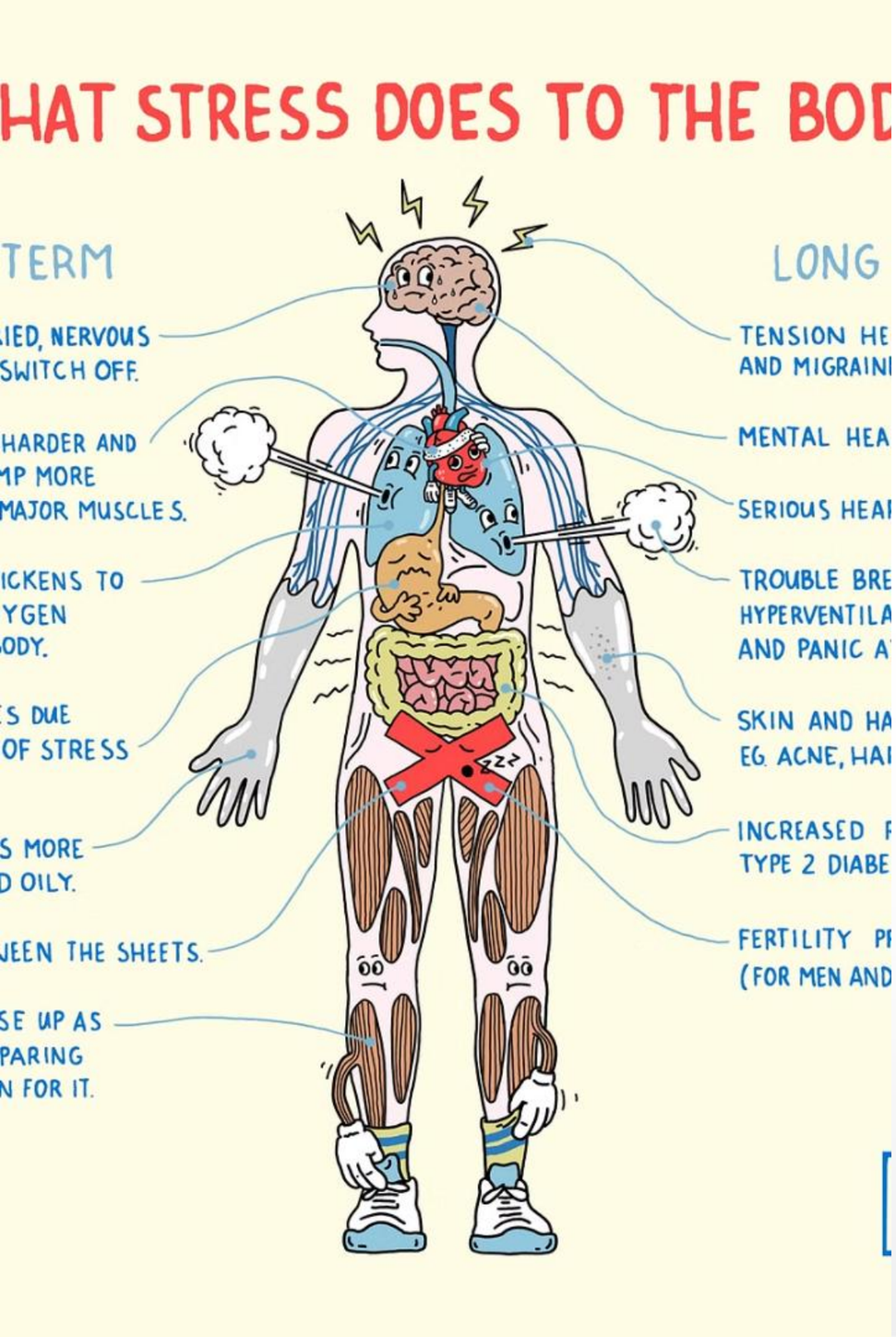


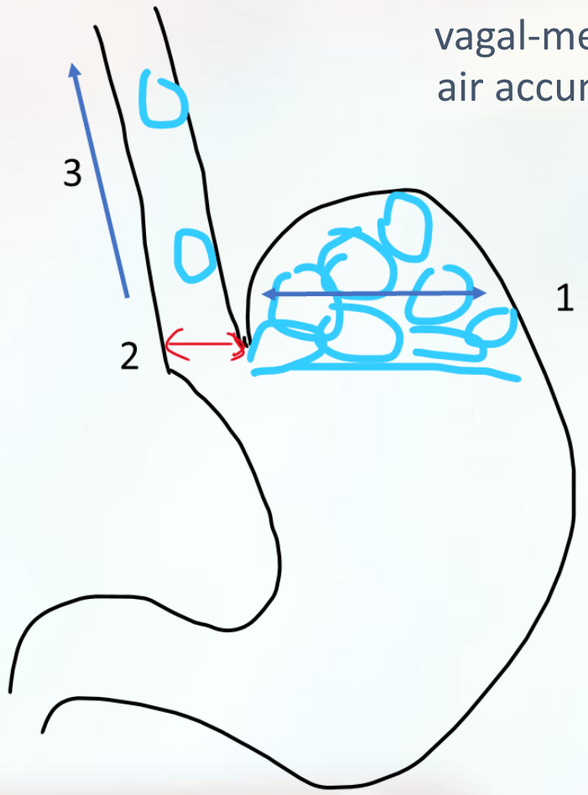
Supragastric belching

Teodora Surdea-Blaga, Medicală II, SCJU Cluj

Outline

- Gastric vs. supragastric belching
- Belching disorders
- How to recognize and diagnose SGB?
- The role of psychological factors in SGB
- Pathophysiology and diagnosis of belching
- Treatment options in SGB
  - CBT
  - Diaphragmatic breathing exercises
  - Speech therapy

Belches



Gastric

vagal-mediated reflex, activated by air accumulated in the stomach (1)

↓

Relaxes LES (2)

↓

gastric ventilation (3)

Supragastric

Air is aspirated (by creating negative intrathoracic pressure) or injected into the esophagus from the pharynx– (1), descends but does not reach the stomach, and is quickly expelled through the mouth (2)

Roma IV – Belching disorders (gastroduodenal disorders)

Belching is pathological if it is excessive and bothersome > 3 days/week, with an onset of > 6 months

A. Excessive gastric belching **GB**
B. Excessive supragastric belching **SGB**

How to recognize and diagnose SGB?

1 Clinical characteristics

- The observation of frequent, repetitive belching is a supportive criterion for excessive SGB.
- Rare disorder – 3.4% din pH-MII

2 Diagnostic test

- Intraluminal impedance measurement is required to distinguish supragastric from gastric belching.

3 Possible cofounders

- Ructus and eructation are **synonyms** for belching
