HIGH-RESOLUTION PRESSURE TOPOGRAPY MANOMETRY and APPLICATION IN A PRACTICAL SETTING

DR SASSA BOTHA GIT GSH

TRAVELLED A LONG ROAD SINCE 1993

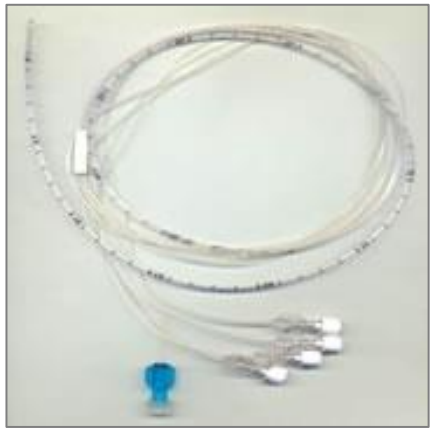
FAST ROUTE

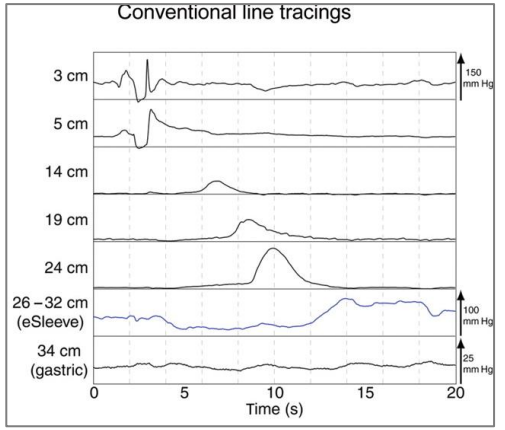
AIM

- Not to confuse you !
- History of the development of Manometry
- Paradigm shift of the Classifications of Motility Disorders
- High Resolution Pressure Topography Manometry (HRPTM) Metrics
- Pattern Recognition
- Indications for HRM
- Case Studies

HISTORY

1950's the Ardendorf low-compliance, pneumo-hydraulic perfusion system with water perfused catheters with 4 or 6 side holes 5 cm apart were introduced into the commercial market

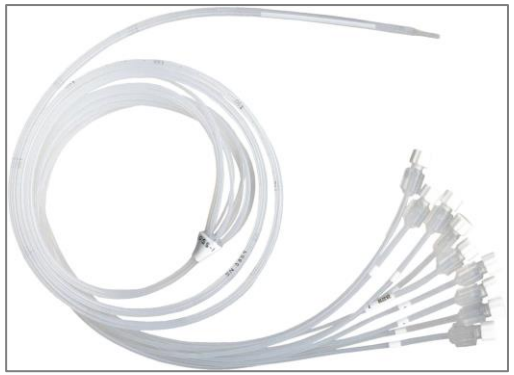


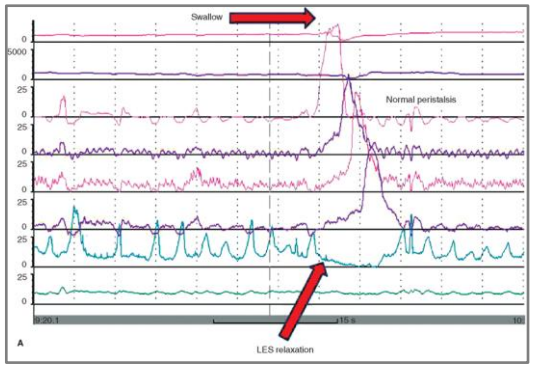


4-6 ch. catheters

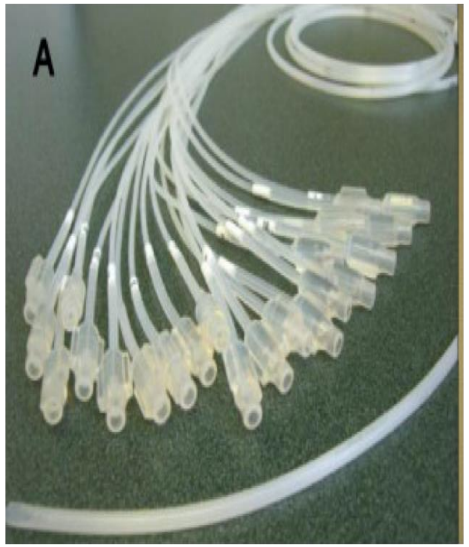
Linear Tracings

Followed by more **advanced conventional systems** and soft ware in late 50's up to the late 90's

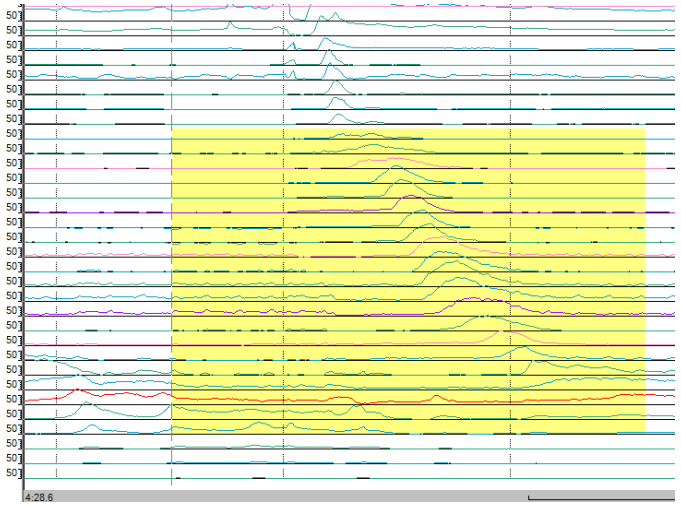


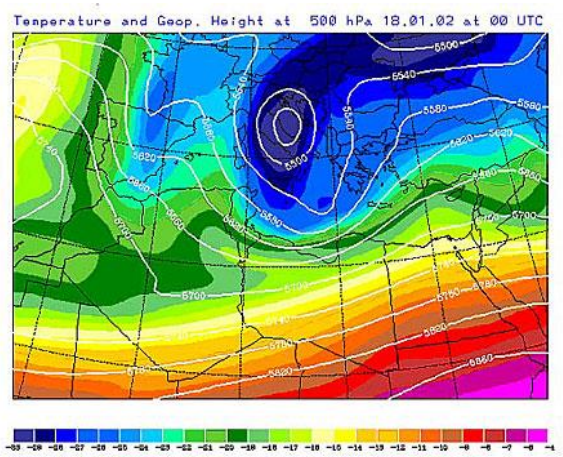


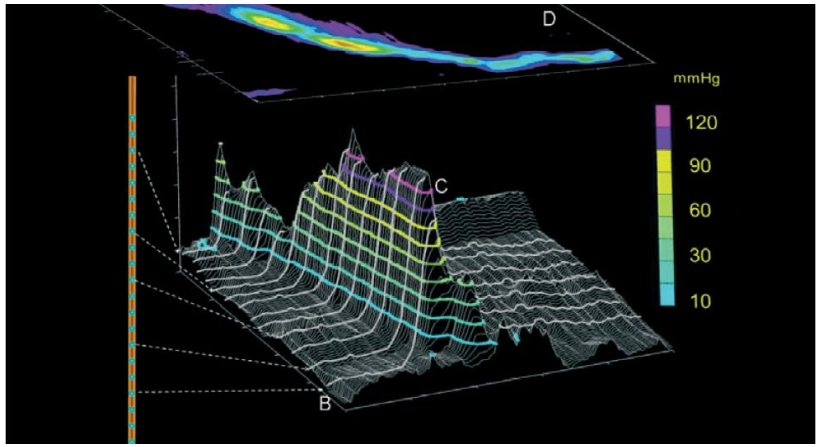
1990 RAY CLAUSE DEVELOPED HRM and the CLAUSE PLOTS

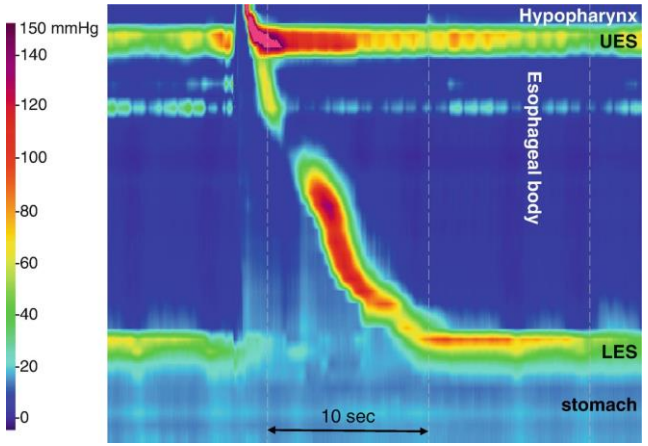


12-36 ch. catheters



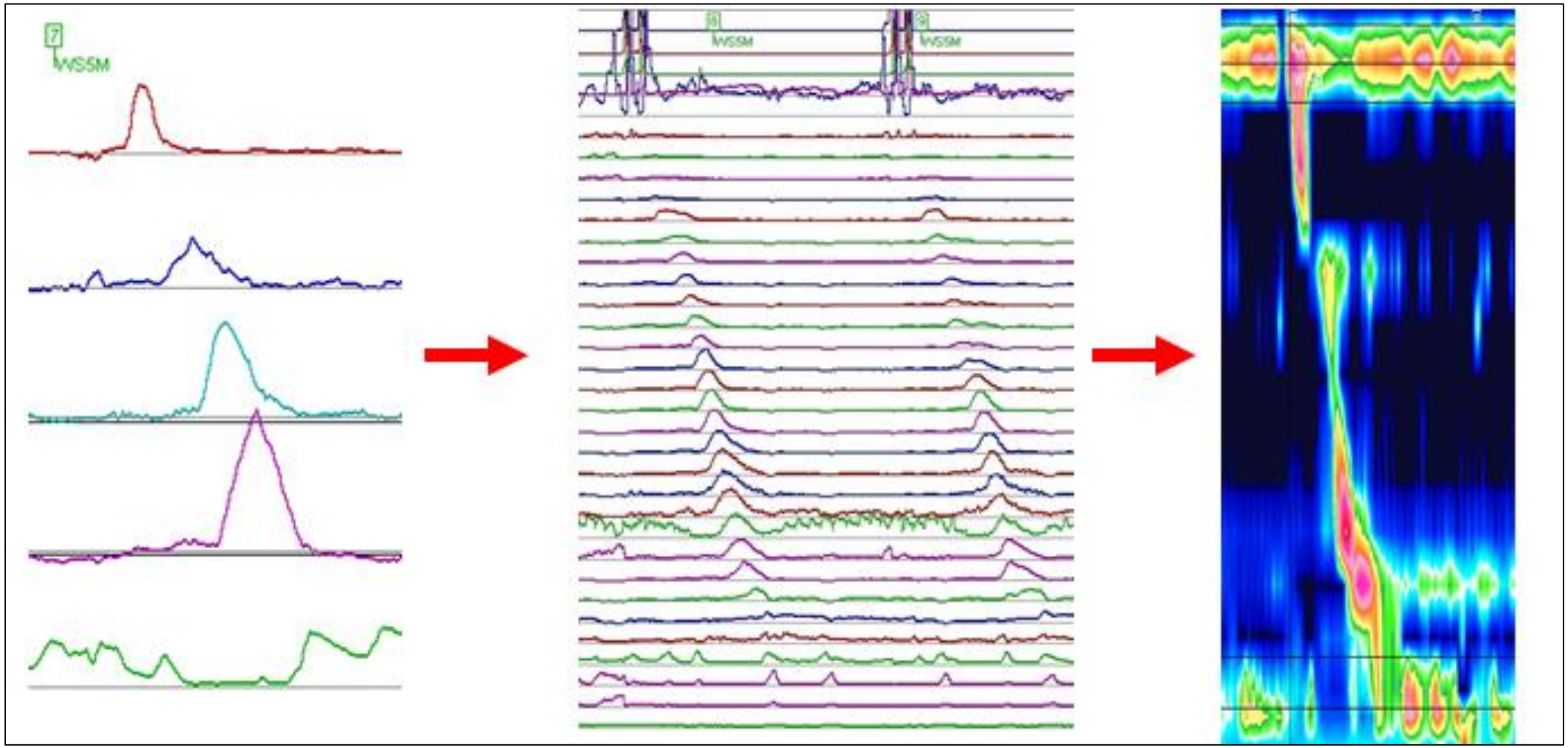




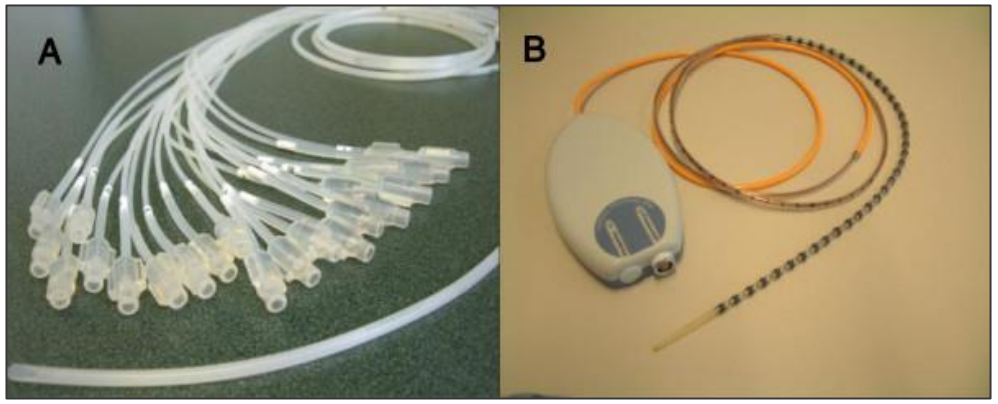


Iso-baric Contour Plots

CONVENTIONAL MANOMETRY TO HIGH RESOLUTION MANOMETRY WITH ISO-BARIC CONTOUR PLOTS



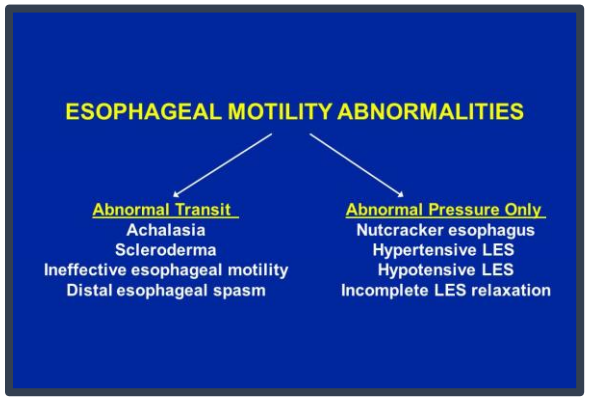
WATERPERFUSED SYSTEM

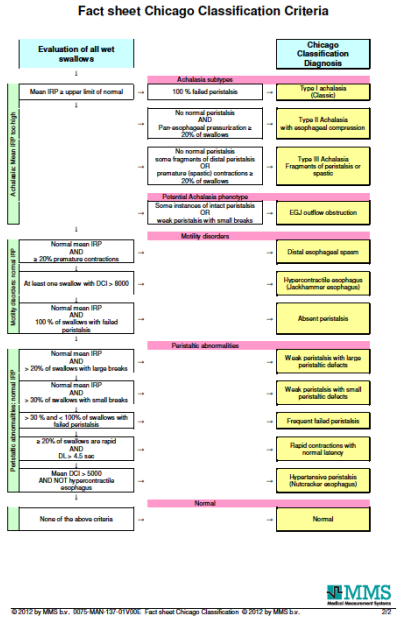


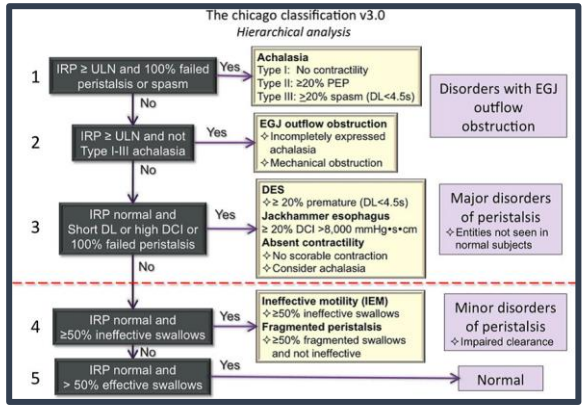
SOLID STATE SYSTEM

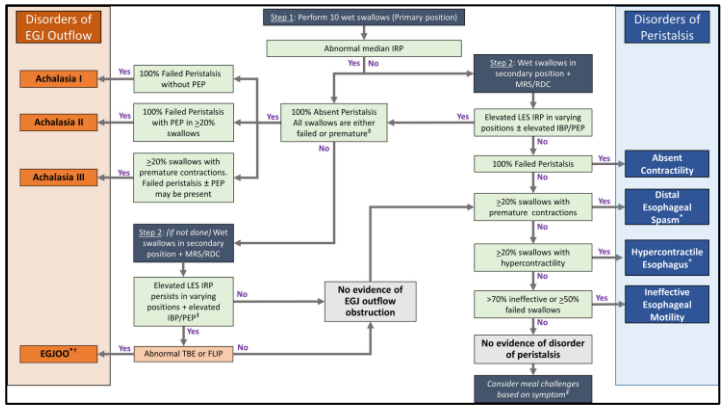
PARADIGHM SHIFT OF CLASSIFICATIONS FOR MOTILITY DISORDERS

CASTELL → CC v 2 → CC v 3 → CC v 4









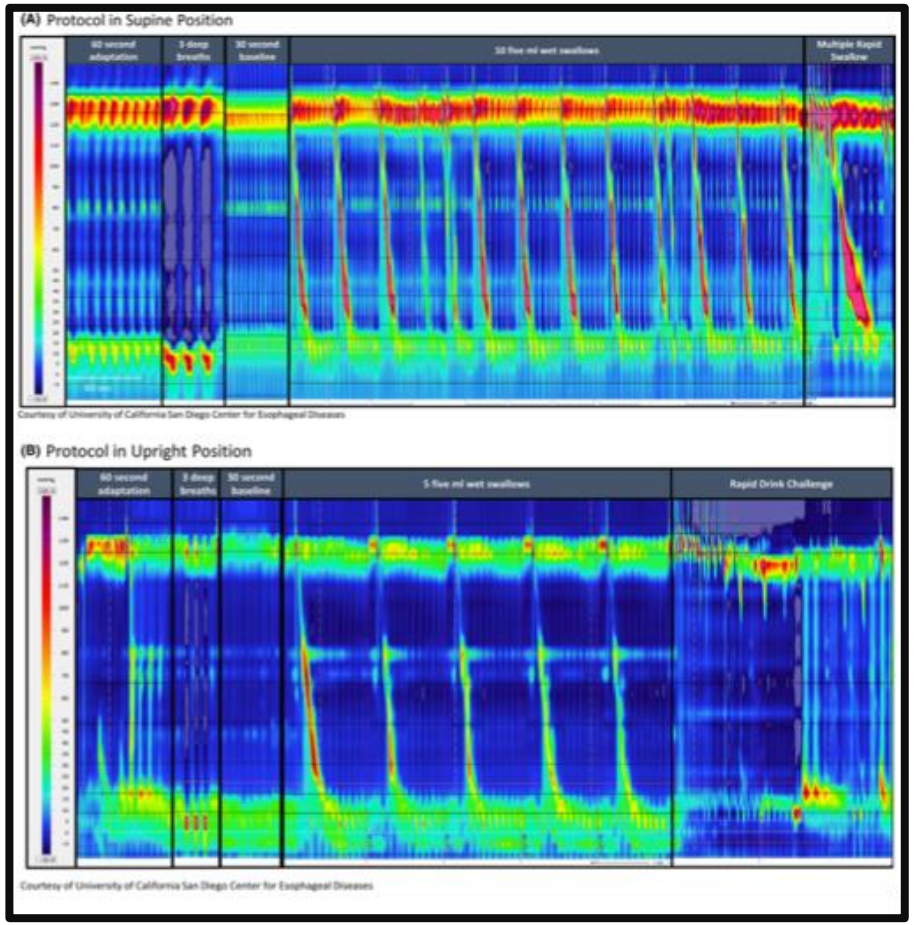
MAIN DIFFERENCES BETWEEN CC v3 and CC v4

- Protocol has a Primary and Secondary Position
- Chase the symptom
- No Major and Minor Motility disorders
- OGJOO defined
- IEM more stringent definitions

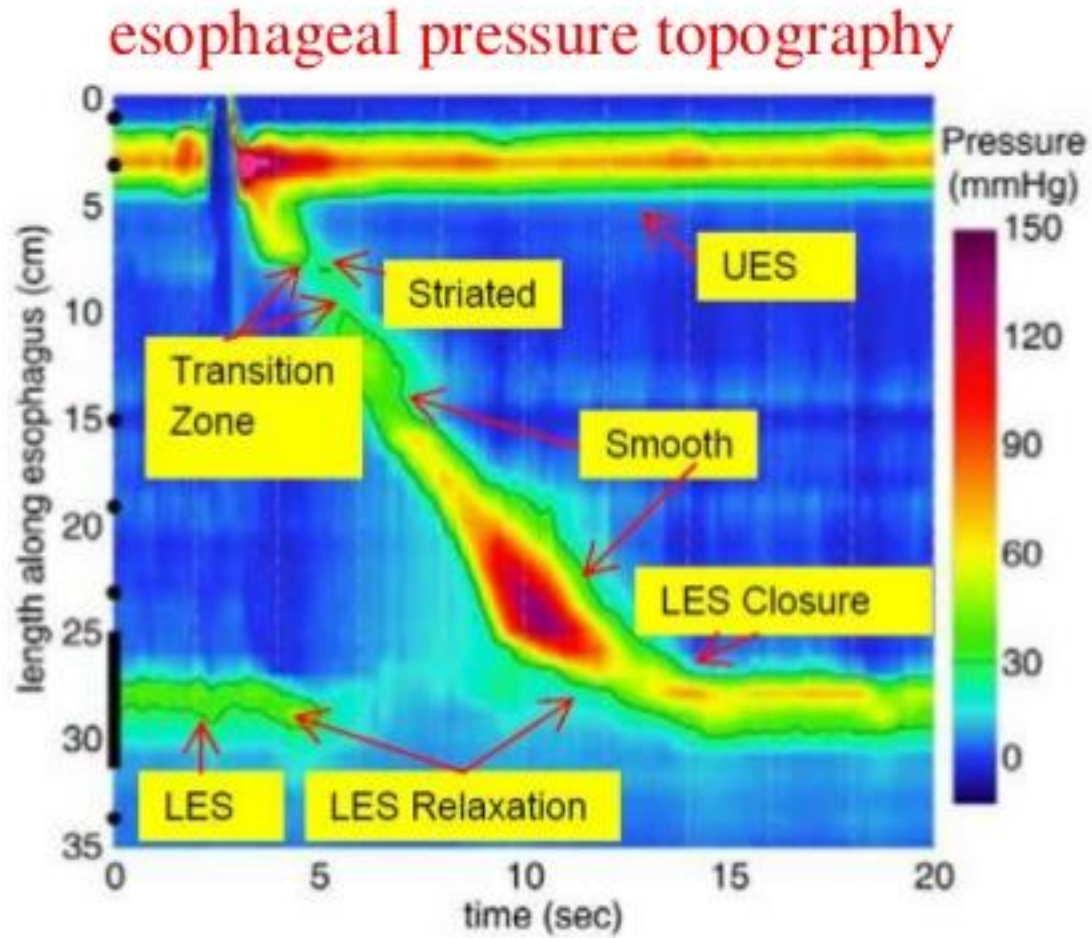
CHICAGO V4 PROTOCOL

PRIMARY POSITION

SECONDARY POSTION



Normal esophageal HRM after a wet swallow

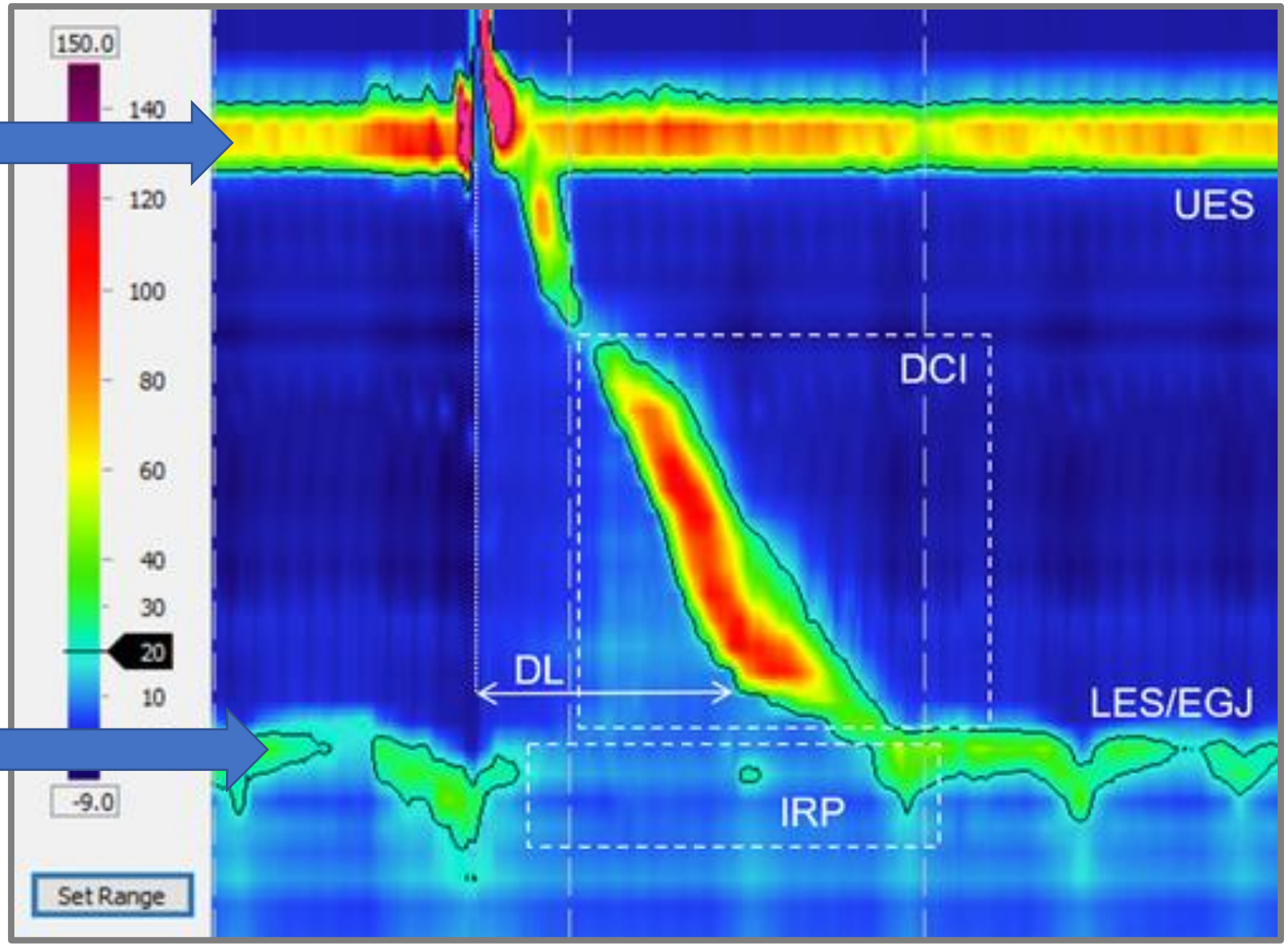


HRM atlas – Medical measurement Systems

TWO BANDS ANCHOR THE PLOTS

UESP band

LOSP band in the OGJ



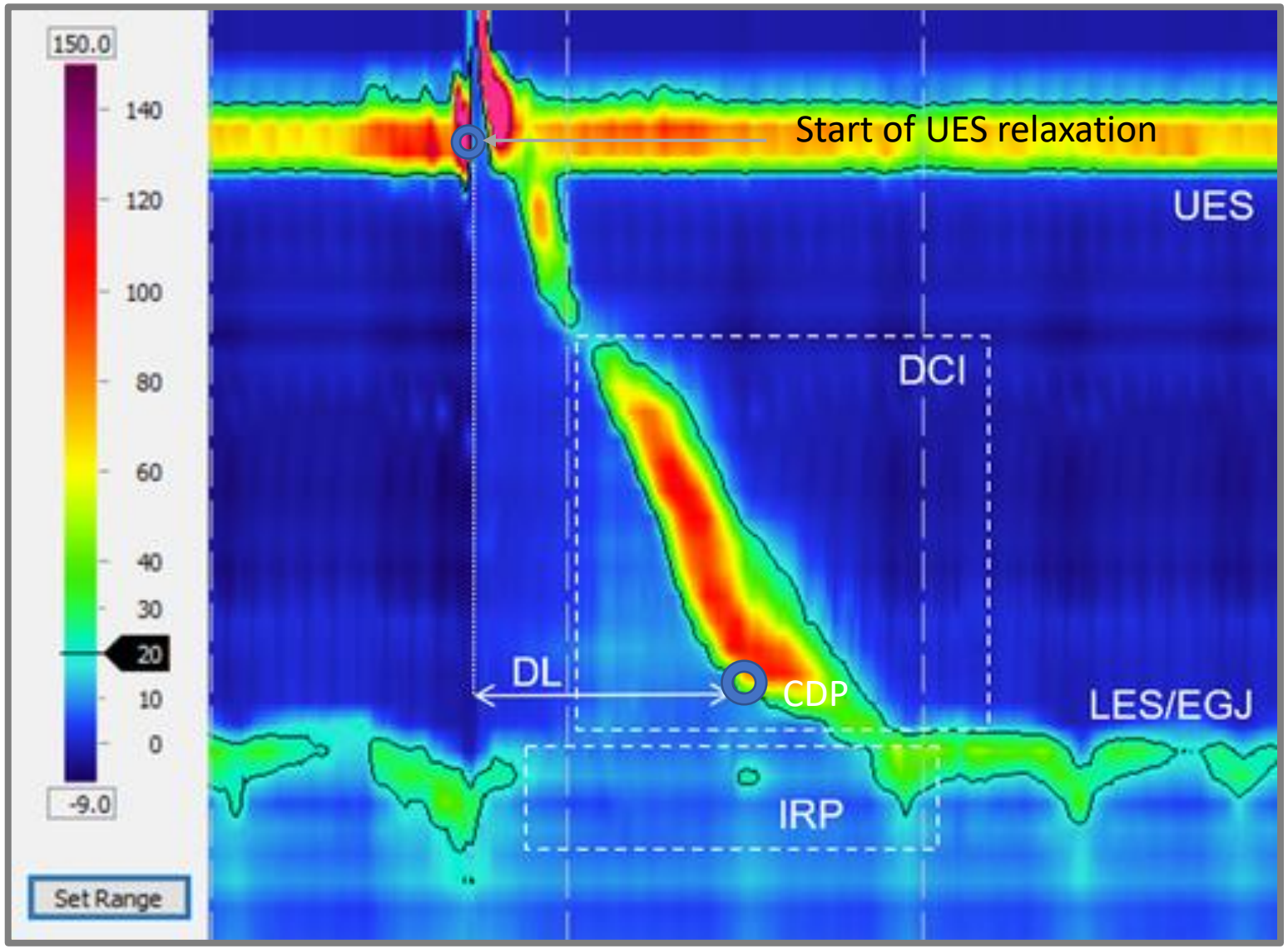
METRICS USED IN HRM

IRP : Lowest mean pressure during 4 continuous or or discontinuous. Seconds of EGJ relaxation pressures over 10 sec period

DCI: Assessment of vigor of the distal contraction of oesophageal body taking cm ,amplitude and duration in consideration

DL: Measures timing from UES relaxation to the CDP

CDP: Where the fast peristaltic progression slows down (ampulla)



