles the information below. With practice, reading a report can be quick, easy, and fun!

One important point to make when interpreting muscle pressure. Let's take a step back and imagine you are in the gym. You are getting ready to bench press. If your muscle "works" then you should have no problem bench pressing a bunch of times. Now, during the process of bench pressing, you may want to know what your "max" is; that is, the maximum amount of weight you can bench press. At the end of the session, you can generate a data set from your performance. This data set can include a **MEAN** (which is simply an average of all the different weights you were bench pressing), a **MAX** (which is simply the maximum weight you were able to put up during the session). Now, if you were lazy during some of the reps, that may bring down the "average". However, that doesn't mean you were weak, if you had a good "max". In other words, if the max pressure is high/normal, then it tells you that the muscle is working. On the other extreme, if you had a ripped pectoralis major, then you wouldn't be able to bench much at all. Thus, your "average" and your "max" would both be low. Thus, you can use the "mean" or the "max" to determine if the muscle pressure is appropriate or not when reading a report. When we look at the reports, we are just checking to see if the muscle works or not. And if it works, does it work in the normal range or not.

Also, another important point to make: You want to get into the habit of reading a report the way a radiologist reads a report. First, the radiologist has a list of the things they see. These are the findings. Then at the end, there is an impression. This is what the radiologist thinks the findings mean. Try to keep them separate. The first part, you are just identifying the data. Later, you will interpret the data. And finally, you will make recommendations based on your interpretation. If you are systematic in your approach, it will keep things moving smoothly.

Now, let's get into the steps!

1. Identify the reason for the testing; this sets the stage for your interpretation!
2. Look at mean resting pressure (IAS)
3. Look at mean squeeze pressure (EAS)
4. Look at anorectal gradient (pressure differential that promotes defecation; if positive, then pressures normal at directing stool out of the rectum; if negative,

then forces are working against defecation; this is not normal. If it is "negative" then you may want to go one step further and figure out why. **See below.

5. Look at exhale mean (gives you sense of spinal cord reflex without rectal stimulation to see if EFFERENT autonomic nerves are intact; when you cough, your IAS should contract since this is reflexive impulse sent from spinal cord to maintain continence regardless of whether stool is in the rectal vault or not); thus, normal is roughly higher than resting pressure.
6. Look at RAIR (if present then stop/normal; if absent look at the Sensation graph; during a blue spike [rise in rectal pressure from balloon], you should see a reflexive "dip" in anal pressures from baseline [the other 4 color lines immediately following]. This is the "spike and dip"*** pattern you want to see.
7. Look at Sensation section, RB volume row and various columns (last page of report) and approximate using my "30-60-90" rule. Ask yourself, is it around 30-60-90? Or are the values "shifted" higher or lower? Too high means that it took more than normal amount of volume to detect stool in the rectal vault; the patient has a "blunted" rectal sensation. Too low means that it took less than normal amount of volume to detect stool in the rectal vault; the patient has visceral hypersensitivity (e.g. proctitis, IBS, etc.)

** In general, when the gradients are negative, you can stop. The patient has dyssynergic defecation. Treatment is biofeedback therapy. However, if you want to be more advanced, then pay attention:

- The gradient is simply a measurement of the pressure difference between the rectal vault and the anal canal. If you want to get toothpaste out of the tube, then you need to relax the nozzle and squeeze the tube hard enough to generate a positive pressure difference, so that the toothpaste wants to exit the tube from this force. Thus, $\text{GRADIENT} = \text{RECTAL PRESSURE} - \text{ANAL PRESSURE}$. When positive, the forces are working to get the toothpaste OUT. When negative, the forces are not strong enough, and thus, toothpaste stays inside the tube.
- Expel FULL/EMPTY. This measures how well the patient can defecate if the toothpaste tube is "brand new" with "lots of toothpaste in the tube" [EXPEL FULL] or towards the end, when you have used up most of the toothpaste, and there is "little toothpaste left inside the tube" [EXPEL EMPTY]. Ideally, if your machinery works well, it shouldn't matter if the tube is full or towards the end. Thus, you should have a "positive" result in BOTH expel full and expel empty. If the machine works, it works. Thus, the values are CONCORDANT. However,

sometimes you may run into a situation where the values are DISCORDANT (one is negative, and the other is positive). This situation can be helpful in making recommendations to a patient. For example, let's say the patient has a normal expel full, but an abnormal expel empty. Well, that tells you when the rectum is "full" it works, but it doesn't work so well when its "not full". Thus, you can therapeutically target that patient to always have a "full rectum" by giving them a nondigestible fiber and therefore, increase the bulk in their rectum. Alternatively, if you have the opposite situation, where expel empty is positive, but expel full is negative, then you can suggest a low fiber regimen. Thus, you target them to be in the state that is positive.