- **Aerophagia** occurs less often than SGB - caused by the swallowing of a large quantity of air leading to :
  - abdominal distension
  - bloating
  - excessive GB

The role of psychological factors in SGB

Stress and belching

1

- SGB – self-induced behavioral phenomenon
- The frequency of belching increases with stress
- During sleep, SGB disappears
- When patients are unaware they are being observed / distraction of attention – reduces the frequency of SGB

Anxiety, depression and SGB

3

- The relationship between anxiety, depression, and SGB – discordant results
- No correlation / increased rates of anxiety and depression in patients with SGB

Psychosocial factors

2

Early life adversities, psychiatric conditions, and maladaptive coping mechanisms are involved in functional gastrointestinal disorders and motility disorders.

Stress, fear of symptoms, and maladaptive coping (such as avoiding certain foods) contribute to the occurrence and persistence of excessive belching.

↓

Anxiety and depression symptoms

↓

Maladaptive coping, the inability to resolve these unpleasant symptoms, reduces quality of life.

Popa SL, et al. Supragastric belching: Pathogenesis, diagnostic issues and treatment. Saudi J Gastroenterol 2022.

SGB - a learned behavioral disorder

1 Quality of life

- SGB - debilitating behavioral disorder
- Interferes with daily functioning
- Leads to absenteeism from work and school
- Causes difficulties in performing household tasks
- Reduces social and leisure activities

