Functional Luminal Imaging Probe (FLIP) in coloproctology

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Fecal incontinence

Definition:

Fecal incontinence is defined as the recurrent inability to voluntarily control the passage of bowel contents through the anal canal and expel it at a socially unacceptable location and time ***(Johanson et al., 1996).***

Prevalence:

The fecal incontinence is a very frequent pathology, the frequency considered in the general population being 2-3%, although the studies of prevalence in the general population show a great variability ***(Macmillan et al., 2004).***

The causes of fecal incontinence are numerous and physiological assessments are widely used to optimize the management of patients.

In addition to transit disorders, fecal incontinence can be associated with either improper rectal reservoir and/or **anal resistive functions** ***(Wald A et al., 2014).***

In 2009, ***Farag*** reported that the following factors affect anal continence:

1. Intra-rectal pressure (IRP).
2. Dynamic viscosity of the stools (DV).
3. Anal canal length (ACL).
4. Anal canal diameter (ACD).

$$\text{Flow} = \text{IRP} \times \frac{3.14 \times (\text{ACD})\ 4}{128 \times \text{DV} \times \text{ACL}}$$

Several methods can be used to investigate the anal sphincter complex:

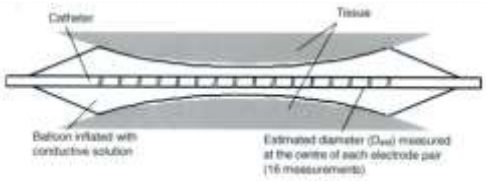
1. **Magnetic resonance imaging** and **trans-anal ultrasound** are used for morphological assessment of the internal and external anal sphincters.
2. **Electrophysiological tests** are used to assess the innervation of the external anal sphincter.
3. **Ano-rectal manometry** is used for anal sphincters function assessment by measuring anal canal pressures during rest and squeeze ***(Kwiatek MA et al.,2010).***

Functional Lumen Imaging Probe (FLIP) System is a new technology used to measure the dimensions and function of a variety of hollow organs, vessels and sphincteric regions throughout the body.

The recently developed (FLIP) allows determination of serial cross sectional areas (CSAs) during distension. This provides detailed and segmental description of geometric and mechanical properties.

FLIP was originally designed to study dynamic wall properties at the gastro-esophageal junction especially in patients with achalasia.

The FLIP System can measure and display diameter estimates at up to 16 points within the balloon. The system can also measure and display balloon pressure.



Clinical applications of (FLIP):

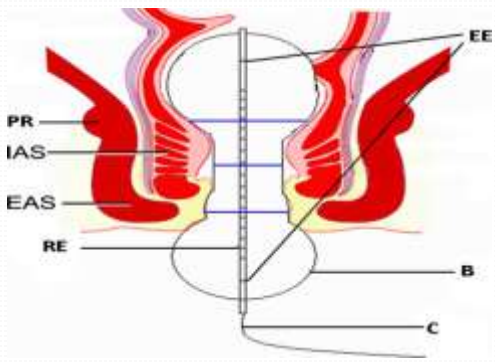
1- Upper GI imaging and surgery.

2- Bariatric surgery.

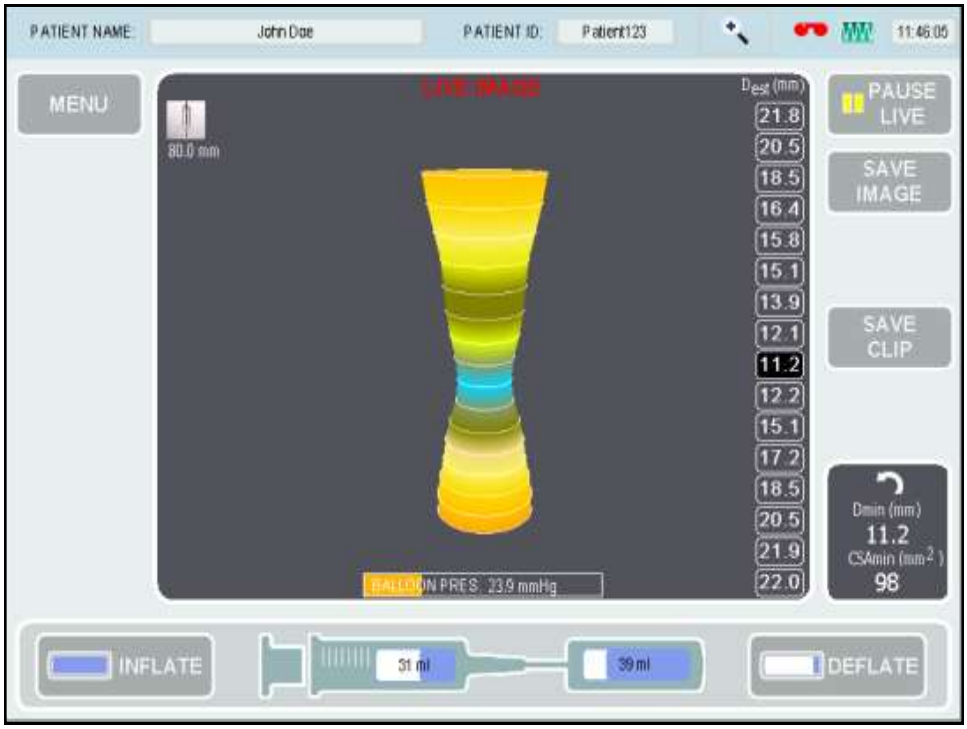
3- Cardiology.

4- Therapeutic endoscopy.

5- Colo-rectal imaging.



PR puborectalis, IAS internal anal sphincter, EAS external anal sphincter, EE excitation electrodes, RE recording electrodes, B bag, C catheter.



AIM OF THE WORK

Our study aims at using Endo-Flip in adjustment the anal canal length and diameter; hence the anal canal resistance in different surgical procedures in management of patients with fecal incontinence.

METHODOLOGY

40 patients complaining from fecal incontinence will be enrolled in the study.

Inclusion criteria:

All patients suffering from fecal incontinence and are candidates for surgical management.

Exclusion criteria:

1. Minor anal incontinence needs conservative measures and biofeedback.
2. Anal incontinence without anal sphincter injury.

All patients are assessed pre-operatively as follow:

A. Scoring system for fecal incontinence.

B. Anal canal resistance assessment:

Measuring anal canal length and anal canal diameter by using the Endo-Flip

The data collected in data storing system.

The anal canal length and diameter will be adjusted intra-operatively using Endo-Flip.

Follow up (3 months later), Re evaluation of the patient by :

1- Scoring system for incontinence.

2- Anal canal length and diameter by FLIP.

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Thank you.