## W37: Pathophysiology, assessment and treatment of anorectal dysfunction in women

**Workshop Chair: Lucia Oliveira, Brazil**  
21 October 2014 14:00 - 18:00

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>Topic</th>
<th>Speakers</th>
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<td>14:00</td>
<td>14:05</td>
<td>Introduction</td>
<td>• Lucia Oliveira</td>
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<td>14:05</td>
<td>14:20</td>
<td>Anorectal anatomy and physiology of defecation</td>
<td>• Mara Salum</td>
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<td>14:35</td>
<td>Neurophysiology of pelvic floor</td>
<td>• Nucelio Lemos</td>
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<td>14:35</td>
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<td>Etiology and clinical aspects of fecal incontinence and ODS</td>
<td>• Lucia Oliveira</td>
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<td>Chronic pelvic pain syndrome</td>
<td>• Nucelio Lemos</td>
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<td>15:05</td>
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<td>Physiology tests for incontinence and ODS</td>
<td>• Lucia Oliveira</td>
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<td>Anorectal and transperineal tridimensional ultrasound</td>
<td>• Lucia Oliveira</td>
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<td>Pelvic MRI</td>
<td>• Alice Brandao</td>
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<td>16:00</td>
<td>16:15</td>
<td>Conservative treatment of fecal incontinence and ODS</td>
<td>• Mara Salum</td>
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<td>16:15</td>
<td>16:30</td>
<td>Biofeedback therapy for fecal incontinence and ODS</td>
<td>• Lucia Oliveira</td>
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<td>16:45</td>
<td>Injectables and other minimal invasive methods</td>
<td>• Lucia Oliveira</td>
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<td>17:00</td>
<td>17:15</td>
<td>Sphincteroplasty and other surgical techniques</td>
<td>• Lucia Oliveira</td>
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<td>17:15</td>
<td>17:30</td>
<td>SNS for fecal incontinence</td>
<td>• Lucia Oliveira</td>
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<td>17:30</td>
<td>17:45</td>
<td>SNS for chronic pelvic syndrome</td>
<td>• Nucelio Lemos</td>
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<tr>
<td>17:45</td>
<td>18:00</td>
<td>Discussion</td>
<td>All</td>
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### Aims of course/workshop

The aim of our workshop is to discuss the different aspects of anorectal dysfunction in the female population.

The specific objectives are:

1. To discuss the pathophysiology and assessment of faecal incontinence and obstructed defecation syndrome;
2. To understand the different anorectal and imaging tests that can be utilized for evaluation of anorectal dysfunction and how they can help during selection of the best treatment modalities;
3. To discuss the conservative, minimal invasive and surgical options to treat anorectal dysfunction in women.
ANORECTAL ANATOMY AND PHYSIOLOGY OF DEFECATION

Mara Rita Salum

In the first part of the presentation, the anatomy of the anorectal area will be presented focusing on the functional role of each element. Anal canal anatomy and pelvic floor components relationship will be described with illustrations. Figures of the integral theory and anatomic structures will be available.

In the second half of the presentation it will be discussed the Physiology of Defecation
Neurophysiology of the Pelvic Floor

Nucelio Lemos, MD PhD
Doctorate in Gynecology by FCM Santa Casa SP
Fellowship in Neuropelveology by the International School of Neuropelveology, Klinik Hirslanden, Zurich
Post-Doctorate Researcher of the Pelvic Neurodysfunctions Clinic of the Department of Gynecology of the Federal University of São Paulo
Chair of the Scientific Committee of the International Continence Society

Financial Disclosures
Nucelio Lemos, MD PhD
- Speaker/Proctor
  - Medtronic®
- Research Grants
  - Medtronic®
  - Laborie®

Lumbar Nerves
- Iliohypogastric N.
- Ilioinguinal N.
- Genitofemoralis N.
- Femoral N.
- Obturator N.

Sacral & Coccigeal Nerves
- Superior Gluteal N.
- Inferior Gluteal N.
- Post. Cutaneous Femoralis N.
- Sciatic N.
- Pudendal N.
- Nn. to the Levator Ani Mm.

Somatic Nerves of the Pelvis

Sensitive Innervation
**Motoric Innervation**

- L2/L3 - Hip flexors (ipsilateral)
- L3 - Hip adductors
- L3/L4 - Knee extensors (Quadriceps)
- L5 - Ankle dorsiflexion, eversion and inversion + Hip abductors
- S1 - Ankle plantar flexion + Hip extensors
- S2-S4 - External anal and urethral sphincters

**Autonomic Nerves**

- Hypogastric Nerves
  - Presynaptic filling sensation
  - Internal urethral and anal sphincters
- Pelvic Splanchnic Nerves
  - Nervi erigenti - parasym pathetic
  - Detrusor contraction
  - Colon descendens, sigmoid and rectum
- Inf. Hypogastric Plexus

**The Sacral Nerve Roots**

- Th10-L2 - Sympathetic
  - Internal Urethral Sphincter Contraction (α1)
  - Detrusor Relaxation (β)
- S2-5 - Parasympathetic (M3)
  - Detrusor Contraction
- S2-5 - Somatic Nervous System
  - Urethral Contraction
  - Levator Ani Muscle Contraction

**Symptoms of Intrapelvic Nerve Entrapment**

- Persistent pain or pain irradiating to the lower limbs, or motoric deficit on the lower limbs, in the absence of a spinal disorder
- LUTS in the absence of prolapse or bladder lesion
- Tenesmus and/or deschits associated with genital and/or gluteal pain
- Rectal or vaginal foreign body sensation
Thank You!
nucelio@gmail.com
www.neurodisfuncao.med.br
Etiology and clinical aspects of fecal incontinence and obstructed defecation syndrome

Lucia Camara Castro Oliveira, MD, PhD
Anorectal Physiology Dept.
Policlinica Geral do Rio de Janeiro, Rio de Janeiro, Brazil.