CHICAGO CLASSIFICATION v 4

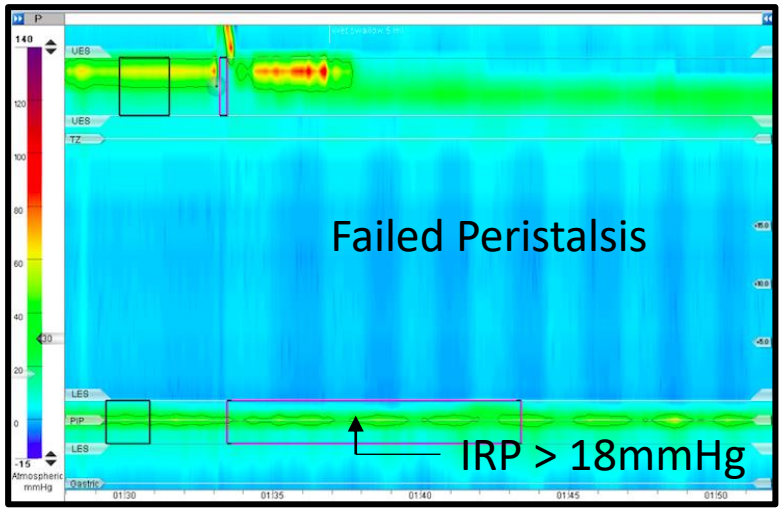
DISORDERS OF THE OGJ OUTFLOW

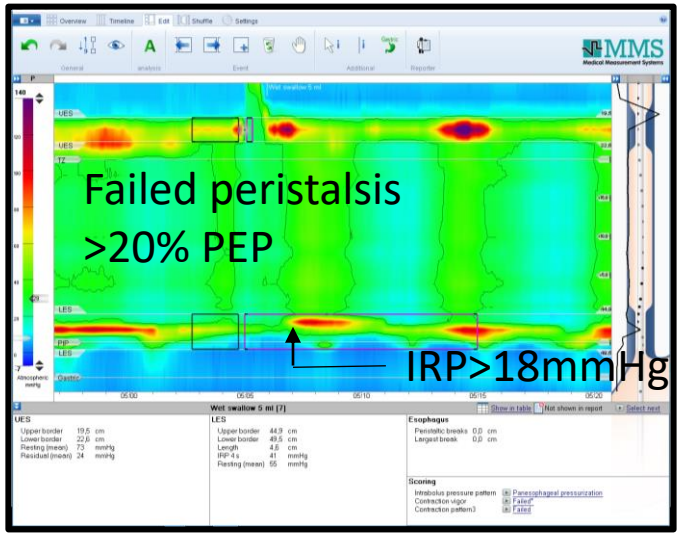
- Achalasia Type I II and III
- OGJOO

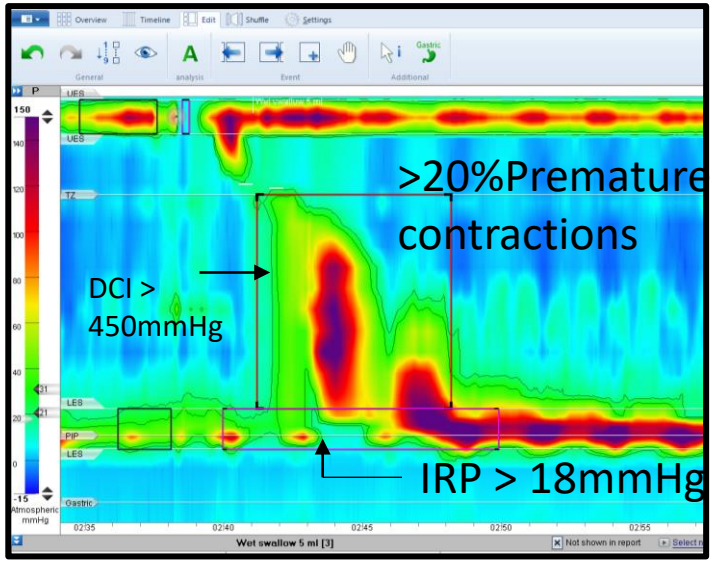
DISORDERS OF PERISTALSIS

- Absent Contractility
- Distal Oesophagel Spasm
- Hypercontractility
- Ineffective Esophageal Motility

DISORDERS OF THE OGJ OUTFLOW

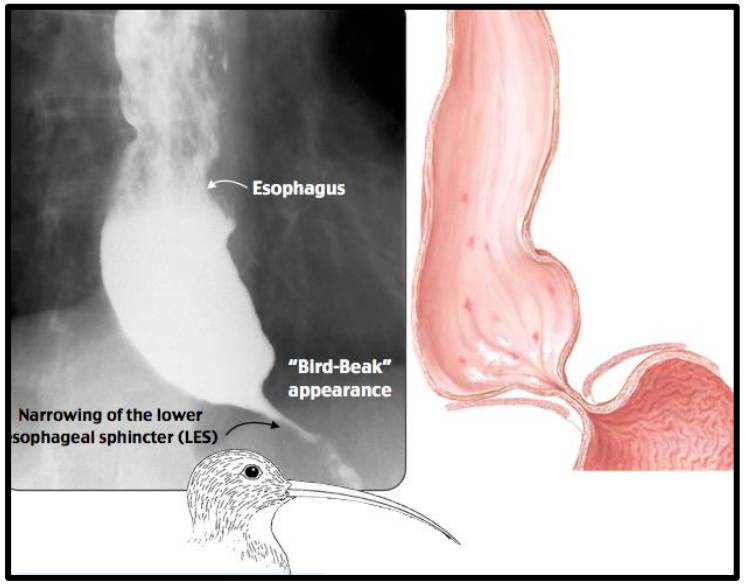




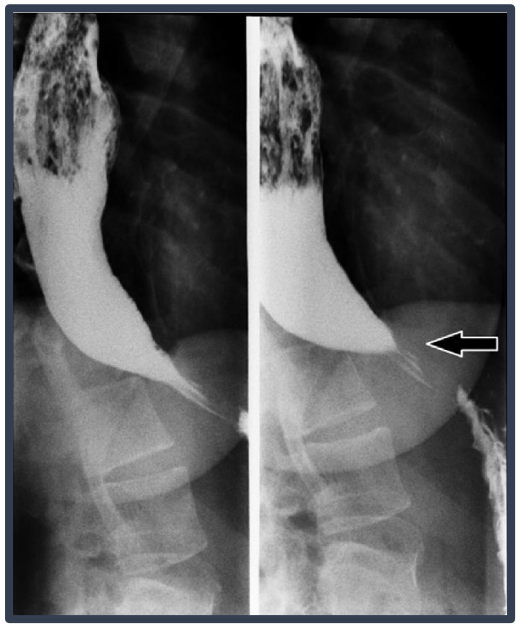


- **ACHALASIA**

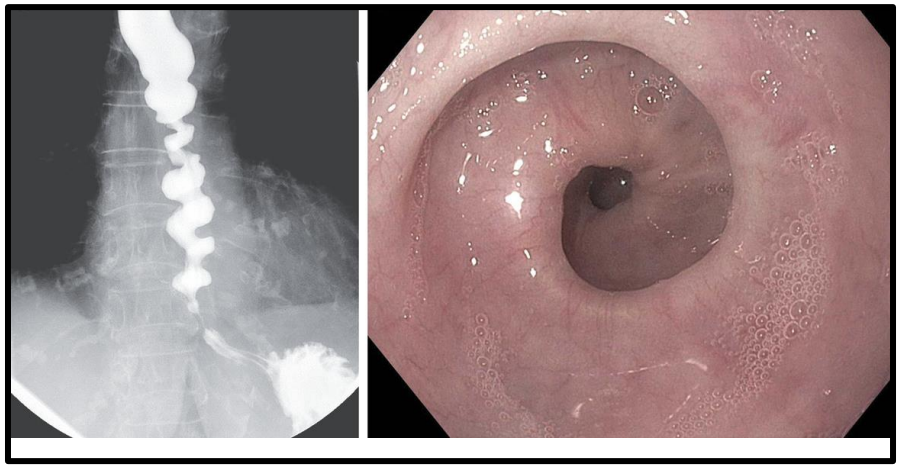
TYPE I



TYPE II

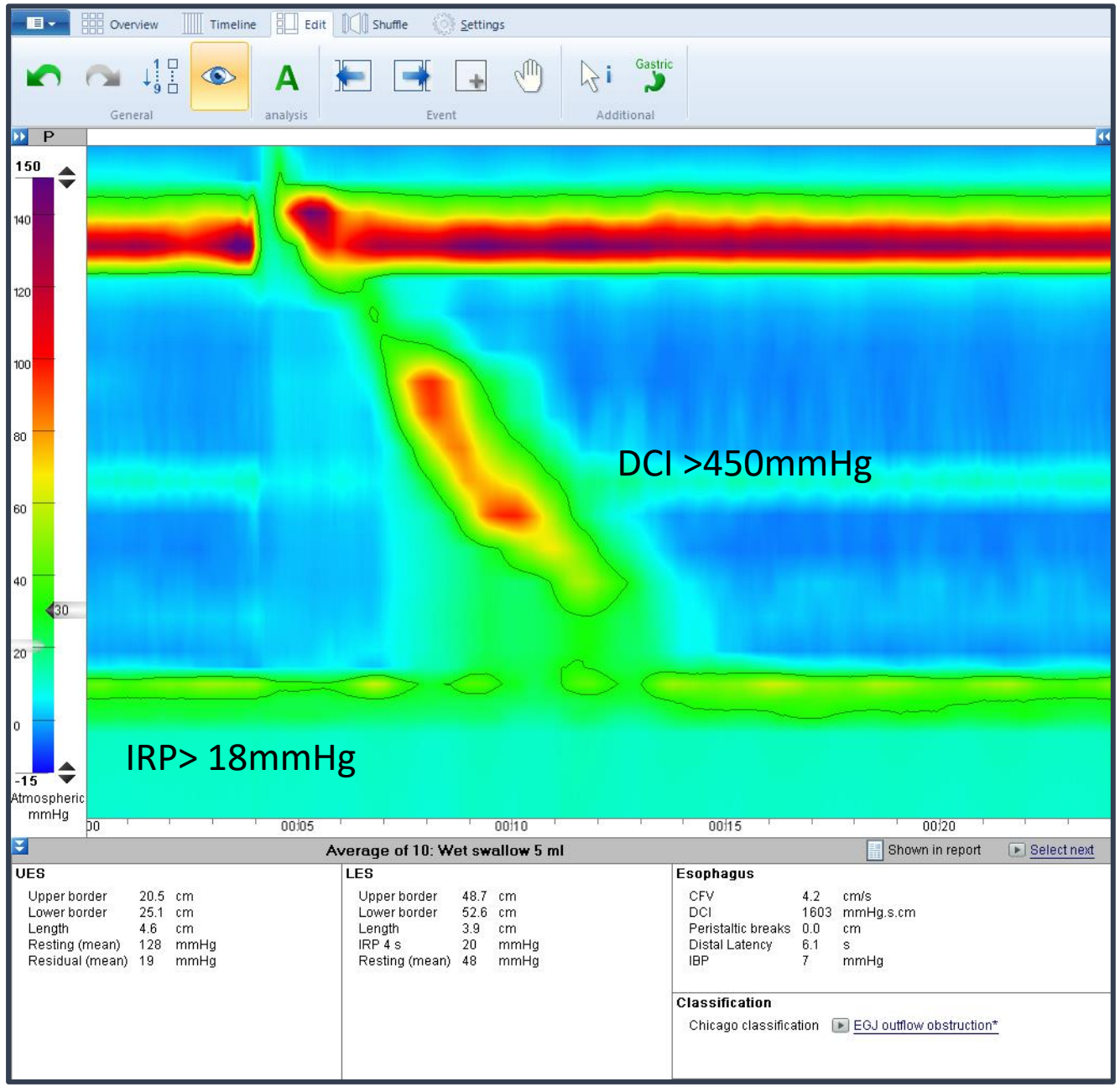


TYPE III

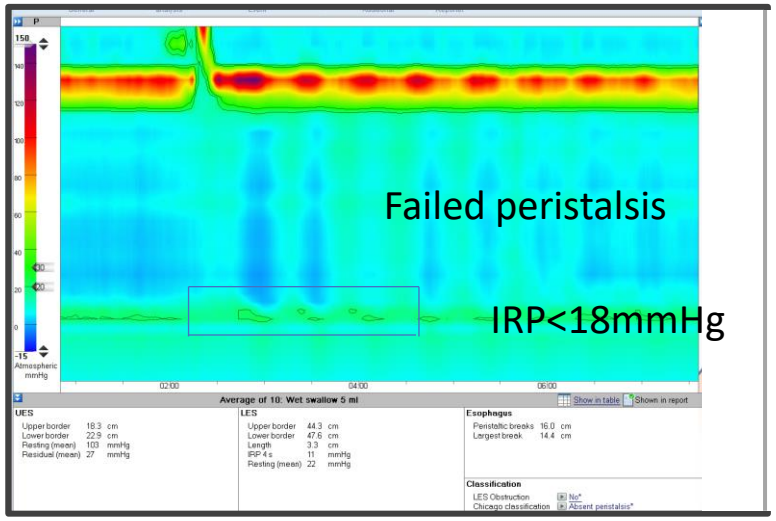


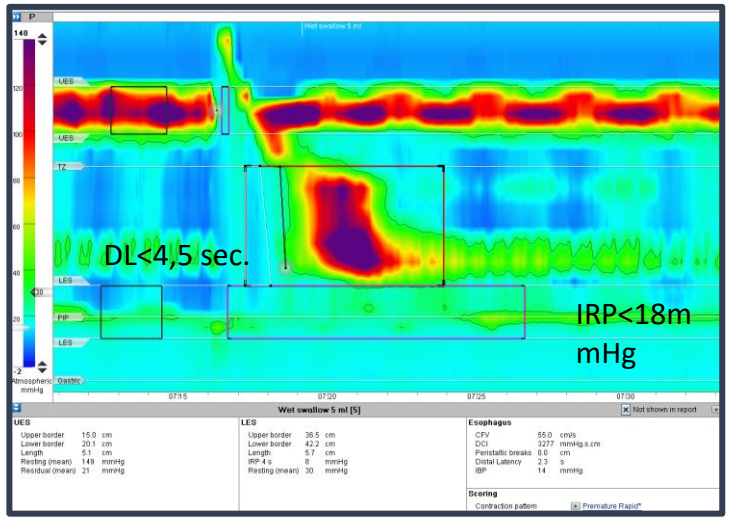
- **OGJOO**

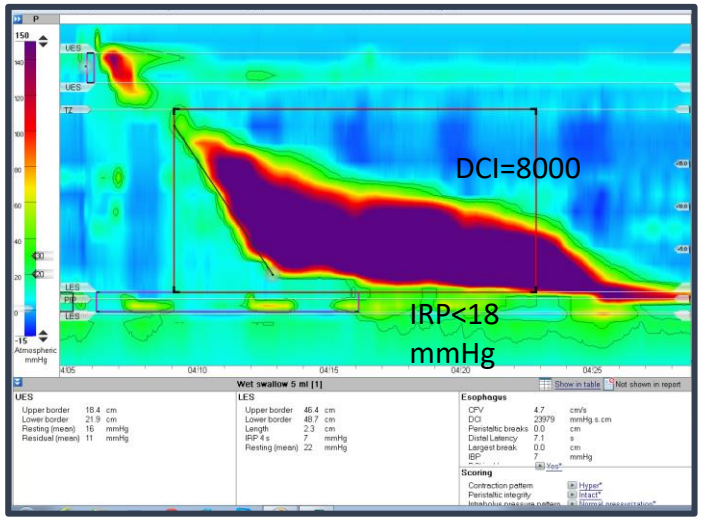
(In the presence of dysphagia or NCC symptoms)



DISORDERS OF PERISTALSIS

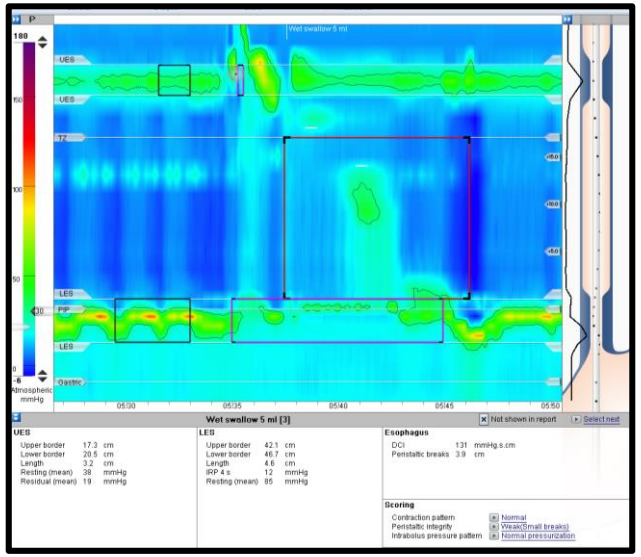


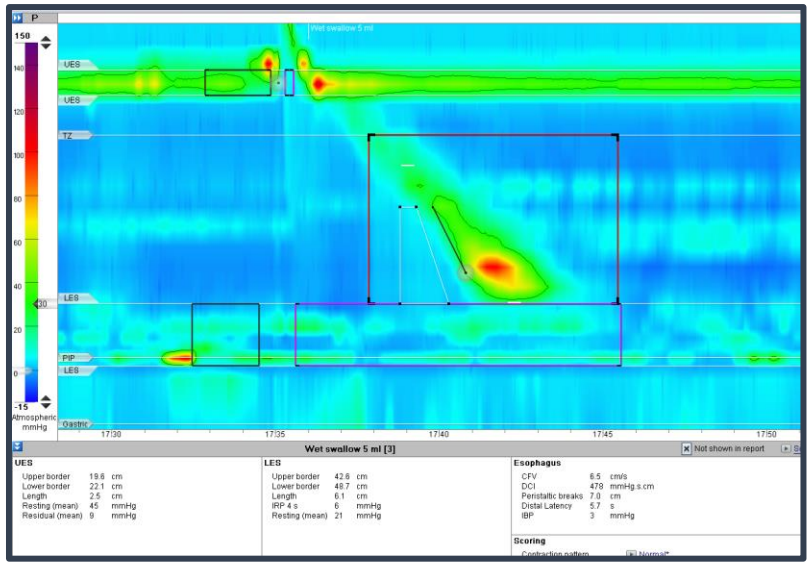




- FAILED PERISTALSIS
- PREMATURE CONTRACTION
- HYPERCONTRACTYLE CONTRACTION

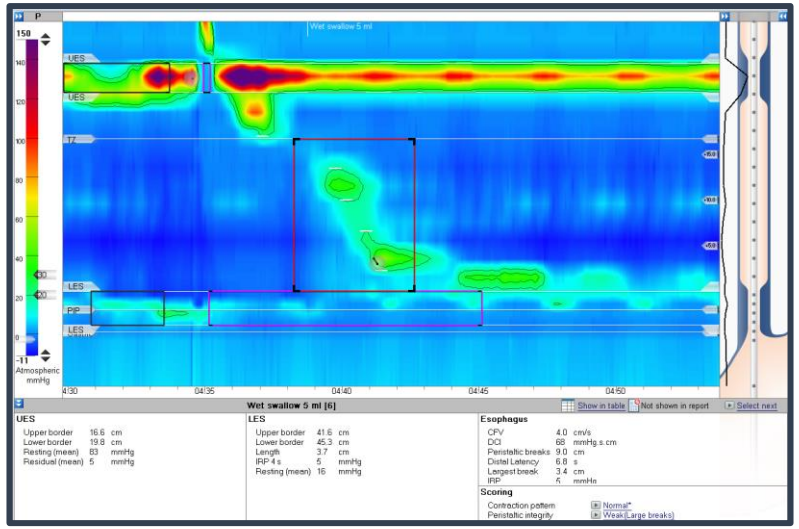
- INEFFECTIVE OESOPHAGEAL MOTILITY (IEM)





70% of weak (DCI<100 < 450mmHg)and fragmented contractions (Breaks in 20mmHg contour >5cm

OR

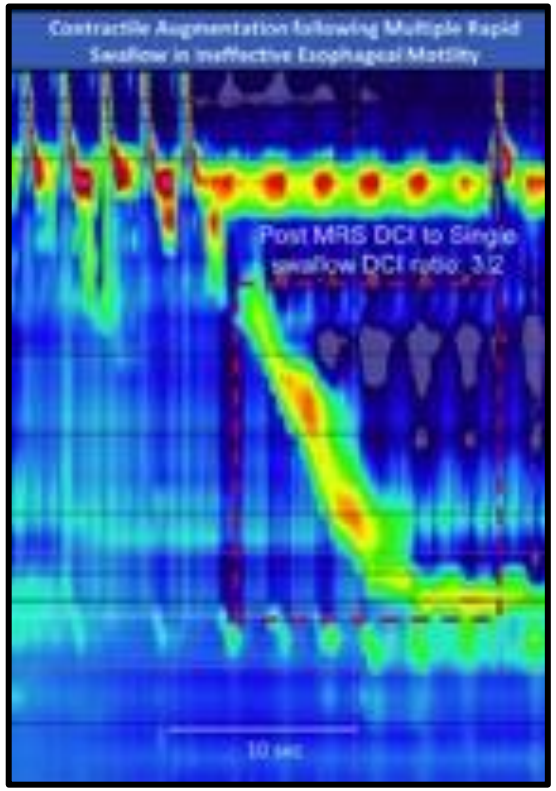


50% of Failed contractions

PROVOCATION TESTING

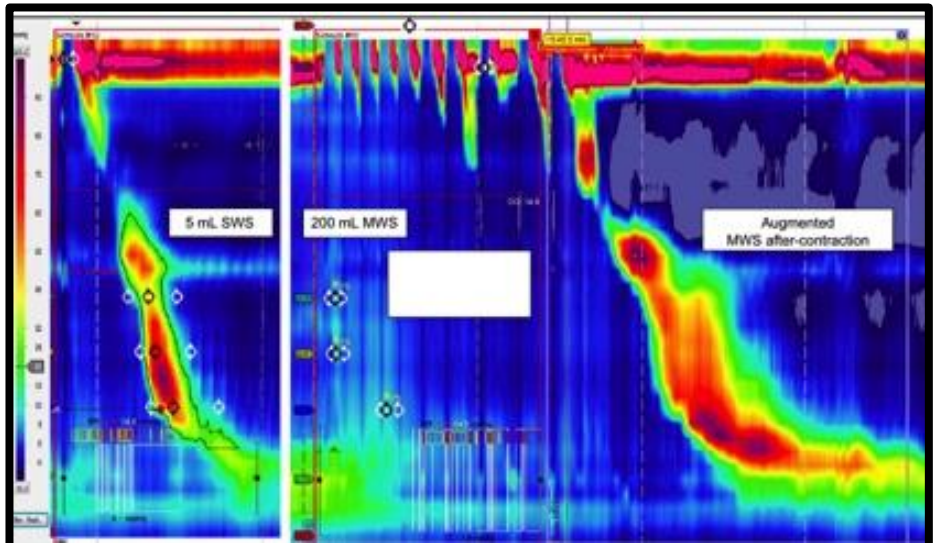
MULTIPLE RAPID SWALLOWS

- Peristaltic reserve



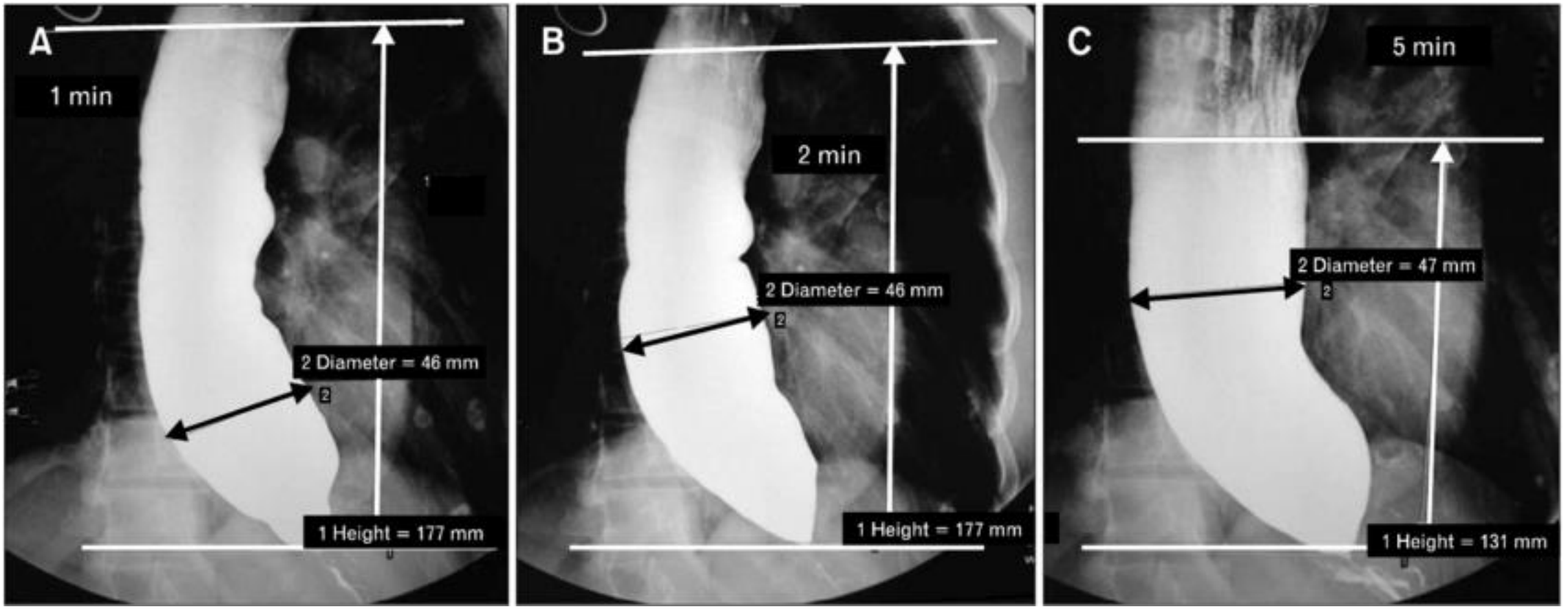
RAPID DRINK CHALLENGE

- Increased IRP (OGJOO)
- Normal clearance Contraction

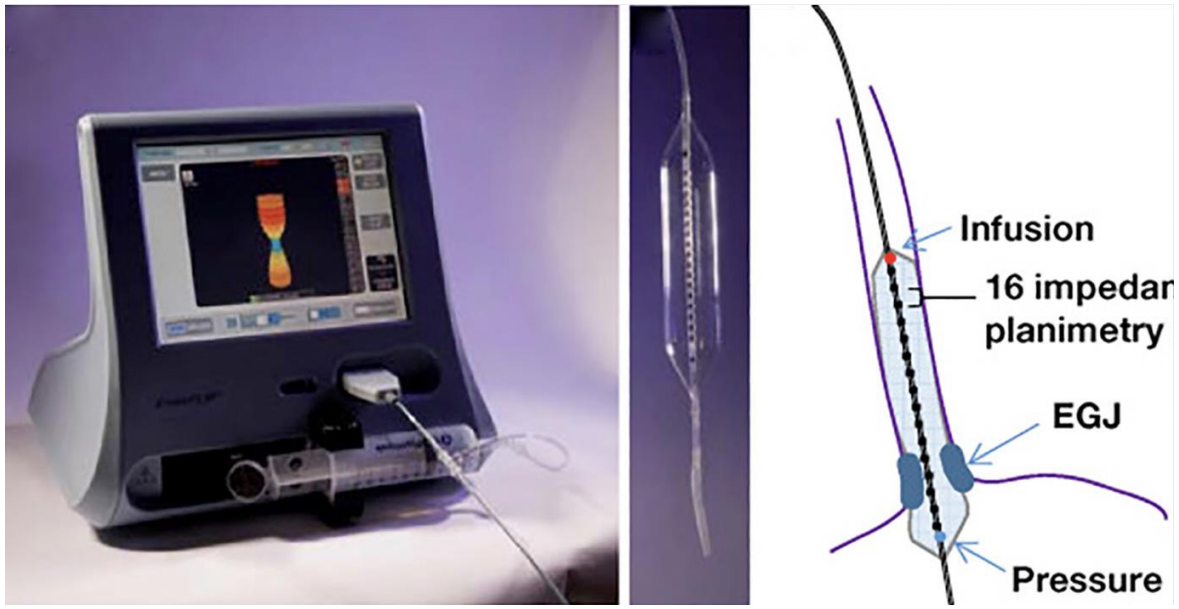


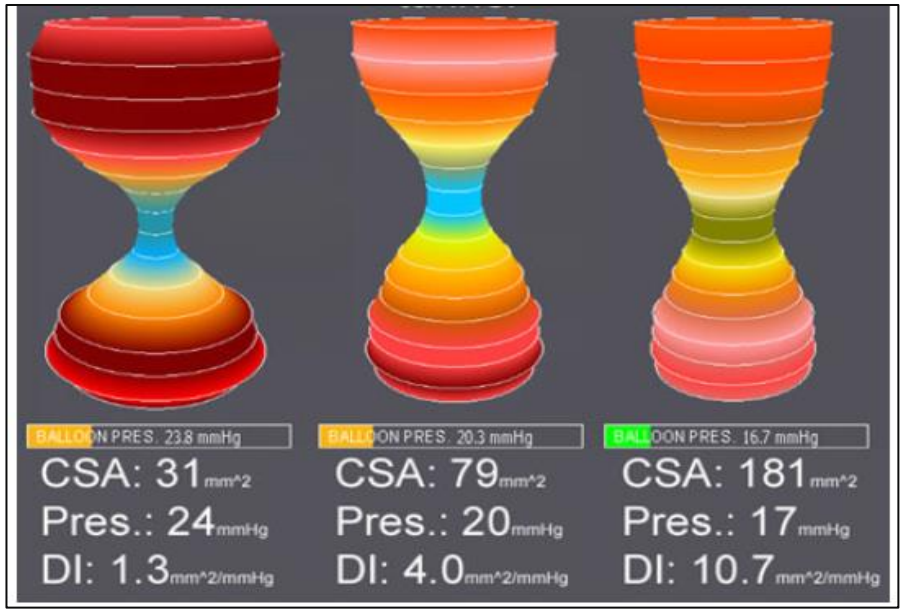
NON-MANOMETRIC INVESTIGATIONS

- TIMED BA-SWALLOW



- ENDOFLIP





MEASURES COMPLIANCE OF THE OGJ

INDICATIONS FOR HRM

1.Definite Evaluation of unexplained oesophageal symptoms (non-obstructive dysphagia and NCCP) Not including oro-pharyngeal dysphagia in this talk

2.Accurate placement of pH, pH-impedance probes

1.Evaluation of peristaltic function before ARS

2.Evaluation of post-operative dysphagia

5.Evaluation of rumination (with impedance)

6.Follow up of achalasia after therapy

7. Evaluation of scleroderma

8. Emerging Evaluation of peristaltic function before bariatric surgery and lung transplantation

CASES 1 (v D,J.)

- 45 year old male patient presented with bolus obstruction for the last 3 years
- 5 episodes of which one needed a gastroscopy with manual decompaction of the food bolus

What would you like to know more about his history ?

