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

Workshop Chair: Lucia Oliveira, Brazil

21 October 2014 14:00 - 18:00

Start	End	Topic	Speakers
14:00	14:05	Introduction	• Lucia Oliveira
14:05	14:20	Anorectal anatomy and physiology of defecation	• Mara Salum
14:20	14:35	Neurophysiology of pelvic floor	• Nucelio Lemos
14:35	14:50	Etiology and clinical aspects of fecal incontinence and ODS	• Lucia Oliveira
14:50	15:05	Chronic pelvic pain syndrome	• Nucelio Lemos
15:05	15:20	Physiology tests for incontinence and ODS	• Lucia Oliveira
15:20	15:30	Anorectal and transperineal tridimensional ultrasound	• Lucia Oliveira
15:30	16:00	Break	None
16:00	16:15	Pelvic MRI	• Alice Brandao
16:15	16:30	Conservative treatment of fecal incontinence and ODS	• Mara Salum
16:30	16:45	Biofeedback therapy for fecal incontinence and ODS	• Lucia Oliveira
16:45	17:00	Injectables and other minimal invasive methods	• Lucia Oliveira
17:00	17:15	Sphincteroplasty and other surgical techniques	• Lucia Oliveira
17:15	17:30	SNS for fecal incontinence	• Lucia Oliveira
17:30	17:45	SNS for chronic pelvic syndrome	• Nucelio Lemos
17:45	18:00	Discussion	All

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 Intenational Continence Society

Neurophysiology of the Pelvic Floor

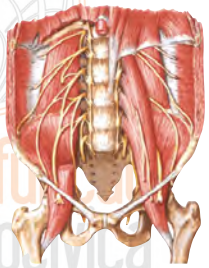
Financial Disclosures

Nucelio Lemos, MD PhD

- Speaker/Proctor
  - Medtronic®
- Research Grants
  - Medtronic®
  - Laborie®

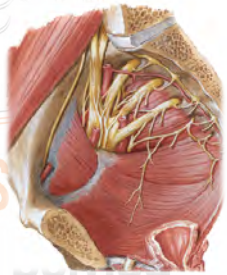
Lumbar Nerves

- Iliohypogastric N.
- Ilioinguinalis 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

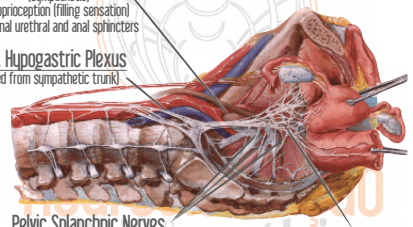
Motoric Innervation

- L2/L3 - Hip flexors (Iipsoas)
- 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
(sympathetic)
Proprioception (filling sensation)
Internal urethral and anal sphincters

Sup. Hypogastric Plexus
(derived from sympathetic trunk)



Pelvic Splanchnic Nerves
(nervi erigenti - parasympathetic)
Detrusor contraction
Colon descendens, sigmoid and rectum
Nociception

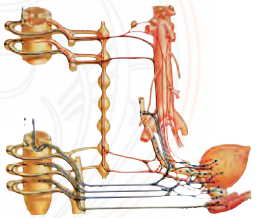
Inf. Hypogastric Plexus

Image from Netter

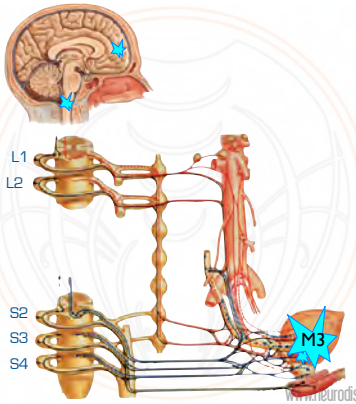
The Sacral Nerve Roots

Neurofisiologia da Micção

- T10-L2 - Sympathetic
  - Internal Urethral Sphincter Contraction (α1)
  - Detrusor Relaxation (β)
- S2-S4 - Parasympathetic (M3)
  - Detrusor Contraction
  - Internal Urethral Sphincter Relaxation
- S2-S4 - Somatic Nervous System
  - Urethral Contraction
  - Levator Ani Muscle Contraction



www.neurodisfuncao.med.br



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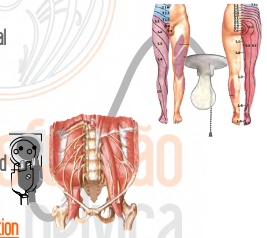
Symptoms of Intrapelvic Nerve Entrapment

- Perineal 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 dischezia associated with perineal and/or gluteal pain
- Rectal or vaginal foreign body sensation




Save the Date
Thank You!
ICS 2014
Rio de Janeiro
20th-24th October
www.ics.org

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

Introduction
Fecal incontinence

- 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
  Chassagne et al, Am J Med. 1999
- Female elderly patients prevalence is higher
  Varma et al, Dis Colon Rectum, 2006
- Impact in quality of life
  Boreham et al, Am J Obstet Gynecol, 2005
  Bharucha et al, Am J Gastroenterol, 2006
  Brown SR,Cochrane, 2009

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FECAL INCONTINENCE: INCIDENCE

Population-Based Surveys

New Zealand	> 65 years old	3.1 %
United Kingdom	Community Service	1.9%
Holland	Women>60 years	4.2% to16.9% With rising age
France	All > 45 years	11%; 6% to feces
Unites States	Market Mailing	7% soiling; 0.7 % to feces
United States	Wisconsin Households	2.2%; 63% women
United States	Wisconsin Nursing Homes	25%

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

Anal incontinence
Etiology

PSEUDO INCONTINENCE

Perineal soiling: mucosal prolapse, hemorrhoids, poor hygiene, fistula, dermatologic conditions,anorectal cancer, sexually transmitted diseases

OVERFLOW INCONTINENCE

- fecal impaction
- Encoprese
- Antimotility drugs

NORMALPELVIC FLOOR

Diarrhea
- Inflammatory Bowel Disease
- Irritable bowel syndrome
- Laxative abuse
- Post-cholecistectomy
- Infectious colitides

Systemic disorders
- Multiple sclerosis
- Scleroderm
- Tumors
- Diabetes

ABNORMAL PELVIC FLOOR

Sphincter injury
- **Obstetric**
- **Surgical Trauma**
- Tumor
- Rectal prolapse

Congenital abnormalities
- Imperfurate anus
- Myelomeningocele
- Spina bifida

Pelvic floor denervation
- Pudendal neuropathy
- perineal descent syndrome

Traumatic
- Aging
- Neoplastic infiltration

Anal incontinence
Introduction

- Complex and multifactorial mechanisms
  - Episiotomies
  - 3rd degree tears
  - Prolonged second stage of labor
  - Forceps
- Detailed clinical history
- Incontinence scales and QoL instruments

Introduction

- Clinical evaluation
- Physical exam
- Exclude bowel disturbances

Diarrhea
Irritable bowel syndrome
Cholecystectomy
Rectocele
Stress urinary incontinence
Bharucha AE Gastroenterology. 2010

Cleveland Clinic Scoring System

FECAL INCONTINENCE
CLINICAL AND FUNCTIONAL EVALUATION
Incontinence Scoring System

TYPE OF INCONT	NEVER	RARELY <1/MTH	SOMETIMES <1/WK, 1/MTH	USUALLY <1/DAY, 1WK	ALWAYS 1 DAY
SOLID	0	1	2	3	4
LIQUID	0	1	2	3	4
GAS	0	1	2	3	4
WEARS PAD	0	1	2	3	4
LIFESTYLE ALTERATION	0	1	2	3	4

Jorge JM, Wexner SD. Etiology and management of fecal incontinence. Dis Colon Rectum. 1993

Fecal Incontinence Quality of Life Instrument-ASCRS

- 4 domains

Embarassment

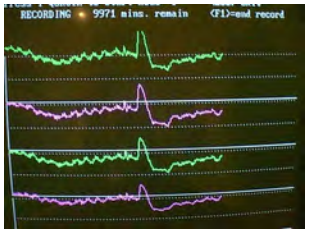
Lifestyle

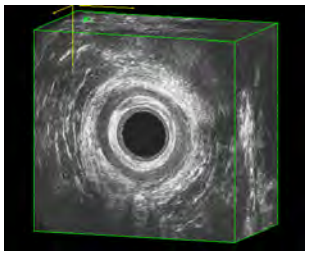
Coping

Behavior

Fecal incontinence
Evaluation

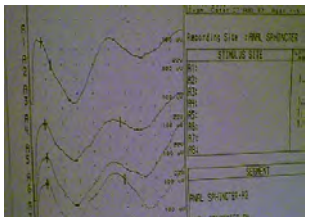
- Anal manometry
- Endoanal ultrasound

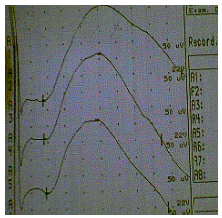




Fecal incontinence
Evaluation

- Pudendal nerve terminal motor latency





Fecal incontinence
Etiology

Internal anal sphincter

- Passive incontinence

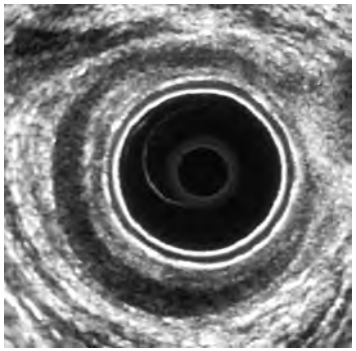
internal anal sphincter dysfunction (IAS)

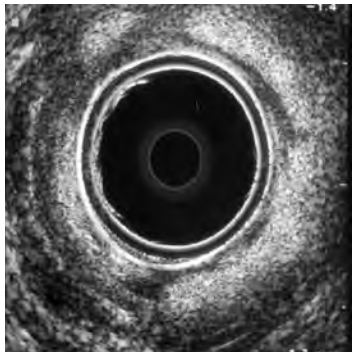
Engel 1995

1.Weak but intact sphincter: primary degeneration or esclerosis

2.Damaged IAS: post-surgical, obstetric defect

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:

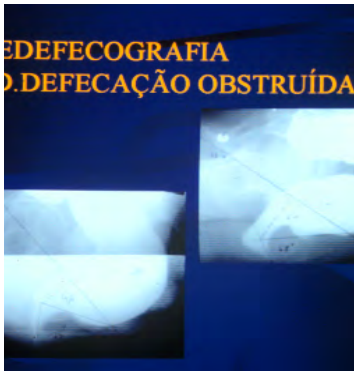
✔difficulty in emptying the rectum ✔symptoms of prolonged repeated straining during bowel movements

✔sensation of incomplete evacuation

✔ the need for digital manipulation.

Obstructed defecation syndrome

- Rectoceles
- Anismus
- Enteroceles
- Rectal intussuception or invagination



Obstructed defecation syndrome

- Complete proctological examination in different position
- Constipation Scoring System-Agachan 1997

Obstructed defecation syndrome

- Colonic transit time with markers
- Anal manometry
- EMG
- Cinedefecography
- Echodefecography
- MRI defecography

Obstructed defecation syndrome

- Colonic transit time
- Radiopaque markers-Sitzmarks

Obstructed defecation syndrome

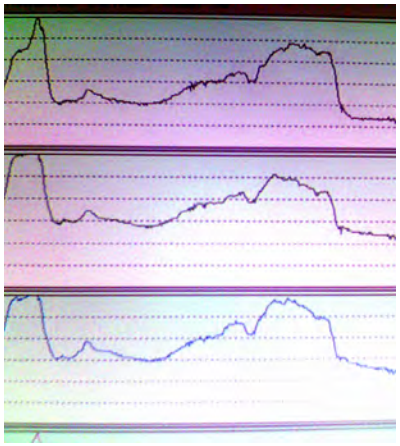
- Anal manometry

-Absence of relaxation during evacuation

-Hypertonic sphincter

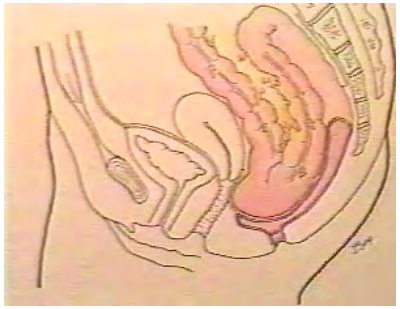
-Prolonged RAIR

-Ballon expulsion test



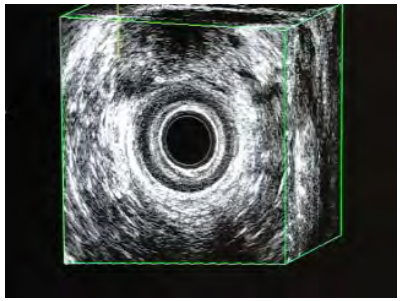
Obstructed defecation syndrome

- Cinedefecography



Obstructed defecation syndrome

Echodefecography and MRI defecography



Chronic Pelvic Pain Syndrome

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Chronic Pelvic Pain Syndrome

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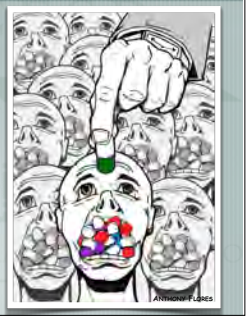
The "Syndromic Era"

- Chronic Pelvic Pain Syndrome
- Bladder Pain Syndrome
- OAB Syndrome
- Irritable Bowel Syndrome
- ADHD



Moving Forward with OAB and BPS diagnosis

Medical Propedeutics & Diagnostic Sequence

Syndromic Diagnosis
Symptoms&Signs

Topographic Diagnosis
Affected /Dysfunctional Organ/Tissue

Topographic Diagnosis
Affected /Dysfunctional Organ/Tissue

Medical Propedeutics & Diagnostic Sequence

Syndromic Diagnosis
Symptoms&Signs

Topographic Diagnosis
Affected /Dysfunctional Organ/Tissue
- Ethiological Diagnosis
- Ethiological Diagnosis
- Ethiological Diagnosis

Topographic Diagnosis
Affected /Dysfunctional Organ/Tissue
- Ethiological Diagnosis
- Ethiological Diagnosis
- Ethiological Diagnosis

Topographic Diagnosis
Affected /Dysfunctional Organ/Tissue
- Ethiological Diagnosis
- Ethiological Diagnosis
- Ethiological Diagnosis