Introduction

Fecal incontinence

- Disabling condition
- Daily or weekly incontinence episodes occur in 2% of adult population and 7% of healthy independent adults over the age of 65
- $400 million each year spent on FI supplies
- FI: second most common reason for institutionalization in the elderly

Prevalence: 1.4% to 20%
Depends on how it is defined, age and whether the patients are community dwelling or living in an institution

Enck et al, Int J Colorect Dis, 1991
Nelson et al, JAMA, 1995
Johanson Am J Gastroenterol, 1996
Norton C, Neurourol Urodyn, 2010

Female elderly patients prevalence is higher
Varma et al, Dis Colon Rectum, 2006

Impact in quality of life
Benjamin et al, Am J Obstet Gynecol, 2005
Bharucha et al, Am J Gastroenterol, 2006
Brown SR, Cochrane, 2009

FECAL INCONTINENCE: INCIDENCE
Population-Based Surveys

<table>
<thead>
<tr>
<th>Country</th>
<th>Age/Setting</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>&gt; 65 years old</td>
<td>3.1%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Community Service</td>
<td>1.9%</td>
</tr>
<tr>
<td>Holland</td>
<td>Women &gt; 60 years</td>
<td>4.2% - 16.9%</td>
</tr>
<tr>
<td></td>
<td>With rising age</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>All &gt; 45 years</td>
<td>11%; 6% to feces</td>
</tr>
<tr>
<td>Unites States</td>
<td>Market Mailing</td>
<td>7% soiling; 0.7% to feces</td>
</tr>
<tr>
<td>United States</td>
<td>Wisconsin Households</td>
<td>2.2%; 63% women</td>
</tr>
<tr>
<td>United States</td>
<td>Wisconsin Nursing Homes</td>
<td>25%</td>
</tr>
</tbody>
</table>

Nelson, RL; Seminars CRS 1997; 8(2): 80-3
**Anal incontinence**

**Etiology**

**PSEUDO INCONTINENCE**
- Perineal soiling: mucosal prolapse, hemorrhoids, poor hygiene, fistulas, dermatologic conditions, anorectal cancer, sexually transmitted diseases

**OVERFLOW INCONTINENCE**
- Fecal impaction
- Encopresis
- Antimotility drugs

**NORMAL PELVIC FLOOR**
- Diarrhea
- Inflammatory bowel disease
- Irritable bowel syndrome
- Laxative abuse
- Post-cholecystectomy
- Infectious colitis

**ABNORMAL PELVIC FLOOR**
- Sphincter injury
- Obstetric
- Surgical trauma
- Tumor
- Rectocele
- Congenital abnormalities
- Imperforate anus
- Myelomeningocele
- Spina bifida

**Systemic disorders**
- Multiple sclerosis
- Scleroderma
- Tumors
- Diabetes

**Pelvic floor denervation**
- Pudendal neuropathy
- Perineal descent syndrome
- Traumatic
- Aging
- Neoplastic infiltration

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**Introduction**

- Clinical evaluation
- Physical exam
- Exclude bowel disturbances

**Diarrhea**
- Irritable bowel syndrome
- Cholecystectomy
- Rectocele
- Stress urinary incontinence

Bharucha AE Gastroenterology. 2010

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**Cleveland Clinic Scoring System**

Fecal Incontinence Quality of Life Instrument-ASCRS

- 4 domains
  - Embarrassment
  - Lifestyle
  - Coping
  - Behavior

Fecal incontinence Evaluation

- Anal manometry
- Endoanal ultrasound

Fecal incontinence Evaluation

- Pudendal nerve terminal motor latency

Fecal incontinence Etiology

Internal anal sphincter dysfunction (IAS)

- Passive incontinence

  - Weak but intact sphincter: primary degeneration or esclerosis
  - Damaged IAS: post-surgical, obstetric defect

Engel 1995
**Internal anal sphincter defects**

**Fecal incontinence**

**Treatment selection**
- Severity of symptoms
- Surgical outcome deteriorates with time
- Poor outcome associated factors: obesity, IBS, neuropathy

---

**Obstructed defecation syndrome-ODS**
- Primary functional constipation was well defined by the Rome III criteria, wherein a subtype of constipation known as obstructed defecation (ODS) was considered when patients present with:
  - ✔ difficulty in emptying the rectum
  - ✔ symptoms of prolonged repeated straining during bowel movements
  - ✔ sensation of incomplete evacuation
  - ✔ the need for digital manipulation.

**Obstructed defecation syndrome**
- Rectoceles
- Anismus
- Enterocoeles
- Rectal intussusception or invagination
<table>
<thead>
<tr>
<th>Obstructed defecation syndrome</th>
<th>Obstructed defecation syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Complete proctological examination in different position</td>
<td>• Colonic transit time with markers</td>
</tr>
<tr>
<td>• Constipation Scoring System - Agachan 1997</td>
<td>• Anal manometry</td>
</tr>
<tr>
<td></td>
<td>• EMG</td>
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<tr>
<td></td>
<td>• Cinedefecography</td>
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<td></td>
<td>• Echodefecography</td>
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<td>• MRI defecography</td>
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<thead>
<tr>
<th>Obstructed defecation syndrome</th>
<th>Obstructed defecation syndrome</th>
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<tbody>
<tr>
<td>• Colonic transit time</td>
<td>• Anal manometry</td>
</tr>
<tr>
<td>• Radiopaque markers-Sitzmarks</td>
<td>- Absence of relaxation during evacuation</td>
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<td></td>
<td>- Hypertonic sphincter</td>
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<td>- Prolonged RAIR</td>
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<td></td>
<td>- Ballon expulsion test</td>
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</tbody>
</table>
Obstructed defecation syndrome

- Cinedefecography

Obstructed defecation syndrome

Echodefecography and MRI defecography
Chronic Pelvic Pain Syndrome

Financial Disclosures
- Nucelio Lemos, MD, PhD
  - Speaker/Proctor
  - Medtronic®
  - Research Grants
  - Medtronic®
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The "Syndromic Era"
- Chronic Pelvic Pain Syndrome
- Bladder Pain Syndrome
- OAB Syndrome
- Irritable Bowel Syndrome
- ADHD

Medical Propedeutics & Diagnostic Sequence
- Syndromic Diagnosis
  - Symptoms & Signs
- Topographic Diagnosis
  - Affected / Dysfunctional Organ / Tissue

Moving Forward with OAB and BPS diagnosis
POSSIBLE SOURCES OF PAIN OR URGENCY
- Bladder / Urothelium
- Urethra
- Vagina
- Fascia/Ligaments
- Urine Composition

POSSIBLE SOURCES OF PAIN OR URGENCY
- Muscles
- Nerves
- Blood Vessels

Anamnesis
- Careful Characterization
  - Pain
- Beginning
- Intensity
- Characteristics (sharp, shock, burn etc)
- Irradiation/Lateral Preponderance
- Frequency
- Worsening and Ameliorating Factors
- Correlation with Urinary Symptoms
- Surgical/Obstetric History
- History of Pelvic Infection

Physical Examination
- Pelvic reflexes
  - Clitoridion
  - Bulbo cavernous
  - Cutaneous-anelis
- Trigger points
  - Vaginal palpation
  - Bladder neck palpation
- Pelvic Floor Muscles palpation
- Urethral Support Simulation

Neurologic Examination
US & MRI
- Endometriosis
- Myomas
- Malignancies
- Other diagnoses

LUT evaluation
- Urinary biomarkers
- Future perspective
- Urodynamics
  - Low Bladder Compliance
  - Increased Bladder Sensitivity
  - Detrusor Overactivity
  - Bladder Outlet Obstruction

LUT evaluation
- Potassium sensitivity test
  - No longer used
  - Painful
  - Excessive false positive results
- Intravesical lidocaine
  - to distinguish the pelvic pain related to the bladder from that of non-bladder-related pain

In Conclusion...