- Now, you can also see the reason for dyssynergic defecation in order to subclassify what *type* of dyssynergic defecation the patient has. This is not usually necessary, since treatment again, is the same (biofeedback) and serves a more academic purpose. But here we go (for you over-achievers):
 - Step 1: Compare the anal pressure (in your data set) to the resting pressure (IAS). Remember, NORMAL defecation involves RELAXING the anal canal (unscrewing the nozzle). Thus, if you see that in the data set, that the anal pressure IS NOT lower than the resting pressure, this is ABNORMAL. Even if the pressure stays the SAME, this is ABNORMAL. So, if anal pressure GOES UP or STAYS THE SAME, this is DYSSYNERGIC.
 - Step 2: Look at the rectal pressure. The rectal pressure should be HIGHER than the resting anal pressure (IAS). If the patient has a poor effort and does not generate a high enough abdominal/rectal pressure, then even if the anal pressure relaxes, they are not squeezing the toothpaste tube hard enough to get the toothpaste out.
 - Thus, you can have dyssynergic defecation if 1) you don't unscrew the cap/nozzle enough, or 2) you don't squeeze the tube hard enough, or 3) BOTH! Either way, the patient has to "re-learn" this process through biofeedback.

*** Below you will see a graph for identifying a RAIR. The x axis is just time. The y axis corresponds to "volume" and "pressure". Volume of the rectal balloon that the operator is inflating. And pressure that the sensor is reading within the anal canal. When the operator inflates the rectal balloon, distends the rectum, you would expect that if the RAIR is present, then the corresponding anal sensors should record a "drop" in the anal pressure. Thus, you are looking for a "spike" in the rectal balloon tracing, followed by a "dip" in the various colored anal pressure color lines following that.

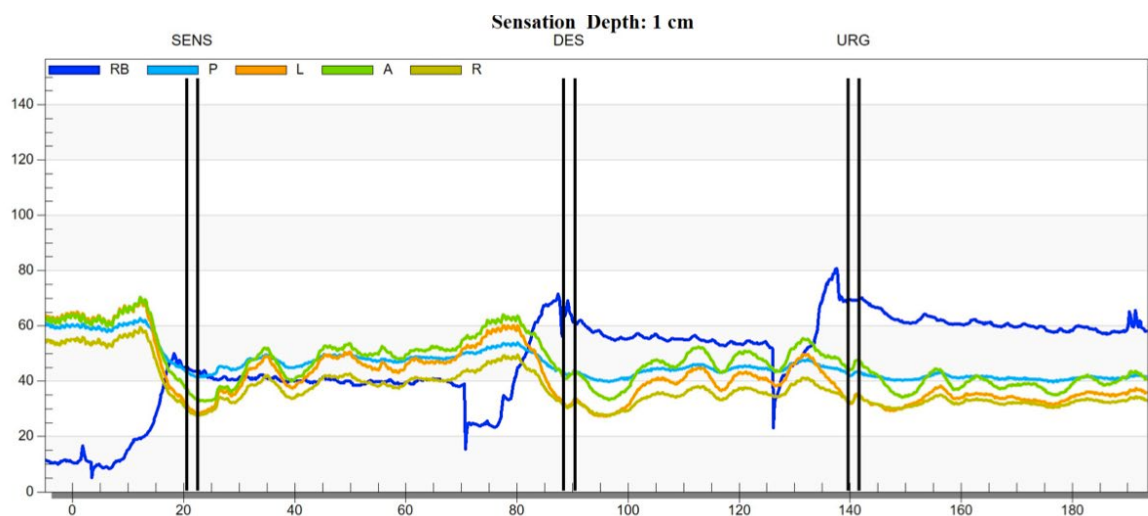
DARK BLUE= RECTAL BALLOON

LIGHT BLUE = Posterior anal sensor

ORANGE = Left anal sensor

GREEN = Anterior anal sensor

YELLOW = Right anal sensor



Notice how when the dark blue line goes up (rapidly), you get a drop in the colored lines (like a cup). This is the "SPIKE AND DIP" pattern. Remember, the phenomenon of accommodation. If you inflate the rectal balloon TOO SLOWLY (and don't produce the rapid spike upward), you may not get a reduction in anal pressure, because you did not "trigger" the RAIR due to accommodation. Thus, it is important to RAPIDLY increase the rectal balloon pressure during this part of the examination.