OAB/BPS

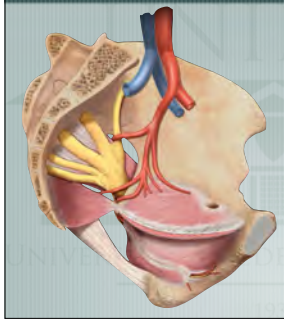
Topographic Diagnosis

POSSIBLE SOURCES OF PAIN OR URGENCY

- Bladder / Urothelium
- Urethra
- Vagina
- Fascia/Ligaments
- Urine Composition

OAB/BPS

Topographic Diagnosis

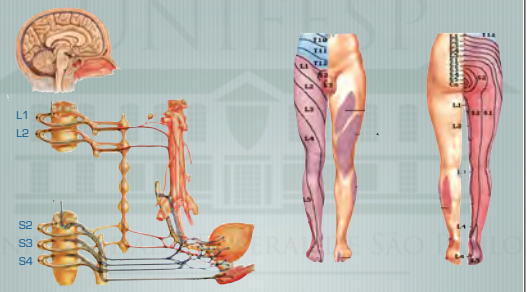


POSSIBLE SOURCES OF PAIN OR URGENCY

- Muscles
- Nerves
- Blood Vessels

OAB/BPS

Topographic Diagnosis



OAB/BPS

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

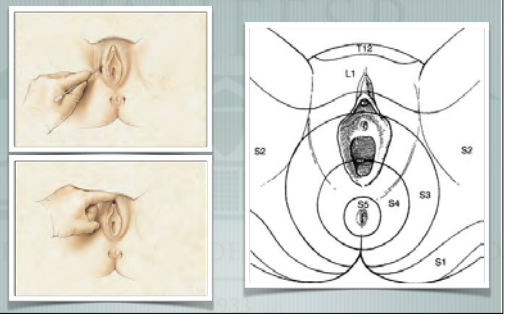
OAB/BPS

Physical Examination

- Pelvic reflexes
  - Clitoridian
  - Bulbocavernosus
  - Cutaneous-analis
- Trigger points
  - Vaginal palpation
  - Bladder neck palpation
- Pelvic Floor Muscles palpation
- Urethral Support Simulation

OAB/BPS

Neurologic Examination



OAB/BPS

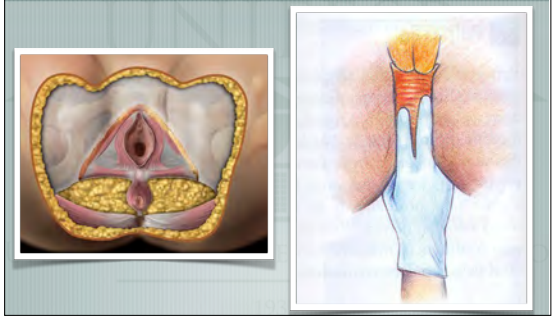
Gynecologic Examination

OAB/BPS

Urethral Support Simulation

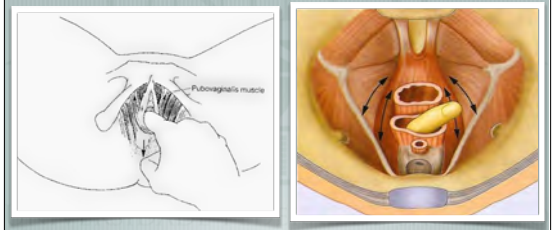
OAB/BPS

Pelvic Floor Muscles Palpation



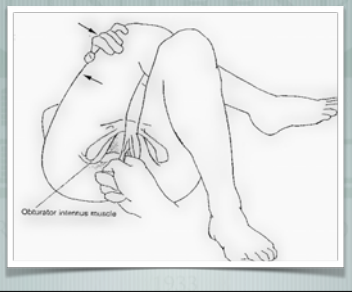
OAB/BPS

Pelvic Floor Muscles Palpation



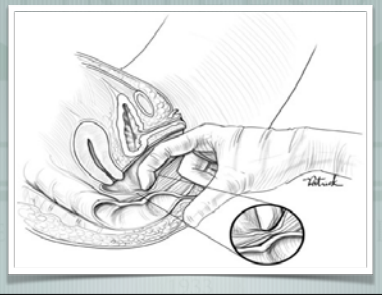
OAB/BPS

Pelvic Floor Muscles Palpation



OAB/BPS

Pelvic Floor Muscles Palpation



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

Offiah, 2013.

LUT evaluation

Int Urogynecol J (2010) 21:321–324
DOI 10.1007/s00192-009-1045-0

ORIGINAL ARTICLE

Intravesical lignocaine in the diagnosis of bladder pain syndrome

Rajesh Taneja

Results Fifteen out of 22 (68.18%) women experienced a substantial reduction in the pain. Thirteen out of these 15 women had features suggestive of BPS/IC on cystoscopy. Out of the seven non-responders, two women were found to have endometriosis, four were diagnosed as pelvic inflammatory disease and one had diverticulitis.

Cystoscopy

- Useful for Diagnosing IC and Classifying the Disease

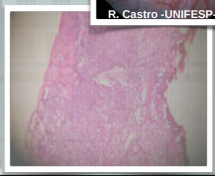
Offiah et al. 2013

R. Castro -UNIFESP-EPM

TABLE 1. Classification Schema of European Society for the Study of Interstitial Cystitis (ESSIC)

	Cystoscopy with hydrodistension			
	Not done	Normal	Glomerulations[a]	Hunner's lesion[b]
Biopsy				
Not done	XX	1X	2X	3X
Normal	XA	1A	2A	3A
Inconclusive	XB	1B	2B	3B
Positive[c]	XC	1C	2C	3C

See Ref. [3].
[a]Cystoscopy glomerulation grades II–III.
[b]With or without glomerulations.
[c]Histology showing inflammatory infiltrates and/or detrusor mastocytosis and/or granulation tissue and/or intrafascicular fibrosis.



In Conclusion...

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

In Conclusion...

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

In Conclusion...

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

Thank you!!

www.neurodisfuncao.med.br
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Anorectal and transperineal tridimensional ultrasound

Lucia Camara Castro Oliveira
,MD,PhD

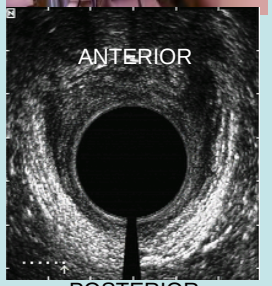
Serviço de Fisiologia da Policlínica Geral do Rio de Janeiro

Introduction

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

Rigth-left

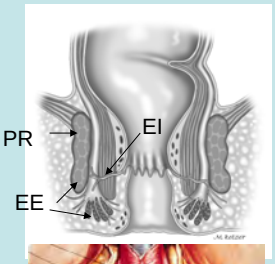
Left-rigth

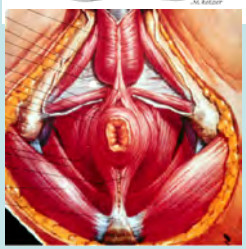


POSTERIOR

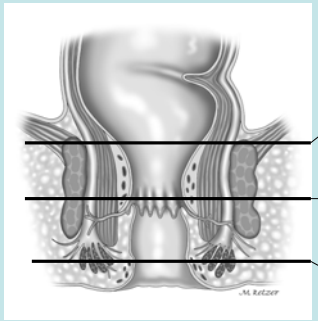
Anal canal anatomy

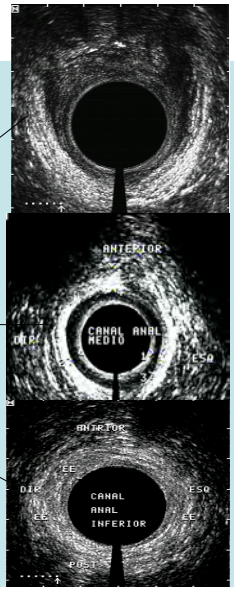
- Inferior: external sphincter(MEE)
- Mid: external and internal anal sphincters
- Superior: puborectalis and internal anal sphincter





Anal canal and US





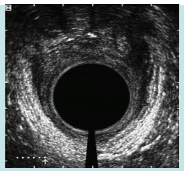
PR

MEE e MEI

MEE

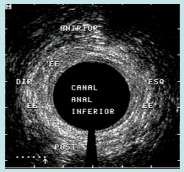
Imagens ultrassonográficas

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



PR

MEE e MEI



MEE

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

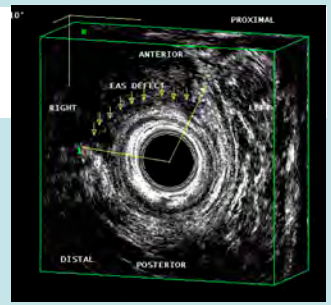
Lesão Esfíncter Externo

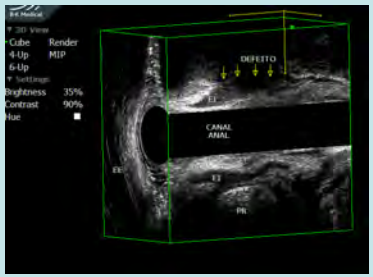
- Lesão obstétrica

  até 24% dos partos vaginais

-Primiparidade
-Episiotomia
-Extrator à vácuo
-Fórcipe
-Peso fetal > 3.5Kg
-Parto Prolongado

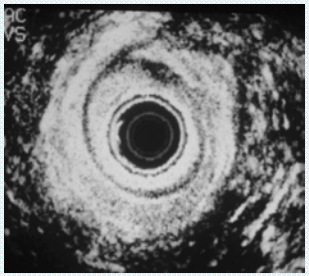
Borgatta et al, Am J Obstet Gynecol, 1989
Sultan et al, NEJM, 1993
Combs et al, Am J Obstet Gynecol, 1990
Zetterstrom et al, Br J Obstet Gynecol,1999





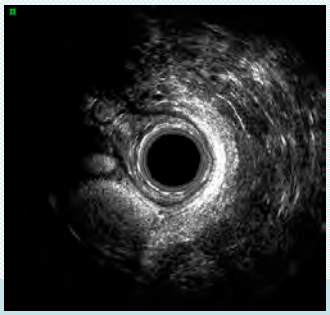
Incontinência anal
US endoanal
Lesão Esfíncter Externo

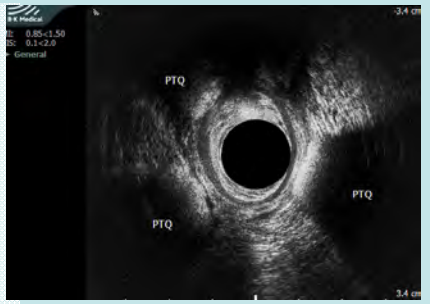
- Acompanhamento pós-esfincteroplastias



Incontinência anal
US endoanal
Acompanhamento

- Pós-injeção de agente de preenchimento

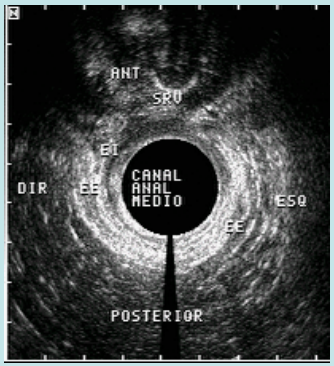




Incontinência anal
US endoanal

- Avaliação do septo reto-vaginal

Espessura normal de 10mm

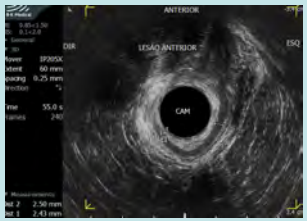


Anal incontinence

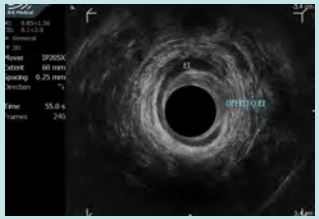
US endoanal

Internal anal sphincter defect

- Origem obstétrica

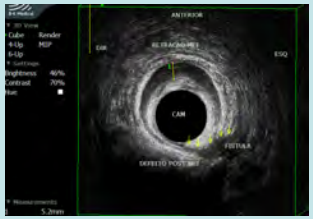


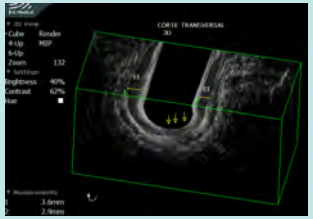
- Pós-esfincterotomia



Fecal incontinence
US endoanal
Internal anal sphincter defect

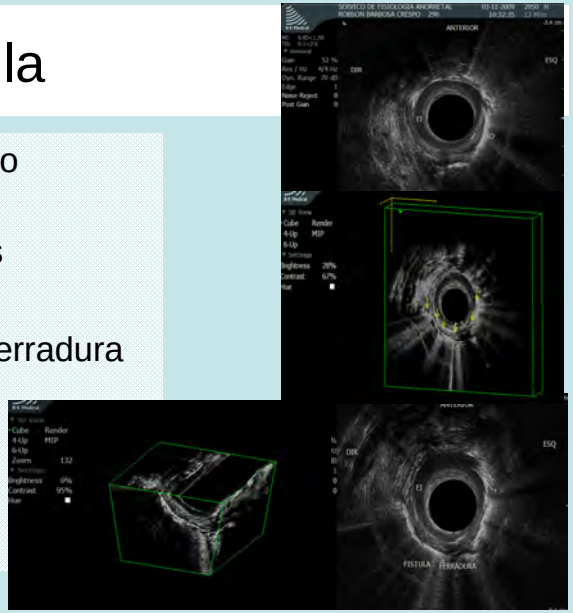
- Pós-fistulotomia
  Fístulas: 57% e 29% (EI e EE)





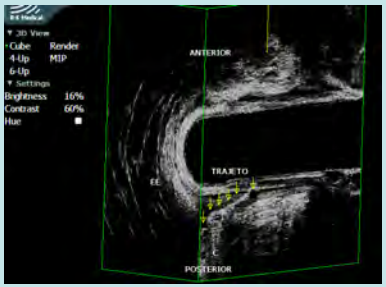
Anal fistula

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



Anal Fistula

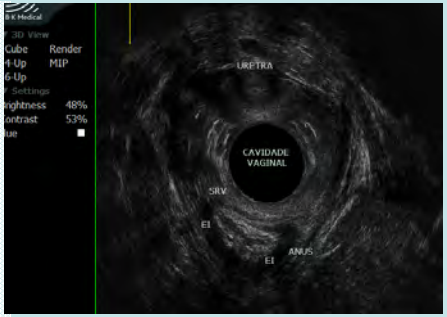
- Identificação dos trajetos
- Utilização do orifício externo para identificação dos trajetos através da água oxigenada
- Avaliação da musculatura



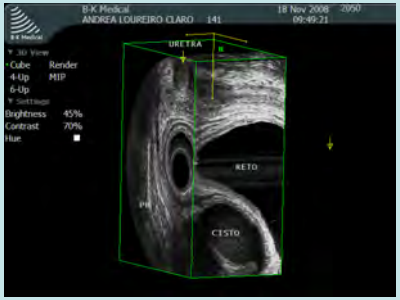
Recto-vaginal fistula

- 27 anos
  secreção vaginal pós-parto vaginal
  e episódios de incontinência

Trabsdutor vaginal para avaliação do septo



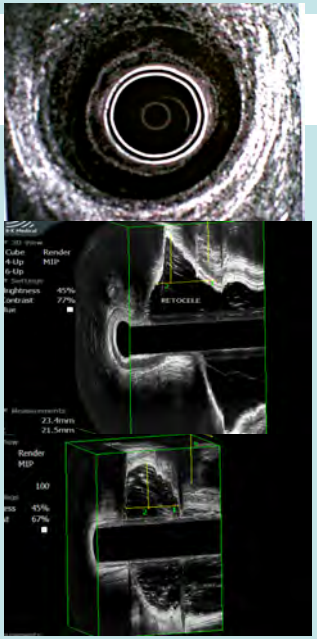
Pre-sacral cysts



Us endoanal
Defecação obstruída

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

Ecodefecografia
Murad-Regadas SM et al.
Surg Endosc, 2008.