OAB/BPS
- LUT evaluation
- Cystoscopy
- Useful for Diagnosing IC and Classifying the Disease

Intravesical lidocaine in the diagnosis of bladder pain syndrome

Offiah et al. 2013

Cystoscopy

Offiah et al. 2013
In Conclusion...

CPPS and BPS are Syndromic Diagnoses
We, therefore, should not be satisfied with that and move forward with topographic and etiological diagnoses
Acceptance and wide-spreading of these concepts by international societies may hamper the understanding of these clinical entities

Possible sources of pain/urgency include:
- Bladder
- Urethra
- Vagina
- Fascia/Ligaments
- Muscles
- Nerves
- Blood Vessels

Differential Diagnosis is the key to OAB/BPS diagnosis and treatment
Careful anamnesis and physical examination are essential for a correct diagnosis
Future research should be focused on etiological diagnosis, NOT ON SYMPTOMS TREATMENT

Thank you!!
www.neurodisfuncao.med.br
nucelio@gmail.com
Anorectal and transperineal tridimensional ultrasound

Introduction

- Circular Transducers
- High frequencies
- Preparation: rectal enema
- Patient position: left lateral decubitus
- Screen orientation: upper-anterior, lower-posterior
  Right-left
  Left-right

Anal canal anatomy

- Inferior: external sphincter (MEE)
- Mid: external and internal anal sphincters
- Superior: puborectalis and internal anal sphincter

Anal canal and US
### Imagens ultrassonográficas

- **PR:** arco de ecogenicidade mista
- **MEE:** ecogenicidade mista, margens laterais pouco definidas
- **MEI:** faixa de hipoecogenicidade bem definida

### Advantages

- **US x clinical exam:** MEI
- **US x transperineal:** tridimensional evaluation
- **US x MRI:** MEI, less cost
- No radiation
- High tolerance by patients
- High definition of images

### Anorectal US

**Indications**

- Fecal incontinence
- Anal fistulae
- Recto-vaginal fistulas
- Anal abscess
- Submucosal lesions
- Cysts
- Endometriose
- Rectoceles and ODS

### Incontinência anal

**US endoanal**

**Lesão Esfínter Externo**

- Lesão obstétrica
  - até 24% dos partos vaginais
  - Primiparidade
  - Episiotomia
  - Extrator a vácuo
  - Fórceps
  - Peso fetal > 3.5Kg
  - Parto Prolongado

---

* Sultan et al, NEJM, 1993
* Zetterstrom et al, Br J Obstet Gynecol 1999
Incontinência anal
US endoanal
Lesão Esfíncter Externo

• Acompanhamento pós-esfíncteroplastias

Incontinência anal
US endoanal
Acompanhamento

• Pós-injeção de agente de preenchimento

Incontinência anal
US endoanal
Internal anal sphincter defect

• Avaliação do septo reto-vaginal

Espessura normal de 10mm

Anal incontinence
US endoanal

• Origem obstétrica

• Pós-esfíncterotomia
Fecal incontinence
US endoanal
Internal anal sphincter defect

- Pós-fistulotomia
  Fistulas: 57% e 29% (EI e EE)

Anal fistula

- 47 anos, sexo masculino
- 3 operações
- Recidivas
- Fístula em ferradura

Anal Fistula

- Identificação dos trajetos
- Utilização do orifício externo para identificação dos trajetos através da água oxigenada
- Avaliação da musculatura

Recto-vaginal fistula

- 27 anos
  secreção vaginal pós-parto vaginal e episódios de incontinência
  Trabsdutor vaginal para avaliação do septo
Pre-sacral cysts

Us endoanal
Defecação obstruída

- Hipertrofia esfínter interno
- Invaginação interna
- Prolapso mucoso
- Retoceles

Ecodefecografia
Murad-Regadas SM et al.

Anorectal US
Anorectal Physiology Dept

- 1996-2014
n=1400
Incontinence
Fístulas
Cysts
Tumors
Obstructed defecation
Dynamic magnetic resonance defecography in closed magnet unit is a valuable method for the assessment of pelvic floor pathologies, both in static and mainly during the dynamic analysis. Evaluation of multiple compartments of the pelvic floor at one exam was made possible, using high-resolution images at rest and during defecation, providing an accurate evaluation of morphology and function of the anorectal and pelvic organs and muscles, involved in pelvic floor dynamics.

MRI of the pelvic floor identifies the diseases affecting the evacuation mechanism, providing information essential for surgical planning and to guide the choice of treatment.

In this talk we will discuss the anatomical aspects of the rectum, anal canal and pelvic floor muscles utilizing MRI images. In addition, we will present patients with fecal incontinence and defecation disorders and the most commonly observed anatomical and functional abnormalities.
Conservative treatment of fecal incontinence and ODS should be based on the etiology of the symptoms.

Most important of all is the good relationship between doctor and patient. The score of incontinence and quality of life questionnaires may help selecting the patient who will benefit from a conservative treatment.

Secondly it is important to define the etiology of the fecal incontinence or ODS.

Oral medications may vary from constipating agents to specific diet restrictions and fiber intake. Cholestyramine, and drugs for irritable bowel, and antidepressants can be associated in some cases.

If the etiology is fecal impaction and pseudo incontinence, the goal of the treatment is to enhance rectal emptying. This could be achieved either with bulk agents associated or not with laxatives or with retrograde assistance such as suppositories or enemas.