2 Association with other psychiatric disorders

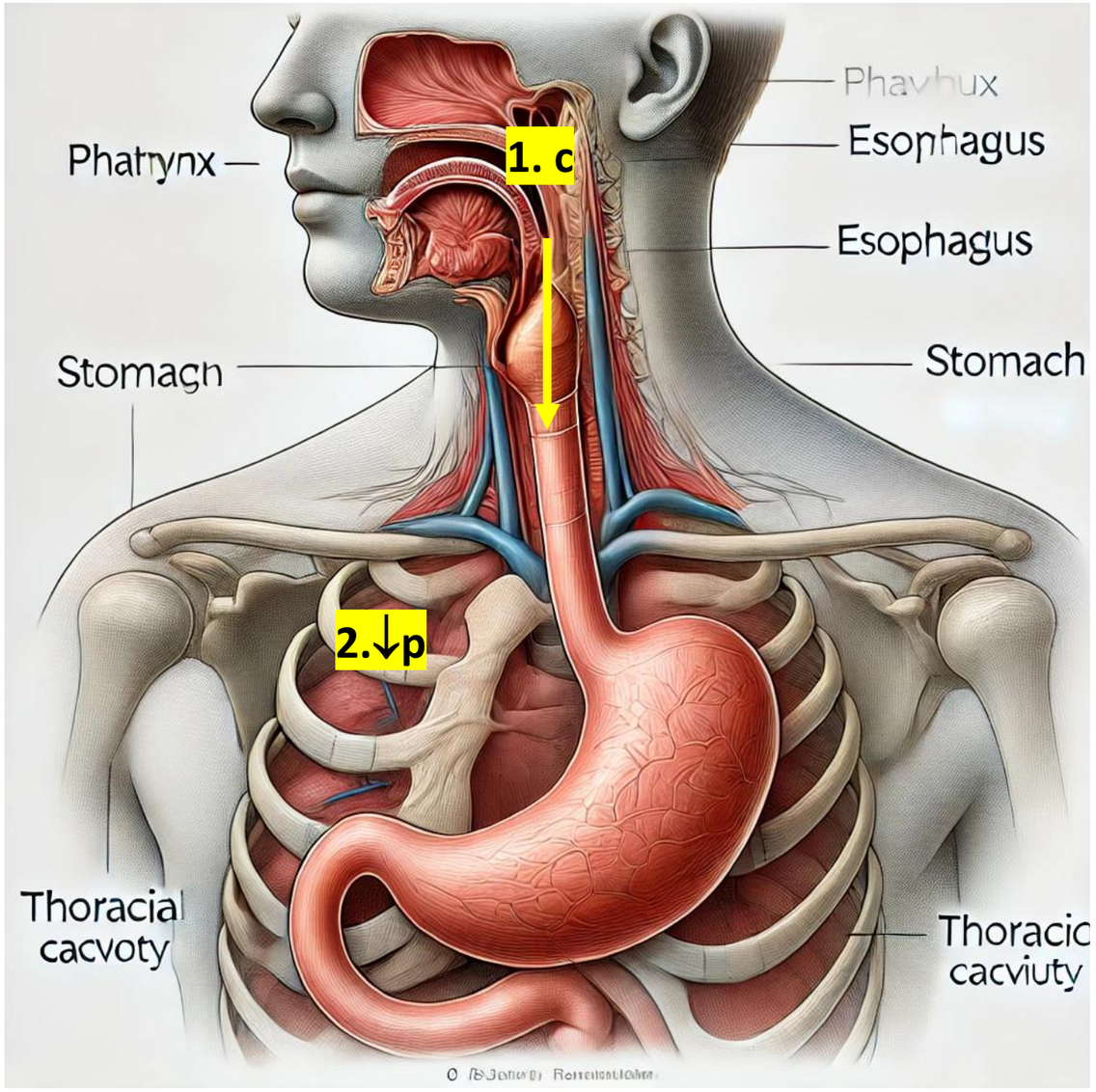
- Obsessive-compulsive disorder
- Depression
- Anxiety disorder
- Eating disorders (bulimia nervosa and anorexia nervosa)

3 Therapeutic trial

- Psychological therapies are effective in the treatment of SGB, emphasizing the importance of psychological factors in the pathogenesis, treatment, and evolution of SGB

Popa SL, et al. Supragastric belching: Pathogenesis, diagnostic issues and treatment. Saudi J Gastroenterol 2022.

PATHOPHYSIOLOGY AND DIAGNOSIS OF BELCHING



SGB mechanisms

1. Retraction of the tongue base pushes air in the pharynx

2. the negative esophageal pressure gradient - sucking the air in

Simultaneous impedance and manometry recordings during a supragastric belch.