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 OBSTRUCTED DEFECATION SYNDROME

Mara Rita Salum

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

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

Introduction
Biofeedback

- Safe and simple treatment option
- Train pelvic floor muscles
- Improve rectal sensation and contraction awareness
- Level of evidence III / recommendation grade B
  ASCRS
  Practice Parameters for the Treatment of Fecal Incontinence.Dis Colon Rectum,2007.

Introduction
Biofeedback

- Different interventions under the term of BF
- Lack of quality and standard protocols among trials
- Clinical series ⇨ positive results
- RCT of BF x pelvic floor exercises
  Heymen S et al.Dis Colon Rectum 2009

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

Methods

INCLUSION CRITERIA

- Anal incontinence
- Motivated patient

EXCLUSION CRITERIA

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

Methods

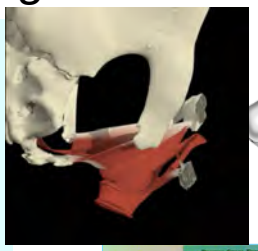
- Manometry or EMG System
- 1 session / week 30-40 min
- 5-10 weeks
- Kegel's exercises for home trainning

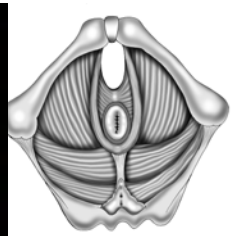
Methods

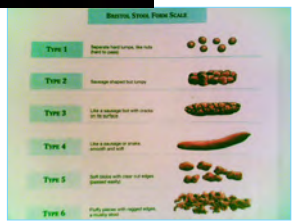
- Low-frequency electro stimulation
- 10-30 Hz
- 10- 15 minutes

Methods
Biofeedback program

- Bowel education
  pelvic anatomy
  video demonstrations
  Bristol scale
- Bowel diary
- Diet orientation







Methods

Post-treatment evaluation

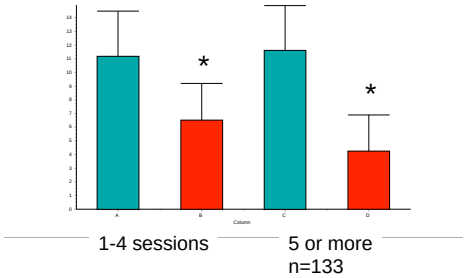
- Clinical: 3 and 6 months, 1 year
  Incontinence score and FIQL scale after 3 months

Successful outcome:

⇨ reduction on incontinence episodes
⇨ improvement in Incontinence scores and FIQLS

Results

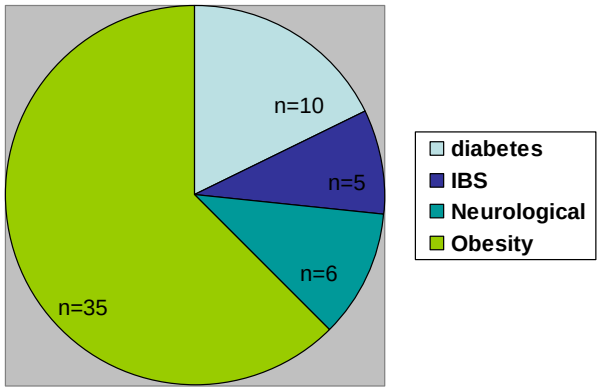
- Patients that performed more than 5 sessions had a better outcome, when compared with those who performed 4 or less sessions, as observed utilizing the CCISS



p<0.0001
Mann-Whitney

Results

Poor prognostic factors
n=56



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

Lehur PA, Stuto A, Fantoli M, Villani RD, Queralto M, Lazorthes F, Hershman M,Carriero A, Pigot F, Meurette G, Narisetty P, Villet R; ODS II Study Group.Outcomes of stapled transanal rectal resection vs. biofeedback for the treatment of outlet obstruction associated with rectal intussusception and rectocele: a multicenter, randomized, controlled trial. Dis Colon Rectum. 2008

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
Doutor em Ginecologia pela FCM Santa Casa SP
Fellowship em Neuropelveologia pela Klinik Hirslanden, Zurique, Suiça
Pós-Doutorando e Responsável pelo
Setor de Neurodisfunções Pélvicas do Departamento de Ginecologia da UNIFESP-EPM

Neuromodulation in Chronic Pelvic Syndromes

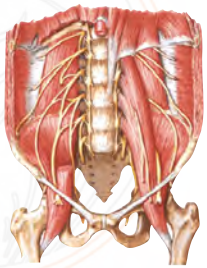
Declaração de Conflitos de Interesse

- Prof. Dr. Nucelio L. B. M. Lemos
- Preceptor da Medtronic® para Neuromoduação
- Financiamento de Pesquisa
  - Medtronic®
  - Laborie®

Neuroanatomy/physiology of the Pelvic Floor

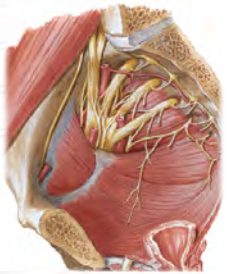
Lumbar Nerves

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



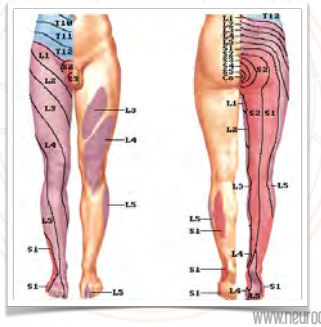
Sacral & Coccigeal Nerves

- 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 (Iipsoas)
- 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

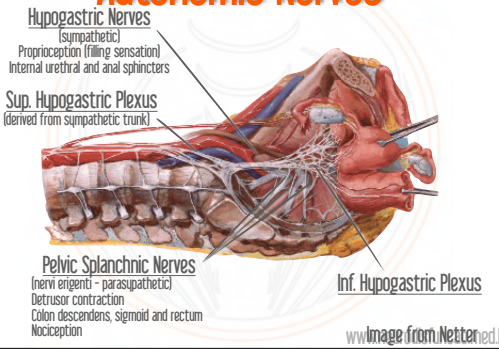
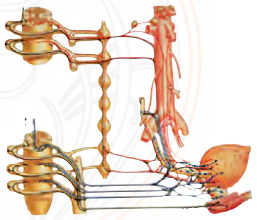


Image from Netter

The Sacral Nerve Roots

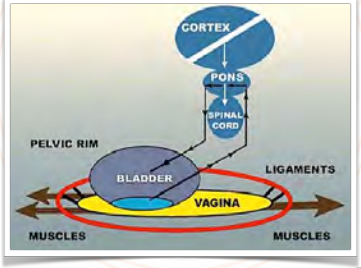
LUT Neurophysiology

- Th10-L2 - Sympathetic
  - Internal Urethral Sphincter Contraction (α1)
  - 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

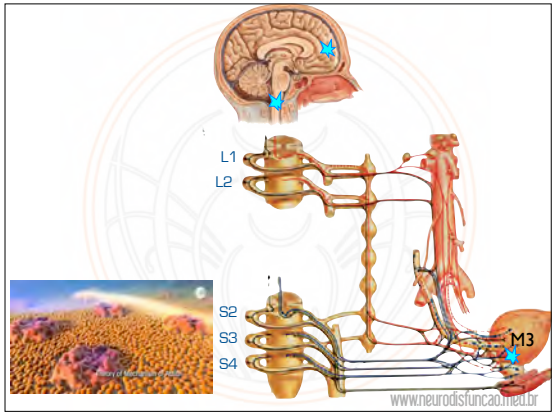
Petros & Ulmsten, 1993



What about neuromodulation?

neurodisfunção pélvica

UNIFESP



Neuromodulation - Indications

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

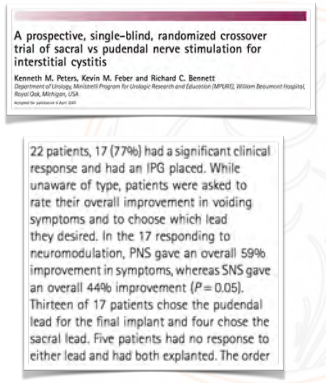
Neuromodulation - Possible Targets

- S3
- Pudendal nerve
- Superior Hypogastric Plexus??


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

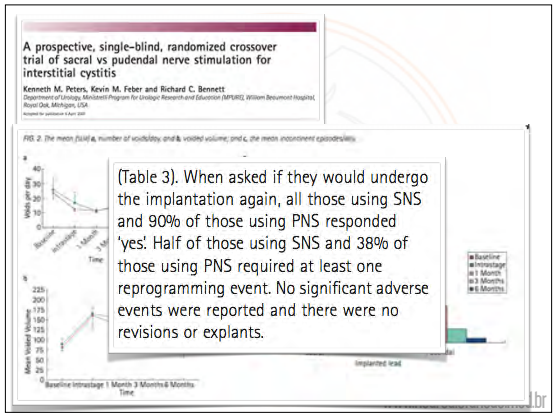
Kenneth M. Peters, Kevin M. Feber and Richard C. Bennett

Department of Urology, Ministrelli Program for Urologic Research and Education (MPURE), William Beaumont Hospital, Royal Oak, Michigan, USA


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

Kenneth M. Peters, Kevin M. Feber and Richard C. Bennett

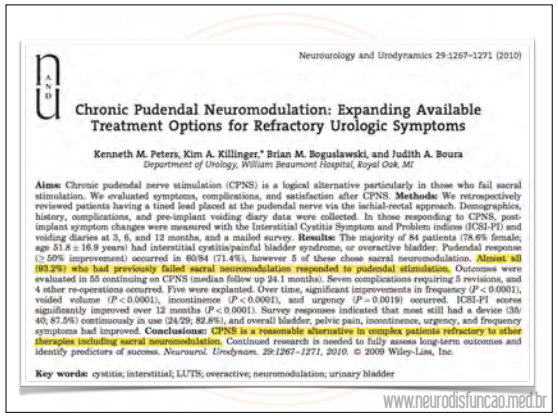
22 patients, 17 (77%) had a significant clinical response and had an IPG placed. While unaware of type, patients were asked to rate their overall improvement in voiding symptoms and to choose which lead they desired. In the 17 responding to neuromodulation, PNS gave an overall 59% improvement in symptoms, whereas SNS gave an overall 44% improvement ($P = 0.05$). Thirteen of 17 patients chose the pudendal lead for the final implant and four chose the sacral lead. Five patients had no response to either lead and had both explanted. The order



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

Kenneth M. Peters, Kevin M. Feber and Richard C. Bennett

(Table 3). When asked if they would undergo the implantation again, all those using SNS and 90% of those using PNS responded 'yes'. Half of those using SNS and 38% of those using PNS required at least one reprogramming event. No significant adverse events were reported and there were no revisions or explants.



Neurourology and Urodynamics 29:1267–1271 (2010)

Chronic Pudendal Neuromodulation: Expanding Available Treatment Options for Refractory Urologic Symptoms

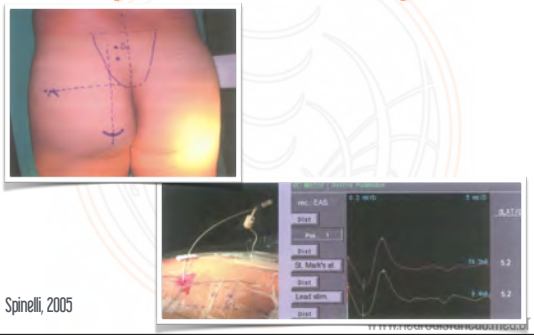
Kenneth M. Peters, Kim A. Killinger,* Brian M. Boguslawski, and Judith A. Boura

Department of Urology, William Beaumont Hospital, Royal Oak, MI

Aims: Chronic pudendal nerve stimulation (CPNS) is a logical alternative particularly in those who fail sacral stimulation. We evaluated symptoms, complications, and satisfaction after CPNS. **Methods:** We retrospectively reviewed patients having a tined lead placed at the pudendal nerve via the ischial-rectal approach. Demographics, history, complications, and pre-implant voiding diary data were collected. In those responding to CPNS, post-implant symptom changes were measured with the Interstitial Cystitis Symptom and Problem indices (ICSI-PI) and voiding diaries at 3, 6, and 12 months, and a mailed survey. **Results:** The majority of 84 patients (78.6% female; age 51.8 ± 16.9 years) had interstitial cystitis/painful bladder syndrome, or overactive bladder. Pudendal response (> 50% improvement) occurred in 60/84 (71.4%), however 5 of these chose sacral neuromodulation. Almost all (93.2%) who had previously failed sacral neuromodulation responded to pudendal stimulation. Outcomes were evaluated in 55 continuing on CPNS (median follow up 24.1 months). Seven complications requiring 5 revisions, and 4 other re-operations occurred. Five were explanted. Over time, significant improvements in frequency ($P < 0.0001$), voided volume ($P < 0.0001$), incontinence ($P < 0.0001$), and urgency ($P = 0.0019$) occurred. ICSI-PI scores significantly improved over 12 months ($P < 0.0001$). Survey responses indicated that most still had a device (35/40; 87.5%) continuously in use (24/29; 82.8%), and overall bladder, pelvic pain, incontinence, urgency, and frequency symptoms had improved. **Conclusions:** CPNS is a reasonable alternative in complex patients refractory to other therapies including sacral neuromodulation. Continued research is needed to fully assess long-term outcomes and identify predictors of success. *Neurourol. Urodynam. 29:1267–1271, 2010.* © 2009 Wiley-Liss, Inc.