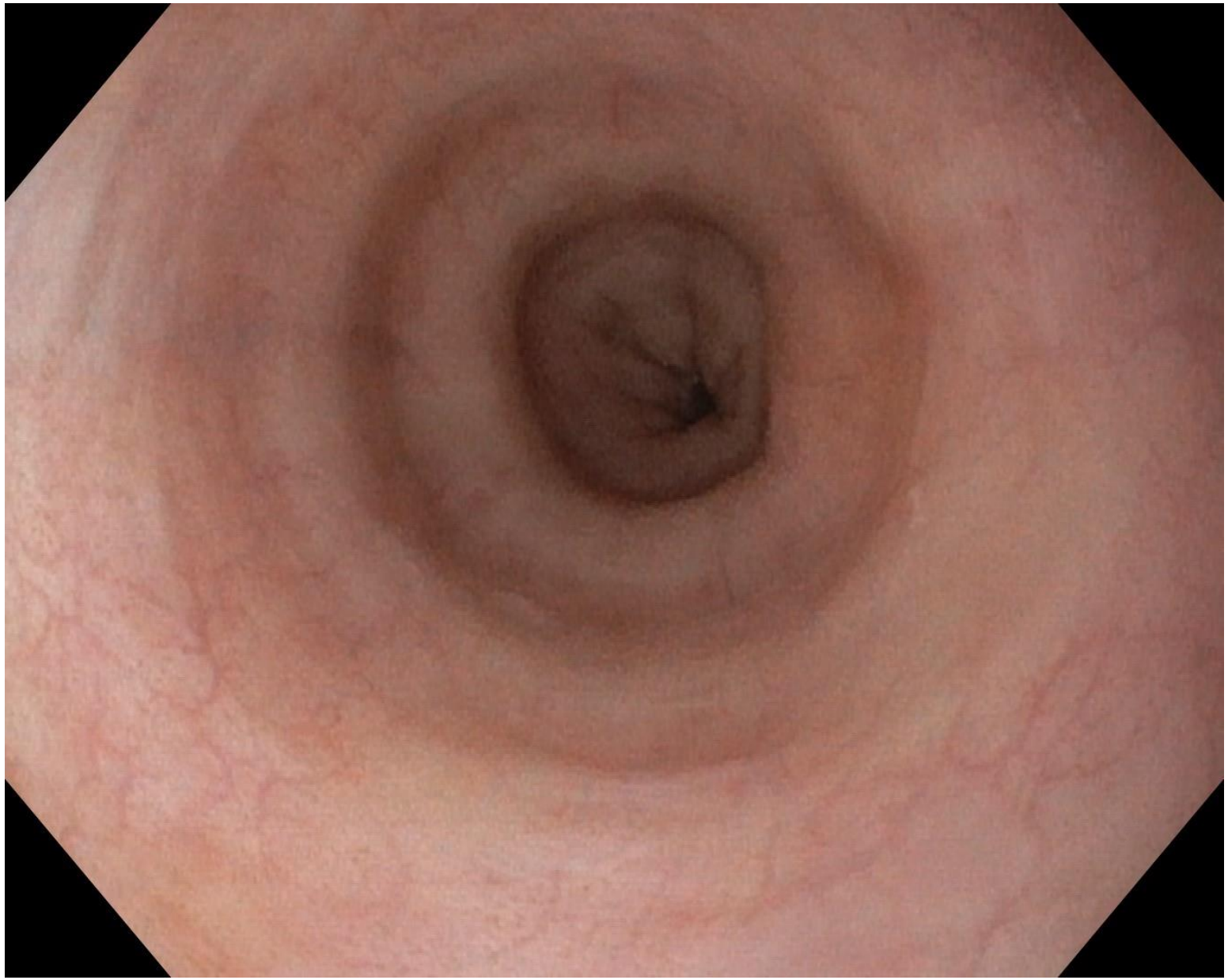
What would be your next investigation ?

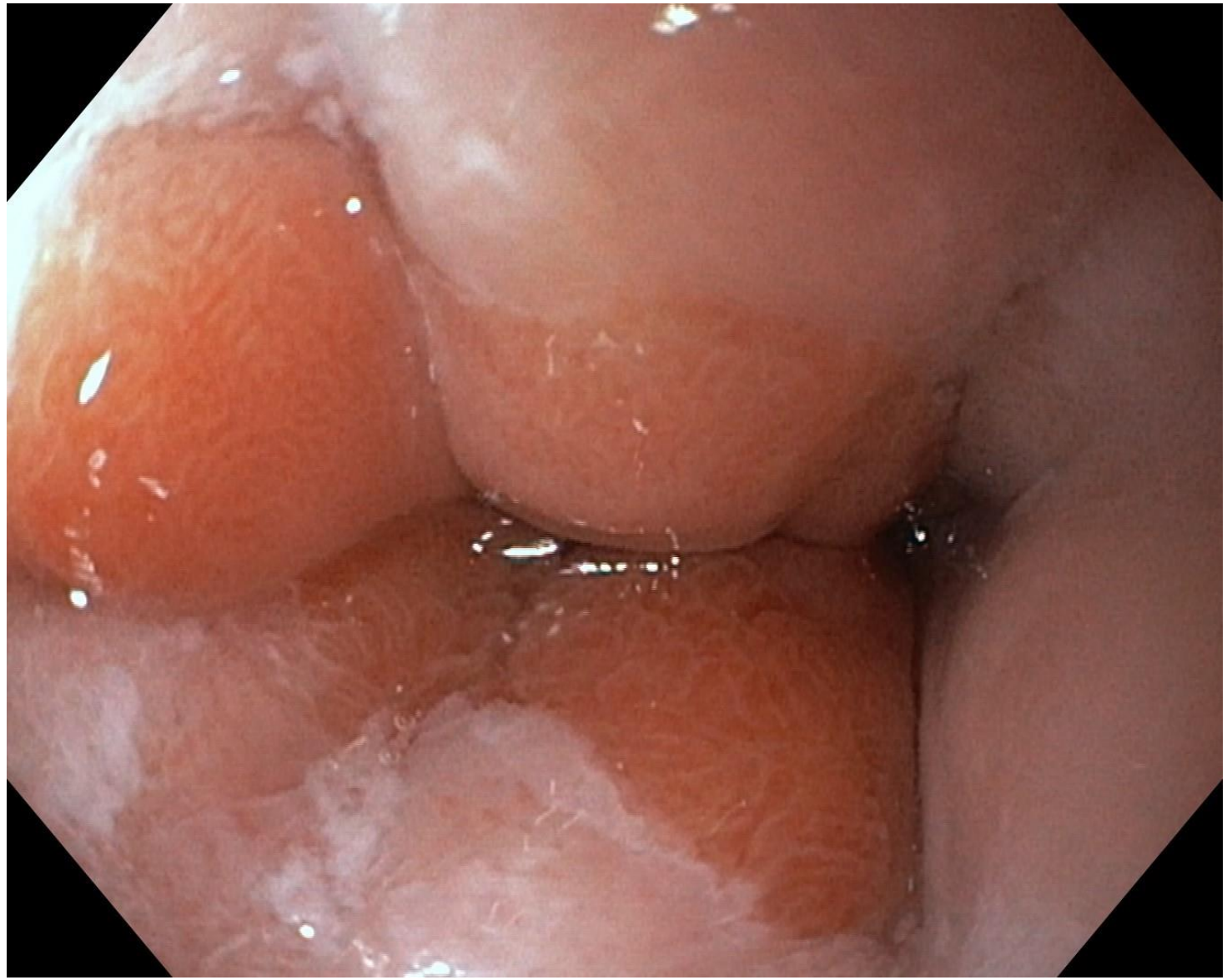
HISTORY

- Danger signs e.g. weight loss
- Food allergies
- Heartburn symptoms
- Co-morbitidies eg. DM ,Connective tissue disease

PROCEDURES

Gastroscopy/Ba-swallow

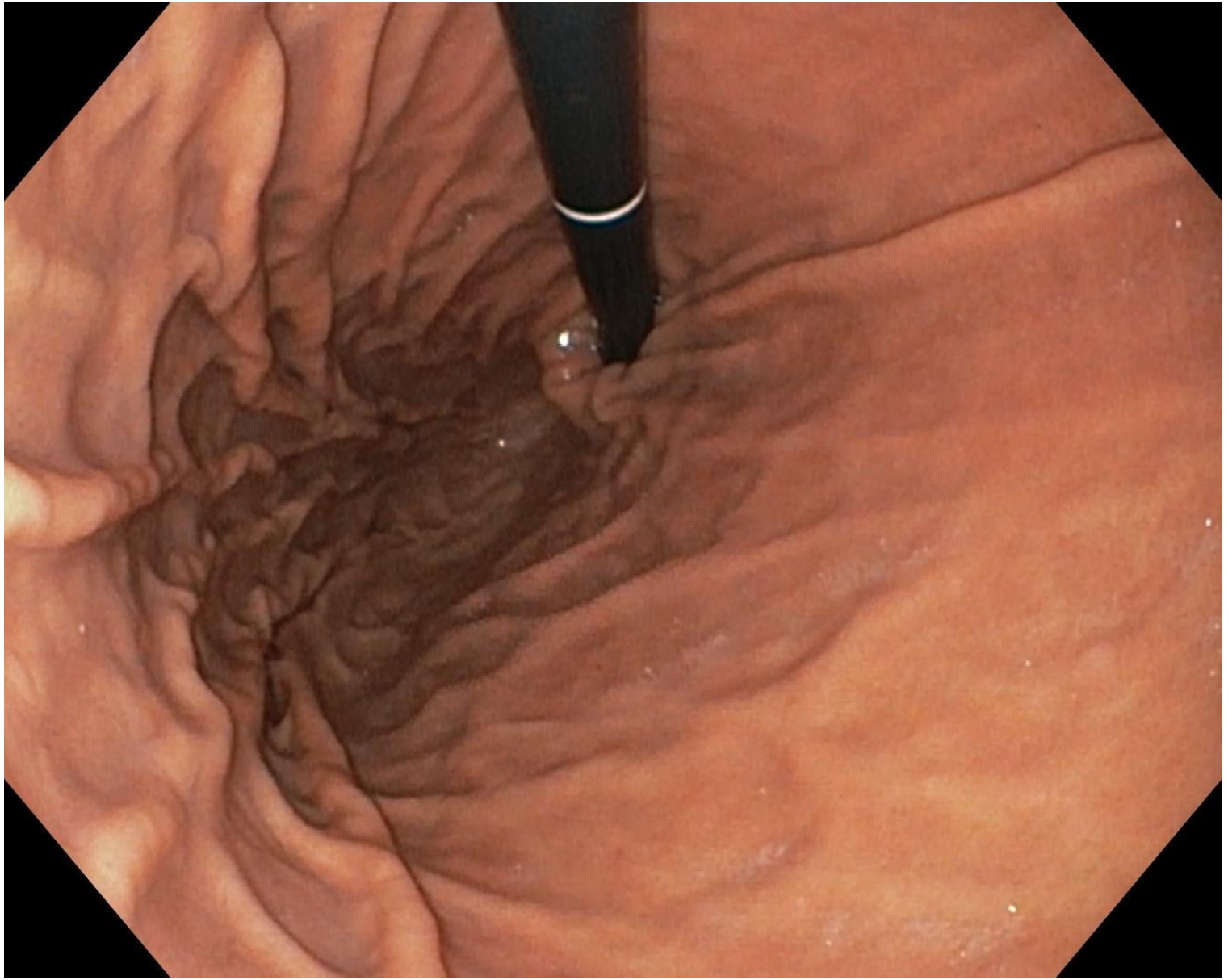




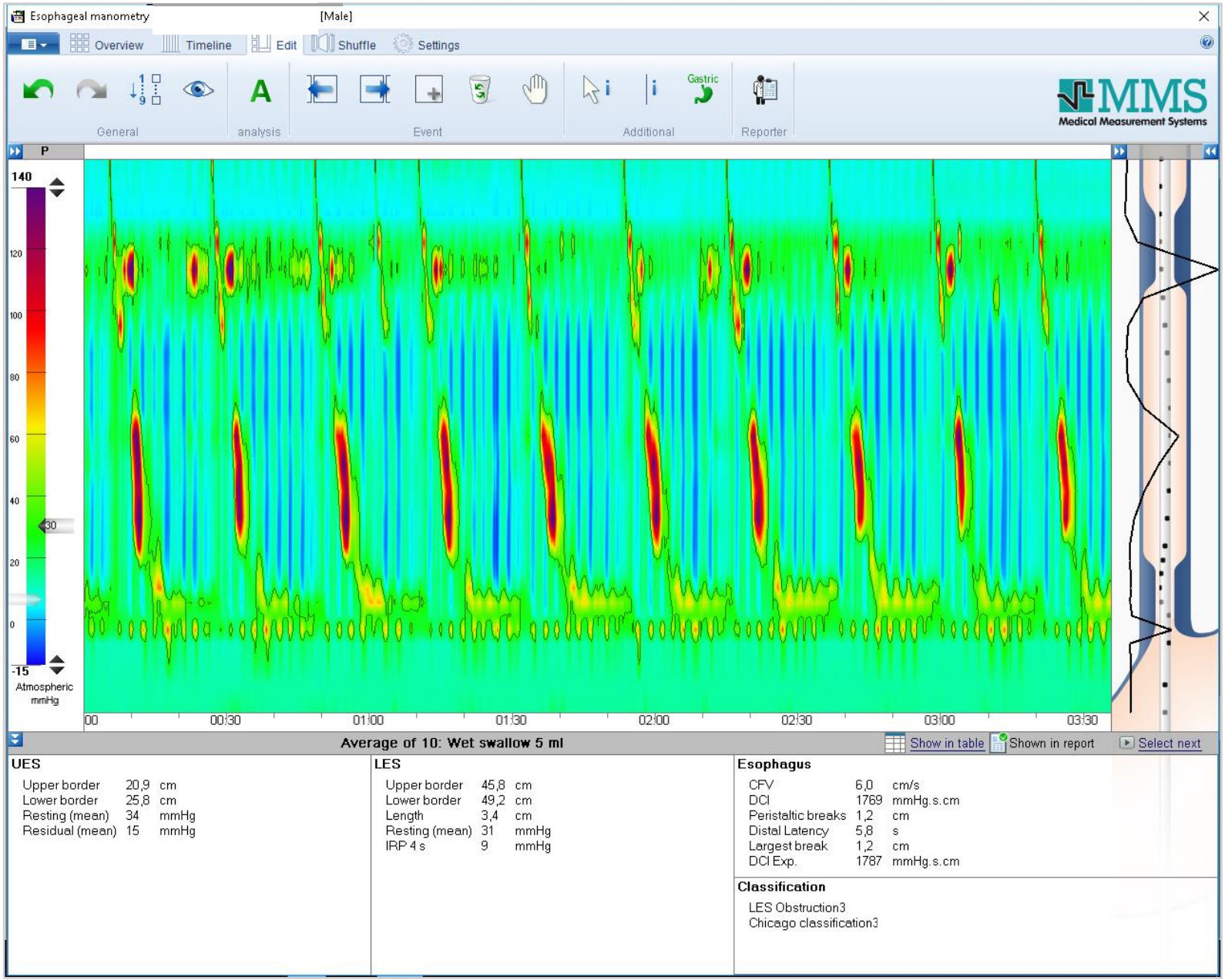
ESSENTIALLY a NORMAL GASTROSCOPY

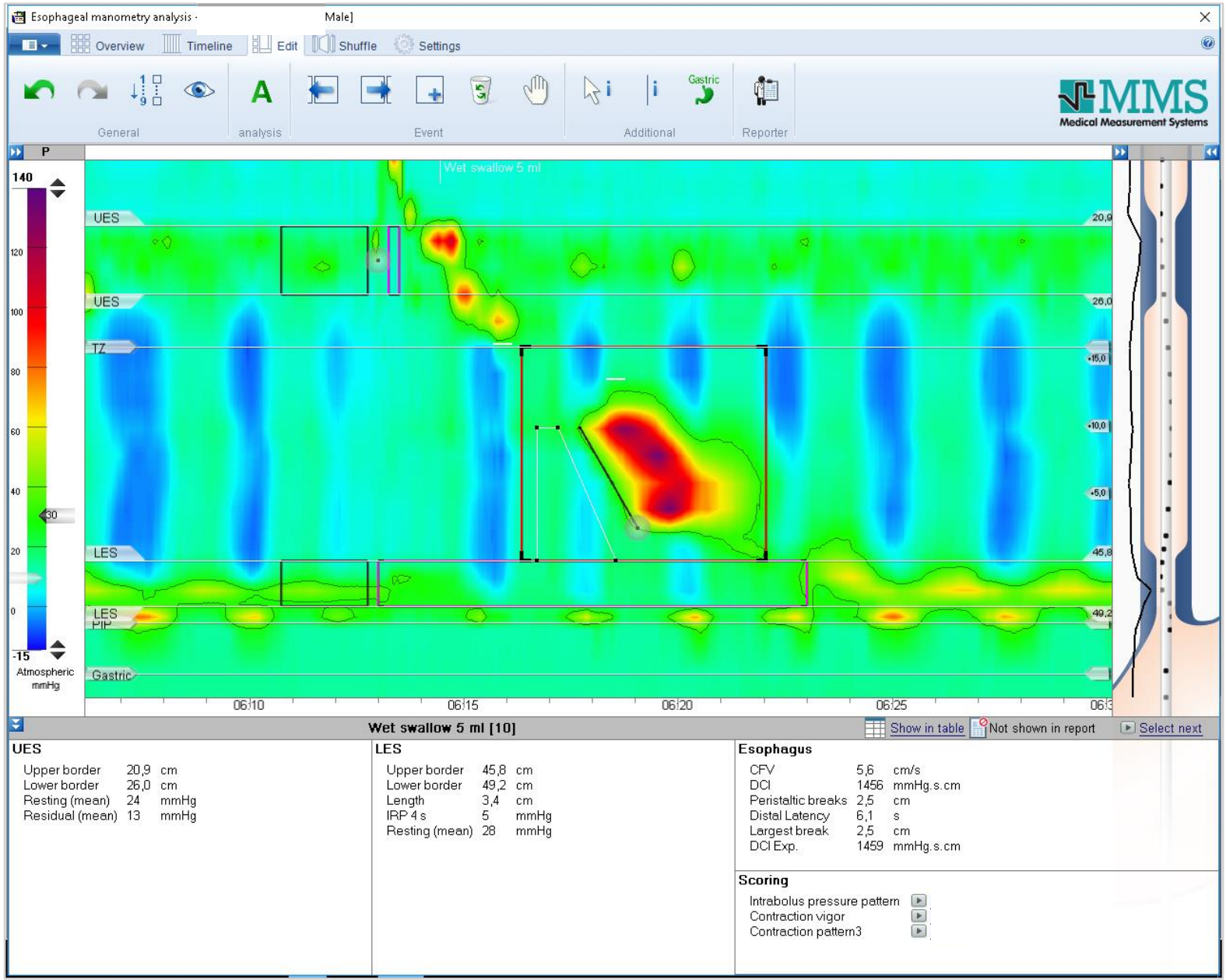
And BA-SWALLOW

What would your next investigation be ?



HRM


Esophageal manometry
[Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Gastric
Reporter
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-15
Atmospheric
mmHg
00
00:30
01:00
01:30
02:00
02:30
03:00
03:30
Average of 10: Wet swallow 5 ml
Show in table
Shown in report
Select next
UES
Upper border 20,9 cm
Lower border 25,8 cm
Resting (mean) 34 mmHg
Residual (mean) 15 mmHg
LES
Upper border 45,8 cm
Lower border 49,2 cm
Length 3,4 cm
Resting (mean) 31 mmHg
IRP 4 s 9 mmHg
Esophagus
CFV 6,0 cm/s
DCI 1769 mmHg.s.cm
Peristaltic breaks 1,2 cm
Distal Latency 5,8 s
Largest break 1,2 cm
DCI Exp. 1787 mmHg.s.cm
Classification
LES Obstruction3
Chicago classification3


Esophageal manometry analysis · Male]
Overview
Timeline
Edit
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analysis
Event
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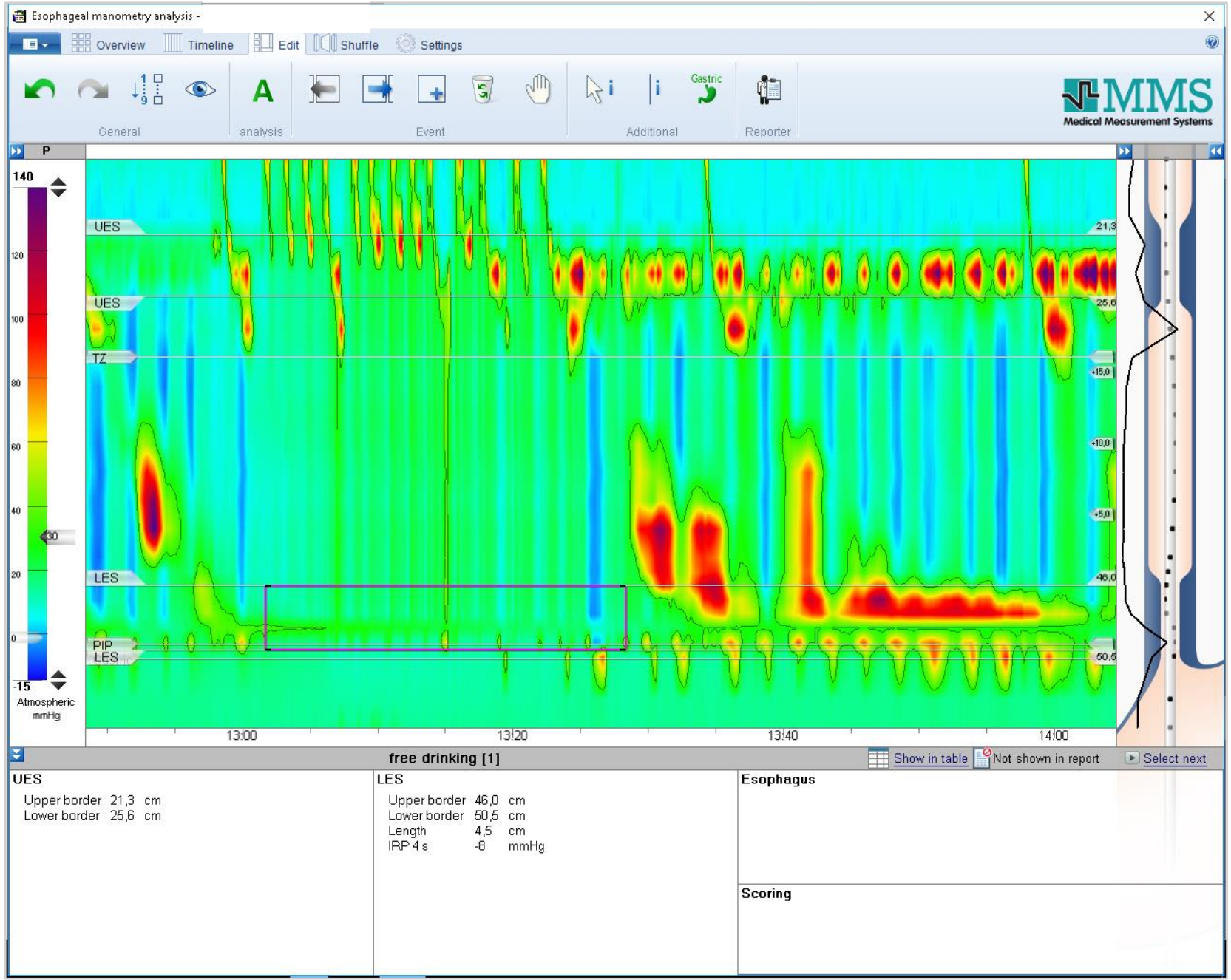
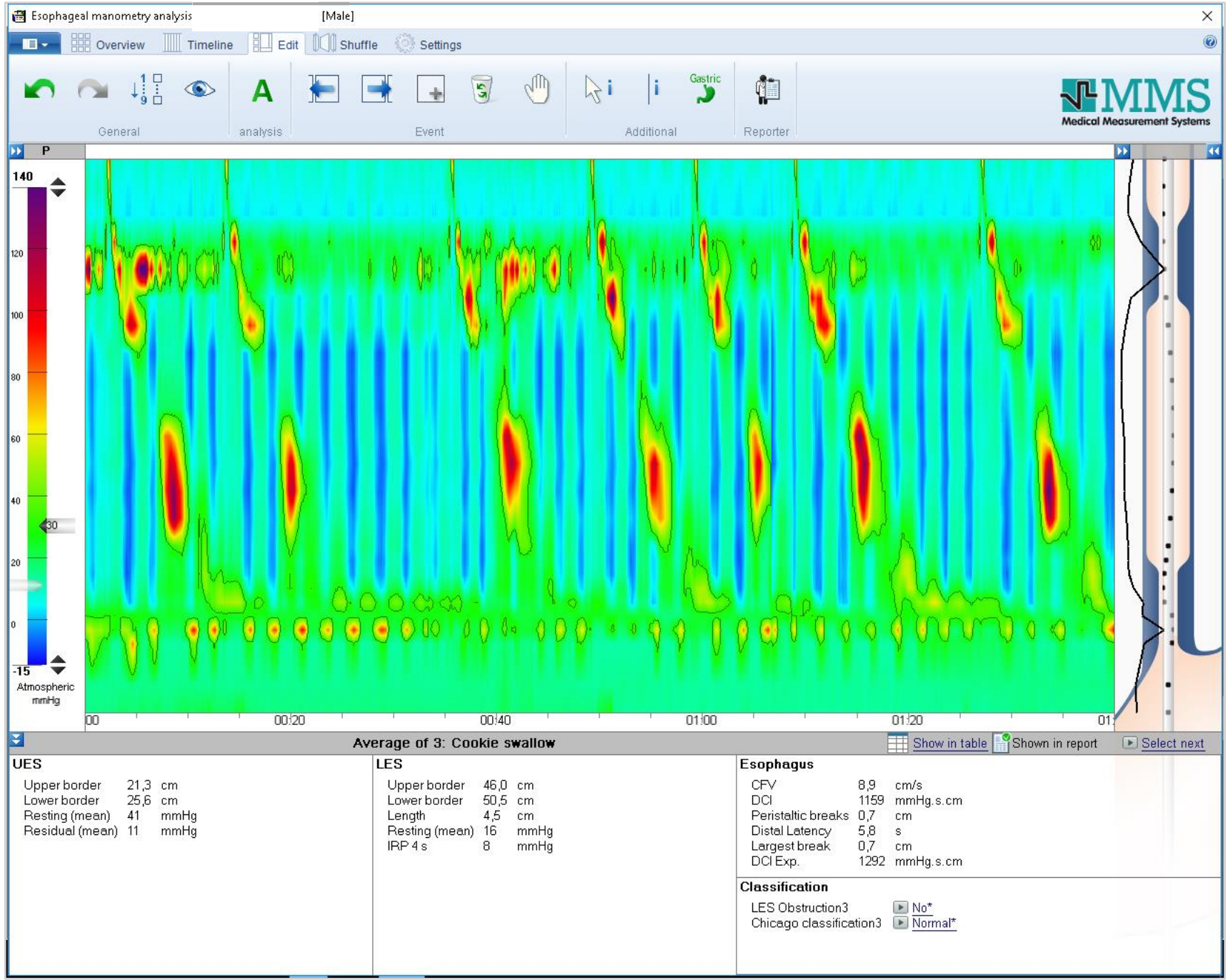
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-15
Atmospheric mmHg
Wet swallow 5 ml
UES
UES
TZ
LES
LES
PIP
Gastric
20,9
26,0
+15,0
+10,0
+5,0
45,8
49,2
06:10
06:15
06:20
06:25
Wet swallow 5 ml [10]
Show in table
Not shown in report
Select next
UES
Upper border 20,9 cm
Lower border 26,0 cm
Resting (mean) 24 mmHg
Residual (mean) 13 mmHg
LES
Upper border 45,8 cm
Lower border 49,2 cm
Length 3,4 cm
IRP 4 s 5 mmHg
Resting (mean) 28 mmHg
Esophagus
CFV 5,6 cm/s
DCI 1456 mmHg.s.cm
Peristaltic breaks 2,5 cm
Distal Latency 6,1 s
Largest break 2,5 cm
DCI Exp. 1459 mmHg.s.cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3


Esophageal manometry analysis -
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
Gastric
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-15
Atmospheric
mmHg
UES
UES
TZ
LES
PIP
LES
21,3
25,6
+15,0
+10,0
+5,0
46,0
50,5
13:00
13:20
13:40
14:00
free drinking [1]
Show in table
Not shown in report
Select next
UES
Upper border 21,3 cm
Lower border 25,6 cm
LES
Upper border 46,0 cm
Lower border 50,5 cm
Length 4,5 cm
IRP 4 s -8 mmHg
Esophagus
Scoring


Esophageal manometry analysis
[Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
Gastric
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-15
Atmospheric
mmHg
00
00:20
00:40
01:00
01:20
Average of 3: Cookie swallow
Show in table
Shown in report
Select next
UES
Upper border 21,3 cm
Lower border 25,6 cm
Resting (mean) 41 mmHg
Residual (mean) 11 mmHg
LES
Upper border 46,0 cm
Lower border 50,5 cm
Length 4,5 cm
Resting (mean) 16 mmHg
IRP 4 s 8 mmHg
Esophagus
CFV 8,9 cm/s
DCI 1159 mmHg.s.cm
Peristaltic breaks 0,7 cm
Distal Latency 5,8 s
Largest break 0,7 cm
DCI Exp. 1292 mmHg.s.cm
Classification
LES Obstruction3 No*
Chicago classification3 Normal*

What should one exclude and how?

- EoE : Biopsies

- Excluded reflux : MII-pH study

How would you manage him if all came back as negative?

Reassurance and Refer to speech therapist

CASE 2 (M,A.)

- 55 year old gentleman presented with a sore throat but had noticed that the food got stuck and he would vomit a month prior to his admission

Esophageal Symptoms:

- Dysphagia occurred with solids and fluids

- Dysphagia and regurgitation occurred with each meal Lost a lot of weight in a short period of time (9kg)
- No chest pain No heartburn
- Was admitted for IV fluid treatment to hospital.
- Was consulted by an ENT surgeon who requested an Barium swallow

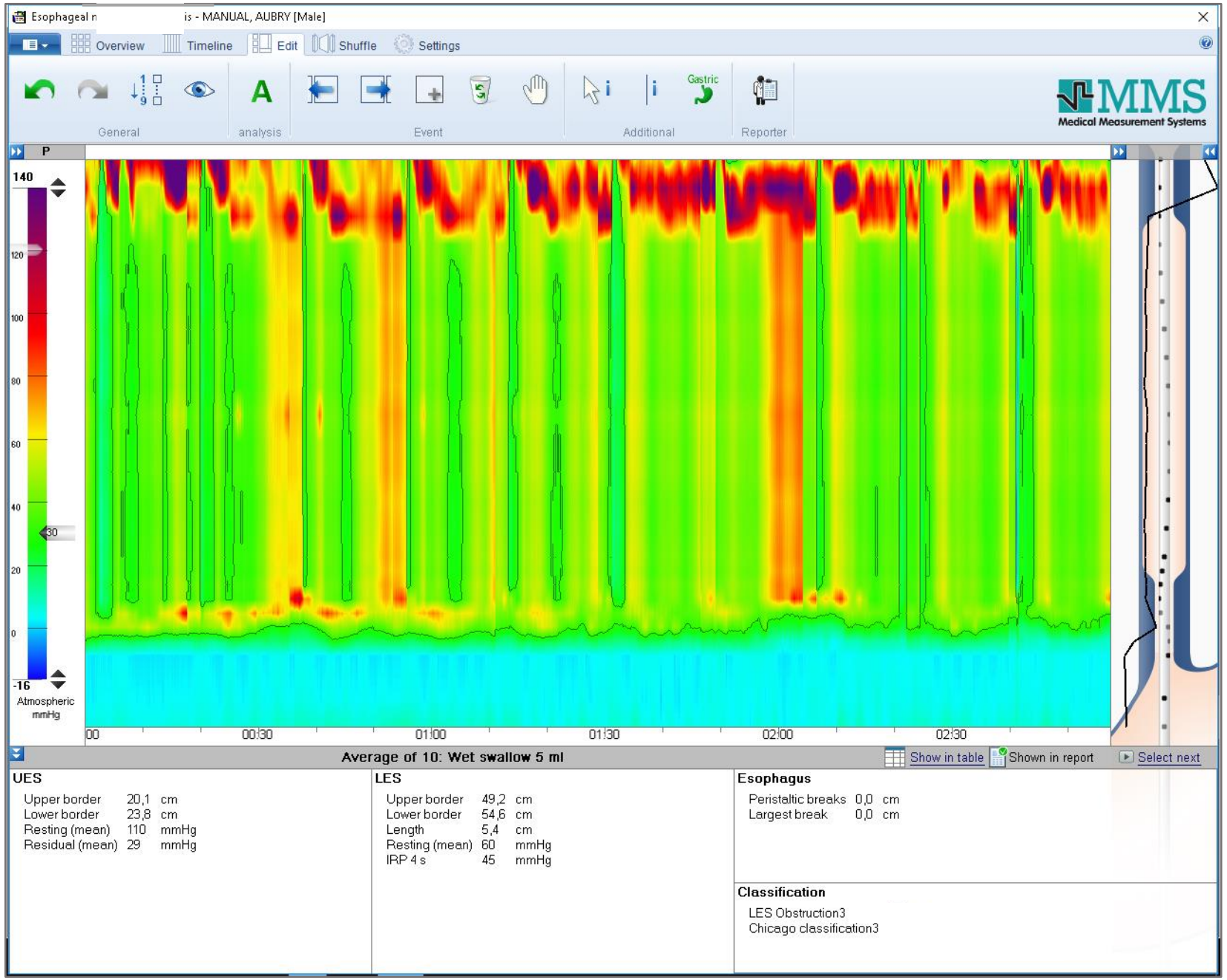
Barium confirmed achalasia
Gastroscopy findings : a tight OGJ

What procedure would you ask for next?
What is bothersome in his history ?