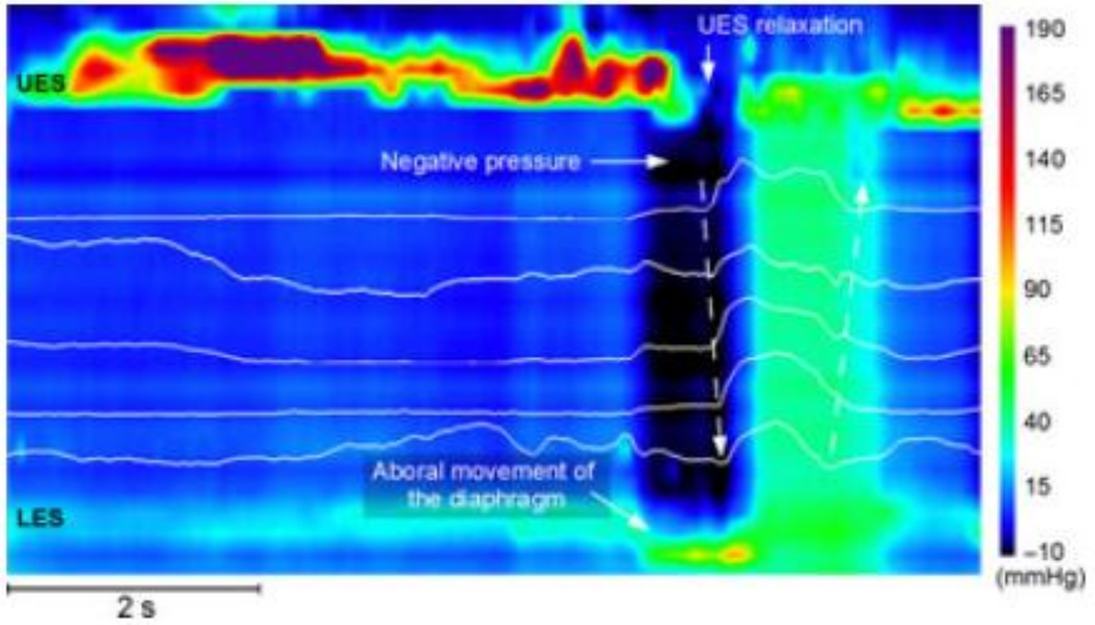


Figure 3 Supragastric belch characterized by a decrease in esophageal pressure preceding the esophageal air flow. Dashed arrows indicate the direction of air flow. Pressure increase at the position of the upper esophageal sphincter during the expulsion of air is caused by intrabolus pressure.

air-suction method

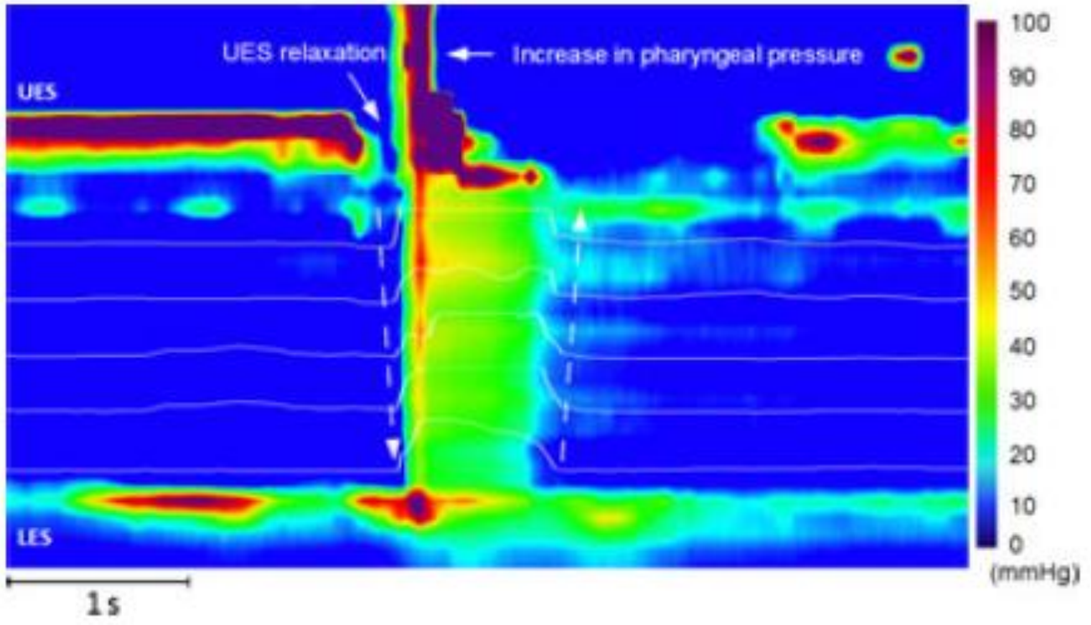


Figure 4 Supragastric belch preceded by an increase in pharyngeal pressure and not by a decrease in esophageal pressure. Dashed arrows indicate the direction of air flow.

