Anorectal manometry in pediatrics

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constipation

- Prevalence in pediatrics is 3% - 30%
- Prevalence of Faecal incontinence is (0.8% to 7.8%)
- Fecal incontinence is related to functional and organic causes

Organic causes

Conditions that affect the

- Anorectum
- Anal sphincters
- Myenteric nerves
- Spinal cord

Organic causes

Several underlying aetiologies including

- **Hirschsprung disease**
- **Anorectal malformations**
- **Neuromuscular disorders**
- **Dyssynergic defecation**

INDICATIONS OF ANORECTAL MANOMETRY

- Chronic (severe) constipation
- Faecal incontinence
- Faecal urgency
- Disorders of neuromuscular origin
- Spinal cord malformations
- Rectal trauma

INDICATIONS OF ANORECTAL MANOMETRY

- Pre- and post-surgery for Hirschsprung disease
- Biofeedback therapy
- Identification of patients that may benefit from botulinum injection
- In patients with persistent symptoms (faecal incontinence) after surgery for anorectal disorders may benefit from the usage of 3D-HR-ARM because of its ability to detect sphincter defects

EQUIPMENT

- Conventional water-perfused manometry
- High-resolution (HR-ARM)
- 3-dimensional high-definition catheter (3D-HR-ARM)

STUDY PERFORMANCE

- ARM can be performed in patients of any age
- Only children from the age of 5 years are able to reliably cooperate with the sensory testing and complete the dynamic components
- For younger children, the test is usually limited to the Resting pressure and RAIR

NEED FOR SEDATION OR ANAESTHESIA

- ARM study should ideally be performed in an awake patient
- Muscle relaxants should be avoided
- Ketamine and midazolam do not affect the sphincter pressure or the reflex response
- Propofol decreases the resting sphincter pressure
- Sevofluorane and nitrous oxide are additional options

PRE-TEST PREPARATION

- Children who are anxious and unfamiliar with the test may benefit from comprehensive explanations
- There is no need to stop medications before the test
- Bowel preparation

Resting Pressure

- **Neonates** (11 to 50 mmHg)
- **1 to 16 months** (23 to 55 mmHg)
- **18 months to12 years** (30 to 60 mmHg)

Resting Pressure

A low resting pressure could be indicative of weakness or disruption of the sphincter Musculature

High anal resting pressure may suggest smooth muscle or striated muscle spasm and often occur in patients with anal fissure or anal pain

Squeeze pressure

Assess the strength of striated muscles of the anal canal

External anal sphincter (EAS)

Puborectalis muscle (PRM)