- HRM **Why? As we know it is achalasia?**

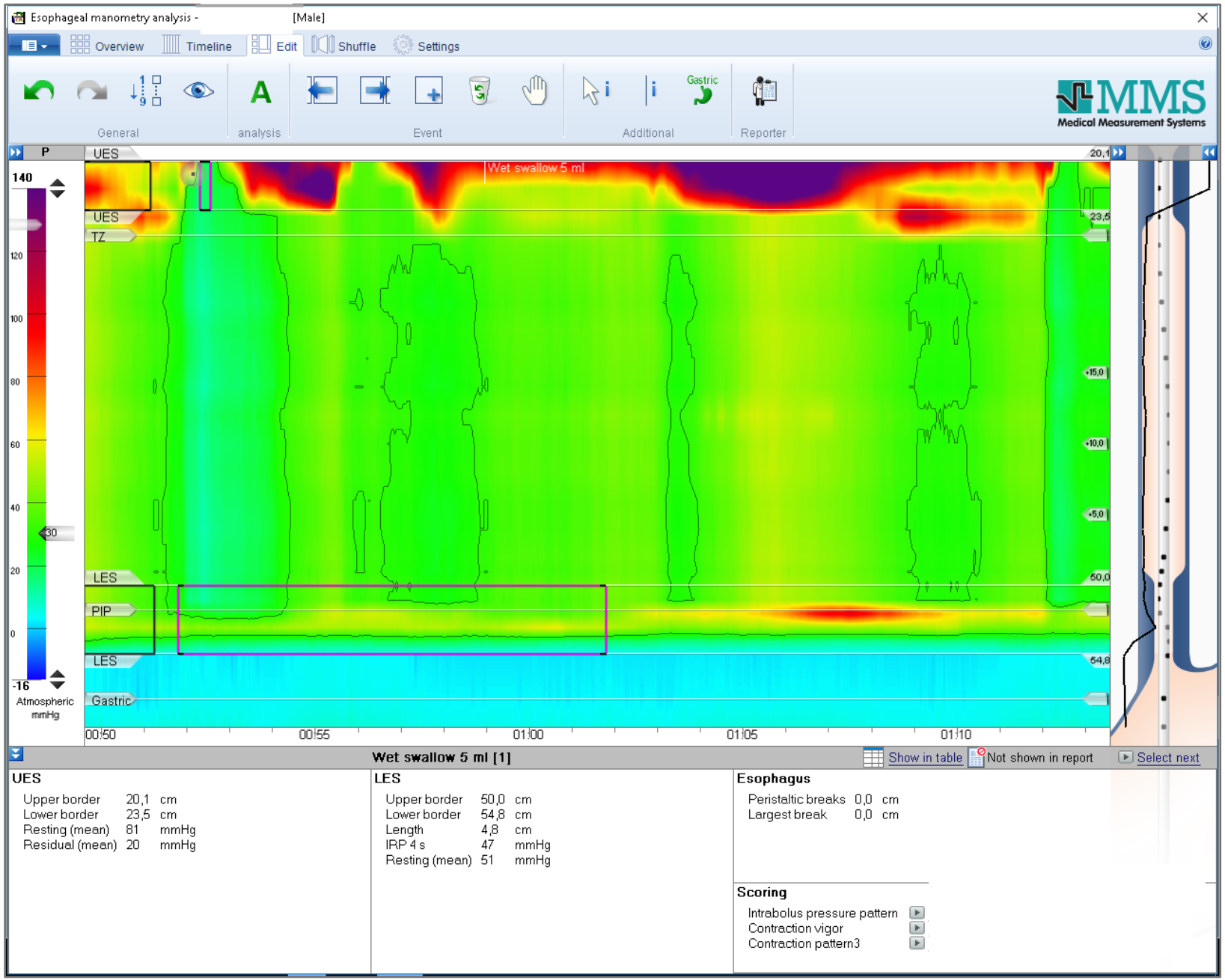
- Short history
- Sudden oncome of his dysphagia and other symptoms with fast progression
- Weight loss
- Age

SUB TYPE


Esophageal n is - MANUAL, AUBRY [Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
Gastric
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-16
Atmospheric
mmHg
00
00:30
01:00
01:30
02:00
02:30
Average of 10: Wet swallow 5 ml
Show in table
Shown in report
Select next
UES
Upper border 20,1 cm
Lower border 23,8 cm
Resting (mean) 110 mmHg
Residual (mean) 29 mmHg
LES
Upper border 49,2 cm
Lower border 54,6 cm
Length 5,4 cm
Resting (mean) 60 mmHg
IRP 4 s 45 mmHg
Esophagus
Peristaltic breaks 0,0 cm
Largest break 0,0 cm
Classification
LES Obstruction3
Chicago classification3

WHY ?

TREATMENT OPTION ?



- PD
- HELLER’S
- POEM

CASE 3 (N,S.)

- 24 year old female student gives a six month history of difficulty swallowing certain solid foods and fluids.
- past two months it has got progressively worse.

Currently
Solids and fluids get stuck with each meal
Few times a week she experiences regurgitation
No chest pain
Weight loss (110 to 95kg)

No heartburn
She does tend to eat slowly with crackling sounds and burping during meals

What could this be?

Why do I ask these above first 4 questions ?

ACHALASIA

ECKARD SCORE

Eckardt score is used to assess the severity of achalasia symptoms.
It is based on four major achalasia symptoms: dysphagia, regurgitations, chest pain, and weight loss.
It is used to evaluate the efficiency of a treatment during the follow-up.
An Eckardt score less than 3 points is considered as remission of the disease.

Score	Weight loss (kg)	Dysphagia	Retrosternal pain	Regurgitation
0	None	None	None	None
1	<5	Occasional	Occasional	Occasional
2	5–10	Daily	Daily	Daily
3	>10	Each meal	Each meal	Each meal

What procedure would you request next ?

- *Gastroscopy* : **What signs must one look out for?**

- *Ba-swallow* : **What must look out for ?**

Gastroscopy:

- Food or saliva residue in distal oesophagus.

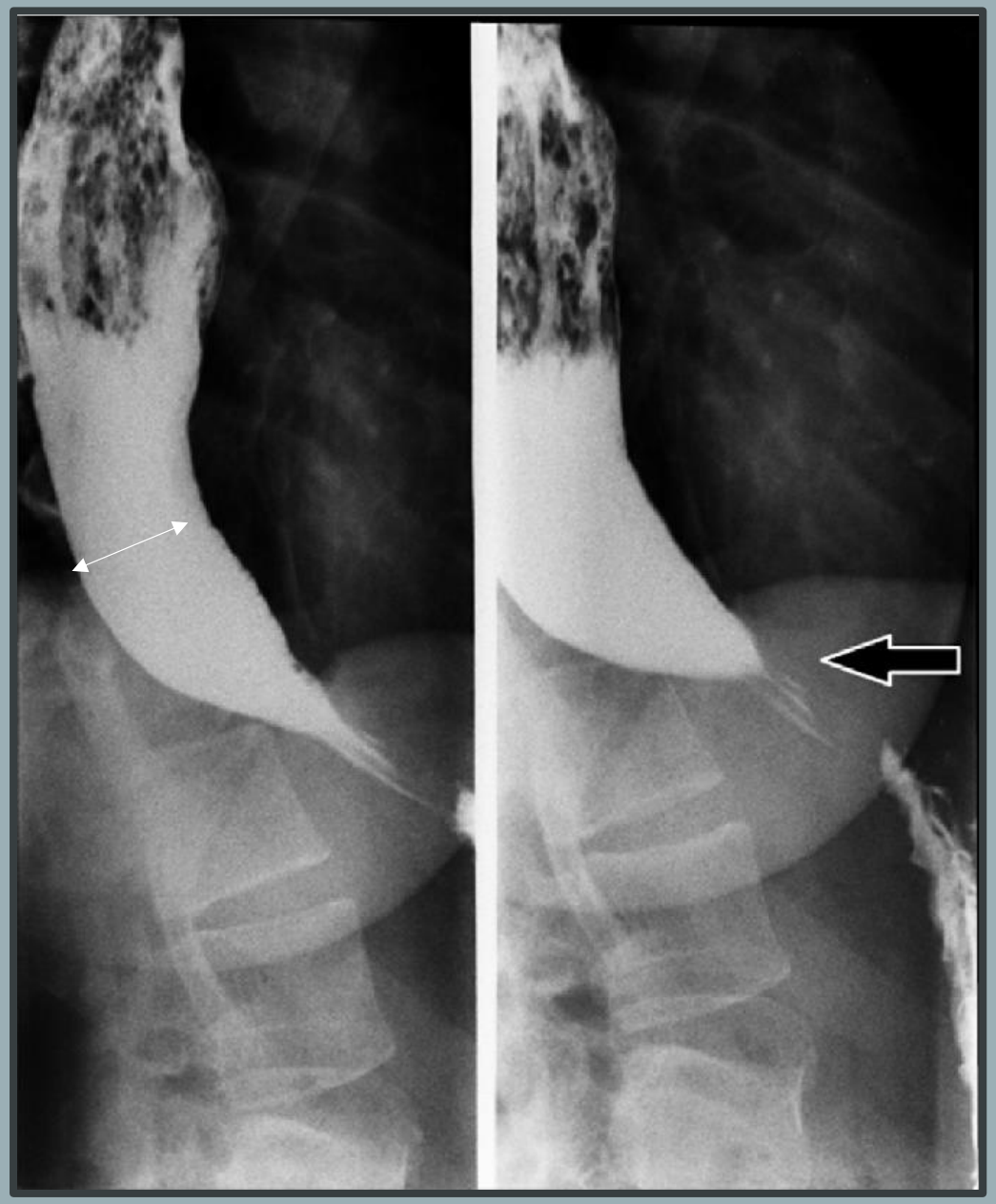
  Oesophagus can be dilated

  Tight OGJ that does not open when blowing air onto LOS and when you pass the gastroscope over the OGJ it has a ‘pop’ sensation

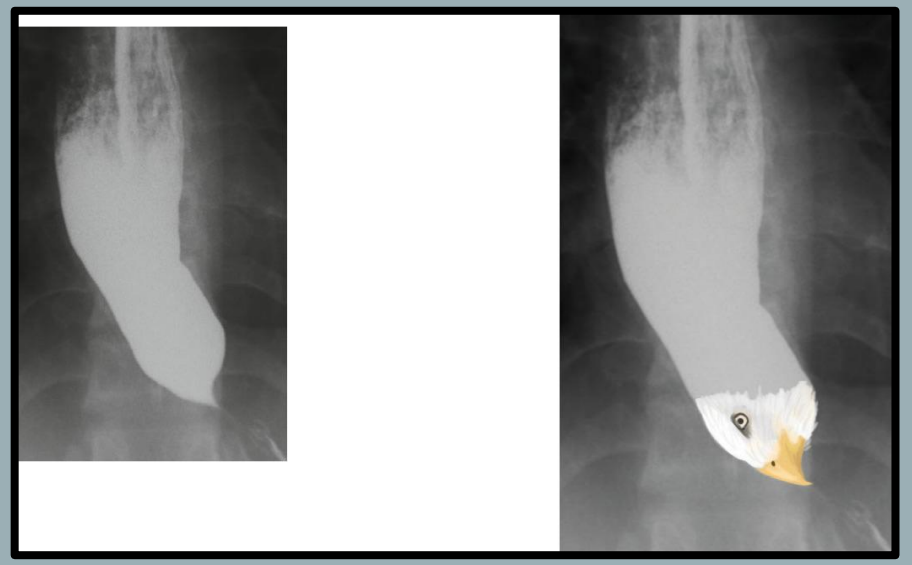
Ba-swallow:

- Dilated oesophagus with bird beak tapering of the distal oesophagus and OGJ (Bird beaked or rat tale appearance

Slightly Dilated Distal Oesophagus



Rat tail

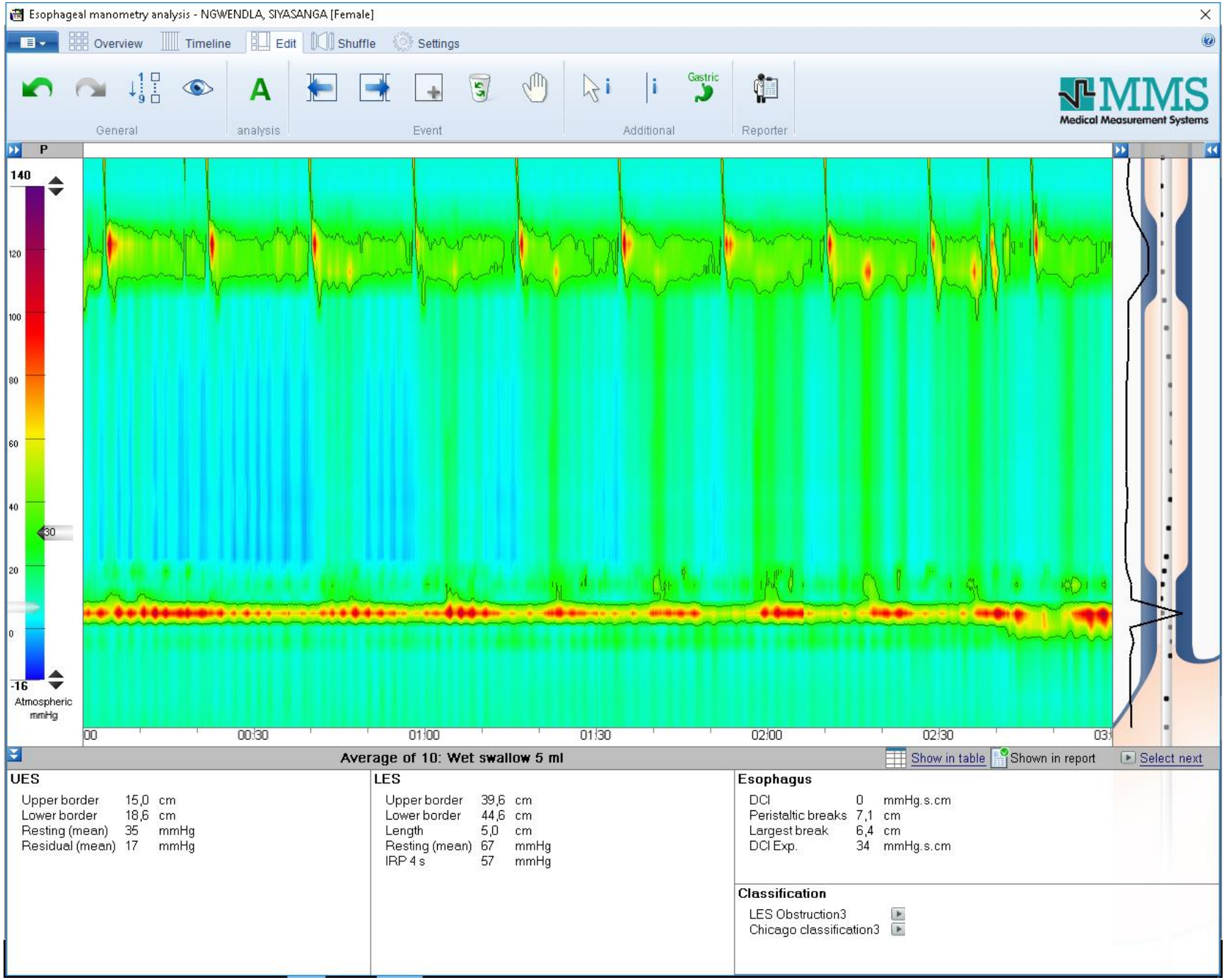


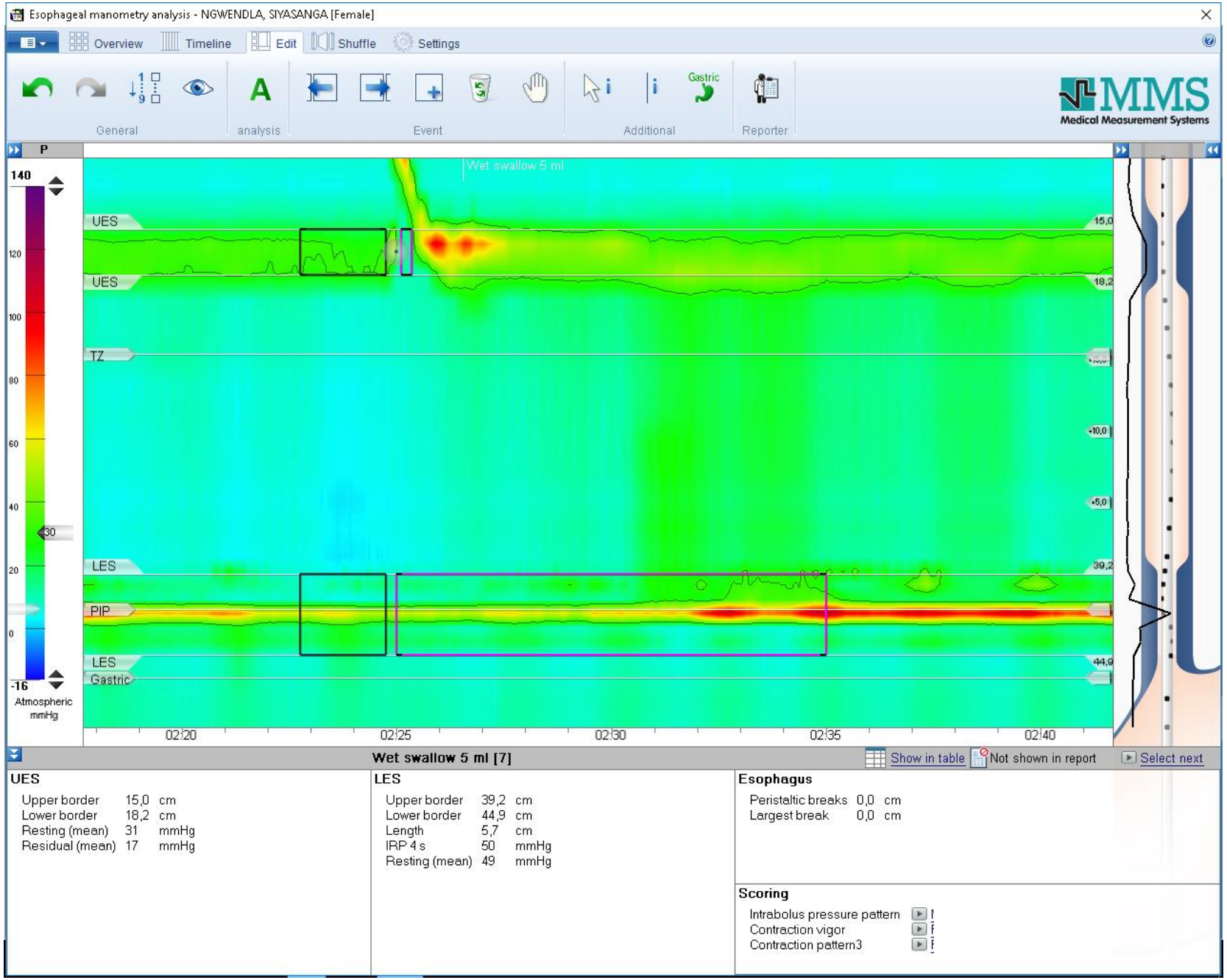
Bird beaked

HRM

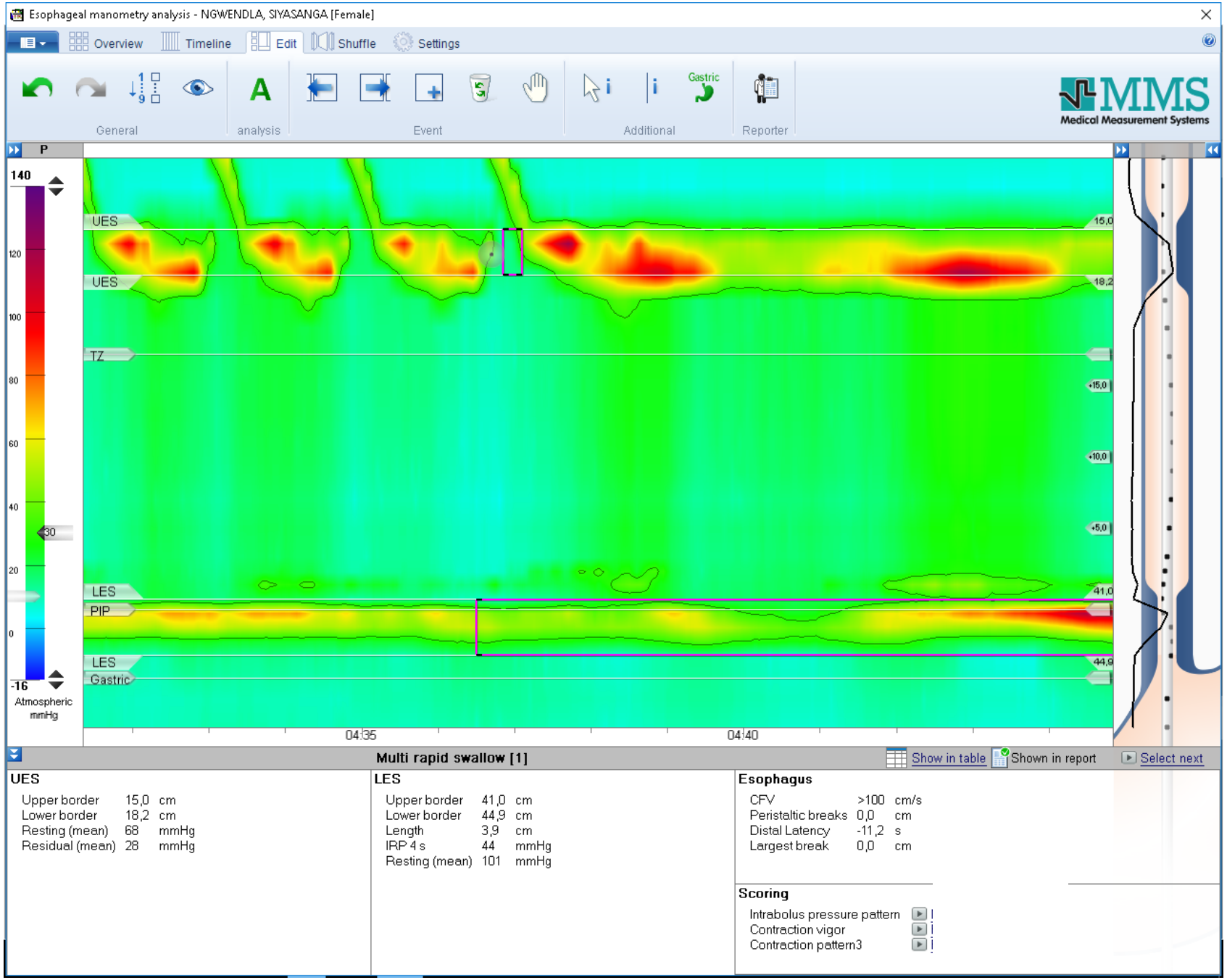
AVG 10 sw of 5ml

boluses of water




Esophageal manometry analysis - NGWENDLA, SIYASANGA [Female]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-16
Atmospheric mmHg
Wet swallow 5 ml
UES
UES
TZ
LES
PIP
LES
Gastric
15,0
18,2
+10,0
+5,0
39,2
44,9
02:20
02:25
02:30
02:35
02:40
Wet swallow 5 ml [7]
Show in table
Not shown in report
Select next
UES
Upper border 15,0 cm
Lower border 18,2 cm
Resting (mean) 31 mmHg
Residual (mean) 17 mmHg
LES
Upper border 39,2 cm
Lower border 44,9 cm
Length 5,7 cm
IRP 4 s 50 mmHg
Resting (mean) 49 mmHg
Esophagus
Peristaltic breaks 0,0 cm
Largest break 0,0 cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3

MRS


Esophageal manometry analysis - NGWENDLA, SIYASANGA [Female]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-16
Atmospheric mmHg
UES
UES
TZ
LES
PIP
LES
Gastric
15,0
18,2
+15,0
+10,0
+5,0
41,0
44,9
04:35
04:40
Multi rapid swallow [1]
Show in table
Shown in report
Select next
UES
Upper border 15,0 cm
Lower border 18,2 cm
Resting (mean) 68 mmHg
Residual (mean) 28 mmHg
LES
Upper border 41,0 cm
Lower border 44,9 cm
Length 3,9 cm
IRP 4 s 44 mmHg
Resting (mean) 101 mmHg
Esophagus
CFV >100 cm/s
Peristaltic breaks 0,0 cm
Distal Latency -11,2 s
Largest break 0,0 cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3

What sub-Type ?

Treatment options?

And in her case?

- **Type I**

- **Treatment options :**

PD

Heller’s Myotomy

POEM

Botox

Drug Therapy

Her case? Debatable

CASE 4 (M, K.)

- 66 year old man from the Congo presented with a globus sensation and a burning sensation up to the throat ? reflux.
- Intermittent regurgitation symptoms.
- Symptoms are worse in the supine position.
- No chest pain.
- Throat clears in the supine position.

Gastroscopy :findings was gastritis. No oesophagitis
Barium : Normal

- PPI single dosage does improve his symptoms

What do you think his diagnosis could be ?

What procedure would you ask for next to confirm the diagnosis and why?

Diagnosis : NERD

P**rocedure**: HRM and pH study

On or Off PPI therapy?

Off PPI

Why ?

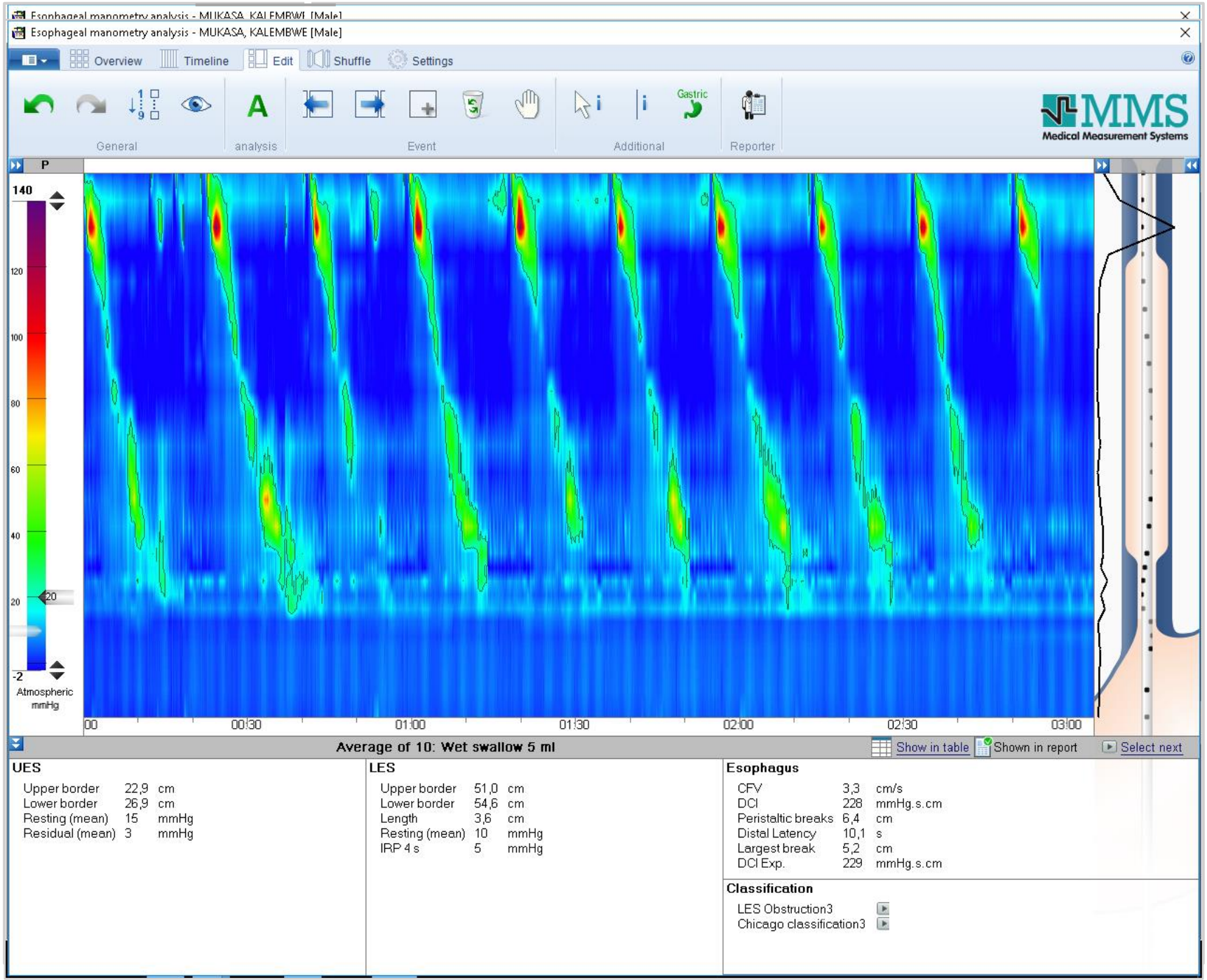
Refer you to LYONS consensus for reflux disease

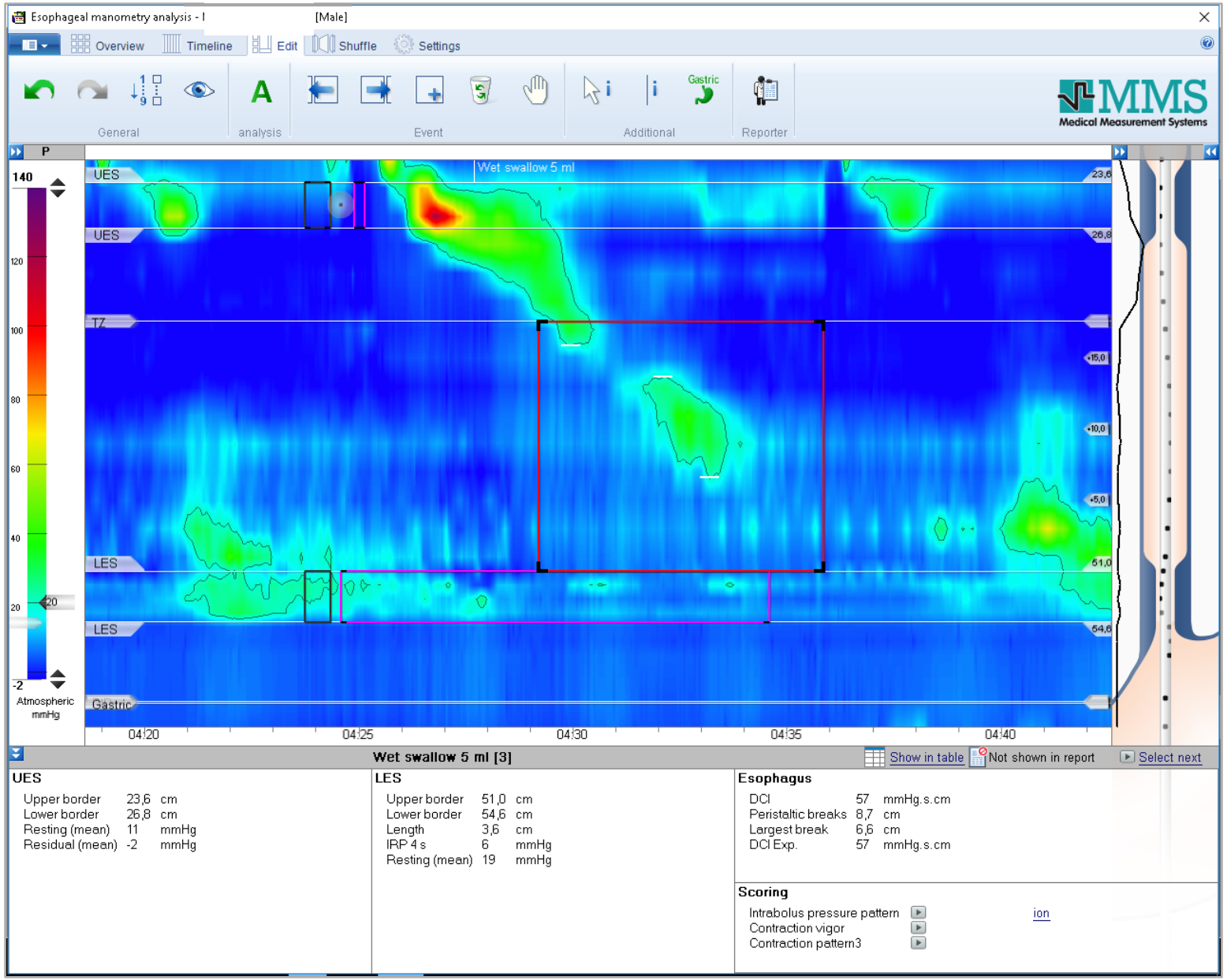
Off as there is no evidence of reflux up to now accept symptoms and the fact that PPI does improve his symptoms