Final considerations are related to evaluation of treatment results and discussion whether other modalities of treatment should be indicated.
Biofeedback therapy for fecal incontinence and obstructed defecation syndrome

Introduction
Biofeedback
- Safe and simple treatment option
- Train pelvic floor muscles
- Improve rectal sensation and contraction awareness
- Level of evidence III / recommendation grade B


Methods
- Incontinent patients were evaluated clinically, with an incontinence scoring system (Cleveland Clinic incontinence scoring system-CCISS) and a quality of life scale (Fecal Incontinence Quality of life scale-FIQLS)
- Anal manometry
- Anal ultrasound

Lucia Camara Castro Oliveira, MD, PhD
Anorectal Physiology Dept.
Policlinica Geral do Rio de Janeiro, Rio de Janeiro, Brazil.
Methods

INCLUSION CRITERIA
- Anal incontinence
- Motivated patient

EXCLUSION CRITERIA
- Patulous anus
- Incontinence related to rectal prolapse
- Greater sphincter defect
- Hearing or visual impairments

Methods

• Manometry or EMG System
• 1 session / week
  30-40 min
• 5-10 weeks
• Kegel’s exercises for home training

Methods

• Low-frequency electro stimulation
• 10-30 Hz
• 10- 15 minutes

Methods

Biofeedback program

• Bowel education pelvic anatomy
  video demonstrations
• Bristol scale
• Bowel diary
• Diet orientation
Methods
Post-treatment evaluation

- Clinical: 3 and 6 months, 1 year
  Incontinence score and FIQL scale after 3 months

Successful outcome:

- Reduction on incontinence episodes
- Improvement in Incontinence scores and FIQLS

Results

- Patients that performed more than 5 sessions had a better outcome, when compared with those who performed 4 or less sessions, as observed utilizing the CCISS

<table>
<thead>
<tr>
<th>Number of Sessions</th>
<th>1-4 sessions</th>
<th>5 or more</th>
</tr>
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<tbody>
<tr>
<td>n</td>
<td>133</td>
<td>133</td>
</tr>
</tbody>
</table>

p < 0.0001
Mann-Whitney

Results

Poor prognostic factors
n = 56

- Diabetes: n = 10
- IBS: n = 5
- Neurological: n = 6
- Obesity: n = 35

BF for fecal incontinence

Conclusion

- Safe and adequate option
  Biofeedback program

- Possible poor prognostic factors
  Number of sessions
  Functional diarrhea
  Diabetes
  Neurological diseases
  Obesity
BF for fecal incontinence

Conclusion
• Results may deteriorate with time
• Improvement in quality of life and reduction in incontinence episodes justify the use of Biofeedback for selected incontinent patients

Obstructed defecation syndrome
• Primary functional constipation was well defined by the Rome III criteria, wherein a subtype of constipation known as obstructed defecation (ODS) was considered when patients present with:
  ✓ difficulty in emptying the rectum ✓ symptoms of prolonged repeated straining during bowel movements
  ✓ sensation of incomplete evacuation
  ✓ the need for digital manipulation.

ODS
Biofeedback therapy
• Minimum of 5 sessions
• 40 minutes
• BF with manometry or EMG
• Ballon expulsion test at the end of the session
• Bowel diary
• BF program

BF for ODS
Evidence
N=119 STAARR superior than BF

Hicks CW, Weinstein M, Wakamatsu M, Savitt L, Pulliam S, Bordeianou L. In patients with rectoceles and obstructed defecation syndrome, surgery should be the option of last resort. Surgery. 2014
N=90 BF with 71% success
Neuromodulation in Chronic Pelvic Syndromes

Nucelio Lemos
Doctor em Ginecologia pela FCM Santa Casa SP
Fellowship em Neuropelveologia pela Klinik Hirslanden, Zurique, Suíça
Pós-Doutorando e Responsável pelo Setor de Neurolisfunções Pélvicas do Departamento de Ginecologia da UNIFESP-EPM

Declaração de Conflitos de Interesse
- Prof. Dr. Nucelio L. B. M. Lemos
- Preceptor da Medtronic® para Neuromodulação
- Financiamento de Pesquisa
  - Medtronic®
  - Laborie®

Neuroanatomy/physiology of the Pelvic Floor

Lumbar Nerves
- Iliohypogastric N.
- Ilioinguinalis N.
- Genitofemoralis N.
- Femoral N.
- Obturator N.

Sacral & Coccygeal Nerves
- Superior Gluteal N.
- Inferior Gluteal N.
- Post. Cutaneous Femoralis N.
- Sciatic N.
- Pudendal N.
- Nn. to the Levator Ani Mm.

Somatic Nerves of the Pelvis
**Sensitive Innervation**

- L2-L3 - Hip flexors (iliopsoas)
- L3 - Hip adductors
- L3/4 - Knee extensors (biceps)
- L5 - Ankle dorsiflexion, eversion and inversion + hip abductors
- S1 - Ankle plantar flexion + hip abductors
- S2-S4 - External and internal anal sphincters

**Motoric Innervation**

- L2-L3 - Hip flexors (iliopsoas)
- L3 - Hip adductors
- L3/4 - Knee extensors (biceps)
- L5 - Ankle dorsiflexion, eversion and inversion + hip abductors
- S1 - Ankle plantar flexion + hip abductors
- S2-S4 - External and internal anal sphincters

**Autonomic Nerves**

- Hypogastric Nerves (sympathetic)
- Propagation to sensate internal anal and anal sphincters
- Superior Hypogastric Plexus (derived from sympathetic trunk)
- Pelvic Splanchnic Nerves (nervi erigenti - parasymphathetic)
- Detrusor contraction
- Colon descendens, sigmoid and rectum
- Nociception

**The Sacral Nerve Roots**

- T10-L2 - Sympathetic
  - Internal urethral sphincter contraction (α)
  - Detrusor relaxation (β)
- S2-S4 - Parasympathetic (M3)
  - Detrusor contraction
  - Internal urethral sphincter relaxation
- S2-S4 - Somatic nervous system
  - Urethral contraction
  - Levator ani muscle contraction

**LUT Neurophysiology**

- Th10-L2 - Sympathetic
  - Internal urethral sphincter contraction (α)
  - Detrusor relaxation (β)
- S2-S4 - Parasympathetic (M3)
  - Detrusor contraction
  - Internal urethral sphincter relaxation
- S2-S4 - Somatic nervous system
  - Urethral contraction
  - Levator ani muscle contraction

**LUT Neurophysiology**

Petros & Ulmsten, 1993
What about neuromodulation?