Key words: cystitis; interstitial; LUTS; overactive; neuromodulation; urinary bladder

Implantation Technique



Spinelli, 2005

Implantation Technique

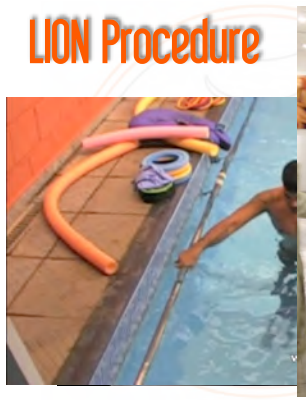
LION Procedure

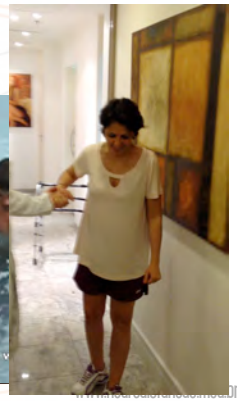
INDICATIONS

- Neuropathic Pain
  - Phantom pain
  - Post-herniorhaphy inguinidynia
  - Chronic Pelvic Pain
  - Perineal Pain
  - Ciatica
  - Post-decompression pain
- Anal Incontinence
- Detrusor Overactivity
- Rehabilitation

LION Procedure

LION Procedure





Obrigado!

nucelio@gmail.com
www.neurodisfuncao.med.br

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:

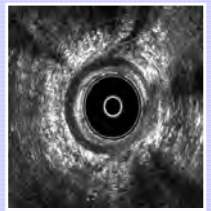
- Complex condition, diverse intervention, limited number of patients, difficulties in recruitment and evaluation of results: little evidence to support the efficacy of surgical treatment.
- Diversion (stoma) does not improve the results of sphincter repair and increase morbidity and hospital stay.
-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

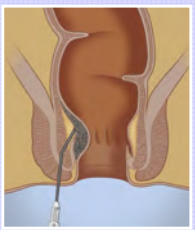
Brown et al Cochrane Database of Systematic Reviews, 2012

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*

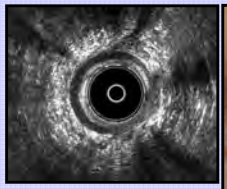



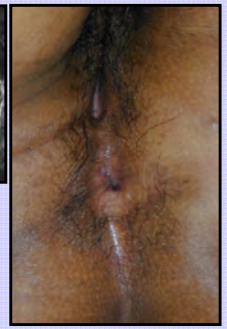



- injections of bulking agents performed under local anesthesia at the level of the IAS-submucosal interface.
- *day care setting*
- *antibiotics: ciprofloxacin 500mg tds*
- *analgesic (paracetamol) and laxative (lactulose)*

Bulking agent injection in anal incontinence

methods





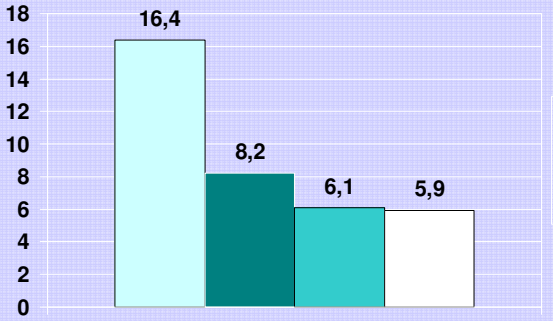
patient selection:

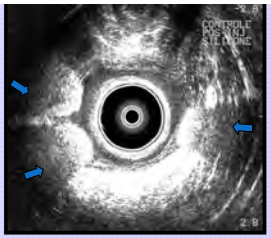
- *passive incontinence due to an isolated* defect of the IAS

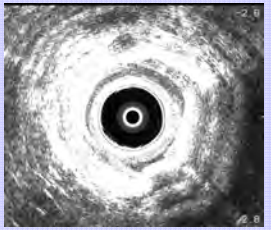
Injectables & minimally invasive methods

Results

Incontinence score (0-20)





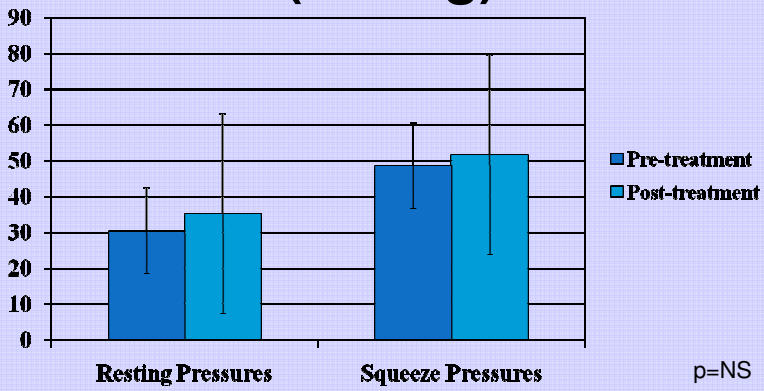


Jorge et al Coloproctology 2005
Oliveira et al SURG Innov 2009

Injectables & minimally invasive methods

results

pressure parameters (mmHg)

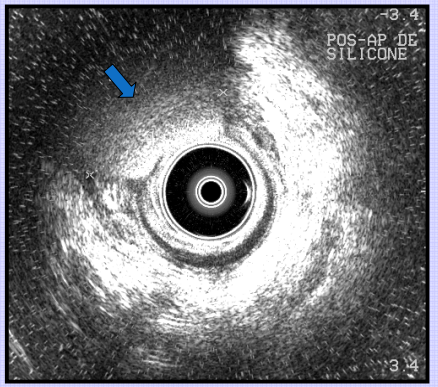


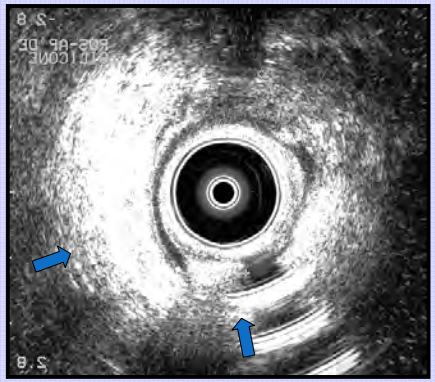
p=NS

Injectables & minimally invasive methods

results

anal ultrasound

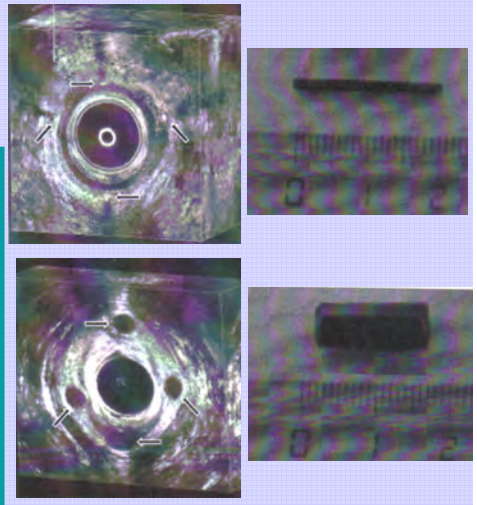




identification of sites of injection on endoanal ultrasound

Injectables & minimally invasive methods

Gatekeeper® implants



- Four poliacrilonitrile solid cilinders
- Ultrasound guided implantations through incisions
- Thickening after 24 hours
- Significative improvement in incontinence and quality of life scores

Ratto C et al Br J Surg 2011

MEDICINA USP

Injectables & minimally invasive methods

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 untill sensitive and motor responses are obtained.
- Stimullus of multiple aferent spinal pathways
- Efficacy – improvement ≥50% dos sintomas: 63 - 82%
- Methodology varies, small studies, follow-up usually 1-3 months

Thomas et al Colorectal Disease 2012

MEDICINA USP

Injectables & minimally invasive methods

Posterior Tibial Nerve Stimulation transcutaneous & percutaneous

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

George et al Br J Surg 2013

MEDICINA USP

Injectables & minimally invasive methods

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

MEDICINA USP

Autologus *myoblast implants*

- Myoblasts culture from peitoral 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

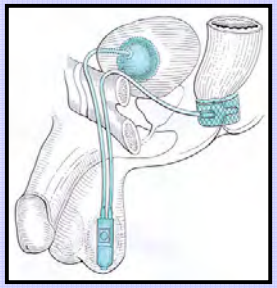
Frudinger et al Gut 2009

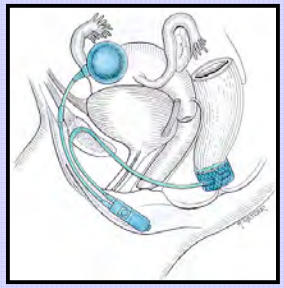
Stem Cell Implantation

- Case Report: 20 years male – automobilistic trauma underwent sphincter repair and biofeedback
- Quadríceps 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

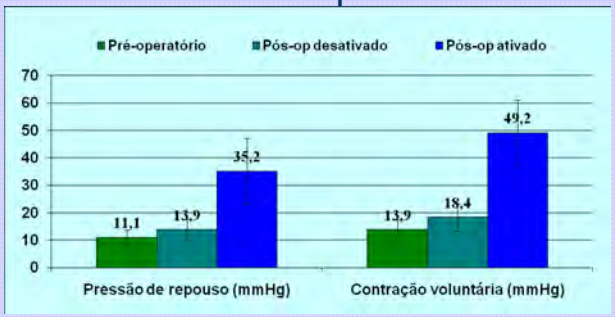




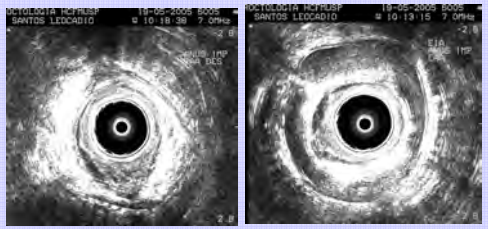
- Components: 1.*Cuff* 2. Reservoir balloon 3. Regulating pump
- Princíple: transference of fluid between the cuff and balloon, controlled by a pump (resistor and valves)

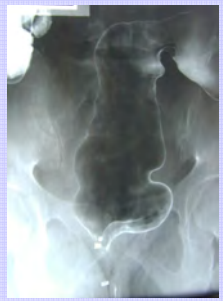
Christiansen e Lorentzen Lancet 1985

Artificial Bowel Sphincter - Results



**p<.,05; Wilcoxon*






Injectables & minimally invasive methods

Articial 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

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Injectables & minimally invasive methods

Artificial Bowel Sphincter vs Magnetic Anal Sphincter

Parameters	Artificial Anal Sphincter	Magnetic Anal Shincter (MAS)	*p*
Operative time (min)	97.5	62	*0.0273*
Hospitalization (days)	10	4,5	*0.001*
Incontinence score	16 to 4	17 to 6	*P<0.001*
Quality of life score	1.80 to3.55	2.03 to 3.51	*P<0.01*
Resting pressure	89	58.5	*0.0147*
Complications	2	4	*0.628*
Device explantation	4	1	*0.830*

Wong et al Dis Colon Rectum 2011

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Sphincter replacement

Biologic

Muscle transposition

Pickrell et al 1952

Neurostimulated neosphincter

Baeten et al 1988

Sinthetic

Metalic wire

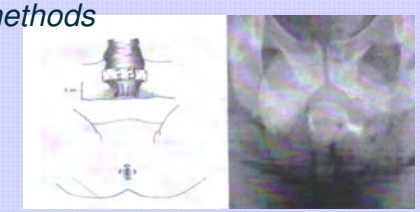
Dacron

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

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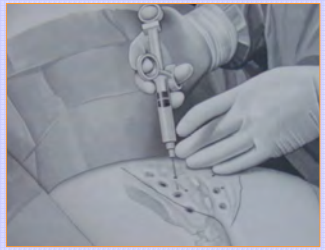
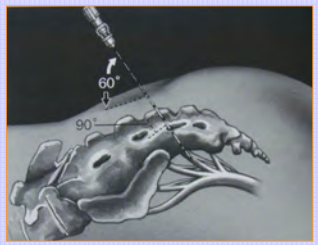
Injectables & minimally invasive methods



Parameters	Pre	Post
Incontinence score	17	2
Resting pressure (mmHg)	37	73
Squeeze pressure (mmHg)	48	93

"Improvement in patients with functional dysfunction but intact morphology"



Tanagho EA et al Urology 1982
Matzel et al Lancet 1995

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Anal Incontinence *treatment*

Muscular lesion — neurogenic

- Isolated IAS lesion → **Bulking agents**
- Complete EAS lesion → **Repair** → **Redo repair**
- Irreparable lesion → Artificial sphincter: **MAS**
- **Biofeedback** **Posterior tibial nerve stimulation** → Reparo pós-anal?
- **SNS**
- **Hormon therapy** **Antidepressants**
- **Colonic irrigation** **Colostomy**

MEDICINA USP

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 dailly bowel movement is a sign of good health*
  - Purchases of laxatives** - Canada: $49,979,000; USA: 512,425,000

**Ruben BD Pract Gastorenterol 1986*

***Rhodes D, 1997*

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Definition & Prevalence

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

Definition	N	Prevalence	
Patient complaint*	877.645	18.5% men 33.7% women	
Medical evaluation**	11.204	8.0% men 20.8% women	**15%**
Infrequent defecation***	16.667	2.0% total 4.5% > 65 years 10.2% >75 years	

* *Hamond, Am J Public Health 1964*

** *Everhart et al, Dig Dis Sci 1989*

*** *Whitehead et al, Gastroenterology 1990*

FMUSP

Definition

- ≤ 2 stools/week and or straining at stool ≥ 25% of the time*
- *The Diagnostic Rome III criteria for functional constipation****

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

   ≥ 25% of defecations
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

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

- 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

FMUSP

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, tranquilizers, narcotics, anti-inflammatories, calcium channel blockers, antiarrhytmcs, lipid lowering drugs, antihypertensives, hematological/oncological drugs, miscellaneous agents