air-injection method

Kessing et al. 2012

Repetitive SGBs

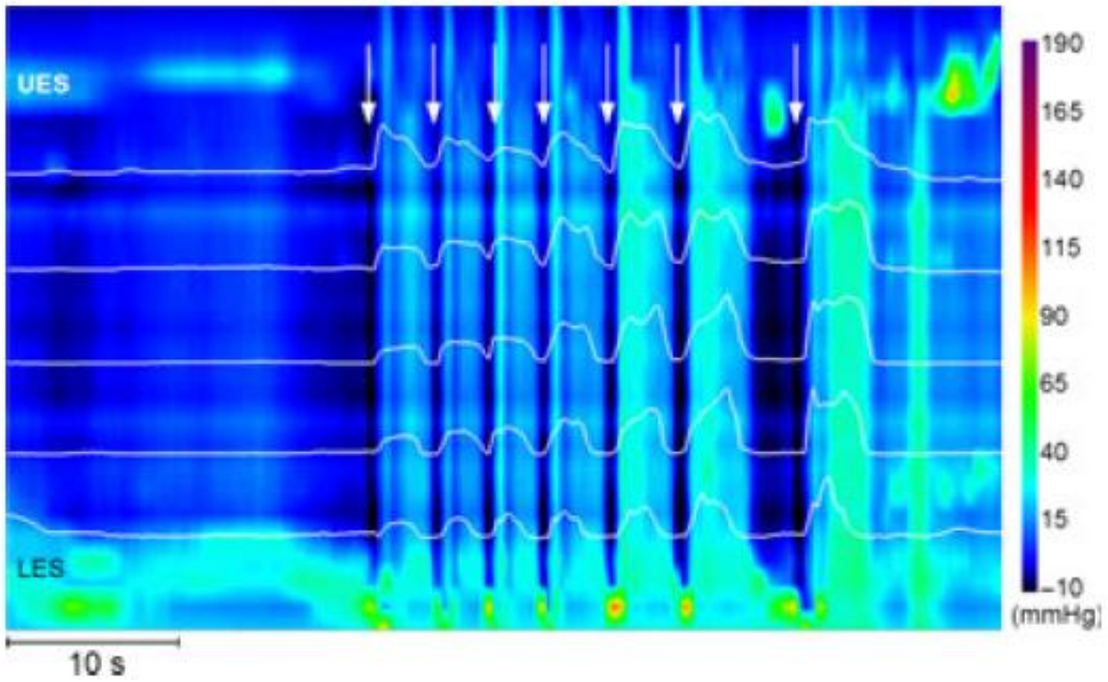


Figure 5 Combined high-resolution manometry and impedance monitoring during an episode of repetitive belching. Arrows indicate the onset of a supragastric belch.

Gastric belch

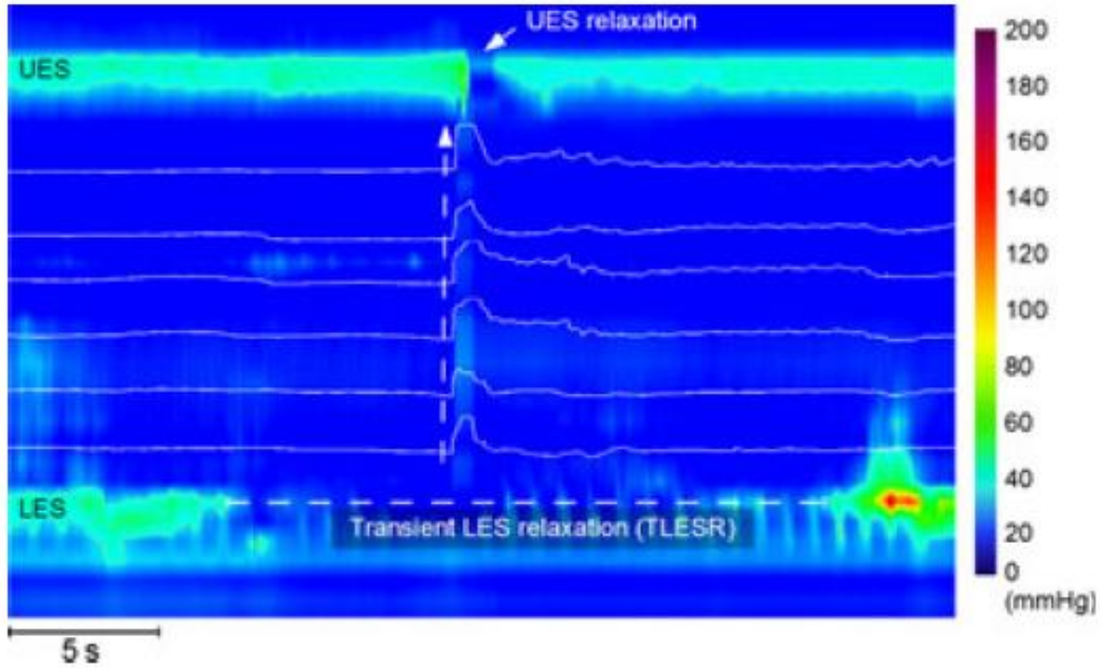
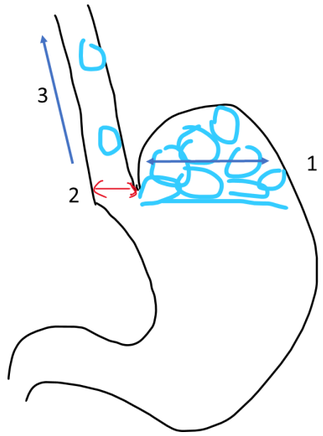
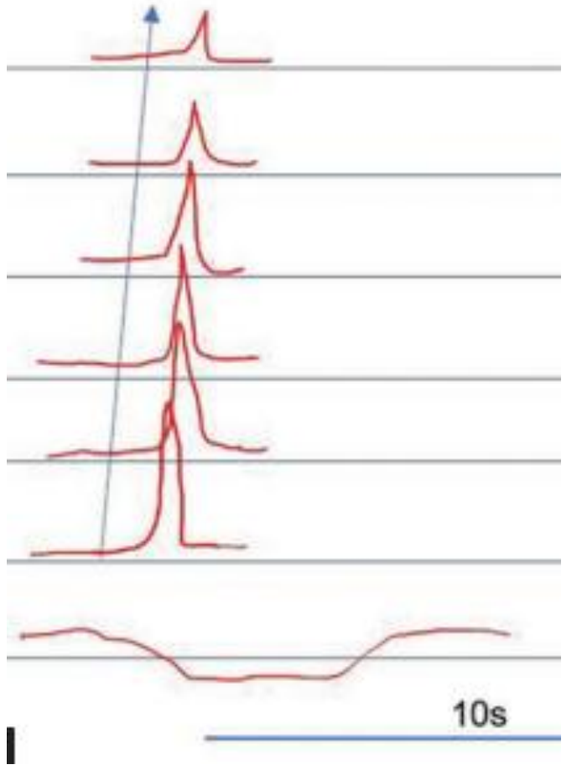