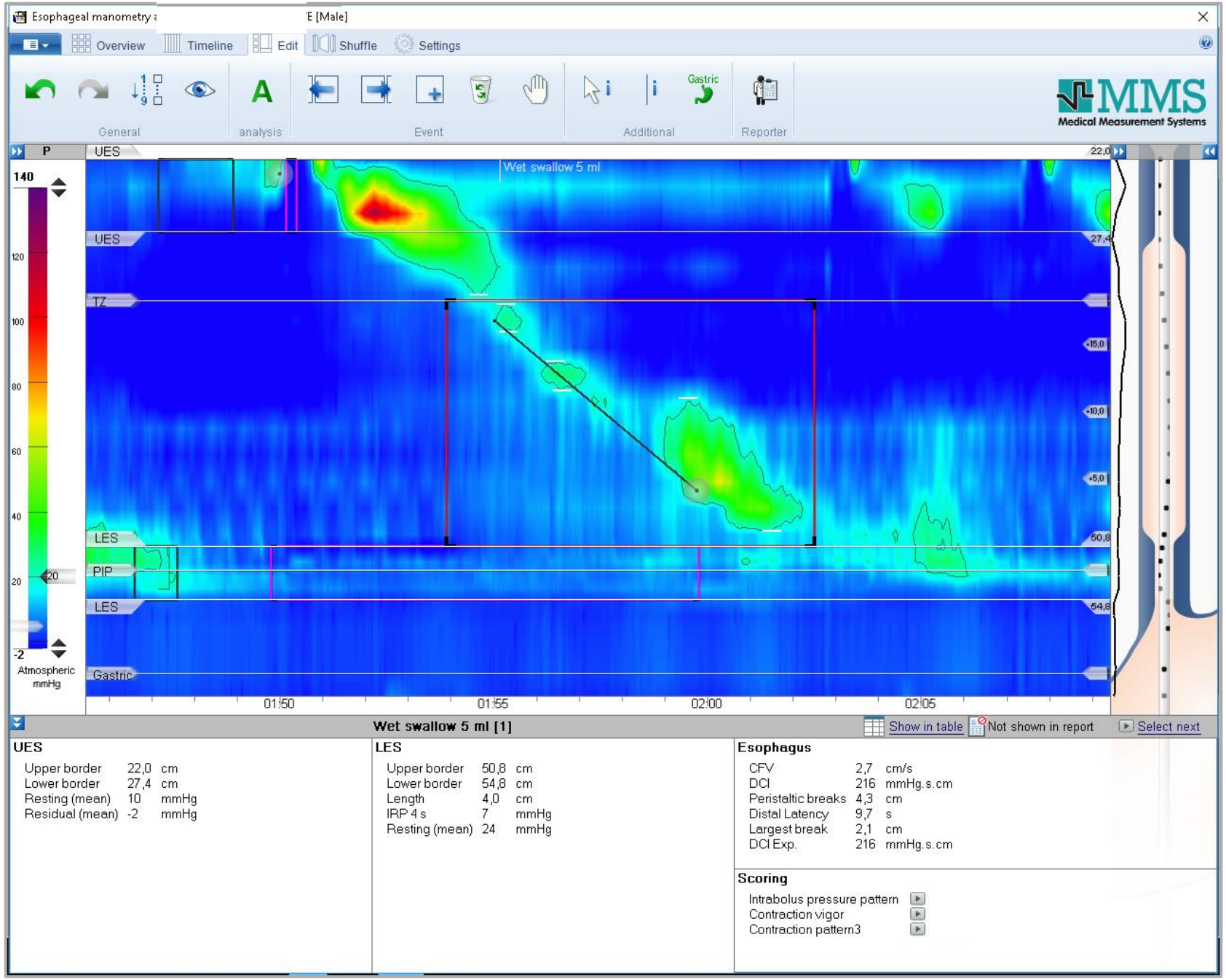
HRM

Avg of 10sw

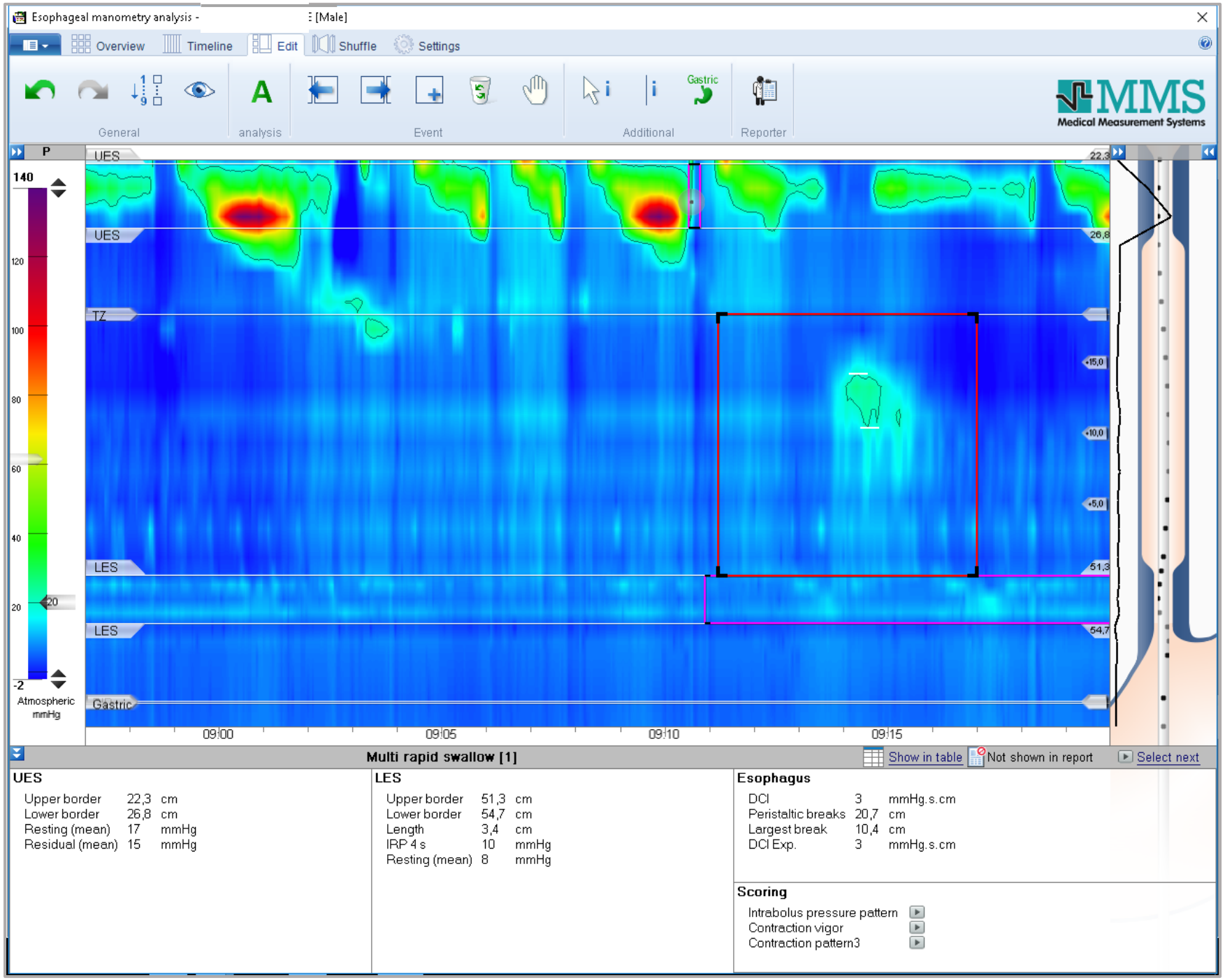
Possible Motility Disorder?




Esophageal manometry analysis - I
[Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
Gastric
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
20
-2
Atmospheric
mmHg
Wet swallow 5 ml
UES
UES
TZ
LES
LES
Gastric
23,6
26,8
+15,0
+10,0
+5,0
51,0
54,6
04:20
04:25
04:30
04:35
04:40
Wet swallow 5 ml [3]
Show in table
Not shown in report
Select next
UES
Upper border 23,6 cm
Lower border 26,8 cm
Resting (mean) 11 mmHg
Residual (mean) -2 mmHg
LES
Upper border 51,0 cm
Lower border 54,6 cm
Length 3,6 cm
IRP 4 s 6 mmHg
Resting (mean) 19 mmHg
Esophagus
DCI 57 mmHg.s.cm
Peristaltic breaks 8,7 cm
Largest break 6,6 cm
DCI Exp. 57 mmHg.s.cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3
ion


Esophageal manometry
'E [Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
MMS
Medical Measurement Systems
P
UES
Wet swallow 5 ml
140
120
100
80
60
40
20
-2
Atmospheric mmHg
UES
TZ
LES
PIP
LES
Gastric
22,0
27,4
+15,0
+10,0
+5,0
50,8
54,8
01:50
01:55
02:00
02:05
Wet swallow 5 ml [1]
Show in table
Not shown in report
Select next
UES
Upper border 22,0 cm
Lower border 27,4 cm
Resting (mean) 10 mmHg
Residual (mean) -2 mmHg
LES
Upper border 50,8 cm
Lower border 54,8 cm
Length 4,0 cm
IRP 4 s 7 mmHg
Resting (mean) 24 mmHg
Esophagus
CFV 2,7 cm/s
DCI 216 mmHg.s.cm
Peristaltic breaks 4,3 cm
Distal Latency 9,7 s
Largest break 2,1 cm
DCI Exp. 216 mmHg.s.cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3

Why MRS?


Esophageal manometry analysis - [Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
20
-2
Atmospheric mmHg
UES
LES
TZ
Gastric
22,3
26,8
51,3
54,7
+15,0
+10,0
+5,0
09:00
09:05
09:10
09:15
Multi rapid swallow [1]
Show in table
Not shown in report
Select next
UES
Upper border 22,3 cm
Lower border 26,8 cm
Resting (mean) 17 mmHg
Residual (mean) 15 mmHg
LES
Upper border 51,3 cm
Lower border 54,7 cm
Length 3,4 cm
IRP 4 s 10 mmHg
Resting (mean) 8 mmHg
Esophagus
DCI 3 mmHg.s.cm
Peristaltic breaks 20,7 cm
Largest break 10,4 cm
DCI Exp. 3 mmHg.s.cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3

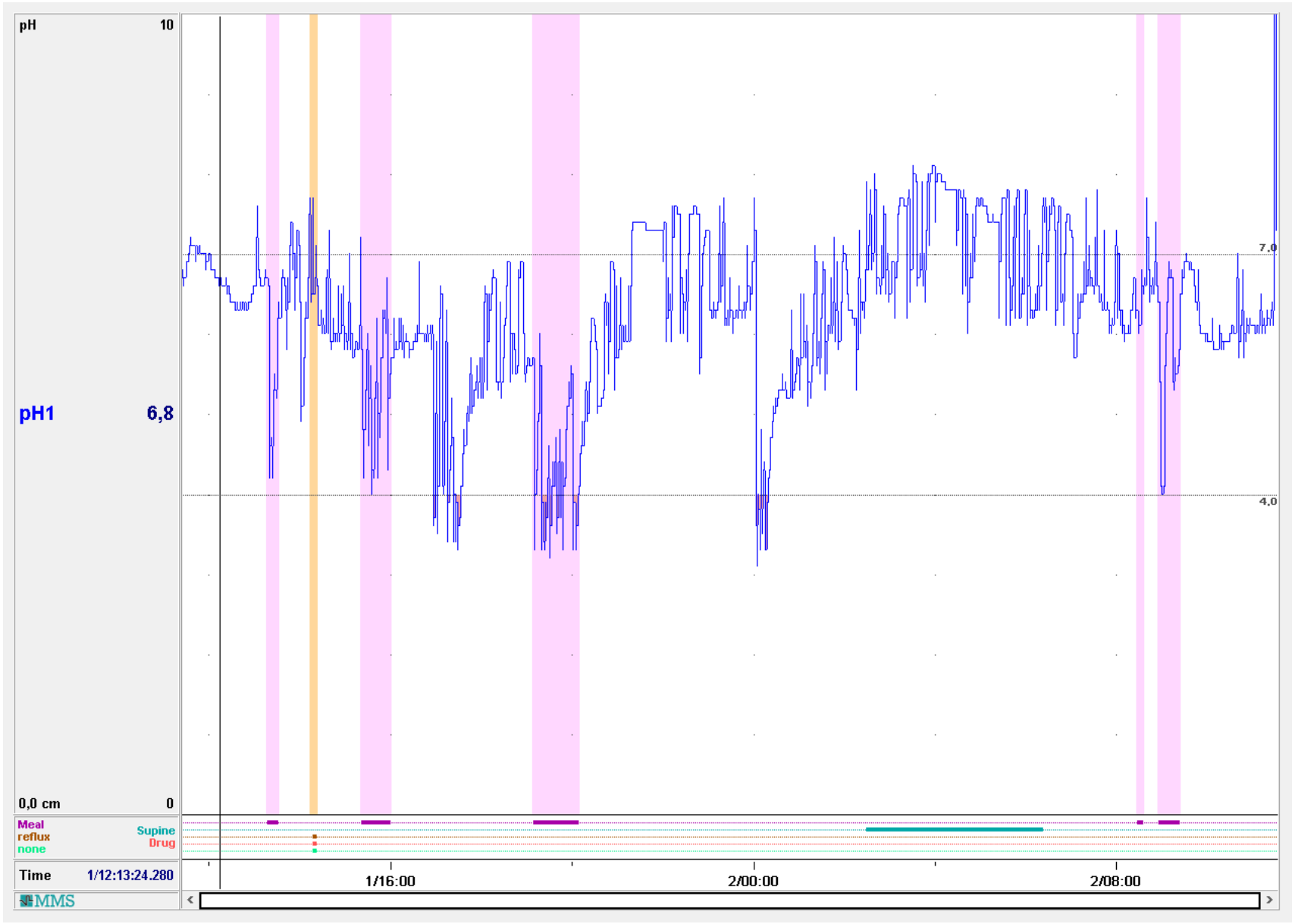
Negative pH only study

Total % pH = .9%

Positive Symptom Correlation to burning sensation (SAP and SI +)

Diagnosis ?

How would you manage such a patient ?



- Sensitive Oesophagus
- Lowest dosage of PPI and since he is more symptomatic at night give the PPI before supper
- Modulator

CASE 5 (J,R.)

- 30 year old male presented with a years history of dysphagia for solids and has to have fluids at hand when eating
- More recently he experiences dysphagia for fluids as well
- Has lost weight
- No heartburn but odynophagia.
- Makes air trapping sounds when eating
- No chest pain

Currently

- Dysphagia with each meal
- Regurgitation with each meal
- No chest pain
- Weight loss of 7,5 kg

What procedure next?

Score	Weight loss (kg)	Dysphagia	Retrosternal pain	Regurgitation
0	None	None	None	None
1	<5	Occasional	Occasional	Occasional
2	5–10	Daily	Daily	Daily
3	>10	Each meal	Each meal	Each meal

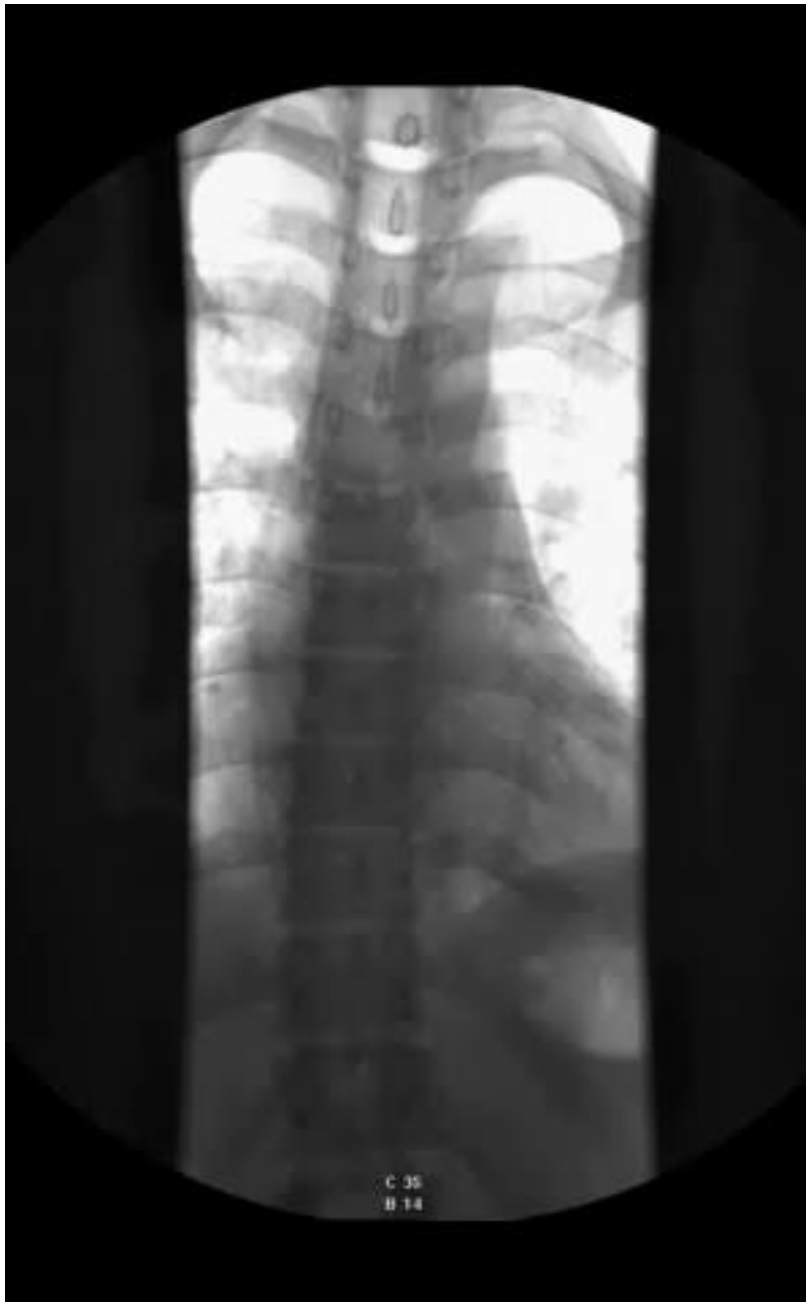
Gastroscopy :

- Tight OGJ and 'pop' when crossed
- Oesophagus appeared dilated with foamy fluid in distal oesophagus

Next procedure?

Ba-Swallow

AND Next?

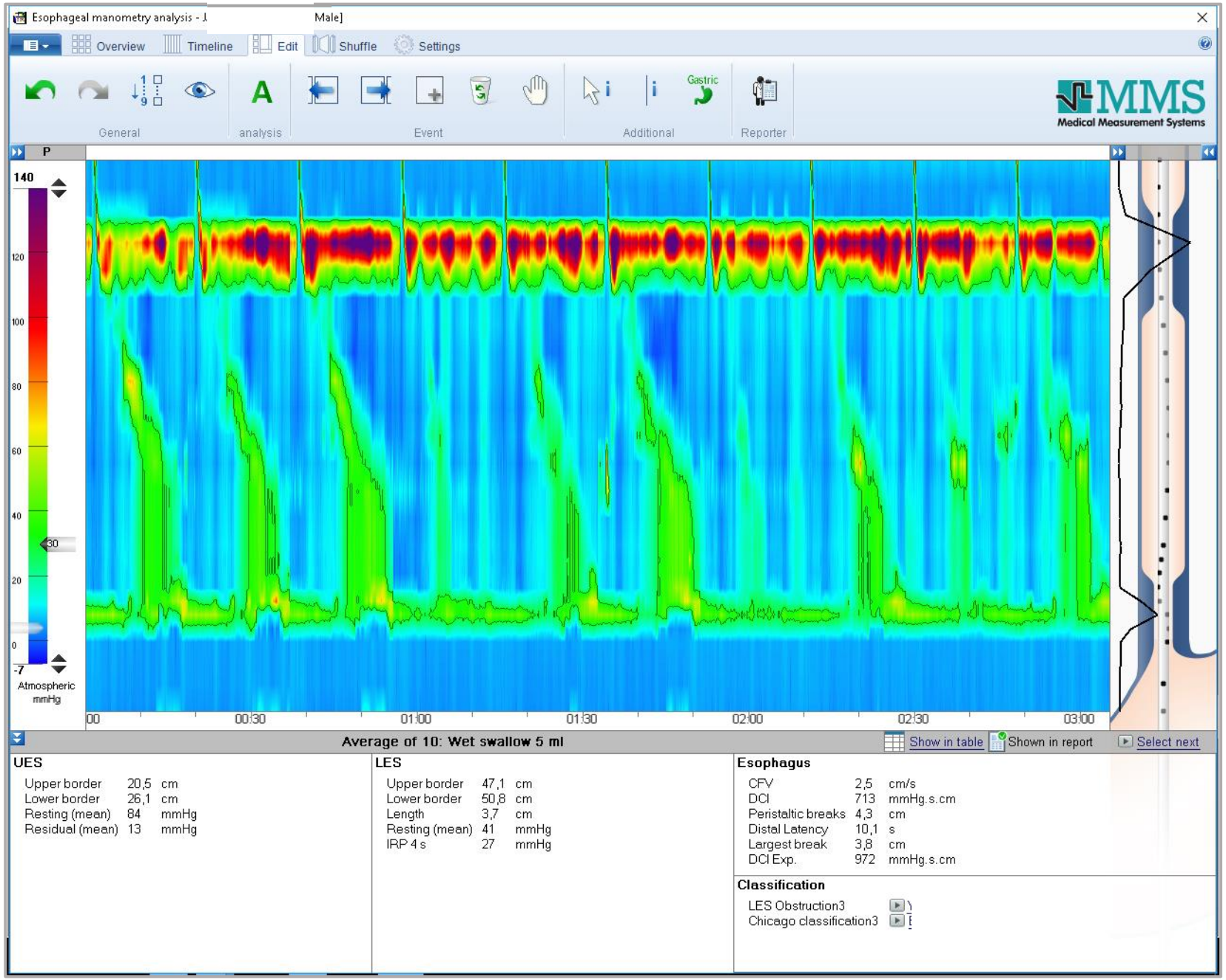


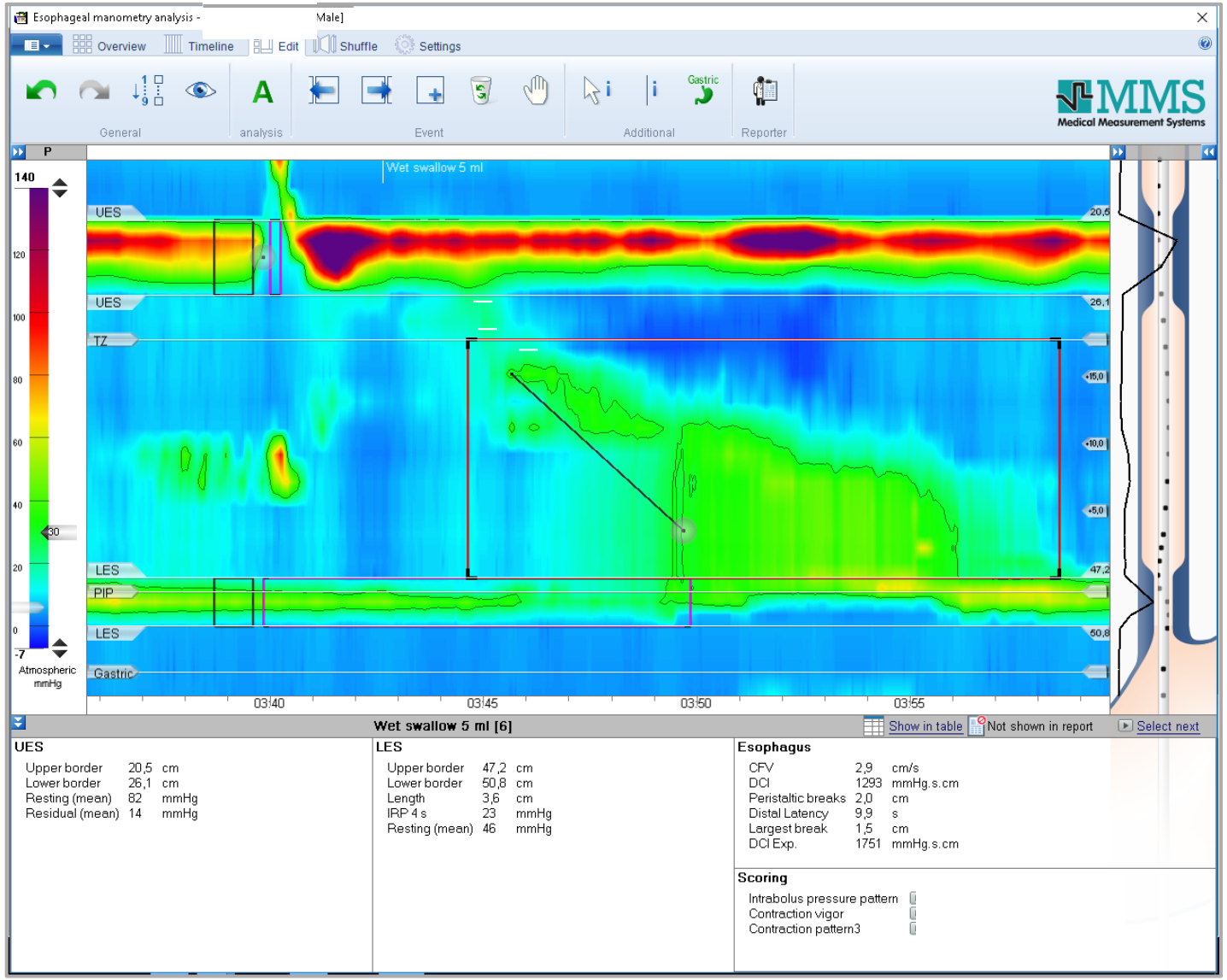
Gastroscopy findings: Saliva sesidue
Slightly dilate dista; oesophagus
Tight OGJ

Failed distal and?
Remnants of proximal contractions noted

OGJOO

Distal pressurization

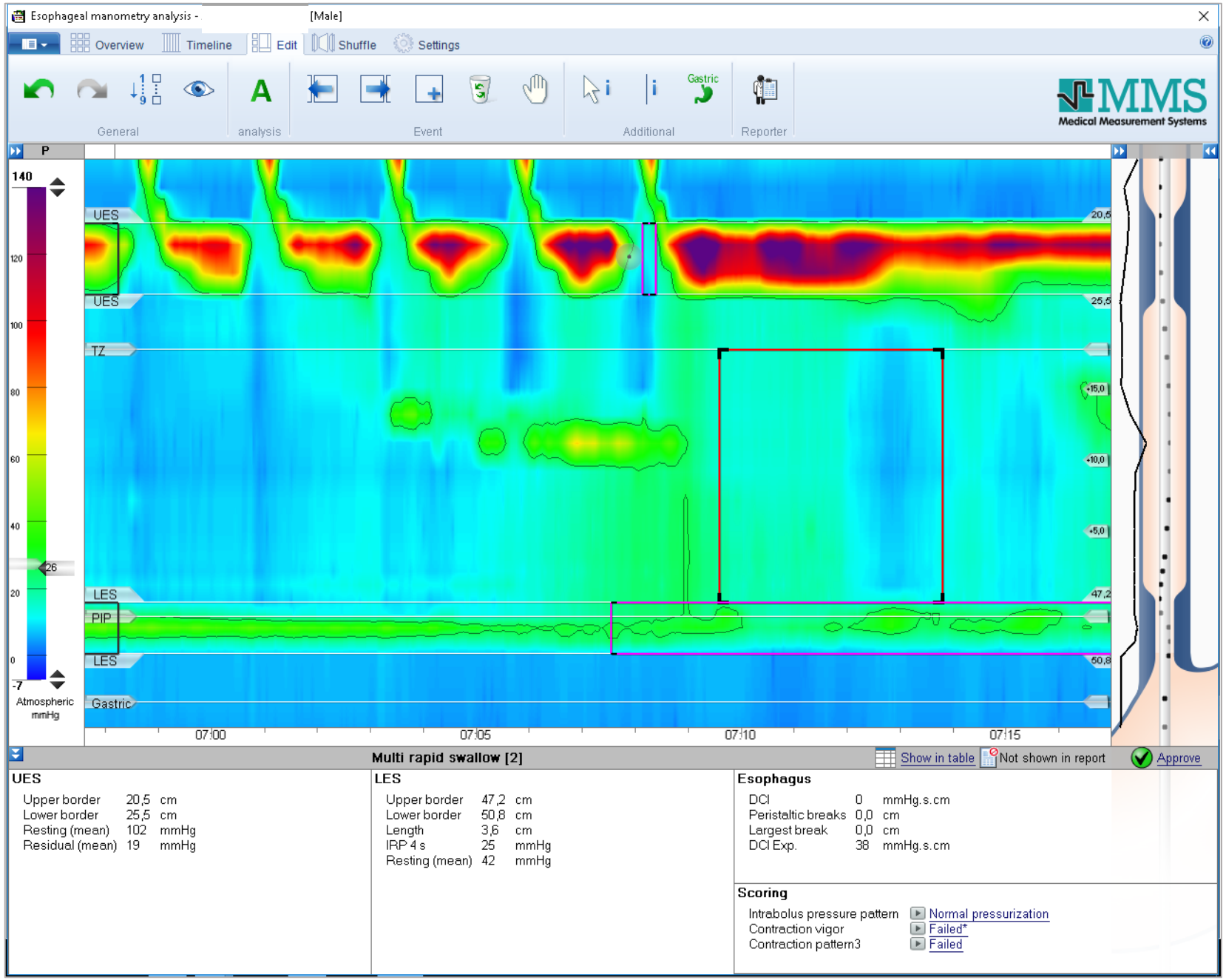



Esophageal manometry analysis -
Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
Gastric
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-7
Atmospheric
mmHg
Wet swallow 5 ml
UES
UES
TZ
LES
PIP
LES
Gastric
20,5
26,1
+15,0
+10,0
+5,0
47,2
50,8
03:40
03:45
03:50
03:55
Wet swallow 5 ml [6]
Show in table
Not shown in report
Select next
UES
Upper border 20,5 cm
Lower border 26,1 cm
Resting (mean) 82 mmHg
Residual (mean) 14 mmHg
LES
Upper border 47,2 cm
Lower border 50,8 cm
Length 3,6 cm
IRP 4 s 23 mmHg
Resting (mean) 46 mmHg
Esophagus
CFV 2,9 cm/s
DCI 1293 mmHg.s.cm
Peristaltic breaks 2,0 cm
Distal Latency 9,9 s
Largest break 1,5 cm
DCI Exp. 1751 mmHg.s.cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3

MRS :

Peristaltic Reserve

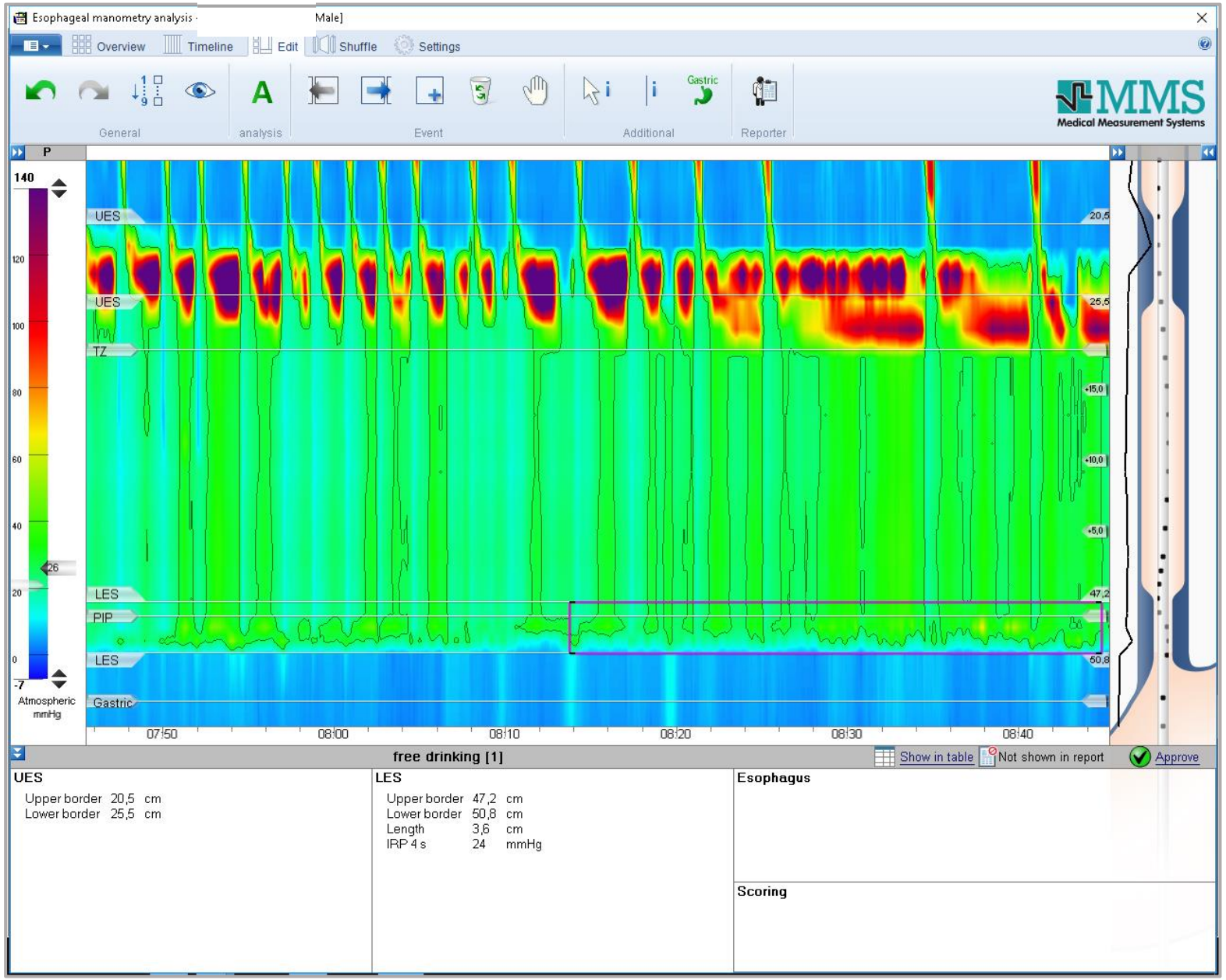
Failed Contraction
Increased IRP



Rapid Drink Challenge

What does the RDC demonstrate?