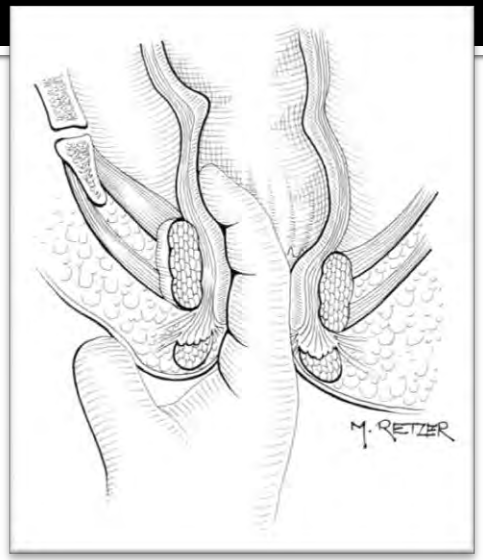
Neurologic disease: cerebral, medular, peripheric

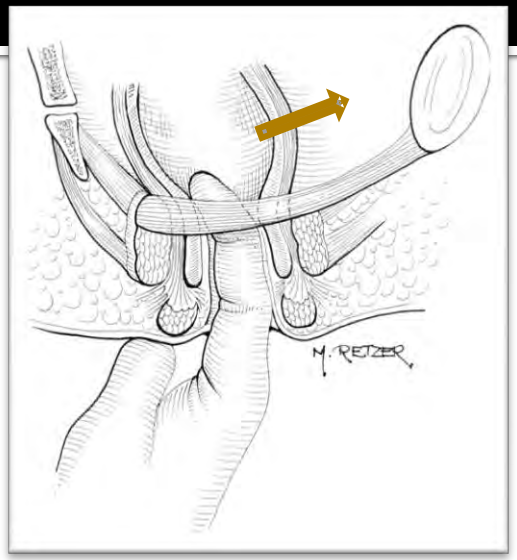
Endocrine disease: Hypothyroidism, diabetes mellitus, pheochromocitoma

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

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

Physical Examination





Constipation: functional investigation

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

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Physiology Testing

Anorectal manometry	*Gowers 1877* *Collins et al 1969*
Colonic transit time	*Alvarez-Freedlander 1924* *Hinton 1969*
Defecography	*Walldén 1952* *Mahieu et al 1984*
Electromiography	*Beck 1930*

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Physyology testing

CONSTIPATION

INCONTINENCE

Colonic transit time

Anorectal manometry

Endoanal USG

Defecography

Diagnosis
Comprehension
Therapeutic decision
Tratament (biofeedback)
Evaluation of results
Legal aspects

Electroneuromiography

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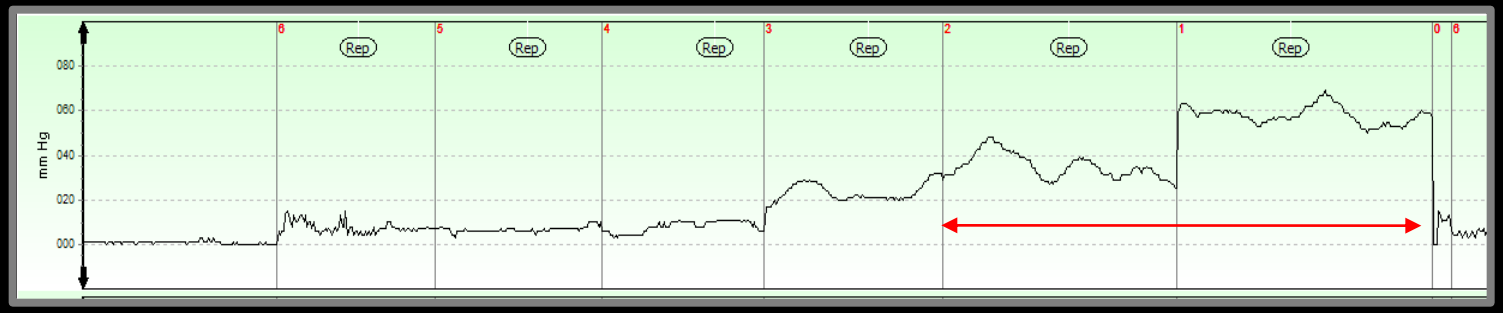
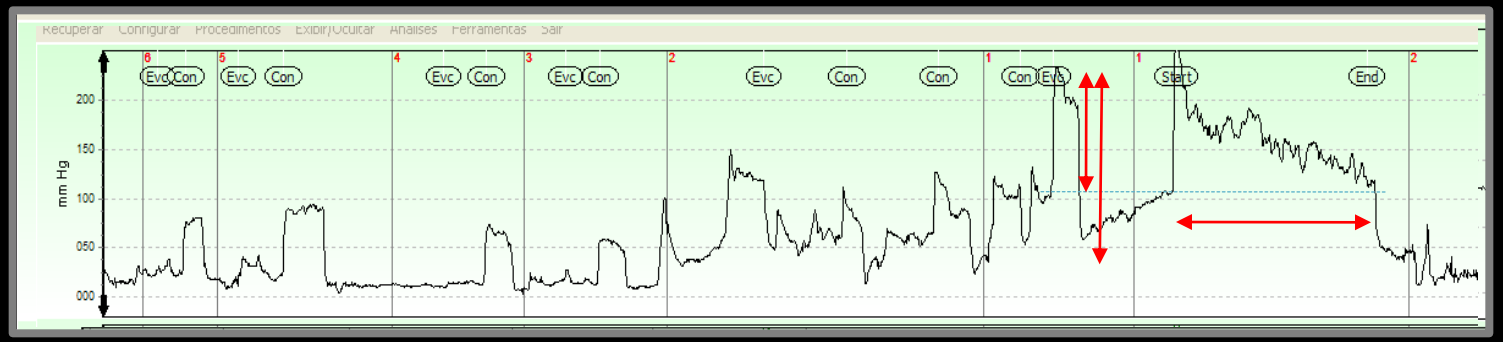
Anorectal Manometry - Parameters

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



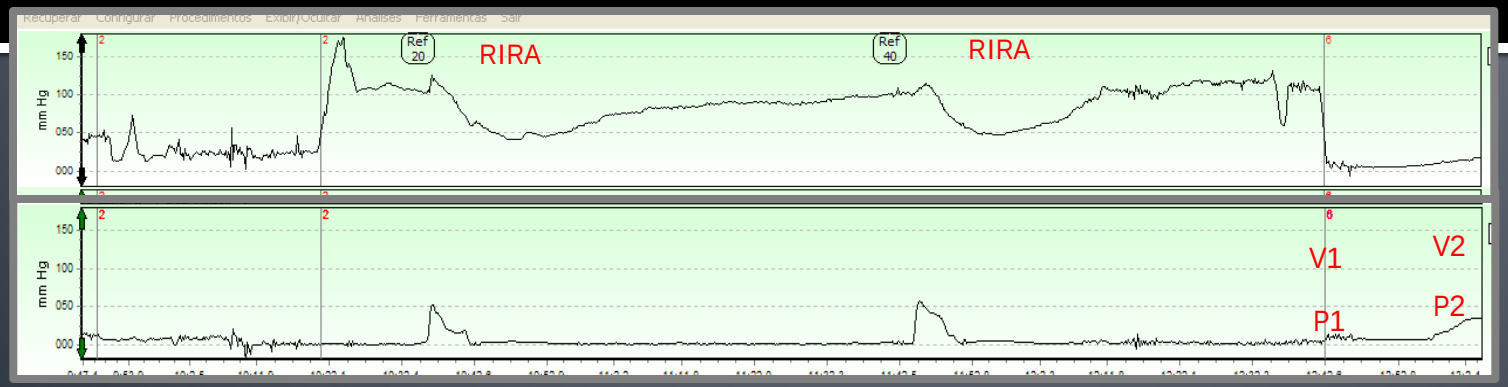
1. Resting pressures
2. Functional anal canal length

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



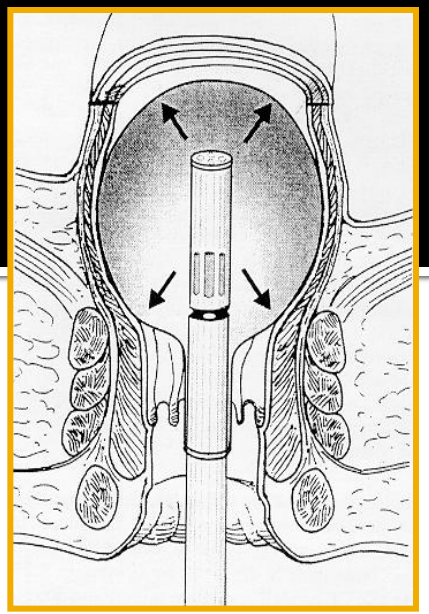
1. External anal sphincter pressures
2. Total volunctary contraction pressures
3. Sphincter Fatigue Index

3. Adjunct studies – use of *intrarectal balloon*

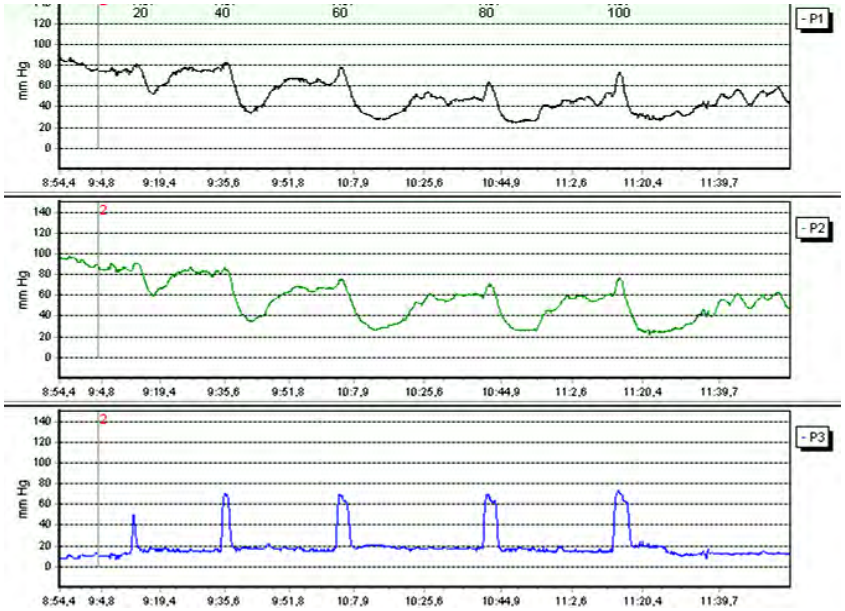


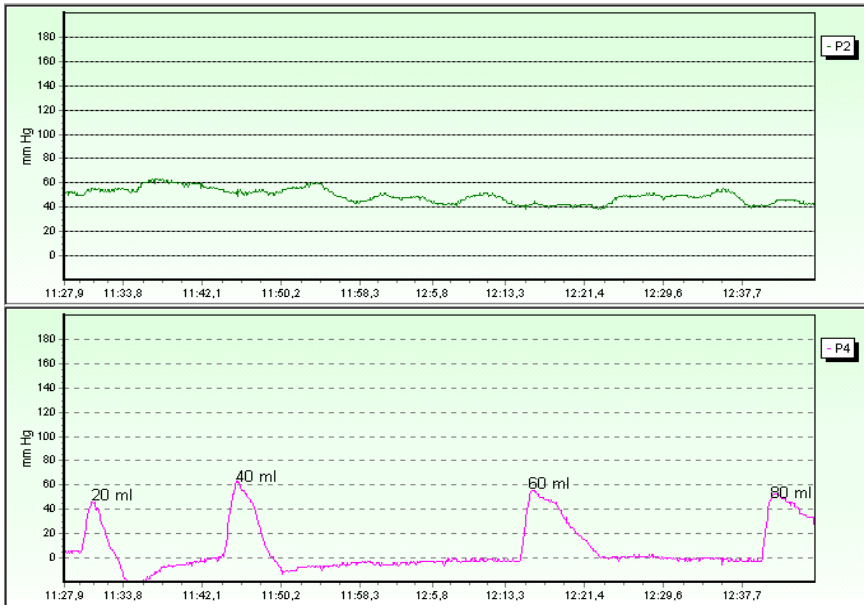
1. Rectal Sensory Threshold
2. Rectal capacity
3. Rectal compliance

Rectoanal inhibitory reflex - absence:



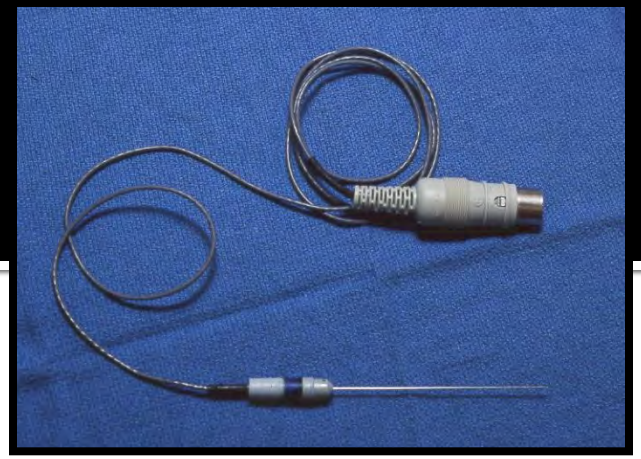
- Hirschsprung's disease:
  - sensitivity=79%
  - specificity=90%
- Chagas' disease