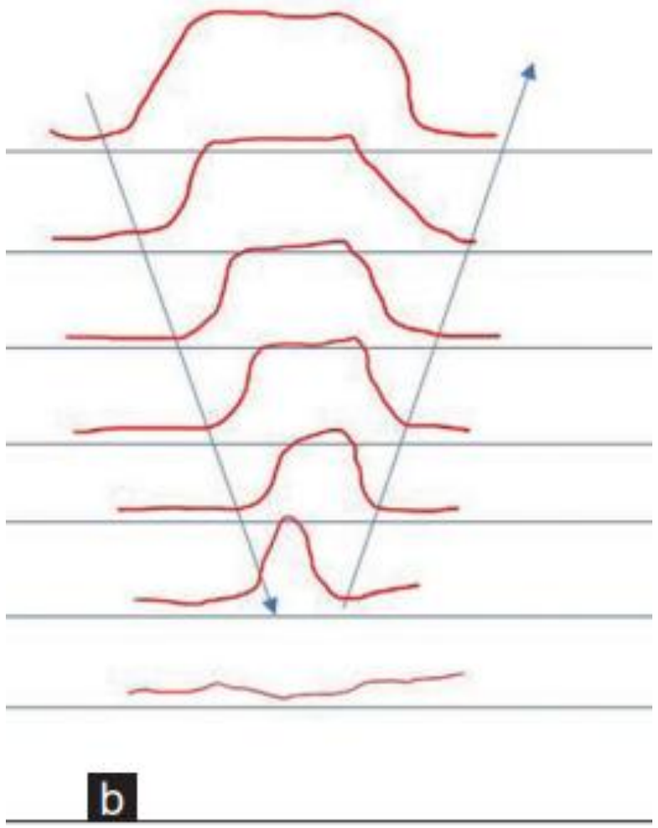
Figure 2 Gastric belch as measured by combined high-resolution manometry and impedance monitoring. The dashed arrow indicates the direction of air flow.