Neuromodulation - Possible Targets
- S3
- Pudendal nerve
- Superior Hypogastric Plexus

Neuromodulation - Indications
- OAB
- Anal Incontinence
- Non-obstructive urinary retention (Detrusor Hypocontractility)
- Neurogenic Bladder
- Painful Bladder Syndrome
- Interstitial Cystitis

A prospective, single-blind, randomized crossover trial of sacral vs pudendal nerve stimulation for interstitial cystitis

22 patients, 17 (77%) had a significant clinical response and had an IPSS improvement. Those who were unaware of type, patients were asked to rate their overall improvement in voiding symptoms and to choose which lead they desired. In the 10 responding to neuromodulation, PNS gave an overall 44% improvement (P = 0.005). Thirteen of 17 patients chose the pudendal lead for the final implant and four chose the sacral lead. Two patients had no response to either lead and had both explanted. The order...
A prospective, single-blind, randomized crossover trial of pelvic or pudendal nerve stimulation for interstitial cystitis

Spinelli, 2005

Implantation Technique

LION Procedure

INDICATIONS
- Neuropathic Pain
- Phantom pain
- Post-herniorrhaphy inguinalgia
- Chronic Pelvic Pain
- Perineal Pain
- Gichta
- Post-decompression pain
- Anal Incontinence
- Detrusor Overactivity
- Rehabilitation

INDICATIONS
- Neuropathic Pain
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LION Procedure

Obrigado!
nucelo@gmail.com
www.neurodisfuncao.med.br

ICS 2014
Rio de Janeiro
20th-24th October
www.neurodisfuncao.med.br

www.ics.org
Injectables and other minimally invasive methods

José Marcio Neve Jorge
Division of Coloproctology, University of São Paulo, São Paulo, Brazil.

Surgical treatment for fecal incontinence in adults

13 randomized studies with 440 participants:
- Complex condition, diverse intervention, limited number of patients, difficulties in recruitment and evaluation of results: little evidence to support the efficacy of surgical treatment.
- Diversion (stoma) does not improve the results of sphincter repair and increase morbidity and hospital stay.
- Biofeedback can improve results of surgery.
- Overlapping or apposition does not seem to affect results.

Brown et al Cochrane Database of Systematic Reviews, 2012

New options for fecal incontinence

1. Injectables and implantables
2. Posterior tibial nerve stimulation
3. Mioblasts/stem cells implantation
4. Slings
5. Artificial anal sphincter

• New options
• Availability

Injectables & minimally invasive methods

- Injections of bulking agents performed under local anesthesia at the level of the IAS-submucosal interface.
- Day care setting.
- Antibiotics: ciprofloxacin 500mg tds.
- Analgesic (paracetamol) and laxative (lactulose).
methods

patient selection:
- passive incontinence due to an isolated defect of the IAS

**Injectables & minimally invasive methods**

**Results**

Incontinence score (0-20)

<table>
<thead>
<tr>
<th>Time</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre treatment</td>
<td>16.4</td>
</tr>
<tr>
<td>6 months</td>
<td>8.2</td>
</tr>
<tr>
<td>1 year</td>
<td>6.1</td>
</tr>
<tr>
<td>2 years</td>
<td>5.9</td>
</tr>
</tbody>
</table>

*N=43*  
*Jorge et al Coloproctology 2005*  
*Oliveira et al SURG Innov 2009*

**Injectables & minimally invasive methods**

Results

**Pressure parameters (mmHg)**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting Pressures</td>
<td>40</td>
</tr>
<tr>
<td>Squeeze Pressures</td>
<td>60</td>
</tr>
</tbody>
</table>

*p=NS*

**Injectables & minimally invasive methods**

results

**anal ultrasound**

identification of sites of injection on endoanal ultrasound
Injectables & minimally invasive methods

**Gatekeeper® implants**

- Four poliacrylonitrile solid cylinders
- Ultrasound guided implantations through incisions
- Thickening after 24 hours
- Significant improvement in incontinence and quality of life scores

Ratto C et al Br J Surg 2011

---

**Posterior Tibial Nerve Stimulation**

- Needle electrode implanted 2 cm posteriorly and 6 cm cephalad to the medial malleolus. Low voltage stimulator (9V) with 0-19 mA current and 20 Hz frequency until sensitive and motor responses are obtained.
- Stimulation of multiple afferent spinal pathways
- Efficacy – improvement >50% dos síntomas: 63 - 82%
- Methodology varies, small studies, follow-up usually 1-3 months

Thomas et al Colorectal Disease 2012

---

**Posterior Tibial Nerve Stimulation transcutaneous & percutaneous**

- 30 women
- Percutaneous group: better results
- Improvement maintained for 6 months

George et al Br J Surg 2013

---

**Mesenchimal Stem cells implantation – Experimental studies:**

- 204 rats after sphincter lesion. During sphincter repair underwent intramuscular or endovenous direct injection of mesenchimal stem cells: better contractile activity in the intramuscular group
- Controlled Studied with 70 female rats undergoing to sphincterotomy or pudendal lesion. Better intra-anal pressures in the sphincterotomy group.

Sutjatha P et al UGA Society 2010
Salcedo L et al StemCell Research 2013
**Autologus myoblast implants**

- Myoblasts culture from pectoral muscle biopsy, injected in the external sphincter, guided by ultrasound.
- 10 women with obstetric related incontinence
- Reduction in 13.7 pts of incontinence score (CCF), increase in squeeze pressures at 1 month and 6 months after injection.
- Safe, well tolerated and efficacious

Frudinger et al Gut 2009

**Stem Cell Implantation**

- Case Report: 20 years male – automobilistic trauma underwent sphincter repair and biofeedback
- Quadriceps muscle samples – preparation - Injections of 3 ml: 1 ml in each side of the scar
- Clinical, manometric and electromiographic improvement after 6 weeks.

Romaniiszyn M et al Int J Colorectal Dis 2013

**Artificial anal sphincter**

- Principle: transference of fluid between the cuff and balloon, controlled by a pump (resistor and valves)

Christiansen e Lorentzen Lancet 1985

**Artificial Bowel Sphincter - Results**

\[ p < .05; \text{Wilcoxon} \]
Injectables & minimally invasive methods

Artificial anal sphincters - new models:
- Device to reproduce the puborectalis action (angulation mechanism)
- System of plates with occlusion with corporeal temperature
- Magnetic artificial sphincter

Finlay et al Br J Surg 2004
Luo et al ASAIO J 2004
Lehur et al Dis Colon Rectum 2010

Injectables & minimally invasive methods

Artificial Bowel Sphincter vs Magnetic Anal Sphincter

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Artificial Anal Sphincter</th>
<th>Magnetic Anal Sphincter (MAS)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time (min)</td>
<td>97.5</td>
<td>62</td>
<td>0.0273</td>
</tr>
<tr>
<td>Hospitalization (days)</td>
<td>10</td>
<td>4.5</td>
<td>0.001</td>
</tr>
<tr>
<td>Incontinence score</td>
<td>16 to 4</td>
<td>17 to 6</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Quality of life score</td>
<td>1.80 to 3.55</td>
<td>2.03 to 3.51</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td>Resting pressure</td>
<td>89</td>
<td>58.5</td>
<td>0.0147</td>
</tr>
<tr>
<td>Complications</td>
<td>2</td>
<td>4</td>
<td>0.628</td>
</tr>
<tr>
<td>Device explantation</td>
<td>4</td>
<td>1</td>
<td>0.830</td>
</tr>
</tbody>
</table>