Impressions / Recommendations

Now, you have gone through the report. You have entered the data in the appropriate sections of the "Findings". Now, you are ready to apply your knowledge and make an interpretation. Here we go!

First, always document whether the quality of the study is good or not. Like a colonoscopy, if the bowel prep was terrible, how can you conclude anything in the rest of the study? Same here. If the patient was uncooperative, or if the testing did not go well, it is important to make a note of that very important caveat, so you do not draw inappropriate conclusions.

IAS: Is it weak? Is it spastic? Or normal? (this is resting pressure)

EAS: Is it weak? Or normal? (this is squeeze pressure)

Expulsion: Is it normal? Or dyssynergic? (this is gradient)

Cough Reflex: Is it present? Or absent? (this is exhale man, checking efferent nerve signal)

RAIR: Is it present? Or absent? Or Inconclusive [can't tell because wasn't done right]?

Rectal Sensation: Is it normal? Blunted? Visceral Hypersensitive?

Once you do enough, you will start to notice patterns of injury. Often, you will see that some patients have more than one thing going on. Sometimes, you will need additional testing to reach a conclusion. Sometimes, you may need to repeat the study. Each situation will be different. But with careful clinical history, sound judgement, using this tool, you will make more informed decisions when treating patients with anorectal disorders!

Here is a list of some things to consider recommending:

Fiber: Consider whether the patient may benefit from more fiber or less fiber in their diet. Looking at expel full and empty can be useful here.

Biofeedback Therapy: Generally useful when dealing with patients with dyssynergic defecation. Negative gradients.

Kegel Exercises: Consider this in patients who demonstrate weakness in the anal sphincters (IAS/EAS)

Anal Cotton Plugs: Exactly what it sounds like. Having the patient place a cotton ball into the anal canal can help "plug up" a leaky dam. It is only temporary but can provide a world of difference to patients suffering from fecal incontinence, smearing, and such. Patients can place this inside, go about their business, then when they go to bathroom, will defecate this out, finish their business, then replace a fresh plug. Simple and effective.

Rectal EUS: Helpful if suspect anal muscle damage. Instead, could also get pelvic MRI.

Pudendal EMG: Checks whether the pudendal nerve is working or not.

Defecography: Useful when needing to know anatomy or physiology of the anorectum. Done by radiology.

Stimulator trial: Useful in patients with fecal incontinence and low IAS/EAS pressures.

Topical NTG or Diltiazem: Useful in patients with anal spasm (high IAS).

Tricyclic Antidepressants: Useful in patients with visceral hypersensitivity.

Continued clinical follow up: Yup. Just giving it time and following clinical course is appropriate sometimes.

Repeat study: Can be useful to follow progress of treatment or to repeat analysis when patients are not responding to treatment protocols.

Anorectal Manometry Report



ANORECTAL MANOMETRY REPORT

Patient Name _____ Patient ID _____

Date of Birth _____ Age _____ Sex: ☐ Female ☐ Male

Study Date _____ Referring MD _____

Performed by _____ Interpreted by _____

Indication:

- ☐ Fecal Incontinence
☐ Constipation
☐ Other _____

ICD-10 Code(s): _____

Procedure:

Informed consent was obtained.
Patient was placed in the lateral position.
A catheter was placed into the rectum and its position was determined by manometry.
Assessment of anal sphincter function, rectal sensation and compliance, and stimulated defecation were evaluated. Patient tolerance was:

- ☐ Good
☐ Fair
☐ Poor

3. Sensation

Rectal Sensation:

Sensation: _____ cc (M 30-58cc, F 30-60cc)*
Desire: _____ cc (M 60-100cc, F 60-108cc)*
Urgency: _____ cc (M 100-170cc, F 88-160cc)*
Pain: _____ cc (M 130-180cc, F 100-170cc)*

Recto Anal Inhibitory Reflex (RAIR) was:

- ☐ Present
☐ Absent

Findings:

1. Resting

Mean resting anal pressure = _____ mmHg
(Male 64-88 mmHg, Female 44-90 mmHg)*

2. Squeeze

Mean squeeze anal pressure = _____ mmHg
(Male 174 and higher, Female 123 and higher)*