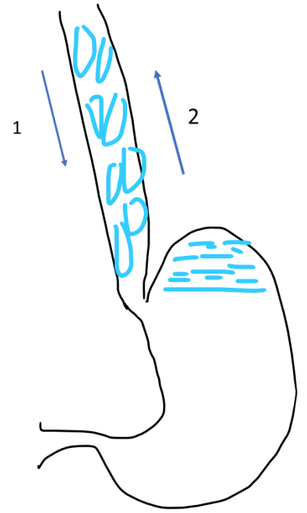
Kessing et al. 2012

Impedance aspects – gastric belches vs. supragastric belches



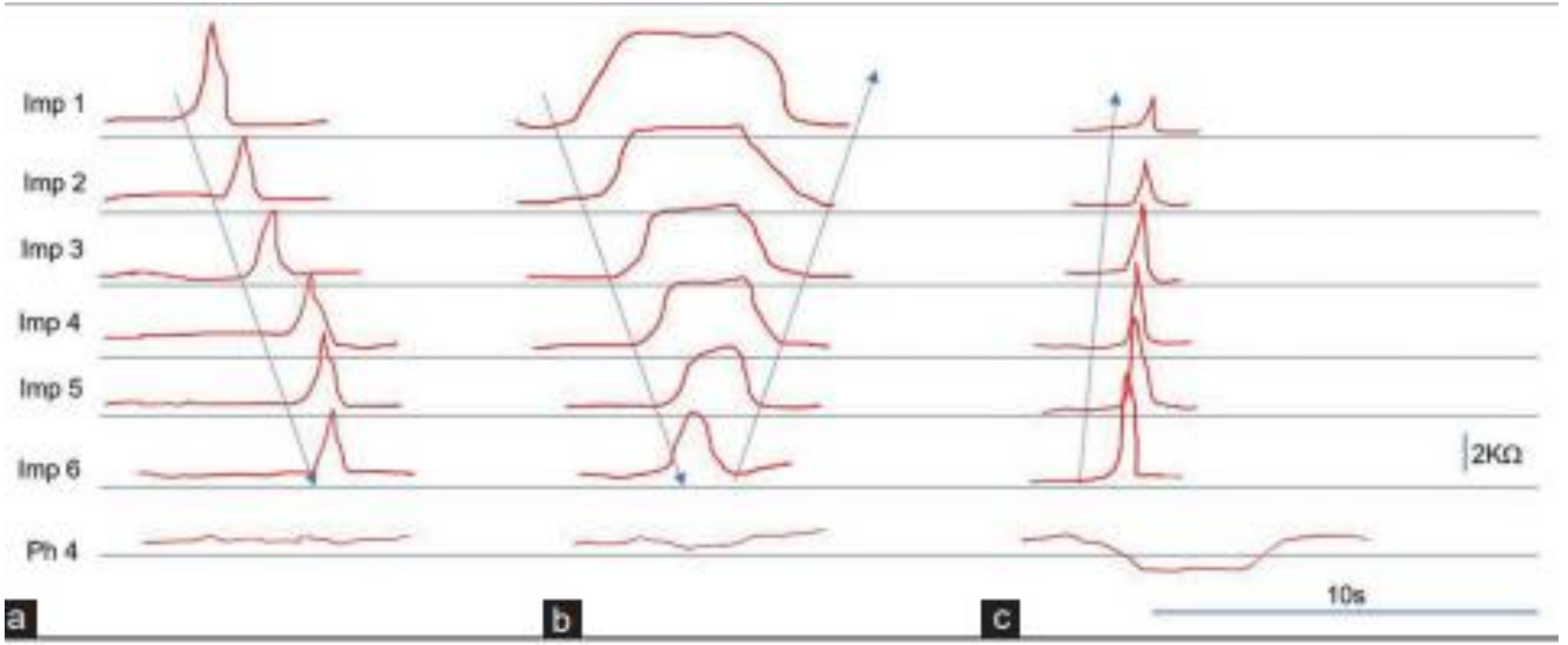






Popa SL, et al. Supragastric belching: Pathogenesis, diagnostic issues and treatment. Saudi J Gastroenterol 2022.

Ph-impedance – differentiates aerophagia, SGB and GB



Impedance monitoring is the diagnostic tool for excessive SGB
Healthy subjects < 1-13 SGB/24 h

Popa SL, et al. Supragastric belching: Pathogenesis, diagnostic issues and treatment. Saudi J Gastroenterol 2022.