Wong et al Dis Colon Rectum 2011

Sphincter replacement

Biologic
- Muscle transposition
  Pickrell et al 1952
- Neurostimulated neosphincter
  Baeten et al 1988

Synthetic
- Metallic wire
- Dacron
  Thiersch 1891
- Artificial anal sphincter
  Christiansen e Lorentzen 1989

Injectables & minimally invasive methods

Anal encirclement with silicone band

- 20 women e 13 men
- 13 removal: 3 permanent and 10 reimplanted
- Safe technique, simple, low cost, however improvements are required

Devesa JM et al Tech Coloproctol 2011
### Injectables & minimally invasive methods

**Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incontinence score</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Resting pressure (mmHg)</td>
<td>37</td>
<td>73</td>
</tr>
<tr>
<td>Squeeze pressure (mmHg)</td>
<td>48</td>
<td>93</td>
</tr>
</tbody>
</table>

“Improvement in patients with functional dysfunction but intact morphology”

Tanagho EA et al Urology 1982
Matzel et al Lancet 1995

### Anal Incontinence treatment

**Muscular lesion**
- Isolated IAS lesion
- Complete EAS lesion
- Irreparable lesion

**Neurogenic**
- Biofeedback
- Posterior tibial nerve stimulation
- SNS

**Repair**
- Bulking agents
- Repair
- Redo repair

**Artificial sphincter:**
- MAS

**Hormon therapy**
- Antidepressants

**Colonic irrigation**
- Colostomy

**Reparo pós-anal?**
Physiology tests for Incontinence and ODS

J. Marcio N. Jorge, M. D.
University of São Paulo - Brazil
Disclosures: none
Challenges

- Complex and multifactorial etiology:
  - habits & diet
  - psychologic
  - Cultural
  - anatomic and functional

- Misconcepts & self-medication:
  - 62% of general population believe that a daily bowel movement is a sign of good health*
  - Purchases of laxatives** - Canada: $49,979,000; USA: 512,425,000

*Ruben BD Pract Gastroenterol 1986
**Rhodes D, 1997
**Definition & Prevalence**

“*in practice constipation presents as a problem when the patient feels the situation to be unsatisfactory*”

<table>
<thead>
<tr>
<th>Definition</th>
<th>N</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient complaint*</td>
<td>877.645</td>
<td>18.5% men</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33.7% women</td>
</tr>
<tr>
<td>Medical evaluation**</td>
<td>11.204</td>
<td>8.0% men</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20.8% women</td>
</tr>
<tr>
<td>Infrequent defecation***</td>
<td>16.667</td>
<td>2.0% total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5% &gt; 65 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.2% &gt;75 years</td>
</tr>
</tbody>
</table>

* Hamond, Am J Public Health 1964
** Everhart et al, Dig Dis Sci 1989
*** Whitehead et al, Gastroenterology 1990
Evaluation of constipation

Definition

1. Must include 2 or more of the following:
   a. Straining at least
   b. Lumpy or hard stools
   c. Sensation of incomplete evacuation
   d. Sensation of anorectal obstruction/blockage
   e. Maneuvers to facilitate (digital evacuation, support of the pelvic floor)
   f. Fewer than 3 defecations per week

2. Loose stools are rarely present without the use of laxatives

3. There are insufficient criteria for IBS

Drossman et al, Int Gastroenterol 1982*
Whitehead et al, Int Gastroenterol 1991
Longstreth et al Gastroenterology 2006***
### Constipation Severity Scores

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Title</th>
<th>Questions (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>McMillan et al</td>
<td>1989</td>
<td>CAS - Constipation Assessment Scale</td>
<td>8</td>
</tr>
<tr>
<td>Agachan et al</td>
<td>1996</td>
<td>CSS – Constipation Scoring System</td>
<td>8</td>
</tr>
<tr>
<td>Frank et al</td>
<td>1999</td>
<td>PAC-SYM – Constipation System Assessment Instrument</td>
<td>12</td>
</tr>
<tr>
<td>Knowles et al</td>
<td>2000</td>
<td>KESS – Knowles-Eccersley-Scott-Sharon</td>
<td>11</td>
</tr>
<tr>
<td>Barucha et al</td>
<td>2004</td>
<td>FICA – Fecal Incontinence and Constipation Assessment</td>
<td>98</td>
</tr>
<tr>
<td>Varma et al</td>
<td>2007</td>
<td>CSI – Constipation Severity Instrument</td>
<td>74</td>
</tr>
<tr>
<td>Altomare et al</td>
<td>2007</td>
<td>ODS score – Obstruction Defecation Syndrome Score</td>
<td>8</td>
</tr>
<tr>
<td>Hart et al</td>
<td>2011</td>
<td>CRDS - Constipation-related Disability Scale</td>
<td>18</td>
</tr>
<tr>
<td>Ducrotté &amp; Caussé</td>
<td>2012</td>
<td>BFI – Bowel Function Index</td>
<td>4</td>
</tr>
</tbody>
</table>

- **Constipation Scoring System (00-normal to 30-severe constipation):** frequency, difficulty and completeness of evacuation, abdominal pain, straining, assistance, duration of symptoms

*Agachan et al Dis Colon Rectum 1996*
Etiology

Poor habits: low fiber diet, inadequate fluid intake, inadequate exercise, ignoring call to stool, situational factors (travel, illness)

Intrinsic bowel disease: mecanic obstruction (neoplasm, inflammation, volvulus, intussusception, incarceration, ischemia), collagen disease, anorectal diseases

Drugs: antidepressants, tranquillizers, narcotics, anti-inflammatories, calcium channel blockers, antiarrhythmics, lipid lowering drugs, antihypertensives, hematological/oncological drugs, miscellaneous agents

Neurologic disease: cerebral, medular, peripheric

Endocrine disease: Hypothyroidism, diabetes mellitus, pheochromocitoma

Metabolic causes: dehydration, uremia, hypercalcemia, porphryya, pregnancy, hypokalemia

Evaluation of constipation

Alarming symptoms:
- recent onset
- bleeding
- loss of wheight
- Familial history
Evaluation of constipation

Physical Examination
Exclusion of intestinal and extra-intestinal causes:
• History & physical exam
• Barium enema or colonoscopy
• Other tests

