

# Do We Need Anorectal Physiology Work Up In The Daily Colorectal Praxis?

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## Abstract

**Objective:** The aim of this article was to discuss the different advantages and disadvantages of the various tests in the colorectal practice and to compare them with practical clinical examination.

**Design:** Patients with severe constipation, fecal incontinence and anorectal pain of unknown origin were tested. Clinical diagnosis was compared to the results received by physiologic tests.

**Results:** Between January 1999 and June 2001, 2942 patients have been seen in our proctological outpatient department. Of these, 75 had severe constipation, 110 fecal incontinence and 18 patients severe anorectal pain. Out of these 203 patients, 193 (95,0%) agreed to a further work up. In 135 patients (70,1%) the diagnosis was confirmed. However, in 58 patients ( 29,9%) the treatment plan was changed due to the physiologic data obtained.

**Conclusions:** Physiology work up is not routine in daily colorectal praxis, but should be done in patients with functional disorders.

## INTRODUCTION

In the last decades, numerous physiologic tests have been invented<sup>1,2,3</sup>. While several centers still refuse physiologic testing, others are enthusiastic. Therefore, the aim of our study was to consider advantages, disadvantages and practicability and to compare the results of a “working diagnosis” without physiologic tests with the “final diagnosis” made by including physiologic test results.

It is obvious that our understanding of anatomy and physiology of the colon, rectum and pelvic floor is still lacking. However, we have a basic idea of the organs and their function: the colon is responsible for water absorption, the rectum has storage function, the pelvic floor muscles fixate the genital organs and the sphincter muscles close the anus. The truth is, that several factors are responsible for maintaining continence (Table1). Continence itself is a dynamic process and therefore adaptation, reorganization of the various body parts must be done continuously. To evaluate the current status of continence three options are available: history, clinical examination and physiologic tests.

## Figure 1

Table 1 : Continence factors

Stool volume and consistency
Small bowel transit
Colon transit
Distensibility, tone and capacity of the rectum
Motility and evacuability of the rectum
Anorectal angle
Anorectal sensory and reflex mechanism
Motility of the anal canal
Anal canal high pressure zone
Pelvic floor and sphincter muscles

## HISTORY

When dealing with functional disorders an exact history is important. Every patient should be asked about food and dietary intake as well as bowel function, stool frequency and consistency. Constipated patients may complain about nausea and bloating as signs for whole large bowel disorder. Pressure in the pelvis and/or inability to evacuate can be a hint for pelvic outlet obstruction. Incontinent patients should be asked about the grade of incontinence, wearing pads and social impairment. Incontinent and constipated patients may

benefit from scoring systems <sup>4,5,6</sup>. It is worth mentioning that 43% of patients with constipation had a previous hysterectomy <sup>7</sup>.

### CLINIC

Basic clinical examination consists of inspection, palpation and proctoscopy. Many proctological diseases can be diagnosed by inspection alone such as fistulas, fissures and external hemorrhoids. In incontinent women the short distance between the anus and the vagina can be the first sign for a suspected sphincter defect. Before we start our rectal-digital examination, we ask the patient to squeeze and push to diagnose a perineal descent or a rectal prolapse. During rectal-digital examination the whole circumference of the anal canal must be palpated. Induration as a sign for inflammation, a pouching rectocele, painful areas (e.g. anal fissures) or a malignant tumor can be felt. It is wise to assess the functional status of the sphincters during the rectal-digital examination by asking the patient to squeeze and push. Especially anterior sphincter defects or paradoxical contraction of the puborectalis muscle can thus be easily diagnosed.

### GENERAL CONSIDERATIONS FOR PHYSIOLOGIC TESTING

To discuss the necessity of physiologic tests, we have to define our expectations for any clinical test. The following criteria are set:

1. The test should be feasible and widely available.
2. The test should be easy to tolerate for the patient.
3. The test should be helpful in the diagnosis and/or management of the relevant disorder.
4. In healthy patients a normal range should be available.
5. Measurements outside the normal range should correlate with the disease.