What are our findings?



RDC：　To exclude or demonstrate OGJOO

Clearance Contraction

Using the CCv3　What would you call this Motility Disorder?

Discussed the case with prof Bredenoord from Amsterdam

Felt that the proximal contractions also did not appear as normal

Provocation test demonstrated Achalasia Type II

History, Barium and gastroscopy does point to achalasia

Felt it was an evolving Achalasia

With his weight loss would offer him a
Hellars or
POEM

CASE 6 (B,G.)

- 55 year old male patient gives a longstanding history of heartburn , regurgitation and volume reflux

- Feels nauseous and when the reflux occurs he experiences chest pain that feels like a heart attack

- Epigastric burning

Gastroscopy findings was Barrett's and a hiatus hernia

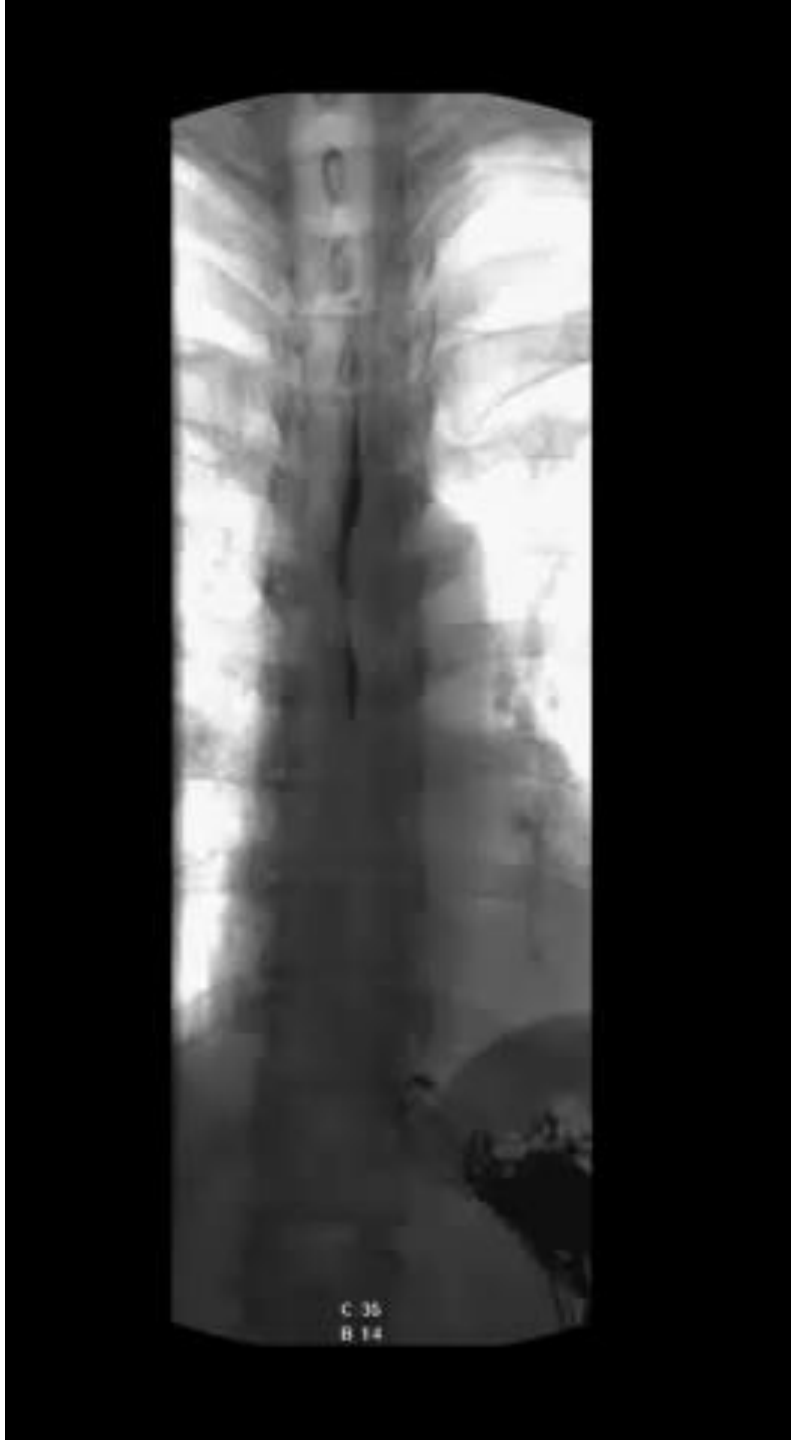
BID PPI does give relief but he still experiences break through symptoms

The patient requested surgery

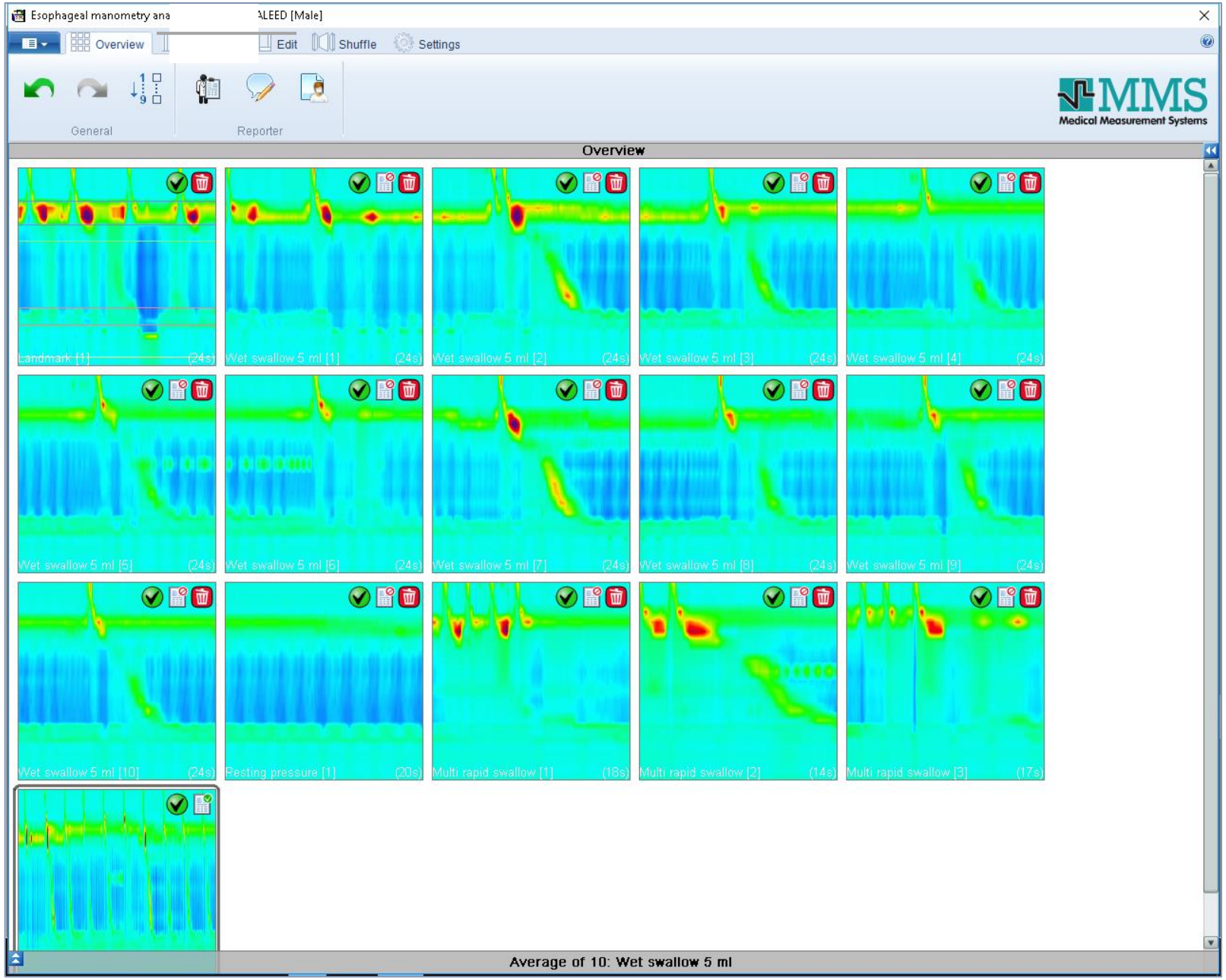
What procedures would you request?

- Ba-swallow
- HRM

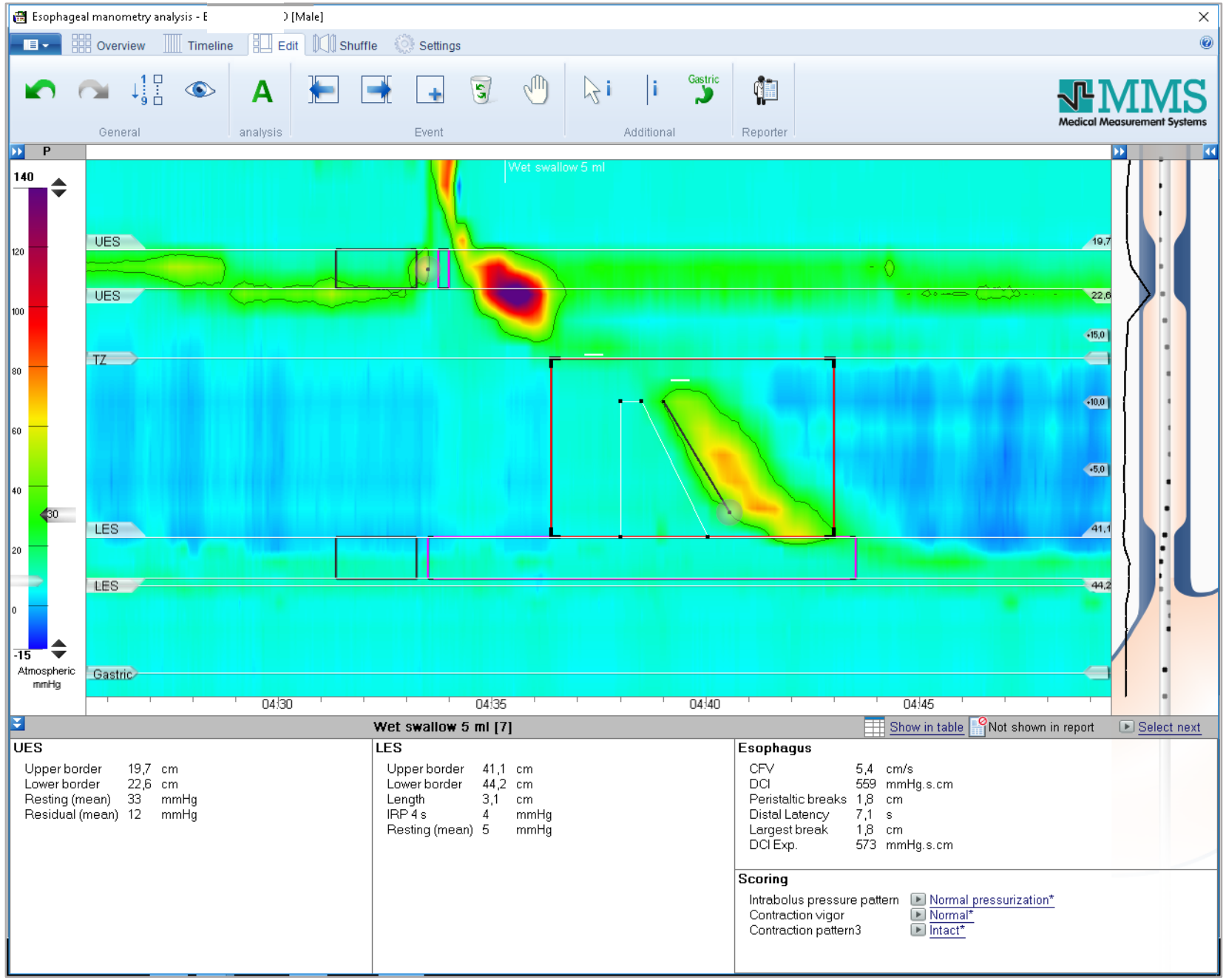
BA-Swallow



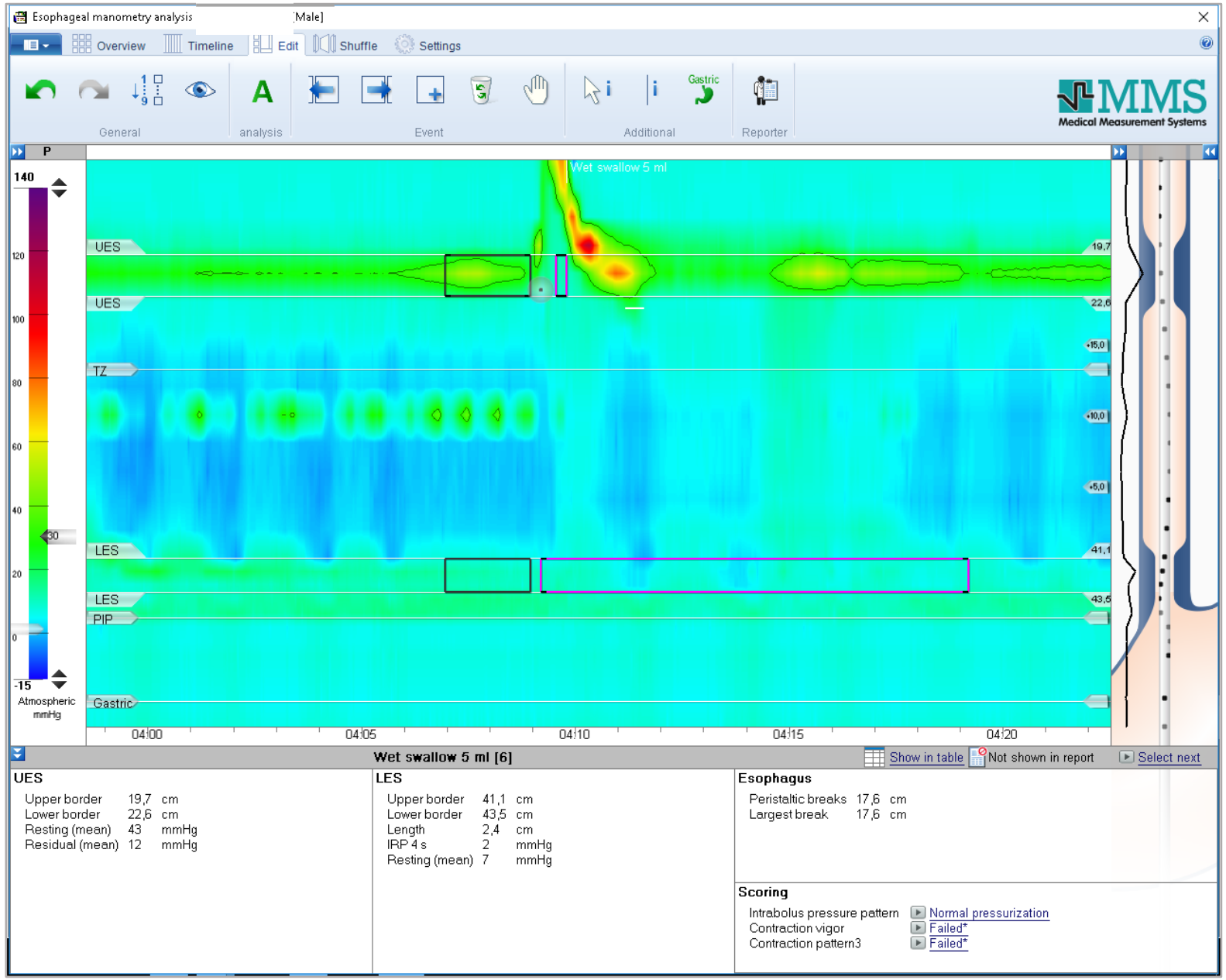
HRM


Esophageal manometry ana
ALEED [Male]
Overview
Edit
Shuffle
Settings
General
Reporter
MMS
Medical Measurement Systems
Overview
Landmark [1] (24s)
Wet swallow 5 ml [1] (24s)
Wet swallow 5 ml [2] (24s)
Wet swallow 5 ml [3] (24s)
Wet swallow 5 ml [4] (24s)
Wet swallow 5 ml [5] (24s)
Wet swallow 5 ml [6] (24s)
Wet swallow 5 ml [7] (24s)
Wet swallow 5 ml [8] (24s)
Wet swallow 5 ml [9] (24s)
Wet swallow 5 ml [10] (24s)
Resting pressure [1] (20s)
Multi rapid swallow [1] (18s)
Multi rapid swallow [2] (14s)
Multi rapid swallow [3] (17s)
Average of 10: Wet swallow 5 ml

3 Normal contractions



6 Failed contractions

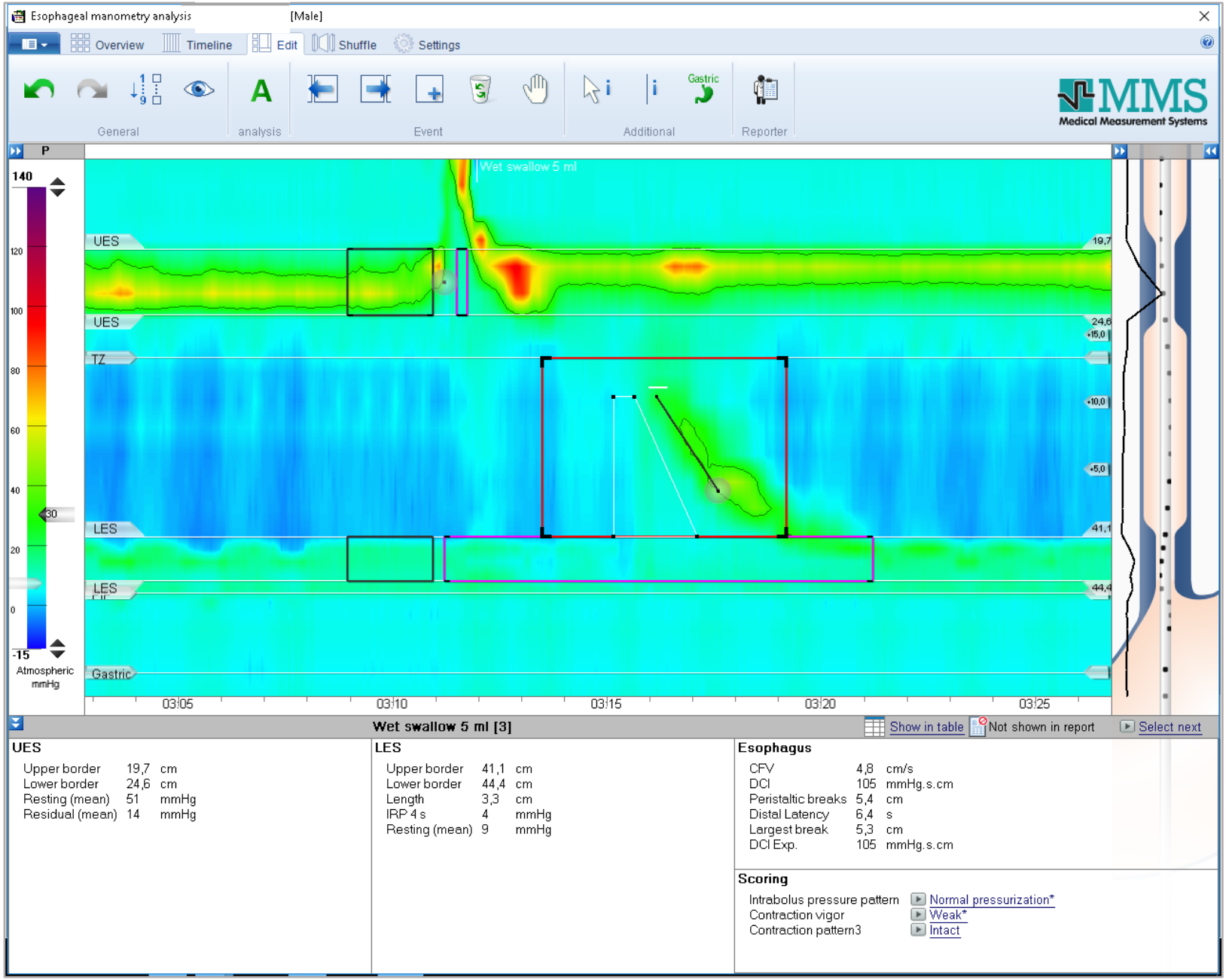


3 Weak Contractions

Using the CCv4

What Motility Disorder?

And why?

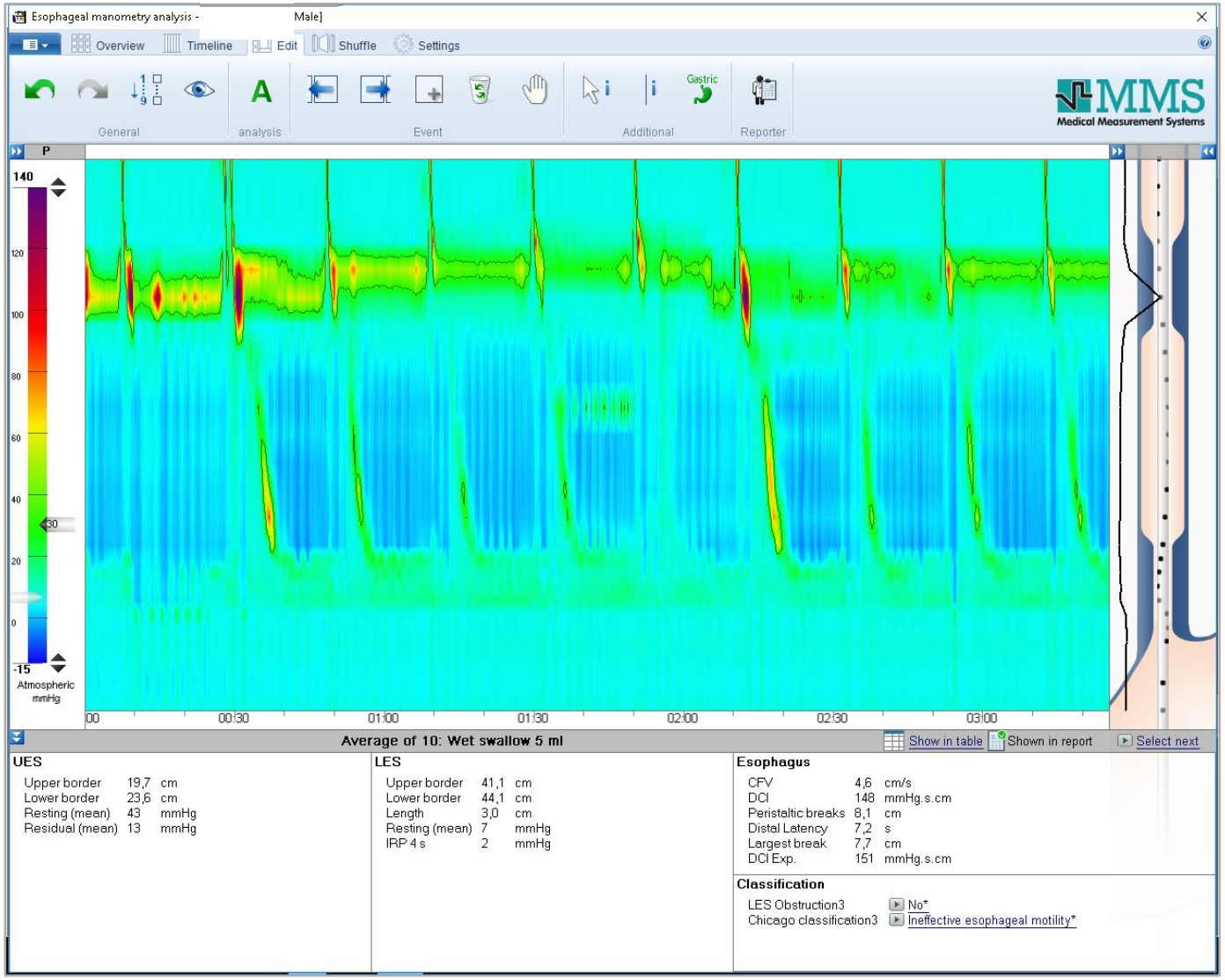


DISORDER OF PERISTALSIS

- IEM 6 Failed Contractions (> 50%)

What findings of HRM is associated with reflux disease?

- IEM
- Hypotensive LOSP
- HH



CASE 7 (P,Z.)

- 69 year old gentleman gives a 10 year history of intermittent dysphagia for especially solids
- He can drink fluids
- Meat tends to get stuck more
- Chest pain occasionally
- Did have heartburn previously but this has resolved
- Has to eat very slowly and tends to burp and make crackling noises(air trapping sounds) when eating
- No weight loss

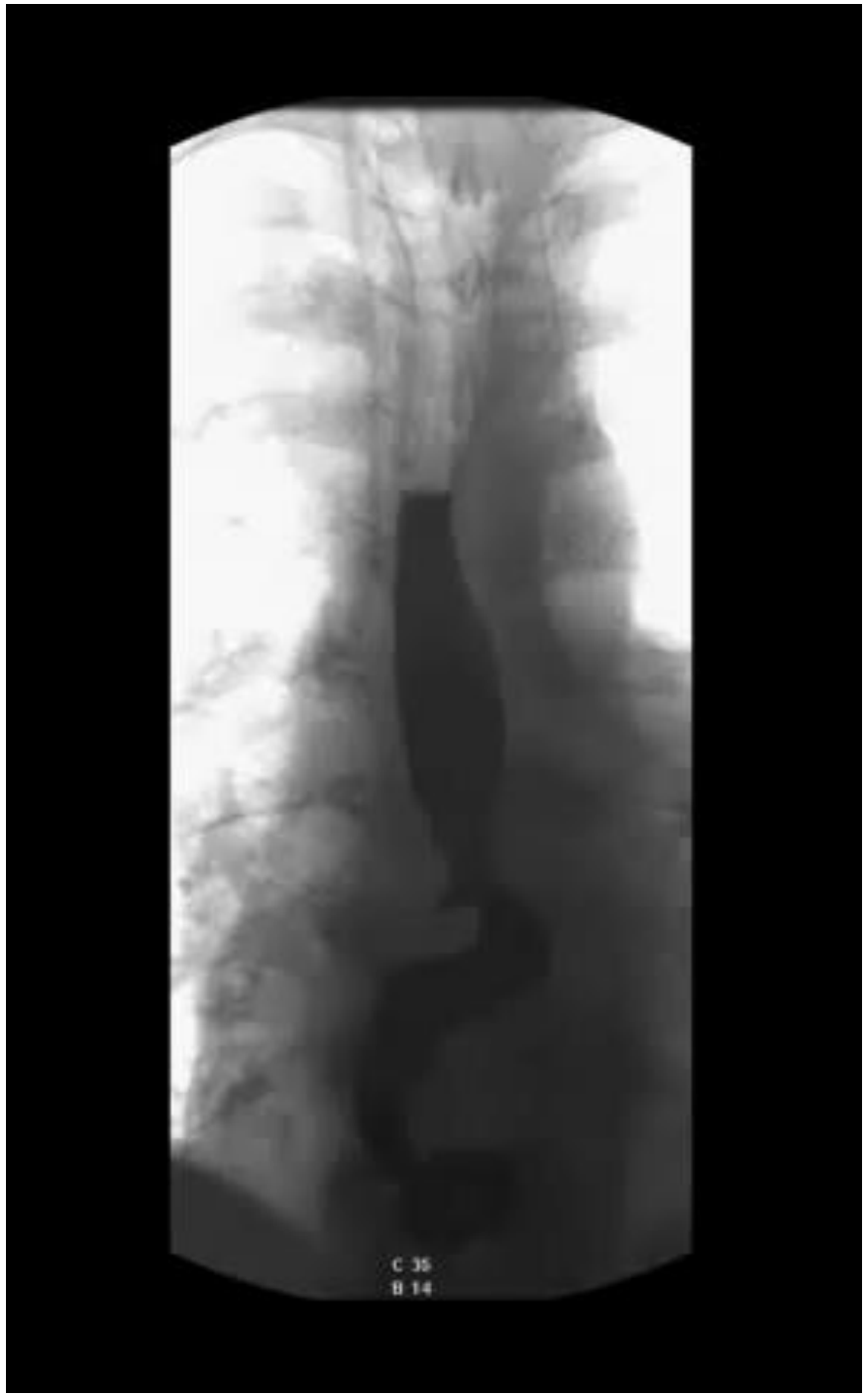
What procedure would you request ?