Initial treatment:
• Dietary: fibers and fluids supplementation, breakfast and gastrocolic reflex
• Physical activity
• Bowel habits
• Psychological support
• Diary

Idiopathic

Refractory

Physiology Lab

Colonic transit times
defecography
anorectal manometry
<table>
<thead>
<tr>
<th>Test</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anorectal manometry</td>
<td>Gowers 1877</td>
</tr>
<tr>
<td>Colonic transit time</td>
<td>Collins et al 1969</td>
</tr>
<tr>
<td>Defecography</td>
<td>Walldén 1952</td>
</tr>
<tr>
<td>Electromiography</td>
<td>Mahieu et al 1984</td>
</tr>
<tr>
<td></td>
<td>Beck 1930</td>
</tr>
</tbody>
</table>
Diagnosis
Comprehension
Therapeutic decision
Treatment (biofeedback)
Evaluation of results
Legal aspects

Physiology testing

CONSTIPATION
Colonic transit time
Defecography

Anorectal manometry

INCONTINENCE
Endoanal USG
Electroneuromiography
Anorectal Manometry - Parameters

1. Resting tone — *internal anal sphincter pressure profile*

   - 1. Resting pressures
   - 2. Functional anal canal length

2. Voluntary contraction — *external anal sphincter/puborectalis pressures*

   - 1. External anal sphincter pressures
   - 2. Total voluntary contraction pressures
   - 3. Sphincter Fatigue Index

3. Adjunct studies — *use of intrarectal balloon*

   - 1. Rectal Sensory Threshold
   - 2. Rectal capacity
   - 3. Rectal compliance
Hirschsprung’s disease:
- sensitivity = 79%
- specificity = 90%

Chagas’ disease

Physiology Testing

Rectoanal inhibitory reflex - absence:

Habr-Gama et al Dis Colon Rectum 1971
Stephen et al Dis Colon Rectum 1997
Indication:
Complementary diagnosis of
Paradoxical puborectalis syndrome

Jorge et al. Cinedefecography and Electromyography in the diagnosis of non-relaxing puborectalis syndrome.
Dis Colon Rectum 1993
Total and segmental colonic transit times

COLON: 80% of total digestive transit time

Radiologic – *Hertz* 1907

Particulate - *Alvarez Friedlander* 1924

Colorimetric - *Mulinos* 1935

Isotopic - *Hansky - Connell* 1962

Chemical - *Dick* 1967

*Hinton et al, Gut 1969*: elimination of > 80 % markers on the 5th day
Segmental colonic transit times & videodefecography: comparison of results

Normal transit (N=36)  Colonic inertia (N=12)

- Rectocele 16.6%
- Paradoxical puborectalis 38.8%
- Normal 16.6%
- Enterocele 5.5%
- Perineal descent 5.5%
- Intussusception 11.1%
- Sigmoidocele 5.5%

- Rectocele 16.7%
- Paradoxical puborectalis 16.7%
- Normal 50%
- Intussusception 16.7%
### Total and segmental colonic transit times (hs)

<table>
<thead>
<tr>
<th>Authors</th>
<th>Right Colon</th>
<th>Left Colon</th>
<th>Rectosigmoid</th>
<th>Total (hs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arhan et al., 1981</td>
<td>13.8</td>
<td>14.1</td>
<td>11.0</td>
<td>39.0</td>
</tr>
<tr>
<td>Chaussade et al., 1986</td>
<td>6.9</td>
<td>9.1</td>
<td>18.4</td>
<td>34.4</td>
</tr>
<tr>
<td>Metcalf et al., 1986</td>
<td>11.3</td>
<td>11.4</td>
<td>12.4</td>
<td>35.0</td>
</tr>
<tr>
<td>Jorge &amp; Habr-Gama., 1991</td>
<td>12.0</td>
<td>14.2</td>
<td>10.7</td>
<td>36.2</td>
</tr>
</tbody>
</table>

\[
\text{TTC} = \frac{\text{N of retained markers} \times \Delta t \text{ between radiographs}}{\text{Total of ingested markers}}
\]

*Arhan et al, DCR 1981*

*Martelli et al, AGA 1978*
Physiology Testing

Colonic inertia – Preoperative Evaluation

• Young women, incapacitating symptom, very decreased bowel frequency*
• Manifestation of systemic disease?? orthostatic hypotension 30%, galactorrhea 15%, esophageal and urinary bladder dysfunction
  1. Clinical severity: diary
  2. Colonic transit time; repeat if necessary***
  3. Exclude upper GI dysmotility:
     small bowel transit time, gastric and esophageal studies
  1. Exclude pelvic floor dysmotility: videodefecography
  2. Anal sphincter functional status: anal manometry
  3. Psychological profile

Evaluation of constipation

Defecography – History

ACTA CHIRURGICA SCANDINAVICA
SUPPLEMENTUM 165

HISTOLOGY (HEAD: MARTIN WRETE, M. D., PROFESSOR OF HISTOLOGY, UNIVERSITY OF UPPSALA)

DEFECATION BLOCK
in cases of
DEEP RECTOGENITAL POUCH

A surgical, roentgenological and
embryological study with special reference
to morphological conditions

BY

LENNART WALLDÉN

Walldén L, Acta Chirur Scand 1952

FMUSP
“Apart from cases such as a tumour, sigmoiditis, volvulus, megacolon &c. the roentgen appearances in constipation have not yet been studied sufficiently to yield information of much practical value. The investigations of Walldén and Snellman have brought to light previously unsuspected causes of intractable constipation.”

Ekengren K & Snellman B Acta Radiol 1953, 40:447-456
Radiologic study of the act of defecation

Walldén L, Acta Chirur Scand 1952
Broden & Snellman, Dis Colon Rectum 1968
Mahieu et al, Gastrointest Radiol 1984
Evaluation of constipation

Videodefecography: technical aspects

- Commode & improvement of image
- Barium paste
- Oral contrast
- Video

Bernier et al. Defecography commode Radiology 1988
Jorge et al. How reliable are currently available methods of measuring the anorectal angle? Dis Colon Rectum 1992
Evaluation of constipation

Videodefecography

Measurements:
- anorectal angle
- puborectalis length
- perineal descent
- Anatomical abnormalities
- Rectal emptying

Perineal descent syndrome
Paradoxical puborectalis syndrome
Rectocele
Enterocoele
Intussusception
Sigmoidocele