Opponents of physiology testing will argue that none of this mentioned criteria would be fulfilled by physiologic tests. But let us look closer to the arguments against physiology testing:

a) **AVAILABILITY:** It is estimated that about 0,5% - 1% of the whole population is suffering from fecal incontinence <sup>8</sup>. Constipation disorders are probably more common and should reach up to 10% of the normal population <sup>9</sup>. Thus

clinicians around the world are called upon to assess and to treat patients with such disorders. Probably many patients will be treated successfully without the use of a physiology laboratory.

b) **RELIABILITY:** Current anorectal physiology measurement techniques involve the insertion of probes, transducers, needles, tubes or liquids into the rectum or anal canal <sup>10,11,12</sup>. Any such foreign material will alter normal physiology. Furthermore we know that any measurement can only give the current status of the anorectum, but in clinical praxis more often long-term function is of interest.

c) **NORMAL VALUES:** AM is a useful test, but it is accepted that every lab has its own normal range. This is due to different diameters of catheters and techniques (water-perfused, pull through technique etc.). Thus data from different clinics are not comparable <sup>13</sup>. Concerning DEFA measurements of the anorectal angle are not reliable <sup>14</sup>.

d) **DIAGNOSIS:** Colorectal surgeons have always used their well educated index finger to assess abnormalities of the anorectal region. There are several reports in the literature that AM is not better than digital examination <sup>15</sup>. Furthermore, anterior sphincter defects can also be palpated as an immobile segment of the external sphincter during voluntary contraction during digital examination.

e) **CLINICAL CORRELATES :** There is no evidence that anorectal measurements predict the response to surgical intervention in borderline cases. In clinical obvious cases, measurements can only confirm the estimation done with digital examination and exact history.

Argument for physiology testing are as follows.

a) **COMPLEXITY:** Anorectal physiology measurements are of value in the diagnosis of disorders of the pelvic floor. These disorders can be similar, but present different physiological abnormalities and demand different treatment options. If physiologic work up is done, it should be said that it is important that no test alone is pathognomic and therefore the most important tests should be done and interpreted collectively.

b) **FORENSIC IMPLICATION:** A well-educated index finger may be of use in the diagnosis but will not help very much in a trial. Therefore manometry data are useful in the evaluation of incontinence, before a coloanal anastomosis is being performed or before potentially jeopardizing anorectal operations are done.

c) CONSTIPATION: Several diseases can only be diagnosed and treated with physiology means.

- Paradoxical puborectalis contraction, suspected on clinical examination, can best be diagnosed by DEFA and EMG with a painless sponge electrode <sup>16</sup>.
- Hirschsprung's disease: Usually this disease is diagnosed during childhood. However, sometimes patients with ultrashort Hirschsprung's disease can be seen. Looking for the rectoanal inhibitory reflex is very easy and if positive excludes an aganglionic segment. Thus a full thickness rectal biopsy as first line diagnostic tool can be avoided.
- Perineal descent : This entity can occur due to aging, perineal trauma or repeated straining at stool. Plugging of the anal canal by rectal mucosa due to an intussusception can lead to a vicious cycle demanding more straining resulting in full thickness rectal prolapse. Physiologic tests can lead you in the direction of appropriate treatment.
- Colonic inertia : chronic idiopathic constipation is a rare, but severe disease mostly in young women. Colonic transit studies can help making the decision for a big operation. AM and DEFA can help to diagnose a mixed pattern of colonic inertia and pelvic outlet obstruction, which should firstly be treated conservatively <sup>17</sup>.

d) FECAL INCONTINENCE: Patients with incontinent problems can profit from physiology evaluation. Especially the differentiation between isolated or multiple defects in the anal sphincter is of enormous importance. Furthermore , when a defect is present, training programs might not be successful. On the other hand, patients with neurogenic incontinence may be offered a more sophisticated operation like SNS (sacral nerve stimulation), artificial bowel sphincter or stimulated graciloplasty.

### SPECIAL PHYSIOLOGIC TESTS

There are several physiologic tests nowadays available (Table2). The most common ones are listed below.

**Figure 2**

Table 2 : Physiologic tests

Anal manometry
Defecography
Endoanal ultrasonography
Pudendal nerve terminal motor latency
EMG of the pelvic floor
Balloon expulsion test
Electrosensitivity study
Fecal flowmetry
Scintigraphic rectal evacuation study
etc.

### ANAL MANOMETRY (AM)

AM is most useful to get objective data on patient's anal pressures. Mean and maximal resting pressures reflect the status of the function of the internal sphincter ; mean and maximal squeeze pressures of the external sphincter muscle. Furthermore the length of the high pressure zone, the recto-anal-inhibitory reflex ( sampling reflex) , rectal sensibility and capacity as well as the rectal compliance can be estimated <sup>18</sup>.

### DEFECOGRAPHY (DEFA)

DEFA is a dynamic investigation which can influence surgical decision making in constipated patients. The presence or absence of sigmoidoceles, rectoceles, intussusception or prolapse can be noted. Adequate or improper function of the puborectalis, anal canal opening, anorectal angle and grade of emptying of the rectum will all be assessed <sup>19</sup>. Concerning important decision making (e.g. operation) this test is quite reliable <sup>20</sup>.