Habr-Gama et al Dis Colon Rectum 1971
Stephen et al Dis Colon Rectum 1997

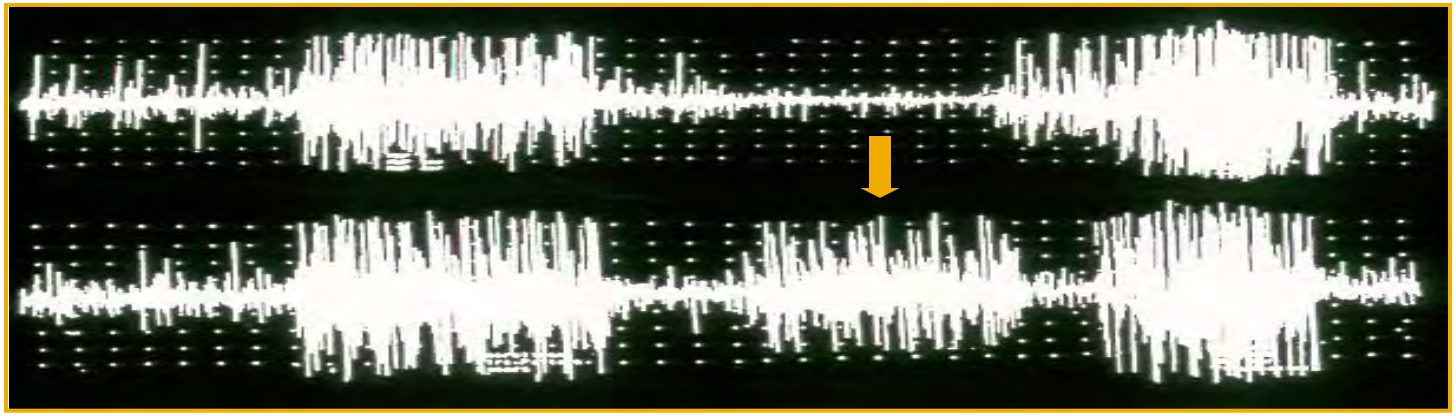
Electromyography



Indication:

Complementary diagnosis of

Paradoxical puborectalis syndrome



Rest Squeeze Evacuation Reflex

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

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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

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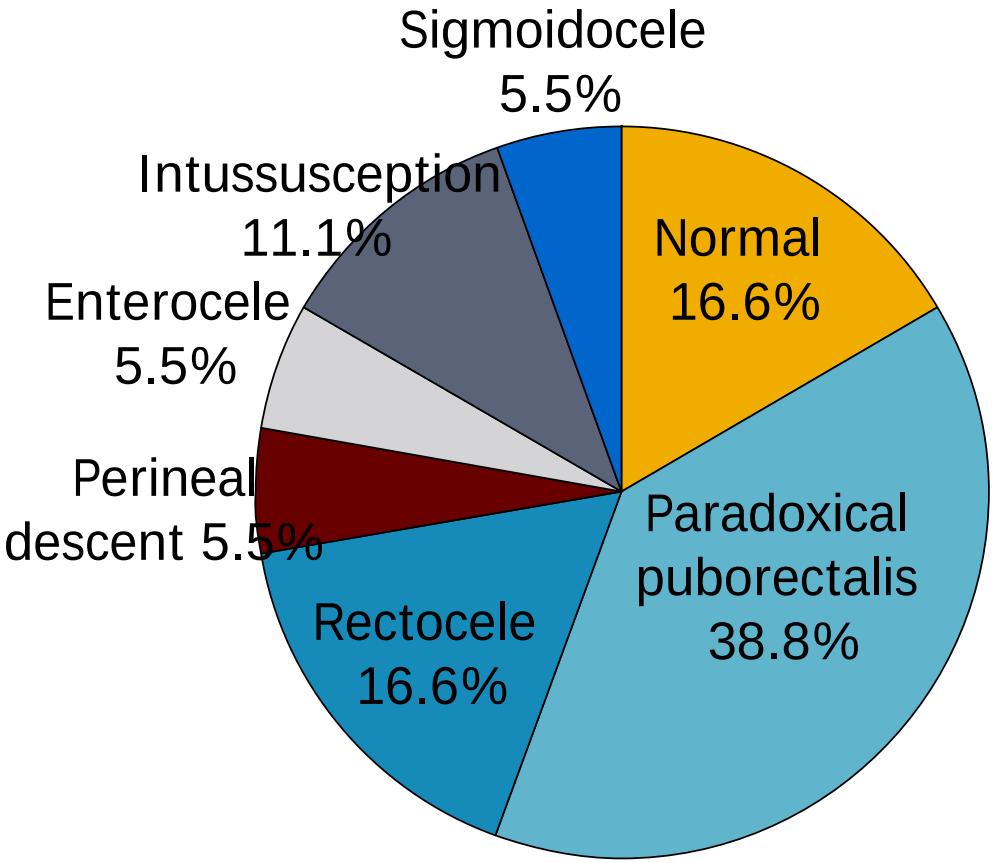
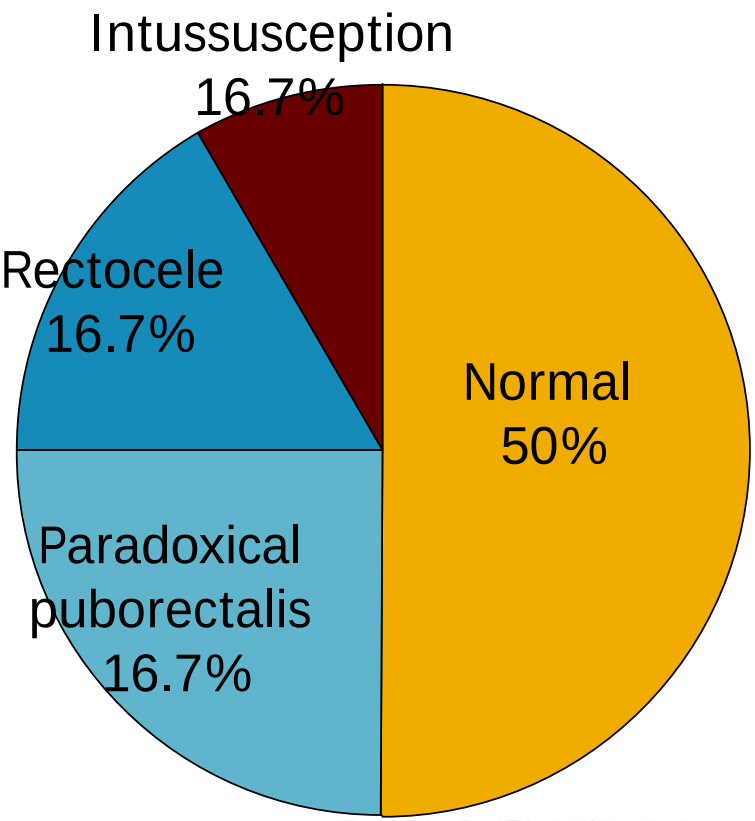
Segmental colonic transit times & videodefecography: comparison of results

Normal transit (N=36)



Colonic inertia (N=12)



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Total and segmental colonic transit times (hs)

Autores	Right Colon	Left Colon	Rectosigmoid	Total (hs)
Arhan et al., 1981	13.8	14.1	11.0	39.0
Chaussade et al.,1986	6.9	9.1	18.4	34.4
Metcalf et al.,1986	11.3	11.4	12.4	35.0
Jorge & Habr-Gama., 1991	12.0	14.2	10.7	36.2

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

Arhan et al, DCR 1981

Marteli et al, AGA 1978

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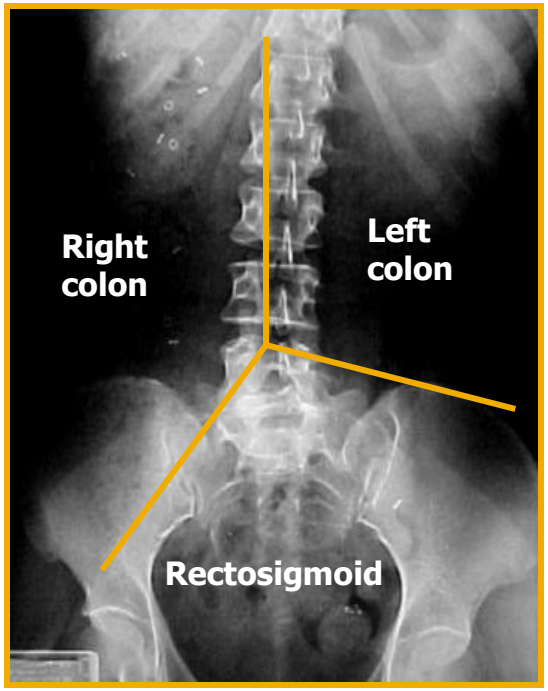
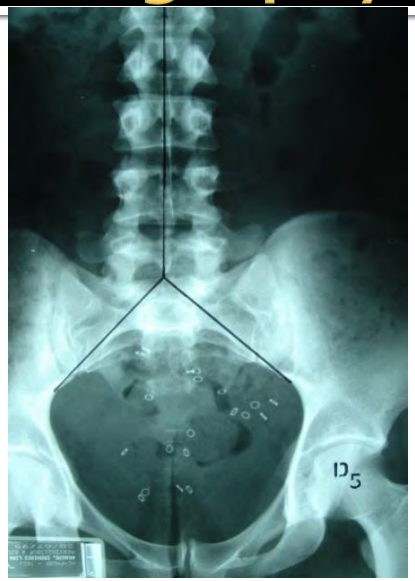


Segmental colonic transit times & videodefecography: comparison of results

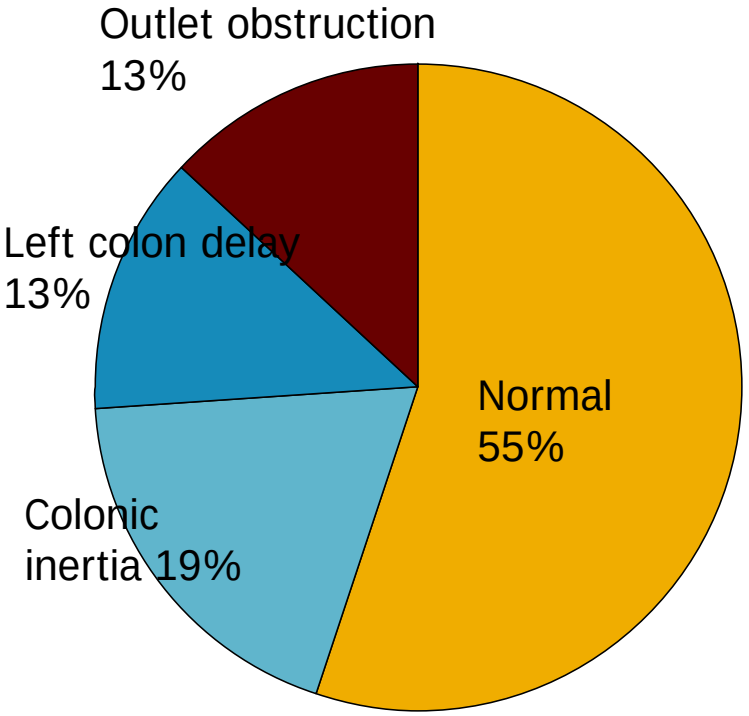
Colonic inertia



Outlet obstruction

Left colon delay

Colonic transit times results (N=66)



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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

**Arbuthnot Lane BMJ 1908 **Watier et al Dig Dis Sci 1983*
****Nam et al Dis Colon Rectum 2001*

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Defecography – *History*

ACTA CHIRURGICA SCANDINAVICA

SUPPLEMENTUM 165

FROM THE DEPARTMENT OF SURGERY, AKADEMISKA SJUKHUSET, UPPSALA, SWEDEN (HEAD: OLLE HULTÉN, M. D., PROFESSOR OF SURGERY, UNIVERSITY OF UPPSALA) AND THE DEPARTMENT OF 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

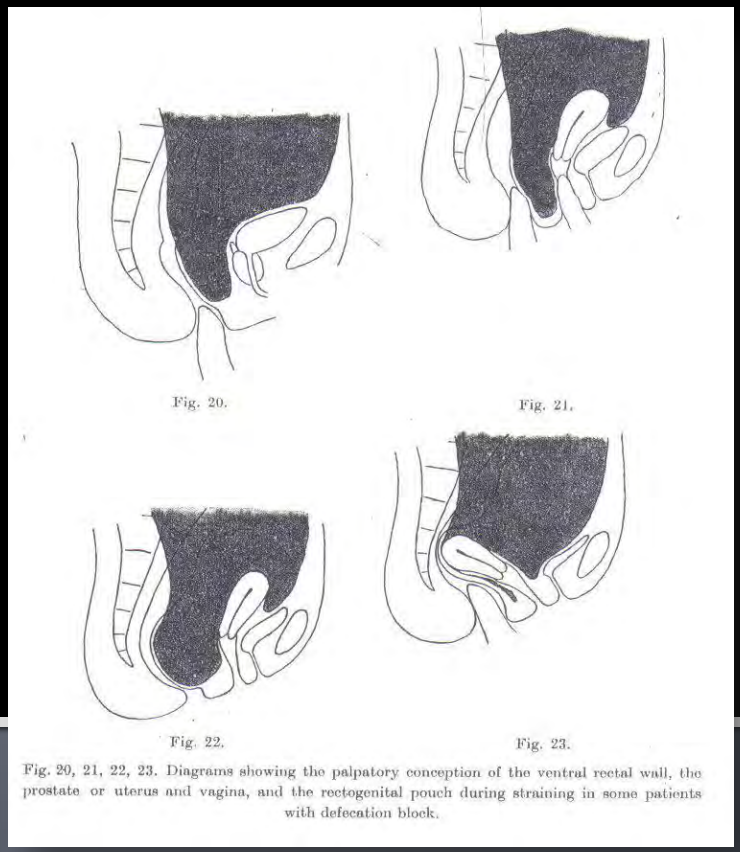

Fig. 20, 21, 22, 23. Diagrams showing the palpatory conception of the ventral rectal wall, the prostate or uterus and vagina, and the rectogenital pouch during straining in some patients with defecation block.

Walldén L, *Acta Chirur Scand* 1952

Barium Enema

"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 pratical 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

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Videodefecography

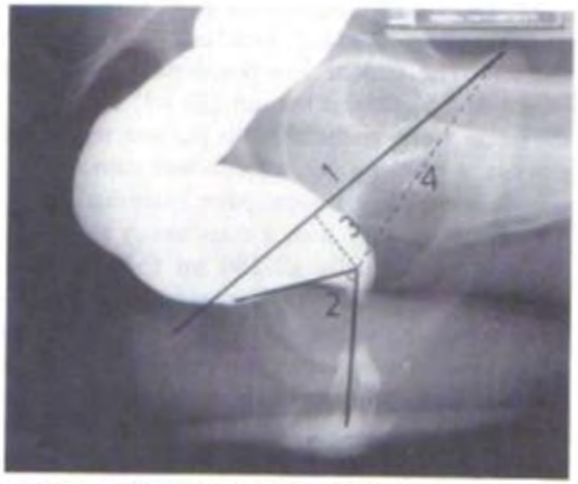

Figure 1. Technique used for cinedefecographic measurements: 1 = pubococcygeal line; 2 = anorectal angle; 3 = perineal descent; 4 = puborectalis length.