Squeeze pressure

A weak squeeze pressure may indicate

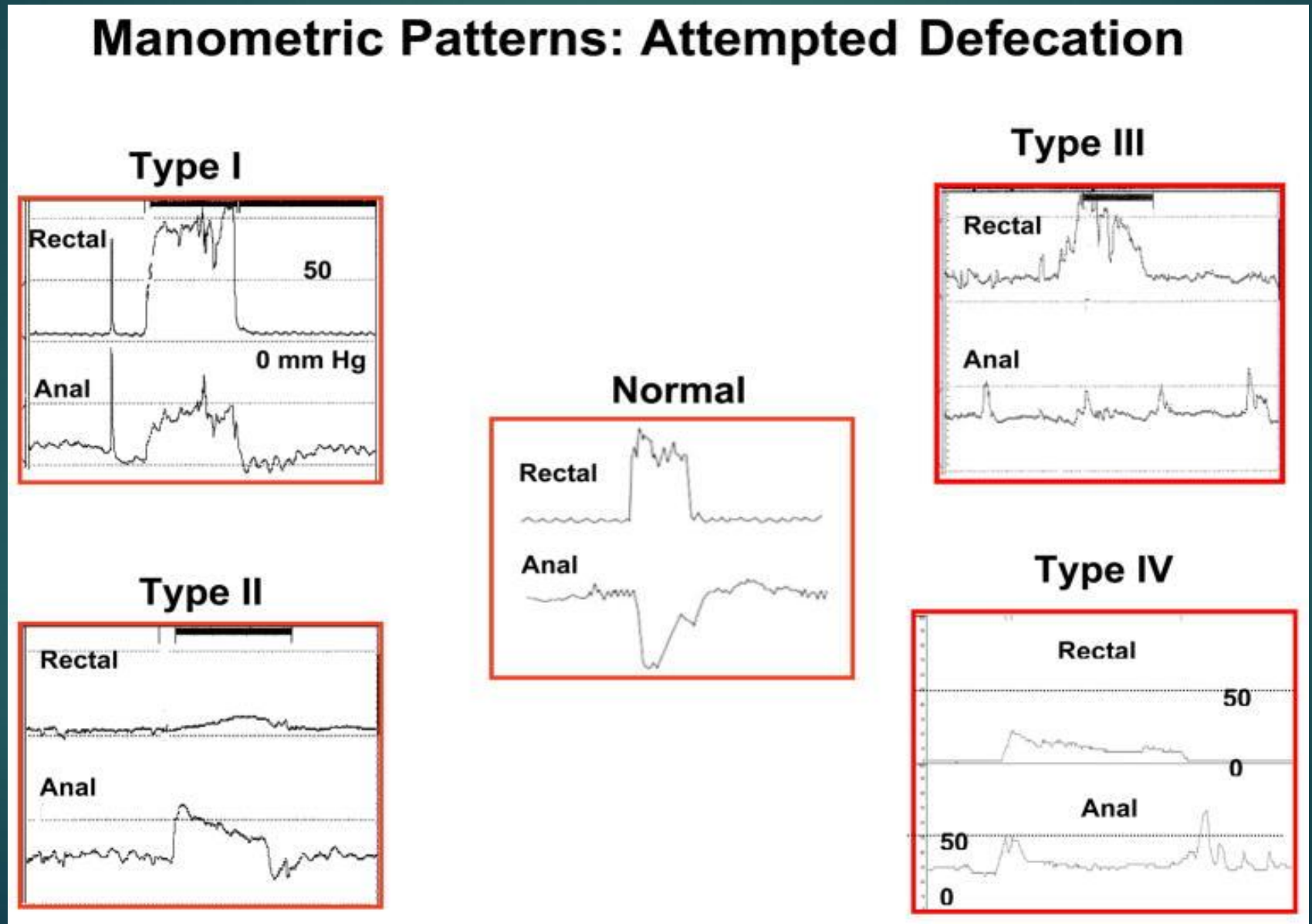
- **Myogenic**
- **Neurogenic causes**
- **Lack of cooperation during the test**

Bear-Down Maneuver

- With normal defecation dynamics, there is an expected **increase in rectal thrust pressure** because of abdominal muscle contraction coordinated with a **decrease in anal sphincter pressure**

- Patients in which these coordinated movements do not occur are thought to have **dyssynergic defecation** often resulting in constipation

Dyssynergia



Cough Reflex

- This reaction is mediated by pudendal nerves and S4 sacral roots

- The lack of increase in resting pressure is suggestive of damage to sacral reflex arc

Recto-Anal Inhibitory Reflex

Different criteria for a positive RAIR are reported in literature

- Decrease of at least 5 mmHg in anal pressure
- Decrease of 20 mmHg in anal pressure
- Decrease >25% in anal pressure in 3D-HR-ARM
- Decrease >50% of anal pressure in HR-ARM

Rectal Sensation

- Rectal sensation is assessed by inflating the balloon continuously with air in incremental volumes
- First sensation is defined as the lowest balloon volume sensed by the patient
- The urge of sensation is the lowest balloon volume at which the patients develops the urge to defecate

Rectal Sensation

- Maximum tolerable sensation is the inflation size associated with severe urgency or/and pain
- Decreased sensitivity (increased thresholds) may indicate megarectum
- whereas increased sensitivity may reflect visceral hypersensitivity

Treatment

- Pharmacologic
- Nonpharmacologic

Nonpharmacologic

- Dietary changes
- Behavioral interventions
- **Biofeedback therapy**
- Botulinum toxin injection
- Anal sphincter myectomy
- Sacral nerve stimulation

Biofeedback therapy

Indications

- Urinary incontinence
- Chronic insomnia
- Migraine headaches
- Chronic fatigue
- Fibromyalgia
- Epilepsy
- Motion sickness
- Depression
- Anxiety

Indications

- Dyssynergic defecation
- Fecal incontinence
- Levator Ani Syndrome with dyssynergic defecation
- Solitary rectal ulcer syndrome with dyssynergic defecation
- Fecal incontinence after surgery for anorectal malformations
- Idiopathic rectal pain

Techniques for Biofeedback

- Manometric-based biofeedback
- EMG biofeedback
- Balloon defecation training
- Home training devices

Duration and Frequency of Training

- On average, 4 to 6 training sessions are required
- Six weeks, three months, six months and twelve months

Thank you