Gastroscopy: demonstrated a proximal contraction, dilated oesophagus with fluid and a tight OGJ

The OGJ 'popped' on crossing the OGJ

Would you ask for a **Ba-swallow** at this stage ?

Ba-Swallow

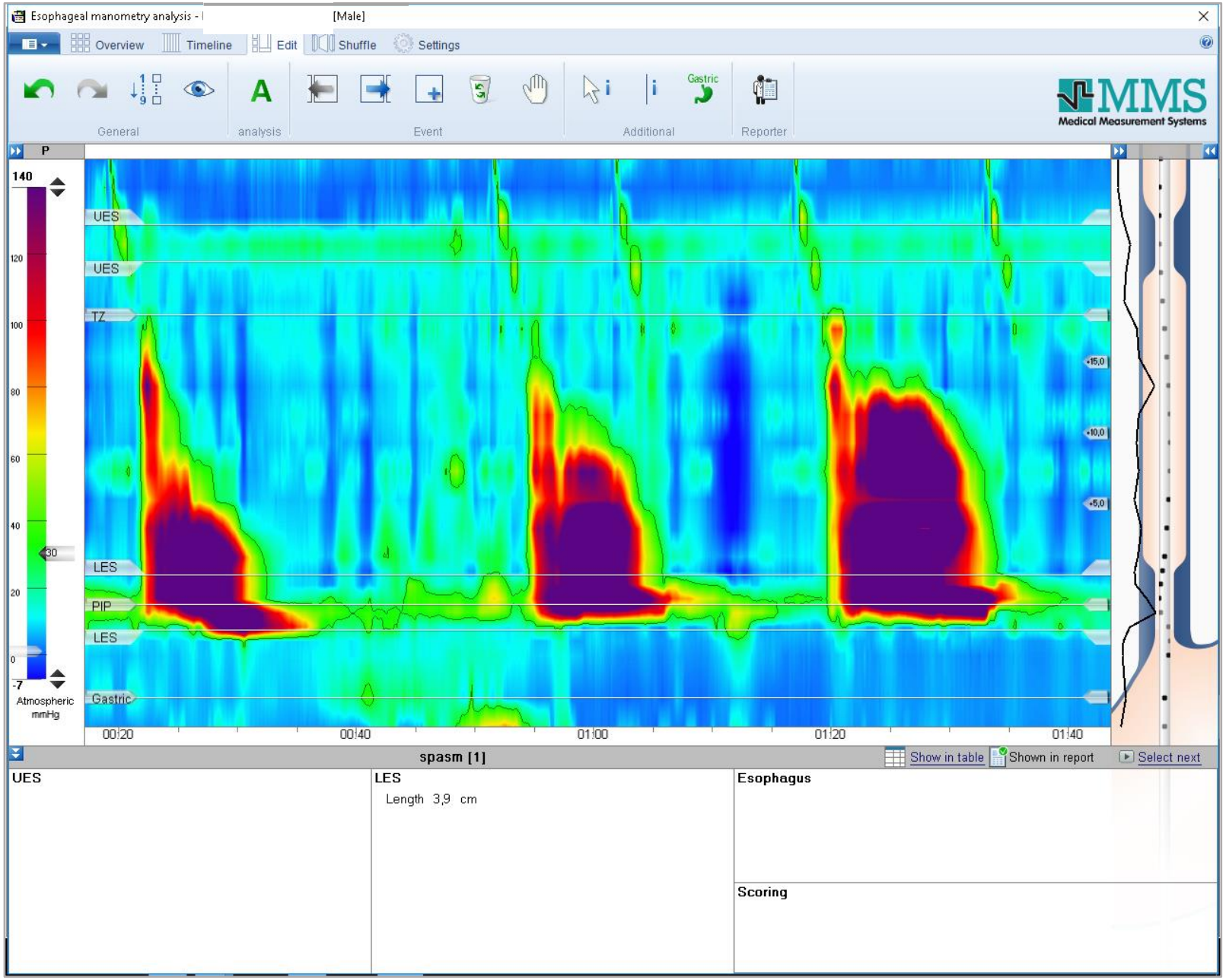


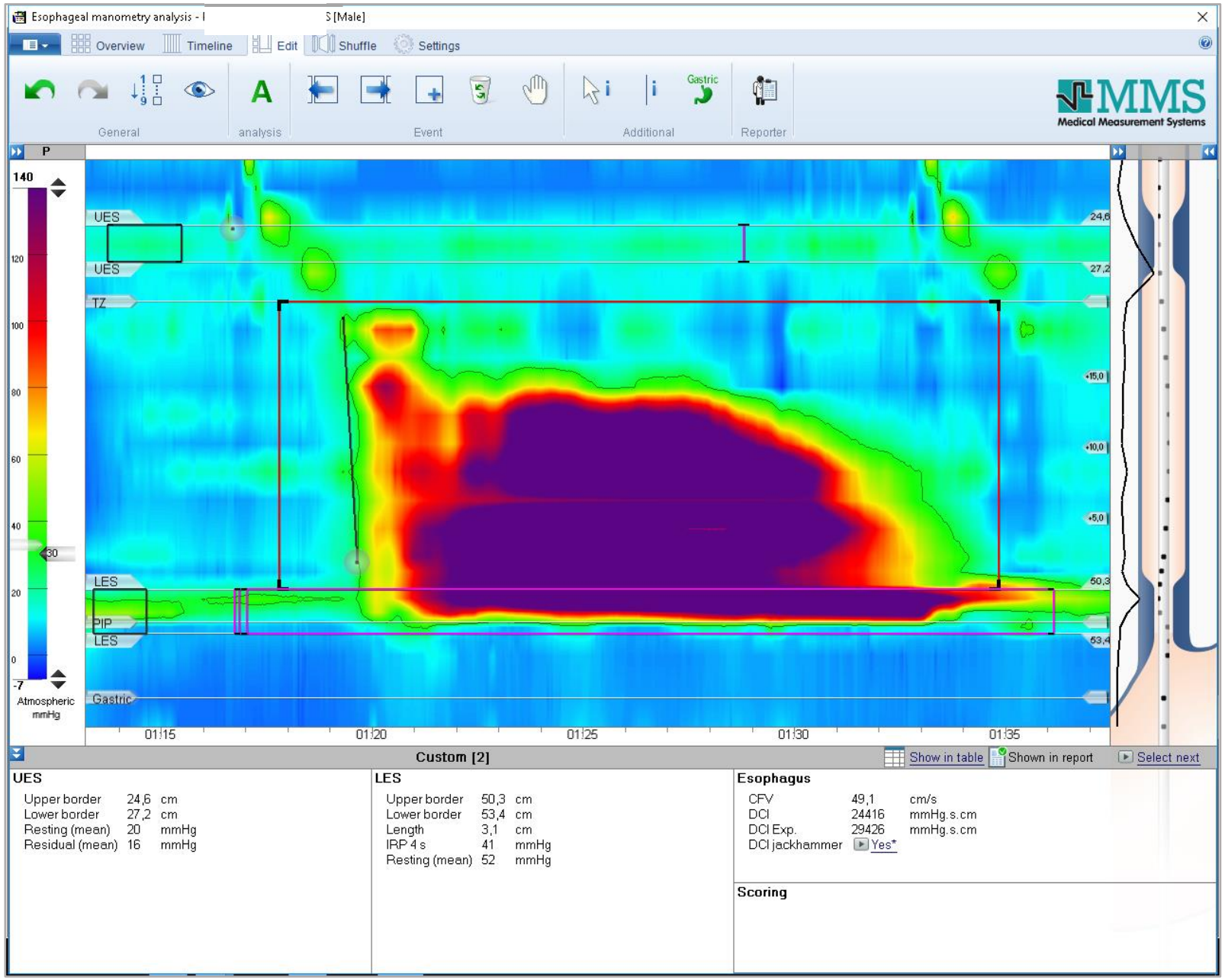
What procedure would

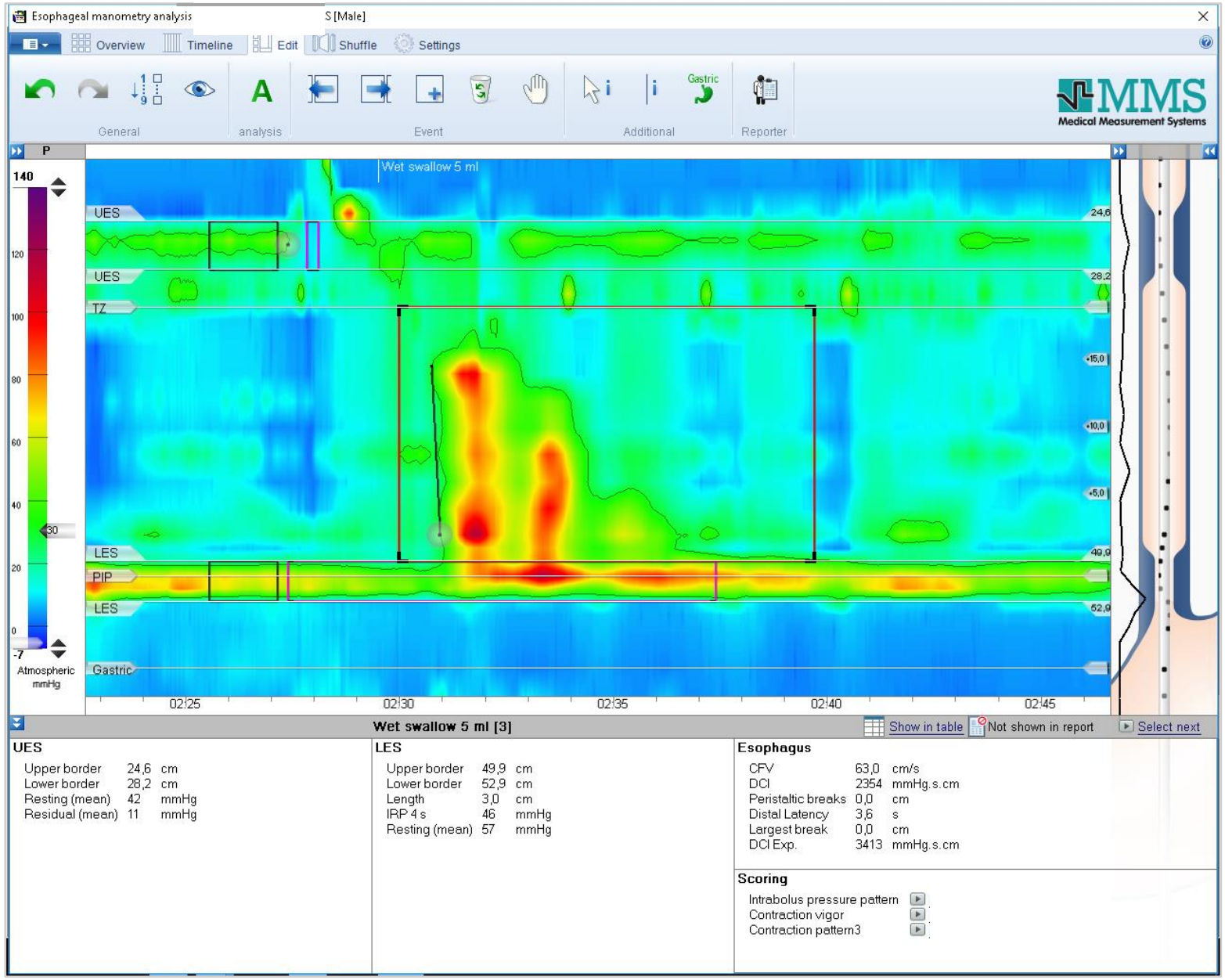
you request next and why?

HRM

? What Motility Disorder would you think of ?




Esophageal manometry analysis - I S [Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
Gastric
MMS
Medical Measurement Systems
P
140
120
100
80
60
40
30
20
0
-7
Atmospheric mmHg
UES
UES
TZ
LES
PIP
LES
Gastric
24,6
27,2
+15,0
+10,0
+5,0
50,3
53,4
01:15
01:20
01:25
01:30
01:35
Custom [2]
Show in table
Shown in report
Select next
UES
Upper border 24,6 cm
Lower border 27,2 cm
Resting (mean) 20 mmHg
Residual (mean) 16 mmHg
LES
Upper border 50,3 cm
Lower border 53,4 cm
Length 3,1 cm
IRP 4 s 41 mmHg
Resting (mean) 52 mmHg
Esophagus
CFV 49,1 cm/s
DCI 24416 mmHg.s.cm
DCI Exp. 29426 mmHg.s.cm
DCI jackhammer Yes*
Scoring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S [Male]
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analysis
Event
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Reporter
Gastric
MMS
Medical Measurement Systems
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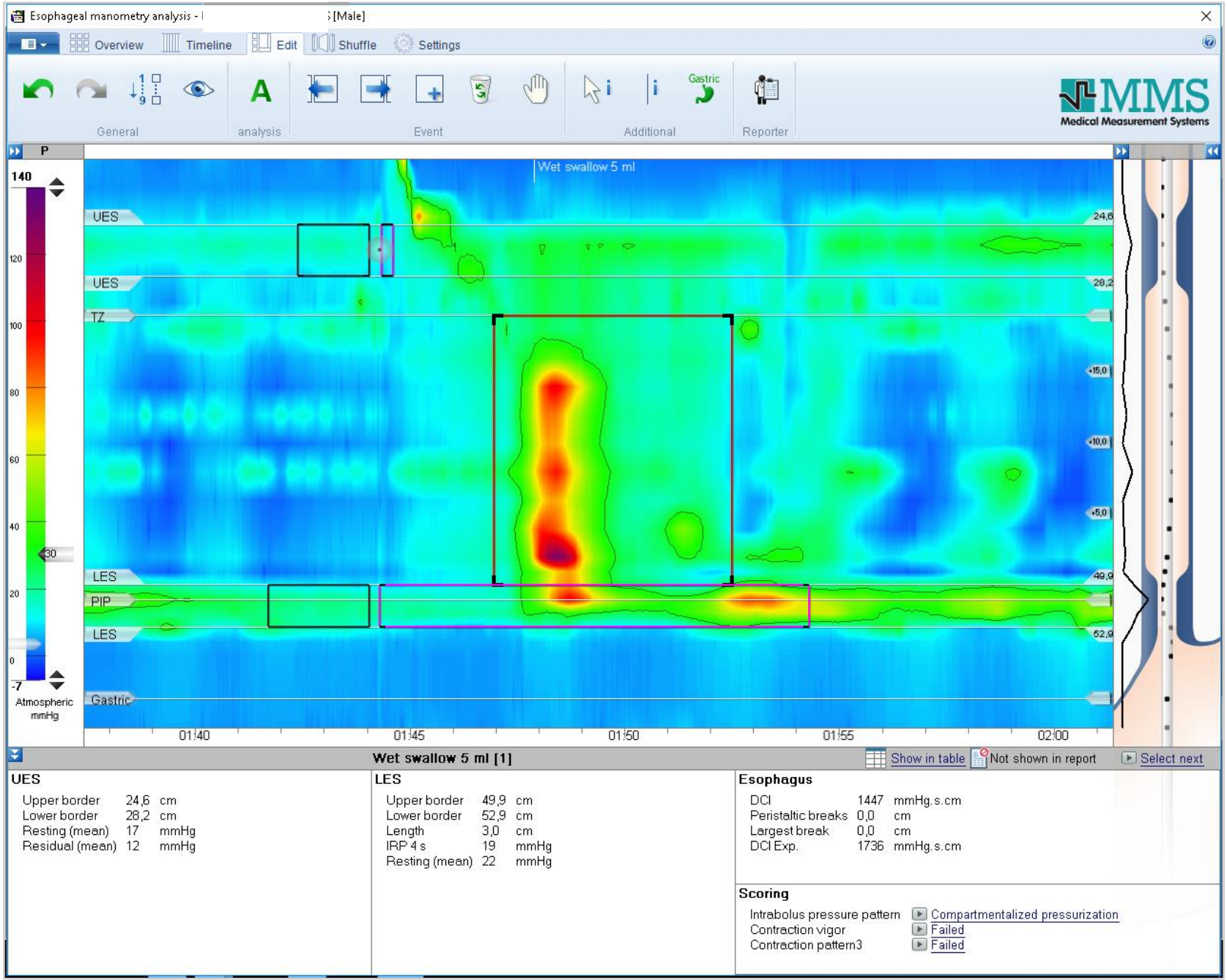
20
0
-7
Atmospheric
mmHg
Wet swallow 5 ml
UES
UES
TZ
LES
PIP
LES
Gastric
24,6
28,2
+15,0
+10,0
+5,0
49,9
52,9
02:25
02:30
02:35
02:40
02:45
Wet swallow 5 ml [3]
Show in table
Not shown in report
Select next
UES
Upper border 24,6 cm
Lower border 28,2 cm
Resting (mean) 42 mmHg
Residual (mean) 11 mmHg
LES
Upper border 49,9 cm
Lower border 52,9 cm
Length 3,0 cm
IRP 4 s 46 mmHg
Resting (mean) 57 mmHg
Esophagus
CFV 63,0 cm/s
DCI 2354 mmHg.s.cm
Peristaltic breaks 0,0 cm
Distal Latency 3,6 s
Largest break 0,0 cm
DCI Exp. 3413 mmHg.s.cm
Scoring
Intrabolus pressure pattern
Contraction vigor
Contraction pattern3


Esophageal manometry analysis - [Male]
Overview
Timeline
Edit
Shuffle
Settings
General
analysis
Event
Additional
Reporter
Gastric
MMS
Medical Measurement Systems
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20
0
-7
Atmospheric mmHg
Wet swallow 5 ml
UES
UES
TZ
LES
PIP
LES
Gastric
24,6
28,2
+15,0
+10,0
+5,0
49,9
52,9
01:40
01:45
01:50
01:55
02:00
Wet swallow 5 ml [1]
Show in table
Not shown in report
Select next
UES
Upper border 24,6 cm
Lower border 28,2 cm
Resting (mean) 17 mmHg
Residual (mean) 12 mmHg
LES
Upper border 49,9 cm
Lower border 52,9 cm
Length 3,0 cm
IRP 4 s 19 mmHg
Resting (mean) 22 mmHg
Esophagus
DCI 1447 mmHg.s.cm
Peristaltic breaks 0,0 cm
Largest break 0,0 cm
DCI Exp. 1736 mmHg.s.cm
Scoring
Intrabolus pressure pattern Compartmentalized pressurization
Contraction vigor Failed
Contraction pattern3 Failed

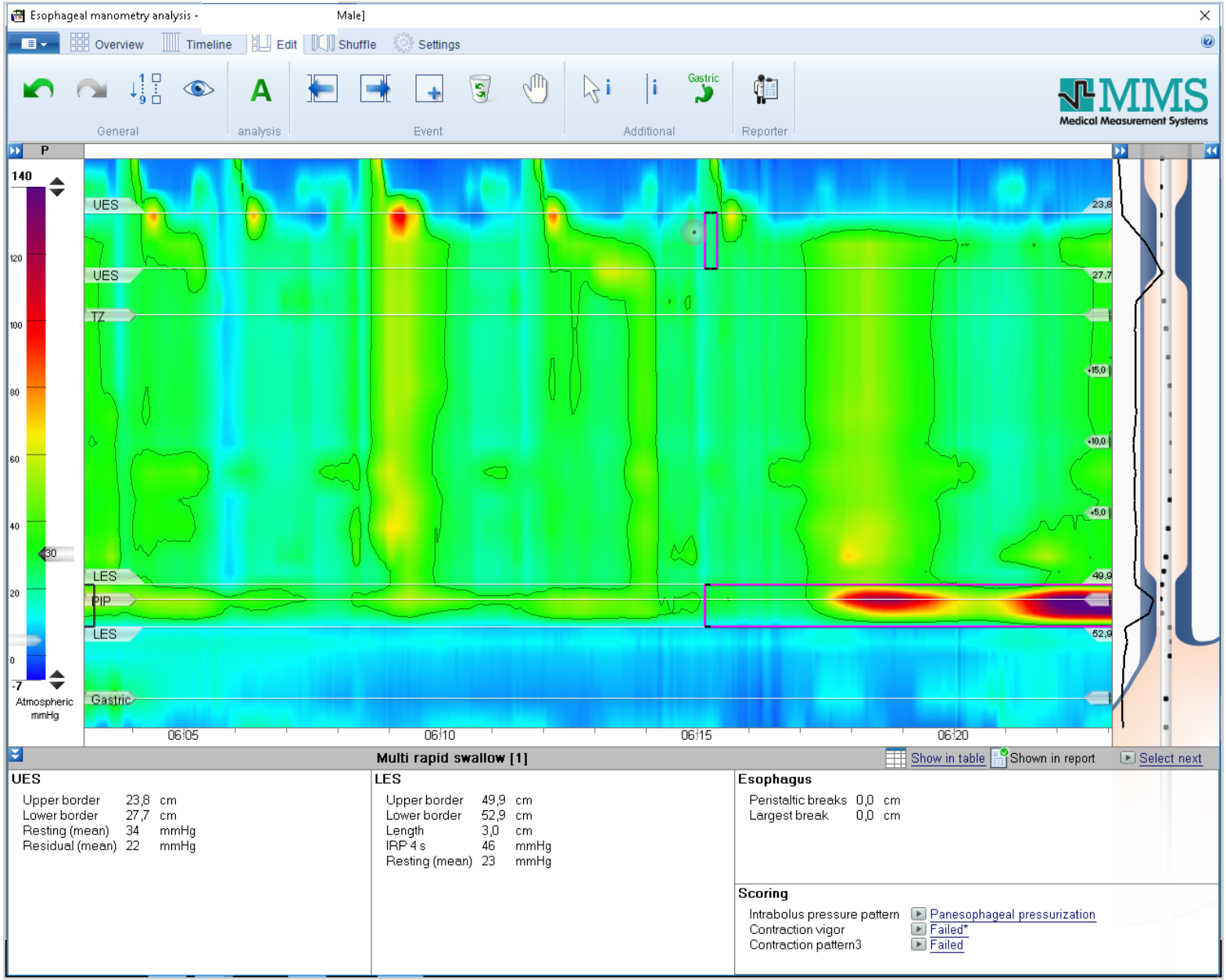
HRM: 4 premature contractions and the rest of the swallows did not appear normal

Pan-oesophageal pressurization and
Compartmentalized pressurization noted

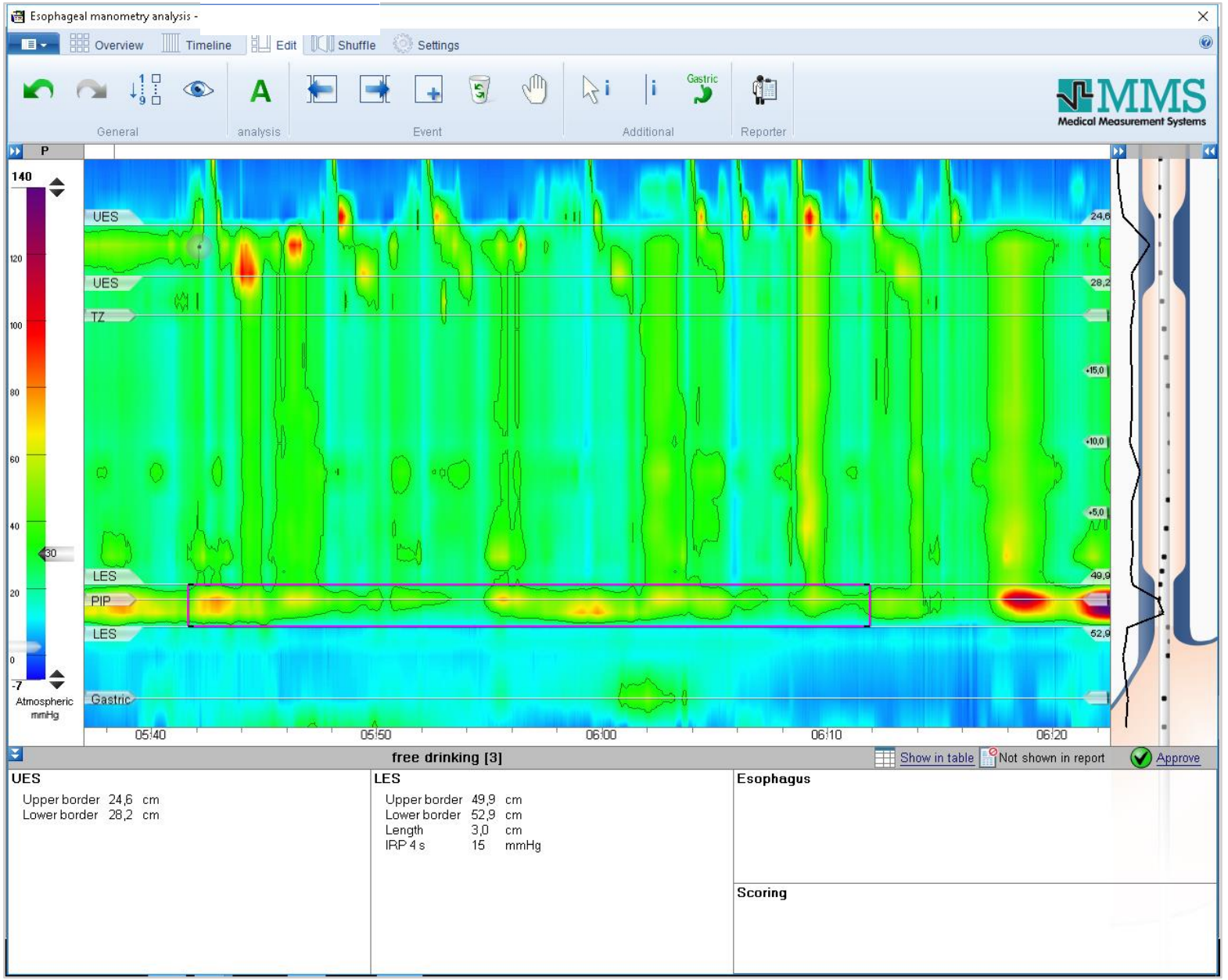
IRP 35mmHg

MRS

- Failed contractions
- IRP increased
- Pan-oesophageal pressurization



RDC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mmHg
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Gastric
24,6
28,2
+15,0
+10,0
+5,0
49,9
52,9
05:40
05:50
06:00
06:10
06:20
free drinking [3]
Show in table
Not shown in report
Approve
UES
Upper border 24,6 cm
Lower border 28,2 cm
LES
Upper border 49,9 cm
Lower border 52,9 cm
Length 3,0 cm
IRP 4 s 15 mmHg
Esophagus
Scoring

Using CCv3 Prof Bredenoord felt this was a Type III Achalasia

CCv4 would classify it as OGJOO with spastic contractions

Timed Barium swallow and Endoflip could be of use .

What treatment is advised for Type III achalasia and why?

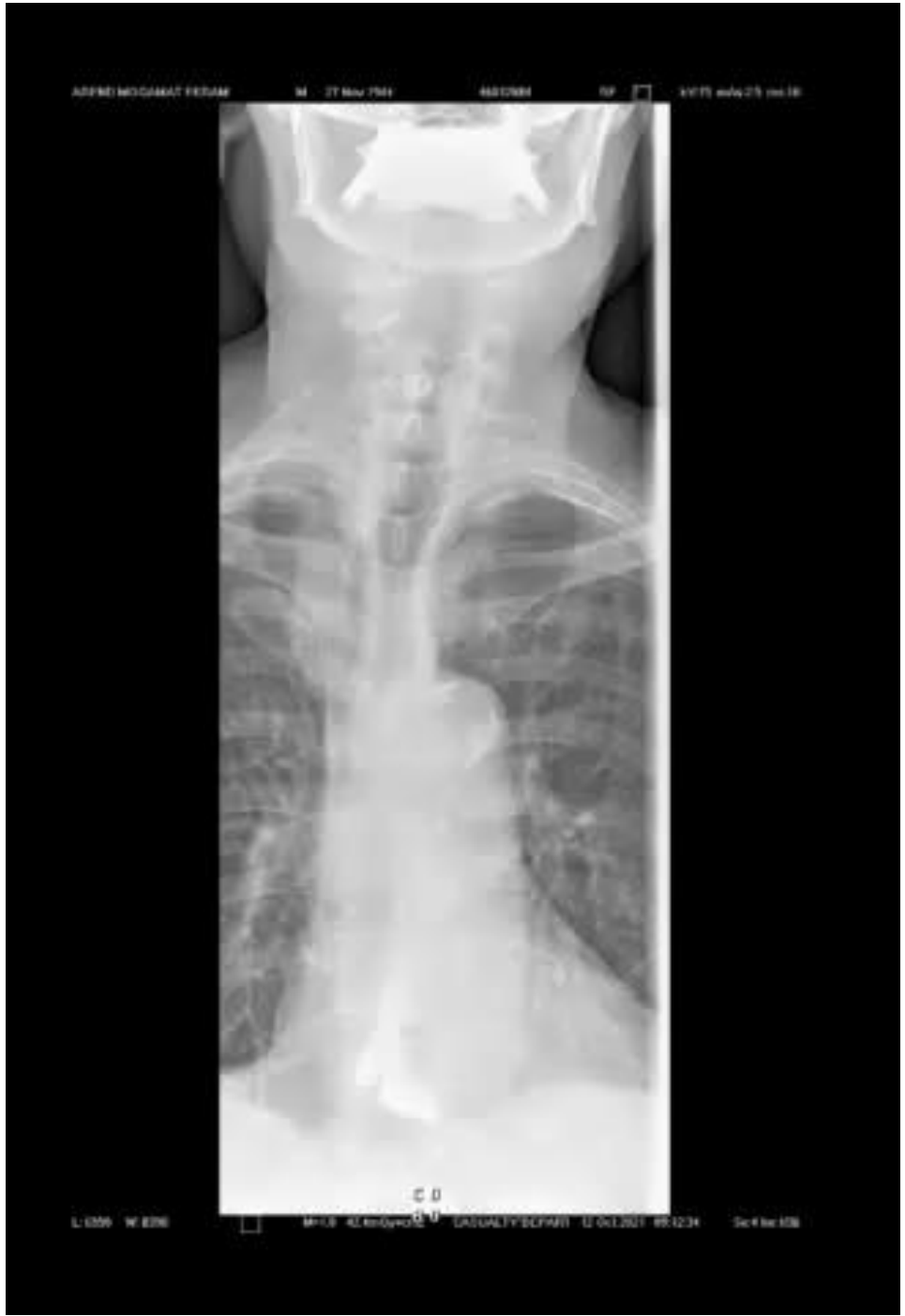
CASE 8 (A,M.)