### ANAL ENDOSONOGRAPHY (EAUS)

EAUS is the most important test to rule out structural lesions in fecal incontinent patients such as isolated or combined sphincter muscle defects. The investigation is simple, painless , accurate and can be repeated, if necessary. Furthermore it is used for follow up after surgical correction of fecal incontinence <sup>21</sup>.

### NEUROPHYSIOLOGIC ASSESSMENT

EMG of the pelvic floor with concentric needles or a single fiber EMG should nowadays only be done in selected patients, as this test is painful. In constipated patients use of a sponge electrode can give proper results <sup>16</sup> . PNTML should be done, as this test may have influence on prognosis after surgical corrections of sphincter defects <sup>22,23</sup>.

## TRANSIT STUDIES

Transit studies can be done in various ways. The most easy and reliable way to distinguish between a colonic disorder or a pelvic outlet obstruction is done with radiopaque markers.

After ingestion from 24 markers on day 5 and 7 a plain abdominal x-ray is done to distinguish between colonic inertia and pelvic outlet obstruction <sup>9</sup>.

## OTHER TESTS

In selected cases other tests like MRI, fecal flowmetry, scintigraphic evacuation procedures as well as electrosensitivity studies may be useful <sup>24, 25, 26</sup>.

## METHODS

Every consecutive patient presented with severe constipation, fecal incontinence or anorectal pain of unknown origin was included into our study. Firstly the history was taken and a clinical examination including proctoscopy was done. Then a “working diagnosis” was given. Physiologic evaluation included water perfused, stationary AM, DEFA, EAUS and measurement of the PNTML. The techniques are described elsewhere <sup>27</sup>. Then, the “final diagnosis” made from clinical plus physiological examination was established. Lastly, differences between the working diagnosis and the final diagnosis were noted.

## RESULTS

Between January 1999 and June 2001 2942 patients have been seen in our proctological outpatient department. Of this 75 patients presented with severe constipation, 110 with fecal incontinence and 18 with severe anorectal pain of unknown origin. Out of this 203 patients, 193 (95,0%) agreed to a further work up. In 135 patients (70,1%) the diagnosis was confirmed. However, in 58 patients (29,9%) the treatment plan was changed due to the physiology data obtained (Table 3).

### Figure 3

Table 3 : Results

Demographic data	N = 2942 Female 2148 (73%) Male 794 (27%) Mean age 61 (16 – 91) years			
				With physiologic tests
Diagnosis	n		Confirmed	Changed
	Clinical diagnosis	Investigated		
Severe constipation	75	69	54 (78,2%)	15 (21,8%)
Fecal incontinence	110	106	67 (63,2%)	39 (36,7%)
Anorectal pain	18	18	14 (77,8%)	4 (22,2%)
TOTAL	203 (100%)	193 (95%)	135 (71,1%)	58 (29,9%)

## DISCUSSION

Anorectal physiology testing is very time consuming. AM and DEFA last about 45 minutes each in experienced hands; PNTML measurement including EMG with the sponge electrode 30 minutes and EAUS approximately 10 minutes. As it is necessary to perform all tests <sup>28</sup> to get a good overview of the patient's disease, physiologic testing must be reserved for special patients in daily routine work. Patients who suffer for many years from constipation having tried almost every conservative therapy option (diets, suppositories etc) should be thoroughly evaluated. In our study in 78% of our constipated patients the treatment plan was not changed. However, in 22% physiologic tests lead us to a sufficient therapy. Especially the diagnosis of colonic inertia and severe intussusception was clinically often not possible to diagnose.

Women incontinent after a birth trauma <sup>29</sup>, who can often be treated sufficiently with an overlapping sphincteroplasty, are the best candidates for physiologic work up. The discrepancy between the working and final diagnosis was mainly due to an additional neuropathy of the pelvic floor. Furthermore in 3 cases a planned sphincteroplasty was abandoned as EAUS confirmed multiple defects of the sphincter muscles.

The high degree of confirmation of the clinical diagnosis in patients with anorectal pain is due to the fact that in most cases even physiologic test did not give any explanation for the pain attacks. In only 4 anorectal pain patients a different diagnosis could be made. One patient had a deep abscess close to the puborectalis muscle sling, 1 a small intersphincteric abscess and 2 patients suffered from paradoxical puborectalis contraction which could be treated successfully by biofeedback.

## CONCLUSION

Physiology work up is not necessary and practicable in daily colorectal praxis. However, centers dealing with patients, who suffer from functional disorders such as constipation and fecal incontinence or from intractable anorectal pain of unknown origin, should use the new developed tests. Thus it should be possible to treat more patients sufficiently according to their underlying physiologic cause.

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