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

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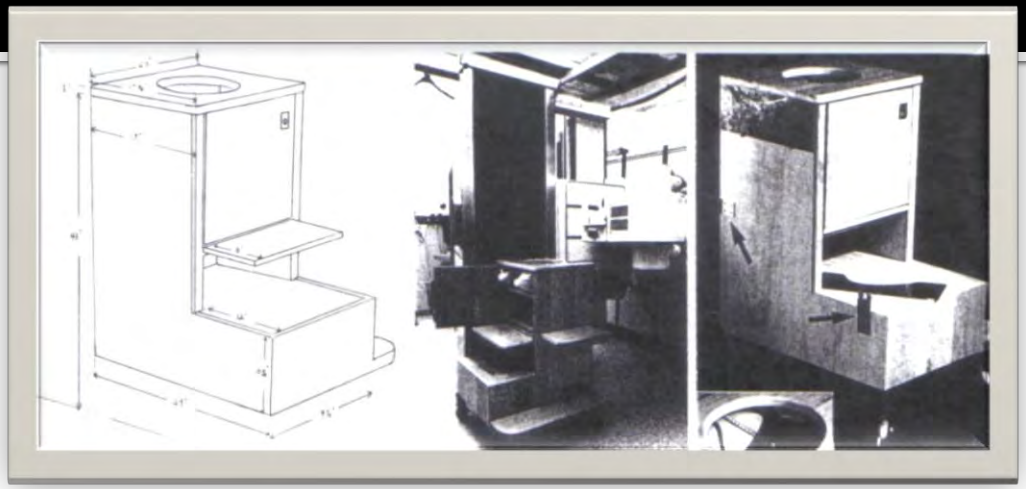
Videodefecography: *tecnical aspects*



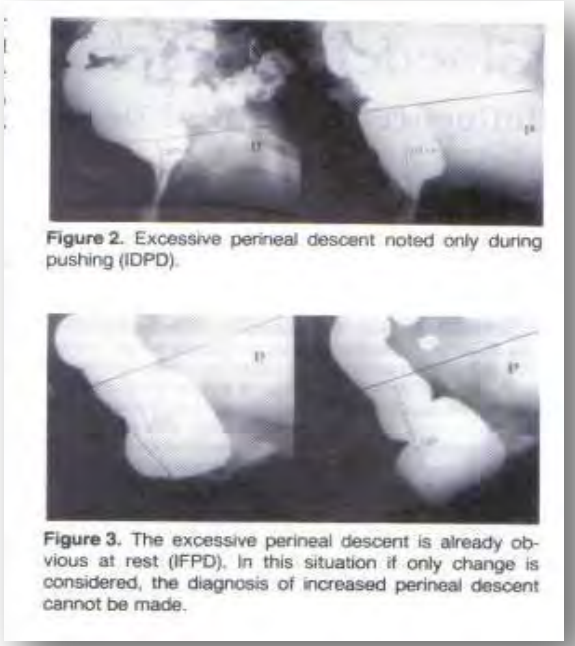


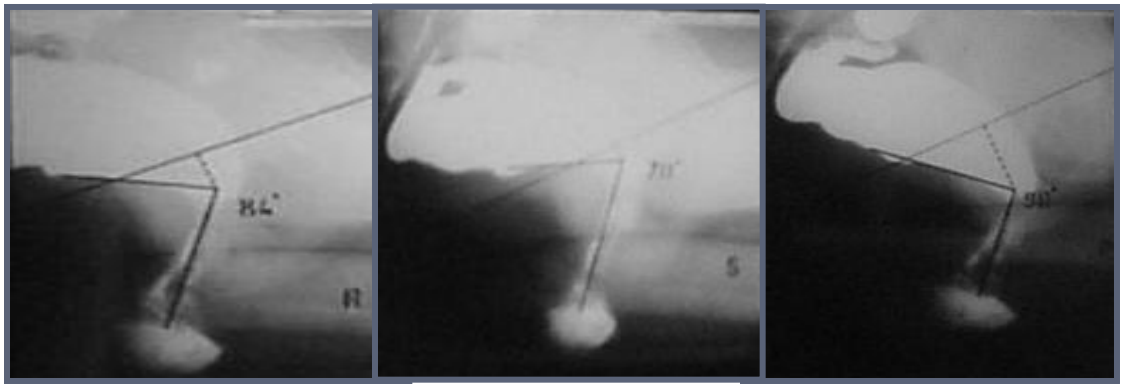
Figure 2. Excessive perineal descent noted only during pushing (IDPD).

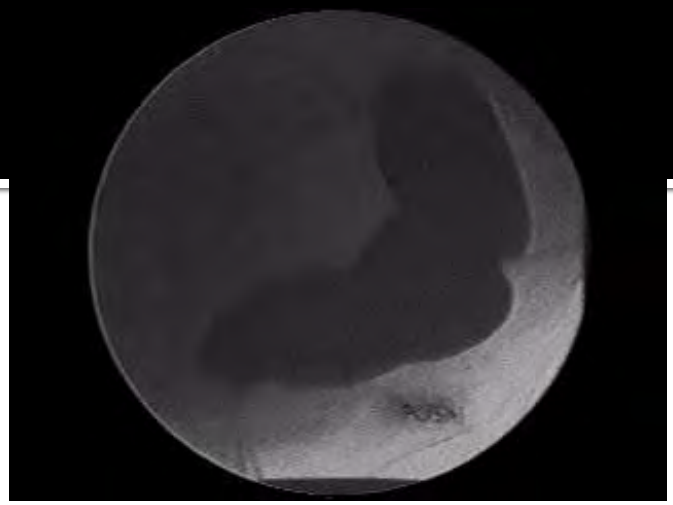
Figure 3. The excessive perineal descent is already obvious at rest (IFPD). In this situation if only change is considered, the diagnosis of increased perineal descent cannot be made.

- 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
Jorge et al Patient positioning during cinedefecography: influence on perineal descent and other measurements. Dis Colon Rectum 1994

Videodefecography





Measurements:

- anorectal angle
- puborectalis lenght
- perineal descent

Anatomical abnormalities

Rectal emptying

Perineal descent syndrome
Paradoxical puborectalis syndrome
Rectocele
Enterocele
Intussusception
Sigmoidocele

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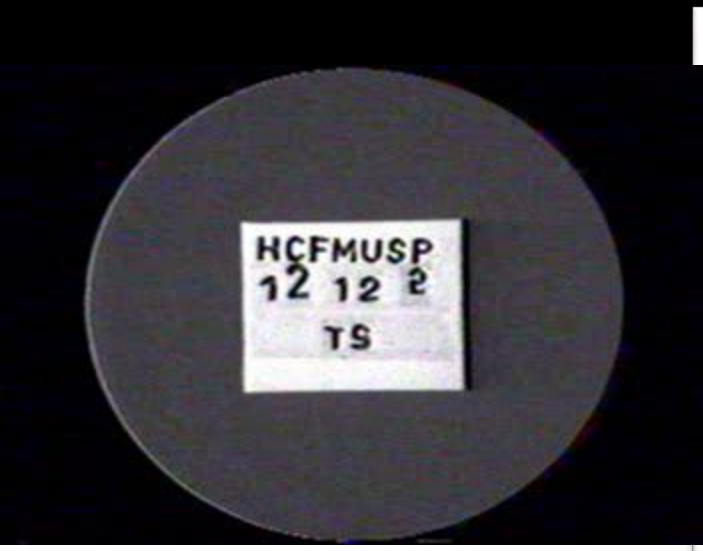
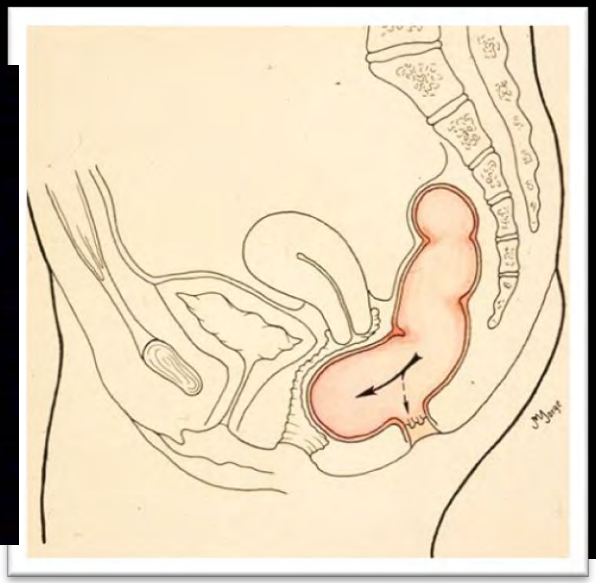
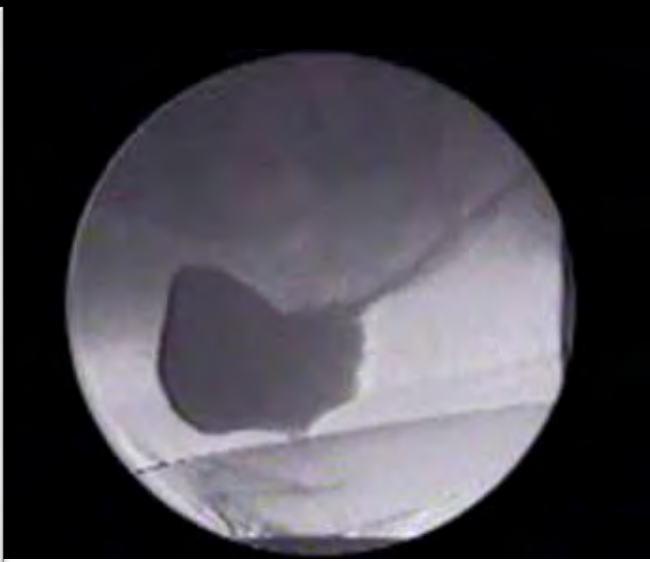
Walldén L, *Acta Chirur Scand* 1952
Broden & Snellman, *Dis Colon Rectum* 1968

Rectocele







- 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*

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Nonrelaxing puborectalis contraction syndrome

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

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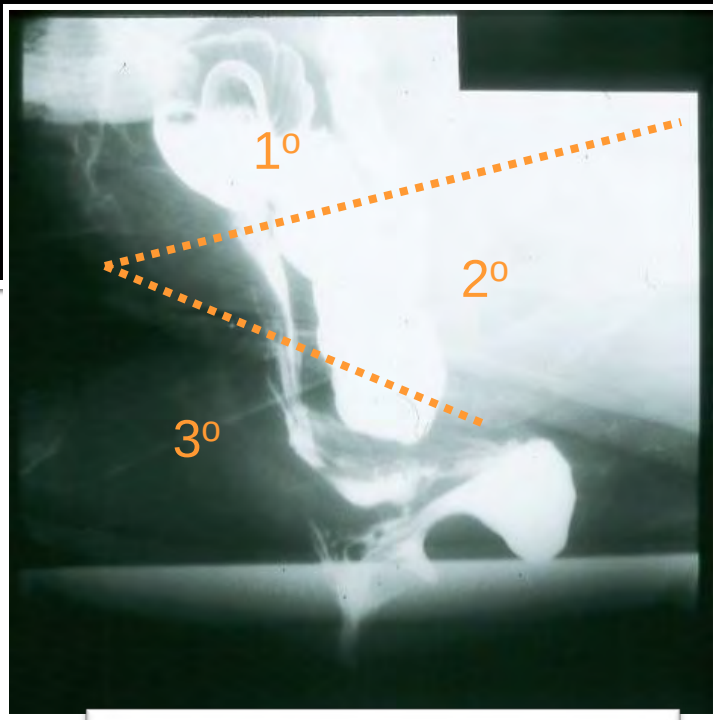
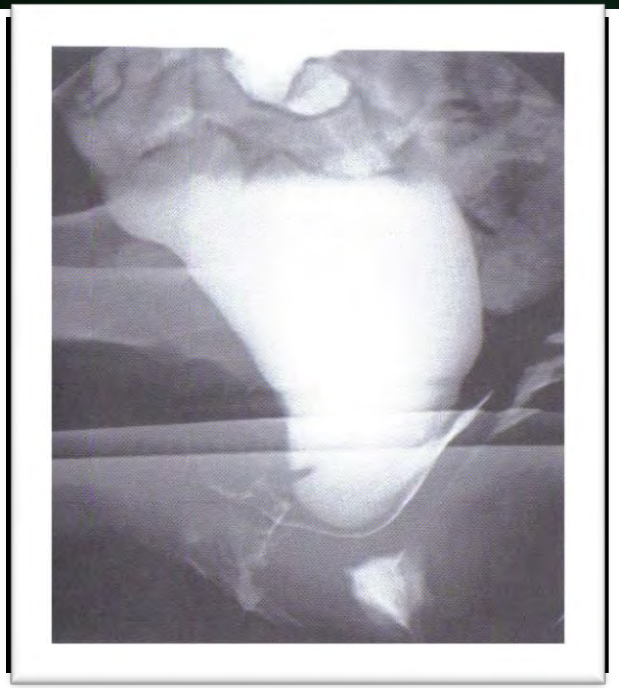
Sigmoidocele





Jorge et al, Dis colon Rectum 1994

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Videodefecography results in healthy volunteers

- Intussusception and rectocele: 50%

Goei et al Radiology 1990
Finlay et al Int J Colorectal 1988

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

Sobrado et al FMUSP 1999

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Physiology Testing

Endoanal Ultrasound

- 3D: faster test, reevaluation
- Longitudinal plane: anal sphincter lenght
- Avaliação do plano longitudinal: medida do comprimento do esfíncter
- Anorectal Dynamic Endosonography:
  - *Endoprobe at* 6-7 cm from anal verge: 3 automatic *scans*, includding 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