- 77 year old gentleman with a longstanding history of dysphagia for solids and fluids. This occurs during most meals. At times he experiences projectile vomiting.
- Experiences regurgitation with meals.
- No chest pain
- No weight loss
- Experience heartburn but this responds well to PPI treatment.
- Diagnosed with schizophrenia but responds well to medication

Gastroscopy findings: Dilated and tortuous and tight OGJ with 'pop’

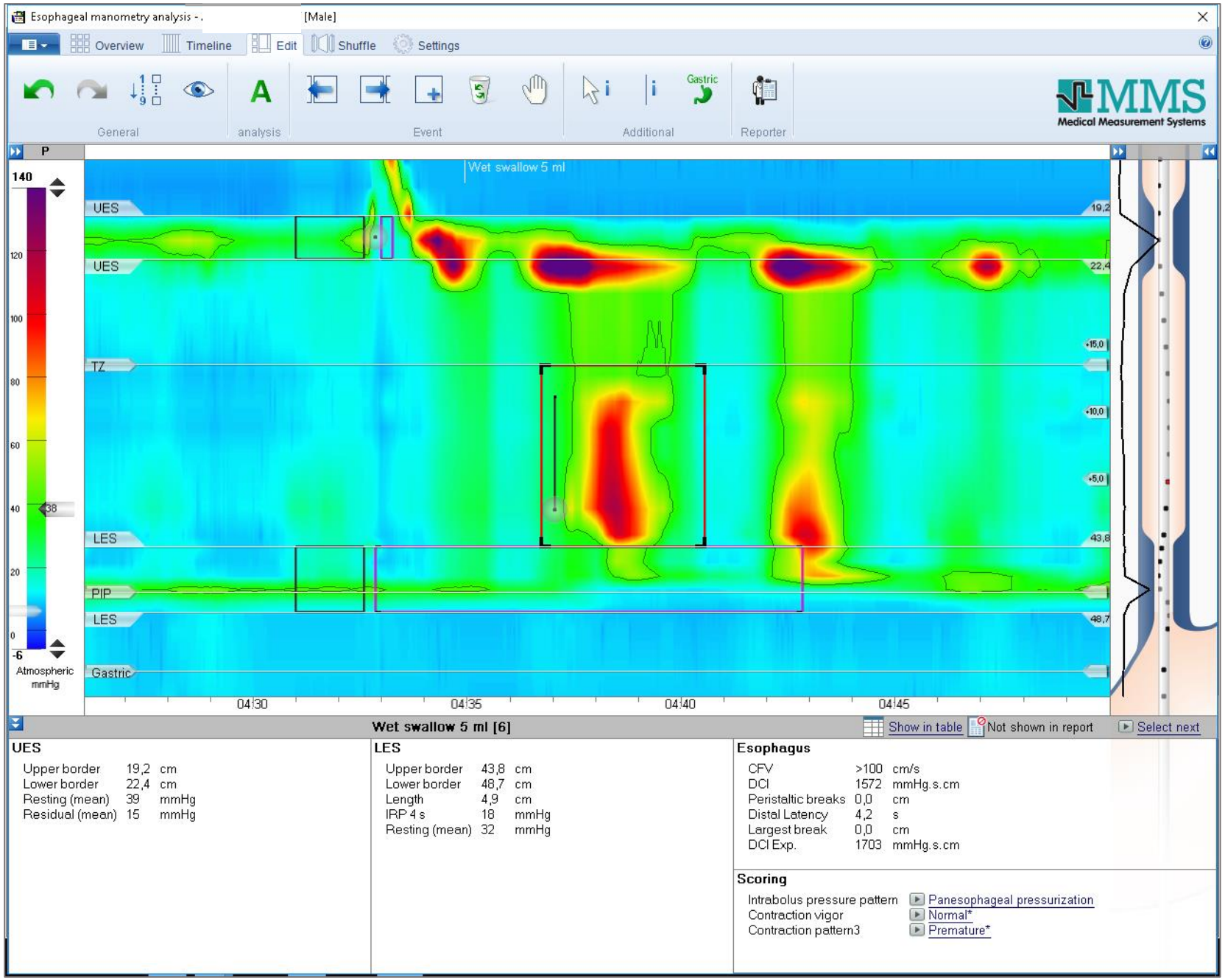
Ba-swallow: Tertiary contractions

BA-Swallow



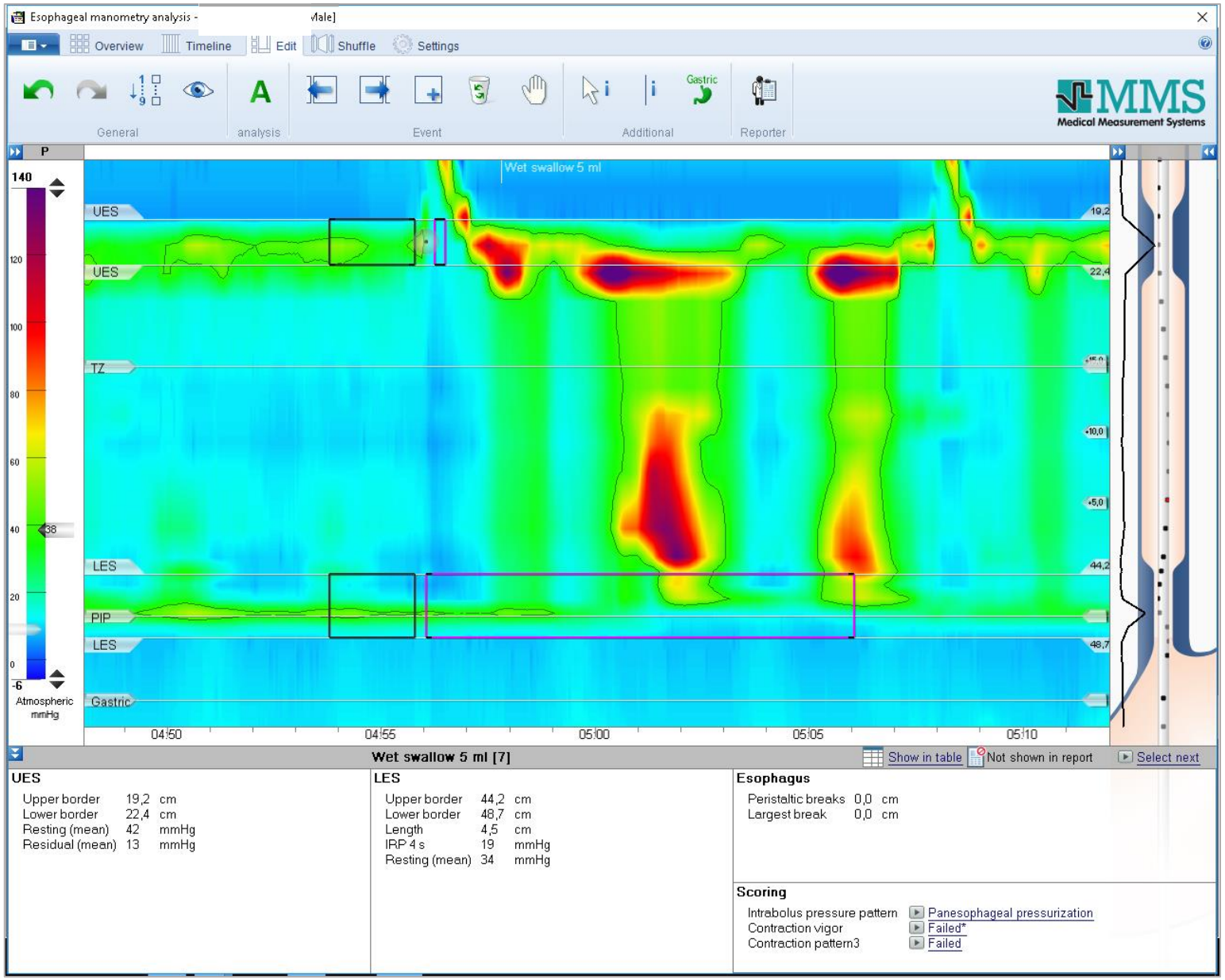
PREMATURE CONTRACTION

IRP =N



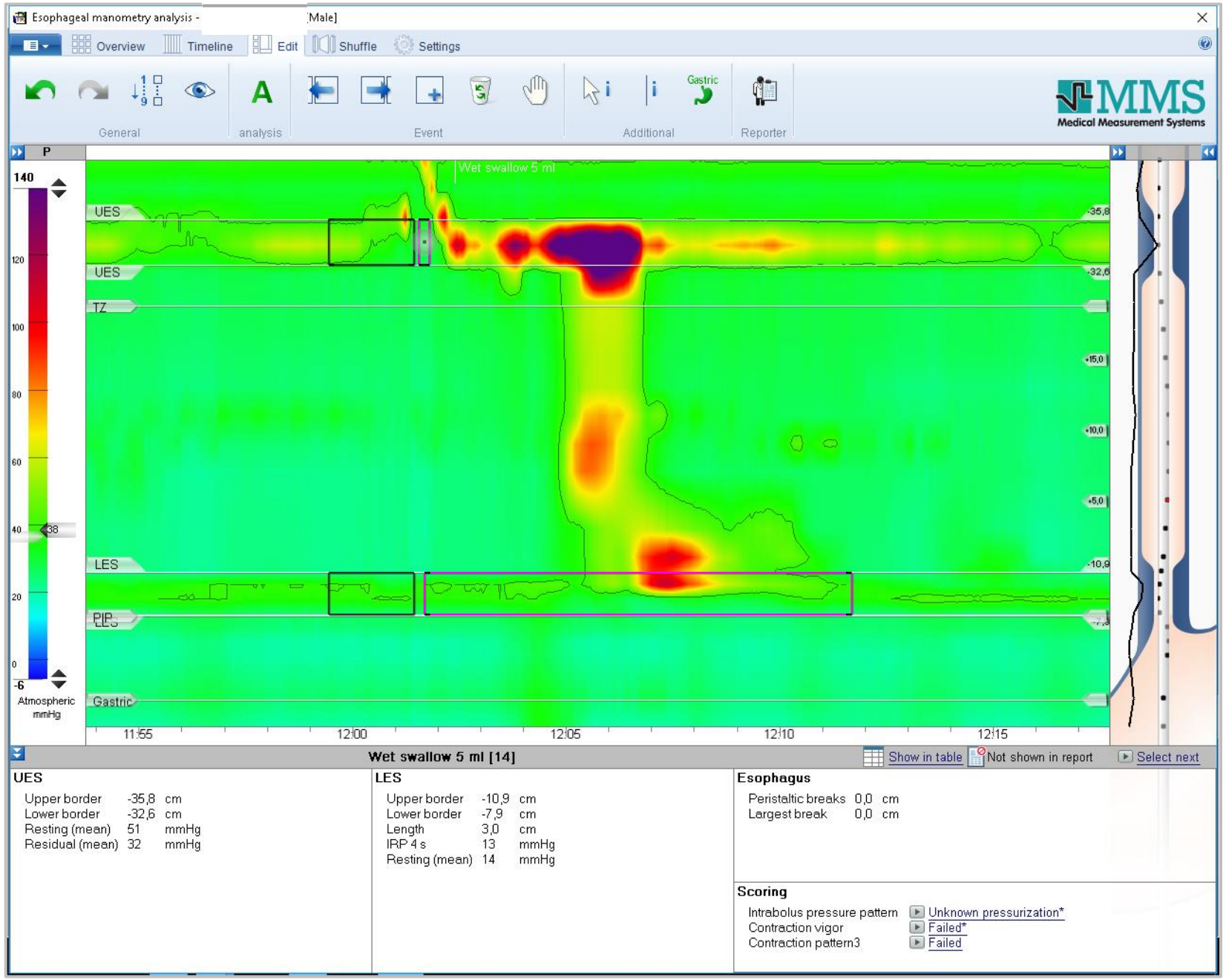
FAILED CONTRACTION

IRP Increased



UPRIGHT POSITION
(secondary position)

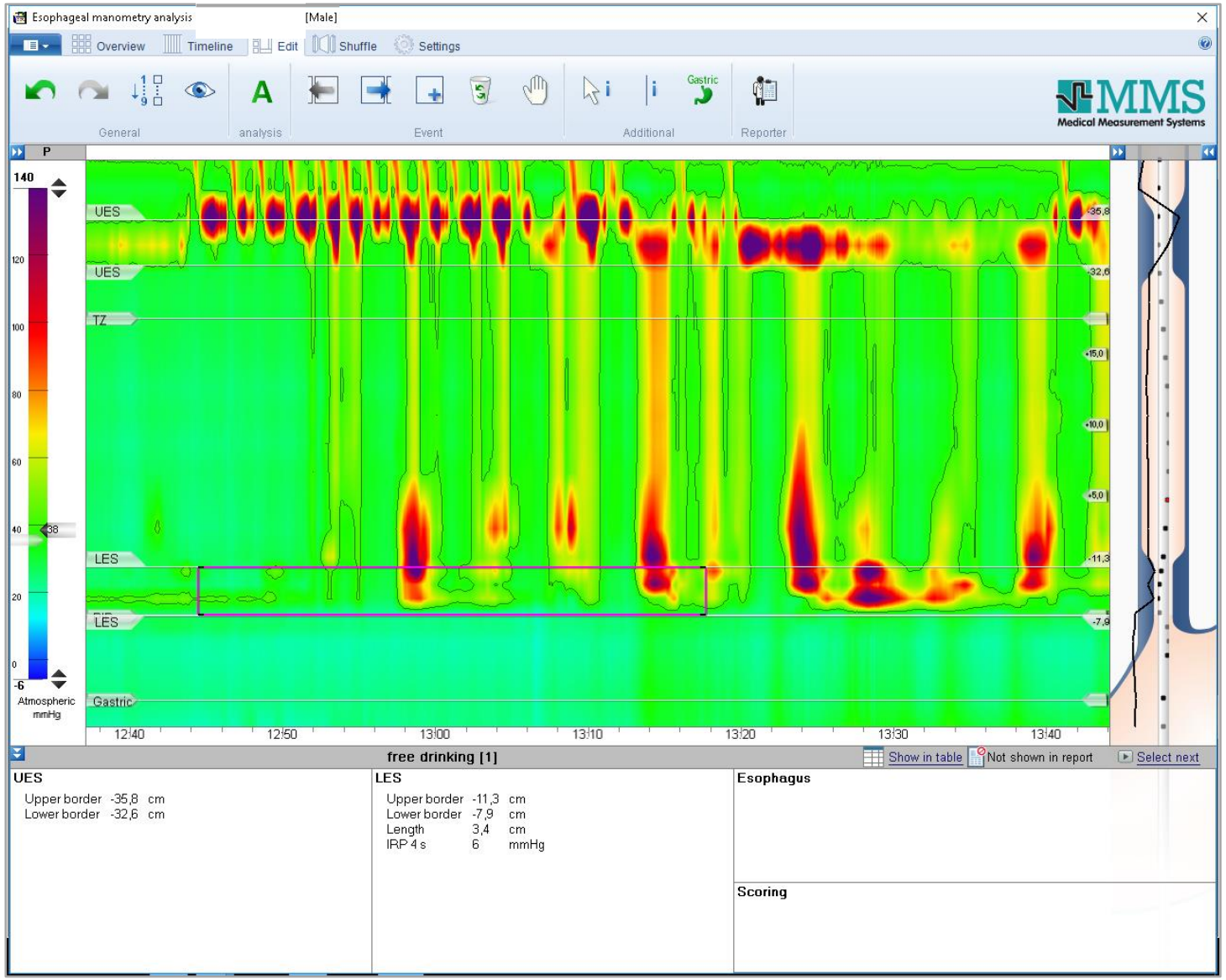
Pattern Repeated of Supine sw



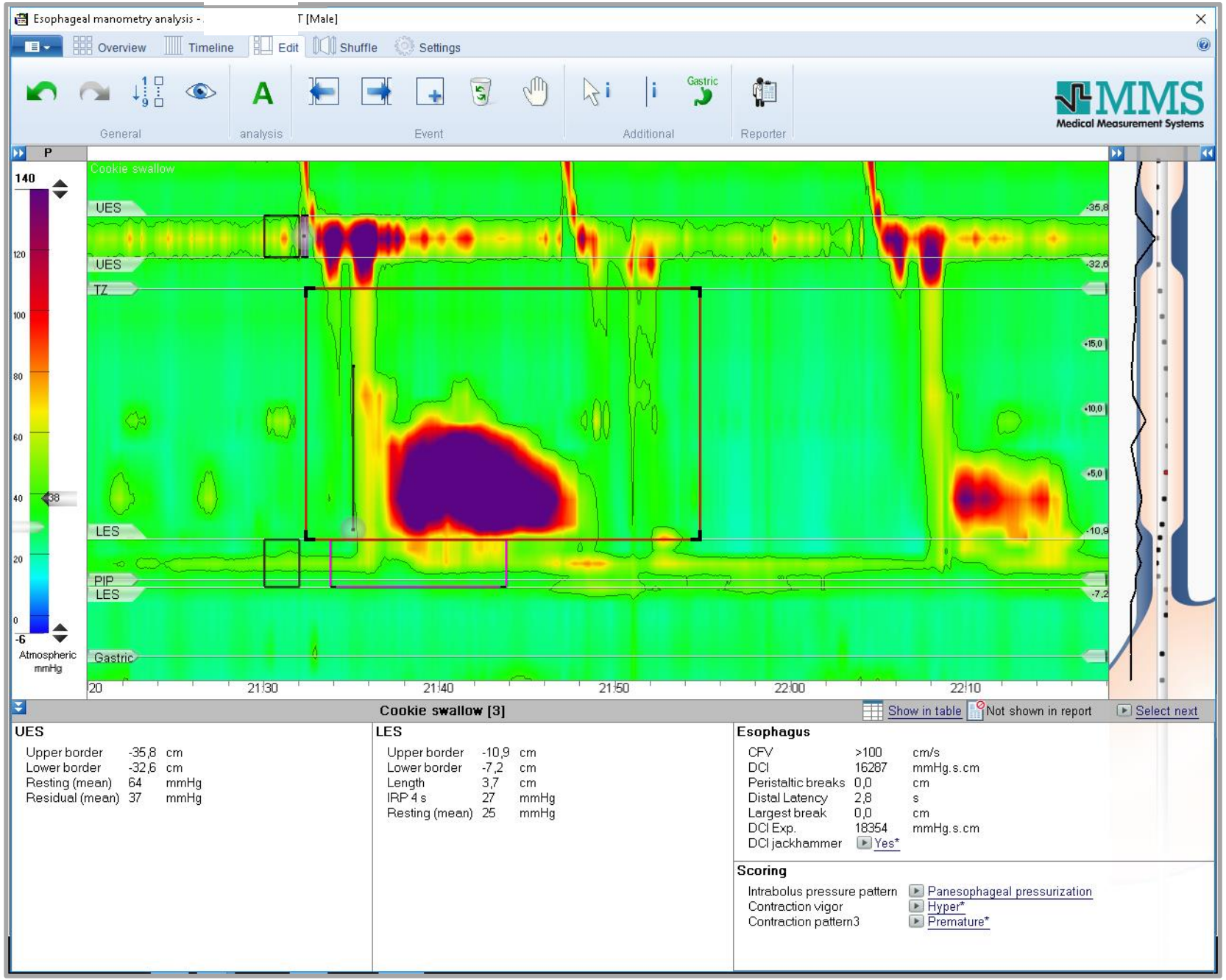
RDC

Pan-oesophageal pressurization

IRP= 6mmHg



Solid SW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UES
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LES
PIP
LES
Gastric
140
120
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80
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20
0
-6
38
Atmospheric
mmHg
-35,8
-32,6
+15,0
+10,0
+5,0
-10,9
-7,2
20
21:30
21:40
21:50
22:00
22:10
Cookie swallow [3]
Show in table
Not shown in report
Select next
UES
Upper border -35,8 cm
Lower border -32,6 cm
Resting (mean) 64 mmHg
Residual (mean) 37 mmHg
LES
Upper border -10,9 cm
Lower border -7,2 cm
Length 3,7 cm
IRP 4 s 27 mmHg
Resting (mean) 25 mmHg
Esophagus
CFV >100 cm/s
DCI 16287 mmHg.s.cm
Peristaltic breaks 0,0 cm
Distal Latency 2,8 s
Largest break 0,0 cm
DCI Exp. 18354 mmHg.s.cm
DCI jackhammer Yes*
Scoring
Intrabolus pressure pattern Panesophageal pressurization
Contraction vigor Hyper*
Contraction pattern3 Premature*

What should one always ask such a patient ?

What can mimic Type III achalasia ?

Opioid use !

He was using 20 to 30 opioid containing pain tablets per day for years!

Management ?

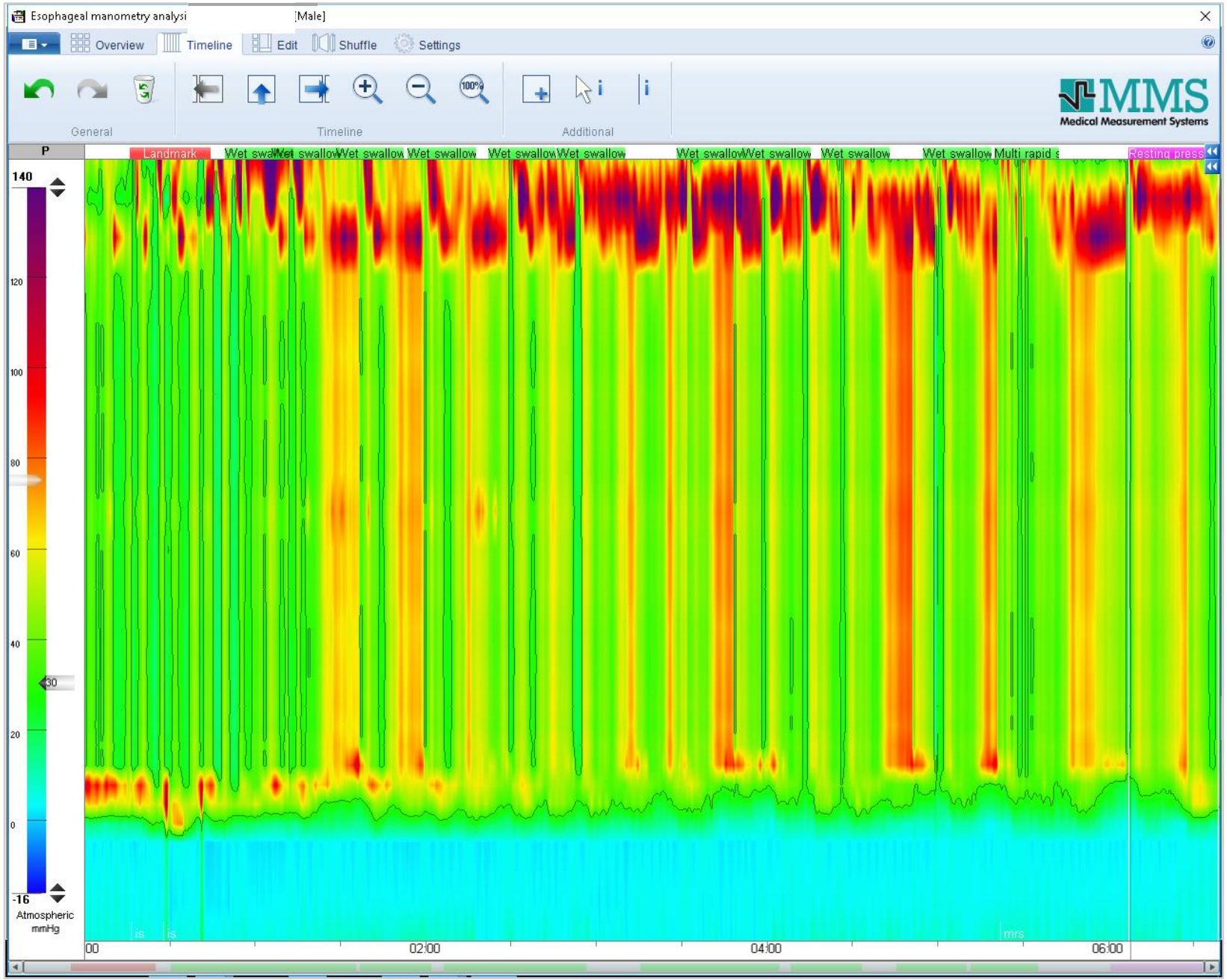
Must be referred to a re-hab center

Sometimes with such a long history of abuse of such drugs the Motility Disorder can b

What protocol was used ?

CCv3 or CCv4

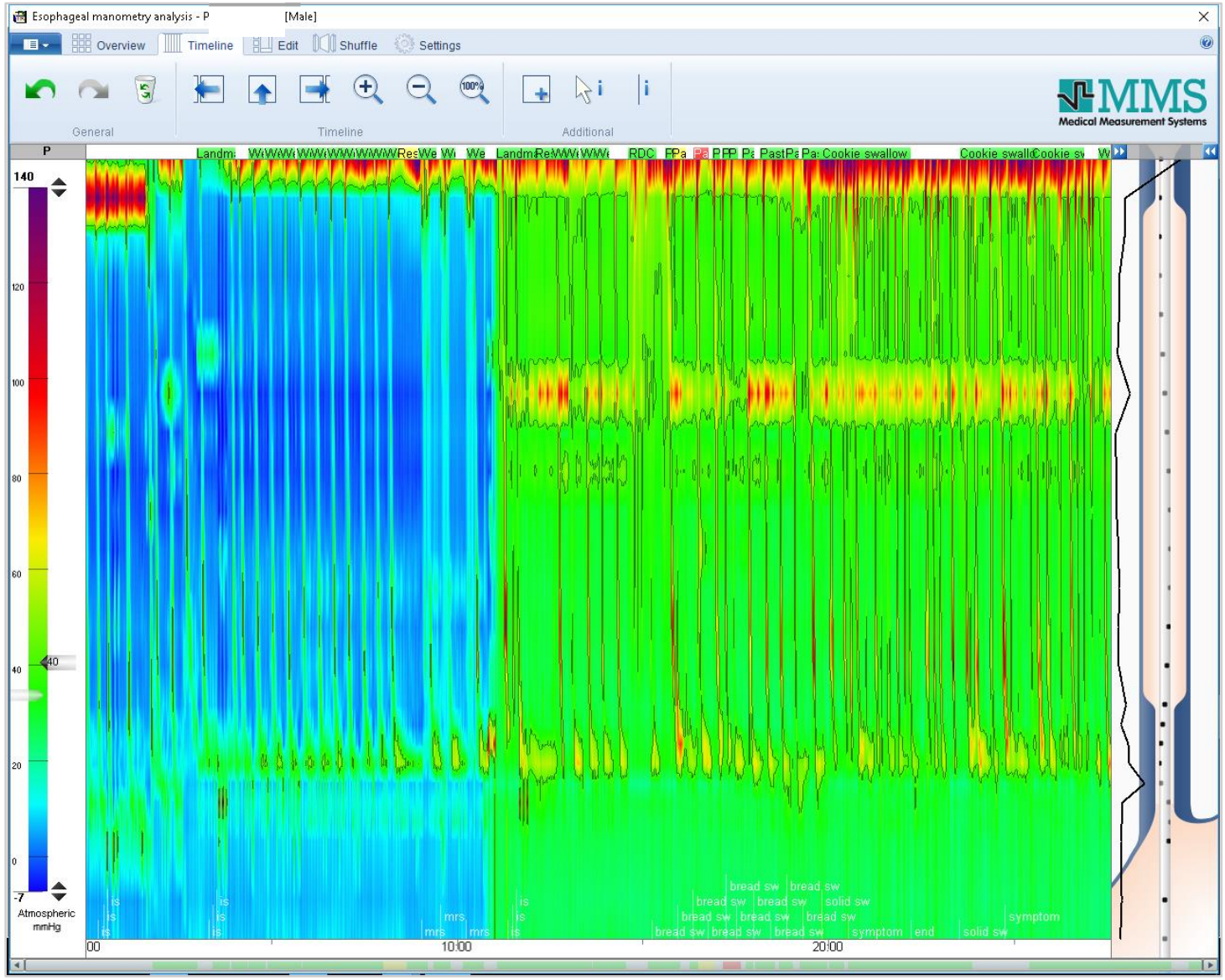
Spot diagnosis ? ?



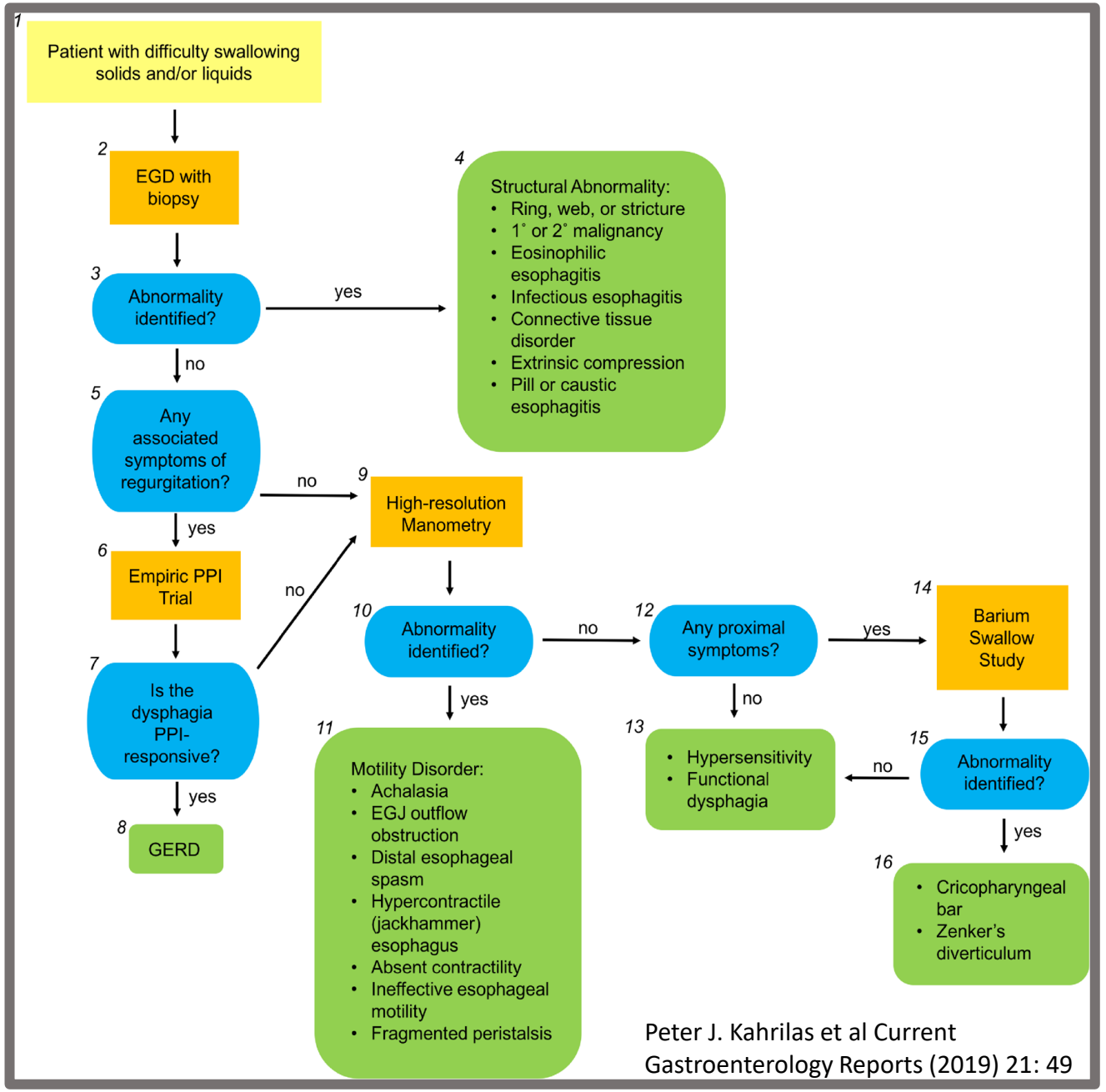
What Protocol was used?

CCv3 or CCv4

What do you think the reason for this HRM was ?



Flow chart for general diagnostic approach to dysphagia



Peter J. Kahrilas et al Current Gastroenterology Reports (2019) 21: 49

How Updates in Chicago Classification Impact Clinical Practice
Rena Yadlapati1 and Peter J. Kahrilas

HTML] **Understanding the Chicago classification**: from tracings to patients
F Schlottmann, FA Herbella, MG Patti - Journal of …, 2017 - ncbi.nlm.nih.gov

Indications and interpretation of esophageal function testing
C. Prakash Gyawali, 1 Nicola de Bortoli,2 John Clarke,3 Carla Marinelli,4 Salvatore Tolone,5 Sabine Roman,6,7,8 and Edoardo Savarino4

How I Approach Dysphagia
Jooho P. Kim1 & Peter J. Kahrilas1 Published online: 20 August 2019
Springer Science+Business Media, LLC, part of Springer Nature 2019

[
[HTML] **Dysphagia**: **Thinking outside** the **box**
H Philpott, M Garg, D Tomic… - World journal of …, 2017 - ncbi.nlm.nih.gov

Thank you for your attention!