Broden & Snellman, *Dis Colon Rectum* 1968
Rectocele

Evaluation of constipation

• Finding in healthy women in up to 50 - 70%*
• Significant finding:
  – Absent or prolonged emptying
  – larger than 2-3 cm
• Exclude paradoxical puborectalis syndrome - association in up to 71%*  
  *Finlay, Int J Colorectal 1988  
  **Johansson et al DCR 1992
Nonrelaxing puborectalis contraction syndrome

- Failure to open the ARA
- Persistent puborectalis indentation
- Elongated anal canal
- Secondary rectocele
- Overcapacious rectum
- Impaired rectal emptying
Evaluation of constipation

Sigmoidocele

Jorge et al, *Dis colon Rectum* 1994
Evaluation of constipation

Videodefecography results in healthy volunteers

- Intussusception and rectocele: 50%
  
  Goei et al Radiology 1990
  Finlay et al Int J Colorectal 1988

- Rectocele: 45%, intussusception: 10%, sigmoidocele: 10%, incomplete puborectalis relaxation: 5%

  Sobrado et al FMUSP 1999
Endoanal Ultrasound

- 3D: faster test, reevaluation
- Longitudinal plane: anal sphincter length
- Avaliação do plano longitudinal: medida do comprimento do esfíncter
- Anorectal Dynamic Endosonography:
  - Endoprobe at 6-7 cm from anal verge: 3 automatic scans, including 20 seconds of straining with patient in lateral decubitus after intrarectal injection of 180 ml of gel.

Gold et al Br J Surg 1999
Regadas et al Dis Colon Rectum 2010
Evaluation of constipation

Ecodefecography
Defecography & Ecodefecography

- 86 women, age 53 (26-76 yrs), Constipation Index: 13 (7-24)
- Ecodefecography and videodefecography have similar diagnostic rate, it is minimally invasive, well tolerated, avoids exposure to radiation and demonstrates all structures involved in defecation.
- Limited use in identification of grade I and II enteroceles.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Defecography</th>
<th>Ecodefecography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Rectocele grau I</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Rectocele grau II</td>
<td>43</td>
<td>31</td>
</tr>
<tr>
<td>Rectocele grau III</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Rectocele total</td>
<td>74</td>
<td>69</td>
</tr>
<tr>
<td>Internal prolapse</td>
<td>36</td>
<td>39</td>
</tr>
<tr>
<td>Anismus</td>
<td>19</td>
<td>26</td>
</tr>
</tbody>
</table>

Regadas et al Dis Colon Rectum 2010
56 women, age 50.7 (SD 12.5) years

Dynamic anorectal endosonography and dynamic MRI defecography show equivalent diagnostic performance in assessing pelvic floor disorders.

Because of its better tolerance and availability, dynamic anorectal endosonography may be preferable as the initial imaging procedure.

Vitton et al Dis Colon Rectum 2011
Defecography & USG

Videodefecography
- Seated position
- Rectal emptying
- Learning curve

Ecodefecography
- No irradiation
- Extrarectal structures
- Extension of physical exam
1943 - *Minnesota Multiphasic Personality Inventory (MMPI)*.

Devroede et al: higher values of hypochondriasis, hysteria in women with constipation when compared to arthritis; “somatization defense structure for dealing with psychologic distress”.

Heymen et al: constipation (N=30), anal incontinence (n=19) and anal pain (N=11). *Neurotic triad: hypochondriasis, depression and hysteria in constipation and anal pain.*
Physiology Testing

Psychological profile of patients with colorectal functional disorders

Results

ANOVA $p < 0.0001$

<table>
<thead>
<tr>
<th></th>
<th>Constipation</th>
<th>Incontinence</th>
<th>Anorectal Pain</th>
<th>Control Group I</th>
<th>Control Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>?</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>L</td>
<td>56</td>
<td>55</td>
<td>53</td>
<td>56</td>
<td>57</td>
</tr>
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<td>K</td>
<td>57</td>
<td>57</td>
<td>59</td>
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<td>F</td>
<td>58</td>
<td>56</td>
<td>59</td>
<td>58</td>
<td>56</td>
</tr>
<tr>
<td>Hs</td>
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Conclusion

- Hypochondriasis, depression and hysteria are frequent in patients with colorectal functional disorders.
- Somatization type of defensive structure - body: way to express psychological distress
- Psychologic evaluation should be included in the management of colorectal functional symptoms.
Funcional Investigation: costs & benefits

- Tests: availability and cost
- Need of association of tests
- Trained professional: careful interpretation
- Patient: discomfort and costs

- N=51:
  - colonoscopy, barium enema, transit times, defecography, EMG and rectal biopsy
  - Diagnosis: colonic inertia: 24%, outlet obstruction: 16%; uncertain: 61%
  - Mean cost: $2,752 (1,150 to 4,792)

Rantis et al, DCR 1997
## Physiological Testing

### Practice parameters for evaluation and management of constipation

<table>
<thead>
<tr>
<th></th>
<th>Level of Evidence (I, II, III, IV, V)</th>
<th>Grade of Recommendation (A, B, C, D)</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>IV</td>
<td>B</td>
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</table>
|   | A problem-specific history and physical examination should be performed in patients with constipation (Level of Evidence IV, Grade of Recommendation B)  
2. | V                                    | D                                    |
|   | The routine use of blood tests, x-ray studies, or endoscopy in patients with constipation without alarm symptoms is not indicated (Level of Evidence V, Grade of Recommendation D)  
3. | III                                  | B                                    |
|   | Anorecta physiology and colonic transit time investigations may help to identify the underlying etiology and improve the outcome in patients with refractory constipation (Level of Evidence III, Grade of Recommendation B)  

*ASCRS – American Association of Colorectal Surgeons  
Terten et al Dis Colon Rectum 2007*
Chronic idiopathic constipation ($N=180$)

- History
- Physical exam
- Colonic transit times
- Videodefecography
- Anal Manometry
- Electromyography
- Final diagnosis

<table>
<thead>
<tr>
<th>Nonrelaxing puborectalis syndrome</th>
<th>33%</th>
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<tbody>
<tr>
<td>Colonic inertia</td>
<td>17%</td>
</tr>
<tr>
<td>Rectocele</td>
<td>11%</td>
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<tr>
<td>Internal rectal prolapse</td>
<td>10%</td>
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<tr>
<td>Enterocele</td>
<td>4%</td>
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</tbody>
</table>

*Wexner e Jorge Eur J Surg 1994*
Colonic cause: colonic inertia, idiopathic megabowel, adult Hirschsprung’s disease

Pelvic outlet obstruction: nonrelaxing puborectalis syndrome, rectocele, enterocele, sigmoidocele

Combined colonic and pelvic floor dysfunction

Normal: irritable bowel syndrome

Whitehead et al Gastroenterol Int 1991