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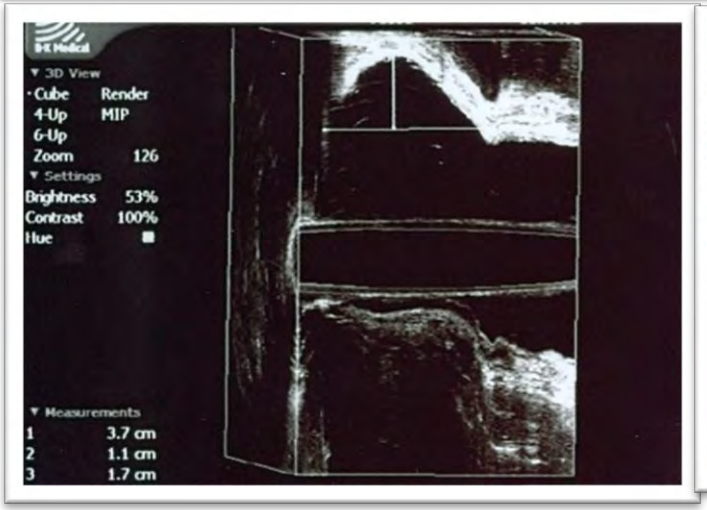
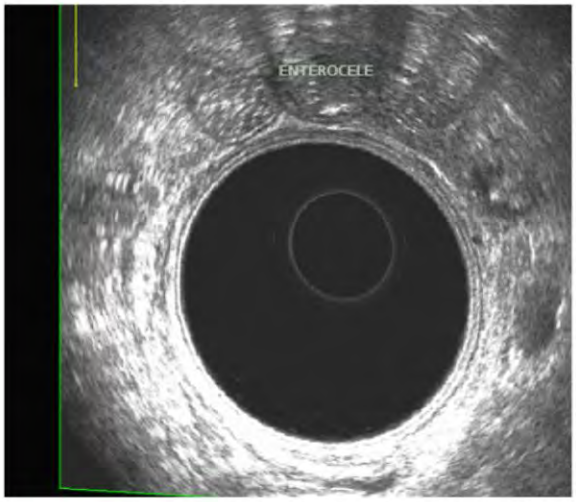
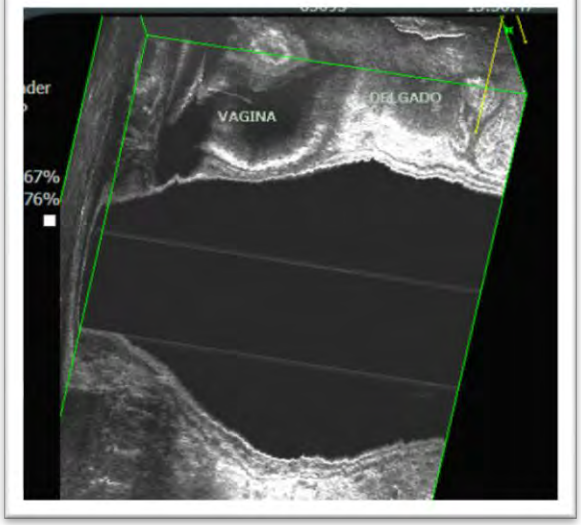
Evaluation of constipation

Ecodefecography

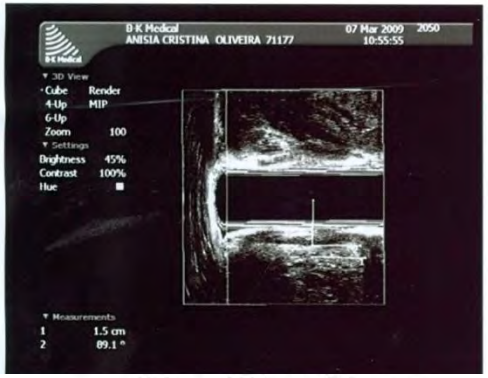






Musculo Puborretal (detalhe)

Sindrome da Contracao Paradoxal ao Puborretal (Anismo)
Angulo anorretal durante evacuacao



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Defecography & Ecodefecography

Diagnosis	Defecography	Ecodefecography
Normal	4	6
Rectocele grau I	11	6
Rectocele grau II	43	31
Rectocele grau III	20	32
Rectocele total	74	69
Internal prolapse	36	39
Anismus	19	26

- 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.

Regadas et al Dis Colon Rectum 2010

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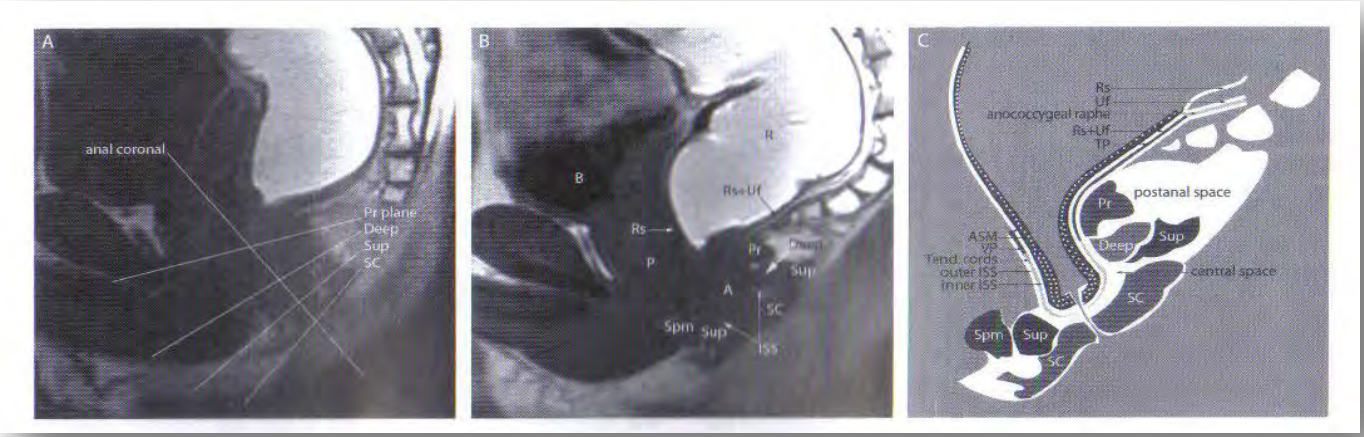
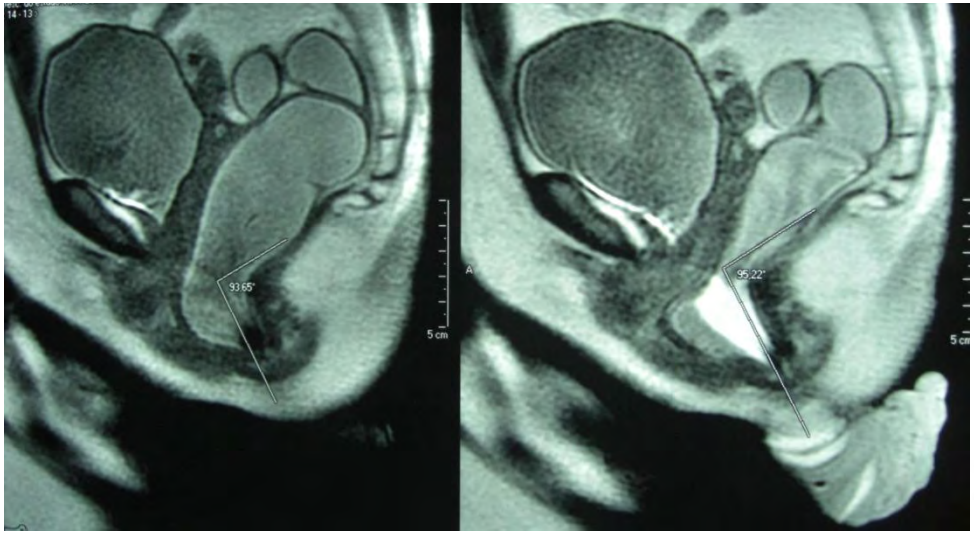
MRI anatomy of the anal region



Guo et al Dis Colon Rectum 2010; 53:1542-1548



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Dynamic Anorectal Endosonography & MRI Defecography & Conventional Defecography

- 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 cet al Dis Colon Rectum 2011

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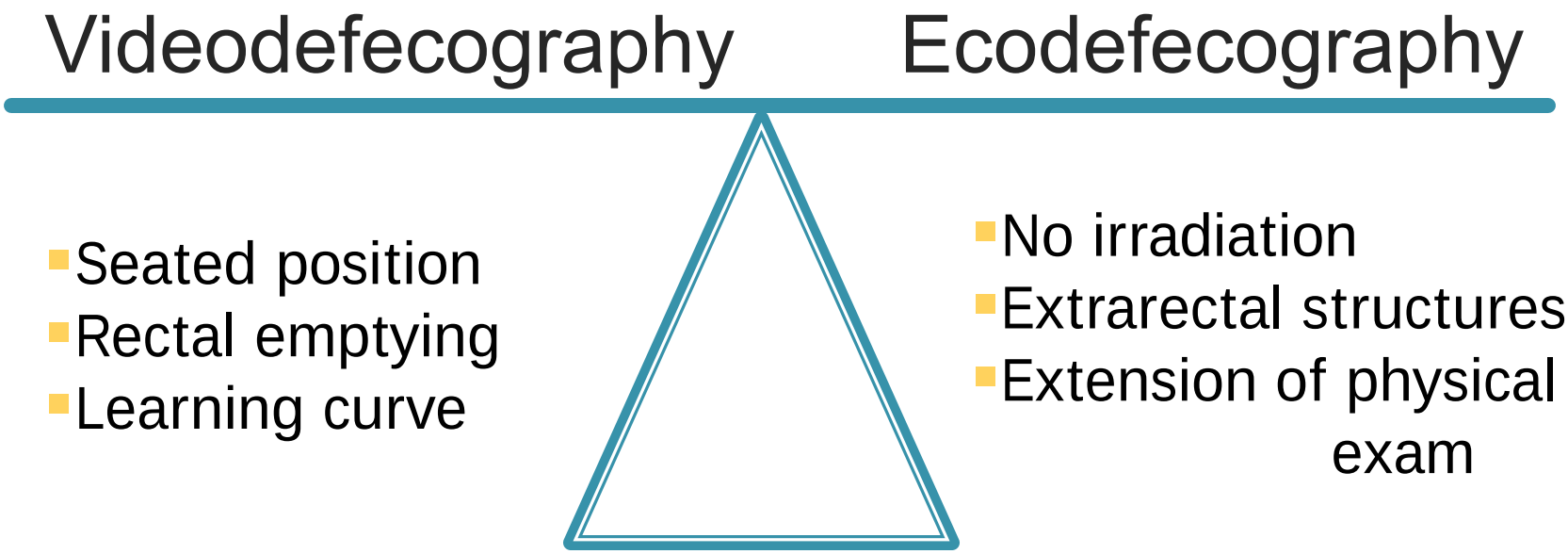
Defecography & USG



Psychological profile of patients with colorectal functional disorders

- *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.*

Devroede et al, Dig Dis Sci 1989
Heymen et al Dis Colon Rectum 1993

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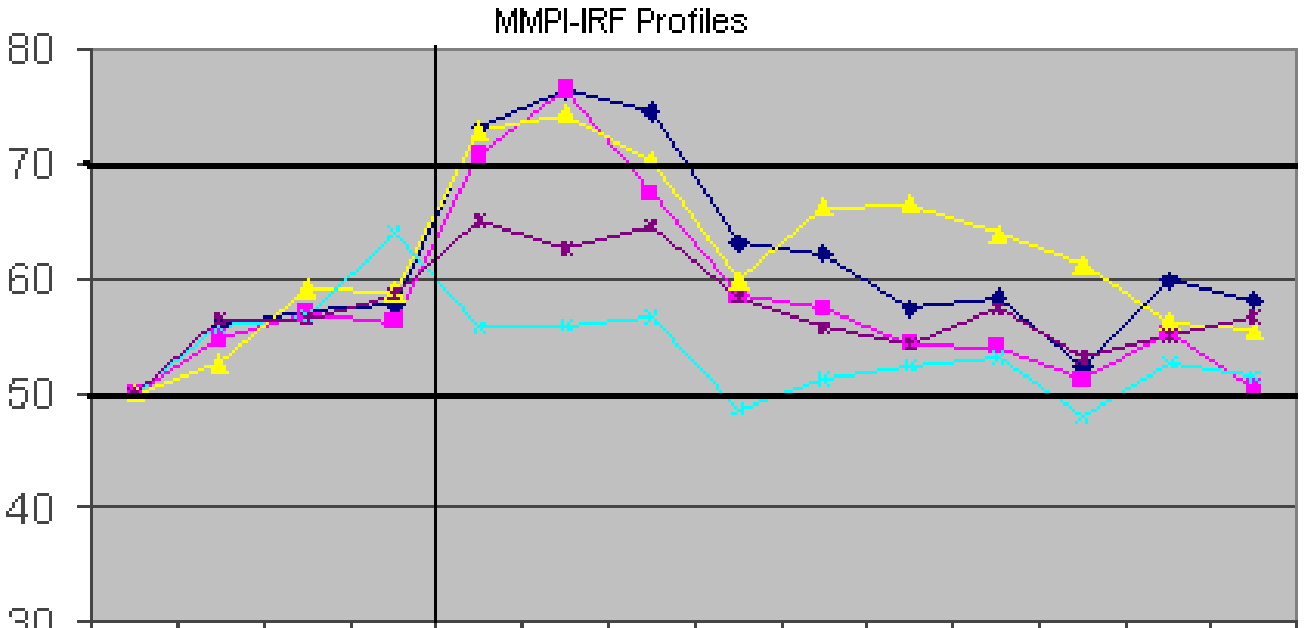
Psychological profile of patients with colorectal functional disorders

Results



	?	L	K	F	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Constipation	50	56	57	58	73	77	75	63	62	58	58	52	60	58
Incontinence	50	55	57	56	71	76	67	59	57	54	54	51	55	50
Anorrectal Pain	50	53	59	59	73	74	70	60	66	67	64	61	56	55
Control Group I	50	56	57	64	56	56	57	49	51	52	53	48	53	51
Control Group II	50	57	57	59	65	63	65	58	56	54	58	53	55	57

ANOVA $p < 0.0001$

Jorge et al ASCRS Vancouver 2011

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Psychological profile of patients with colorectal functional disorders

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.

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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

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Pratice parameters for evaluation and management of constipation

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

ASCRS – American Association of Colorectal Surgeons
Ternent et al Dis Colon Rectum 2007

Chronic idiopathic constipation (N=180)

History
Physical exam

⇨

Colonic transit times
Videodefecography
Anal Manometry
Electromyography

⇨

Final diagnosis

8% **67%** **75%**

Nonrelaxing puborectalis syndrome 33%
Colonic inertia 17%
Rectocele 11%
Internal rectal prolapse 10%
Enterocele 4%

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Wexner e Jorge Eur J Surg 1994

Physiologic testing - etiologic diagnosis in 65-75%:

- *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
Wexner & Jorge, Eur J Surg 1994

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