Anal Pressures were:

- ☐ Symmetric
☐ Asymmetric

With decreased pressure in:

- ☐ Posterior Quadrant
☐ Left Quadrant
☐ Right Quadrant
☐ Anterior Quadrant
☐ N/A

Squeeze Duration was _____ seconds

4. Expel Empty

Rectal Pressure

- ☐ Increase seen during bear down
☐ Decrease seen during bear down

Anal Pressure

- ☐ Increase seen during bear down
☐ Decrease seen during bear down
☐ No change during bear down

5. Expel Full

Rectal Pressure

- ☐ Increase seen during bear down
☐ Decrease seen during bear down

Anal Pressure

- ☐ Increase seen during bear down
☐ Decrease seen during bear down
☐ No change during bear down

* - Refer to the mcompass® Normal Values table for gender / age-based ranges

ANORECTAL MANOMETRY REPORT



Interpretation:

1. Resting

Resting pressures were:

- ☐ Normal
- ☐ Low
- ☐ High

2. Squeeze

Squeeze pressures were:

- ☐ Normal
- ☐ Low
- ☐ High

Asymmetry was:

- ☐ Present
- ☐ Not present

Early squeeze fatigue was:

- ☐ Present
- ☐ Not present

3. Sensation

Rectal Sensation was:

- ☐ Normal
- ☐ Hyposensitive
- ☐ Hypersensitive

Recto Anal Inhibitory Reflex (RAIR) was:

- ☐ Present
- ☐ Absent

4 & 5. Expel Empty & Expel Full

Dyssynergia on push maneuver was:

- ☐ Present
- ☐ Absent

As seen by an Anal Pressure:

- ☐ Increase
- ☐ Decrease

with Intrarectal Pressure (bear down force) as:

- ☐ Adequate
- ☐ Inadequate

6. Exhale (Cough)

Cough Reflex was:

- ☐ Present
- ☐ Absent

7. Quick RAIR (Optional)

Recto Anal Inhibitory Reflex (RAIR) was:

_____ %

Conclusions & Recommendations:

This may include recommendations such as:

Fiber, Biofeedback Therapy, Kegel exercises, Rectal EUS, Anal Cotton Plugs, Pudential EMG, Defecography, Interstim Trial, Topical NTG Cream, Tricyclic Antidepressant, Continued Clinical Follow Up, Repeat Study

Signature: _____ Date: _____

* - Refer to the mcompass® Normal Values table for gender / age-based ranges

MK-0042-004

Clinical History

Some clinical pearls to consider when taking a history of patients with various symptoms. This may help guide your analysis and recommendations.

Constipation:

How long has this problem been going on?

What do you mean when you say constipation?

Do you mean the stools are infrequent?

Do you mean the stools are hard?

Do you mean that you have to strain to defecate/poop?

Have you started any new medications which may have caused this?

Have you been checked for other conditions? Thyroid, DM, calcium, celiac, etc.

Do you have any uncontrolled medical conditions? Parkinson's, Alzheimer's, Huntington's, DM?

Have you had age-appropriate colon cancer screening?

Fecal incontinence:

How long has this problem been going on?

What do you mean when you say incontinence?

Do you ever get warning that you have to go?

Are you describing fecal urgency?

Are you having loose stools? Bloody?

Have you had prior surgery? Hemorrhoids? Anal fissure surgery?

Have you had vaginal childbirths? Were any of them traumatic requiring an episiotomy?

Do you have leakage at rest? With coughing?

Do you have urinary issues also? Incontinence?

Do you have associated, uncontrolled medical conditions? DM? Spinal issues/nerve problems?

Any risk for pudendal nerve injury?

Closing

Hopefully this quick run-down better equips you to handle patients with anorectal dysfunction. Understanding the anatomy, physiology, and the key components of the defecation process is important. Remember that **clinical history is everything** and is required regardless of test results. Being systematic with your approach to interpretation is essential. Remember the uses and limitations of anorectal manometry testing. Always consider adjunctive testing when diagnosis is in doubt. Hopefully this guide will serve as a useful reference tool in your journey to caring for these patients!

Always reach out to your Medspira representative and clinical experts for more information if needed. Plenty of additional reading material regarding these topics can be found on society websites, such as American College for Gastroenterology. Consider further training in Motility, as this is a subspecialty within Gastroenterology, and is constantly evolving.