Case report

T.R., male – 51 ani

HH, Barrett esophagus – Toupet procedure 2021

Symptoms

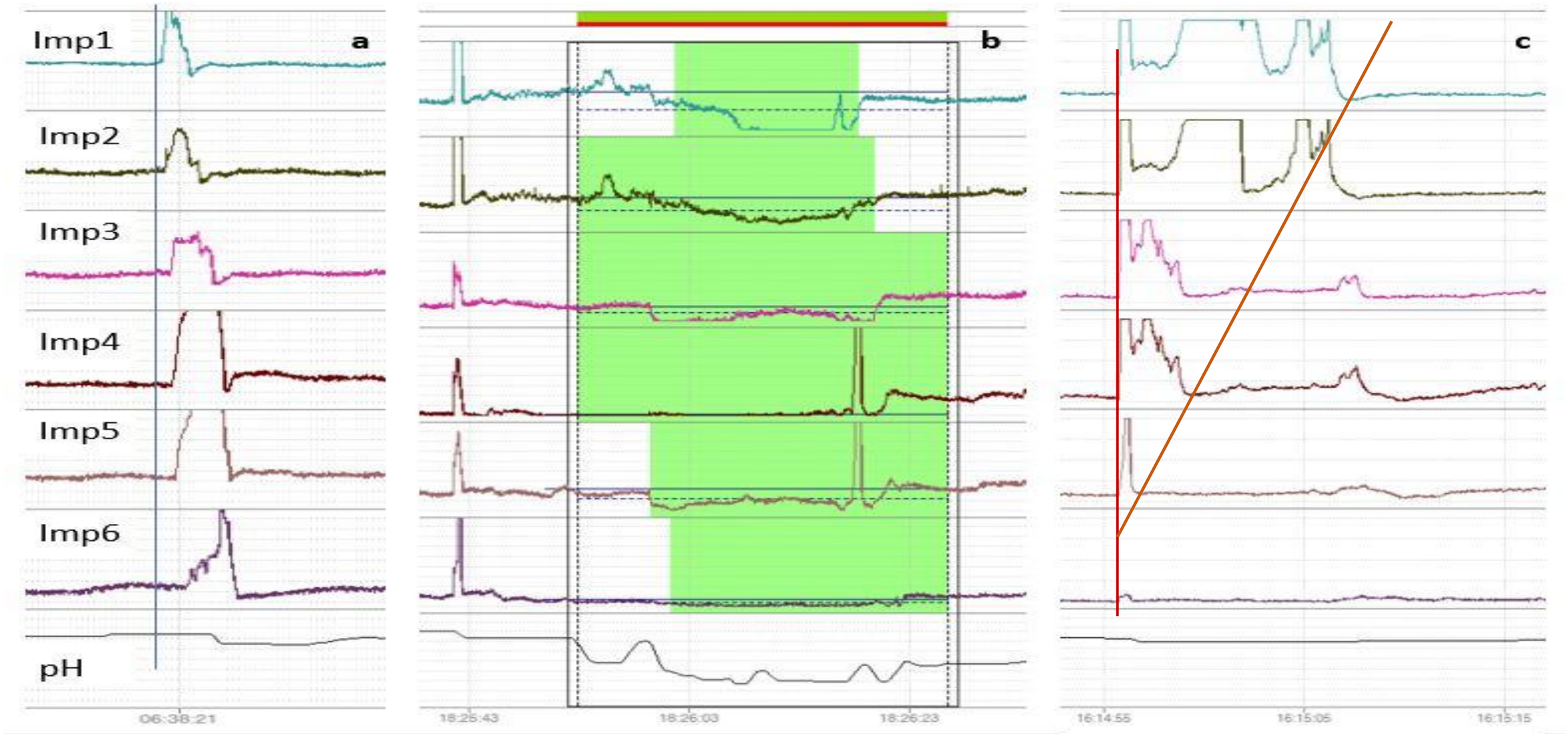
- severe belching - onset 1 month prior to surgery

- belching persists after surgery + dysphagia

- no reflux symptoms

RAPORT

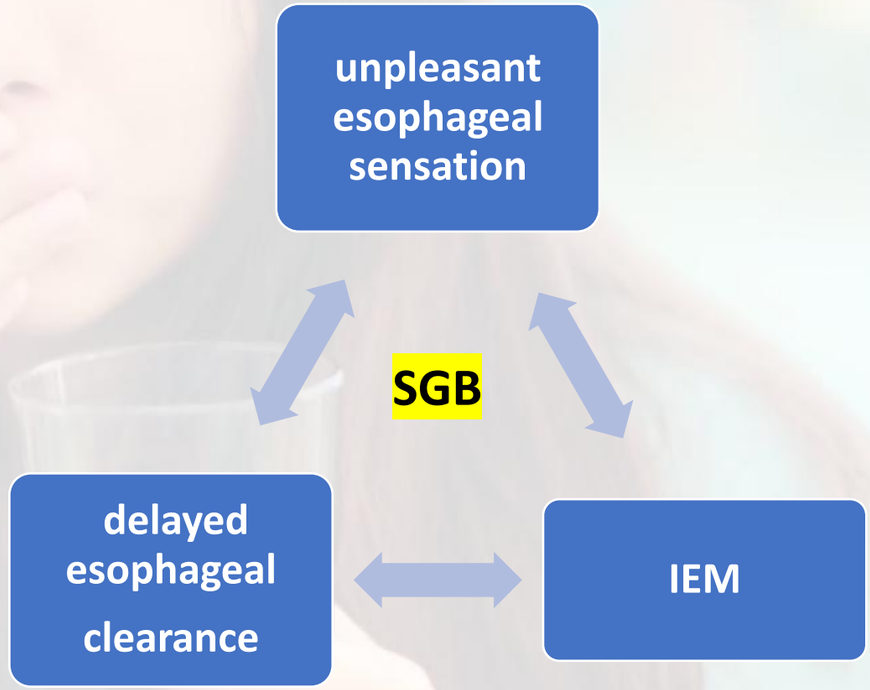
-expunere la acid a mucoasei esofagiene normala – 3.99% din timp
-expunere totala a esofagului la reflux in impedanta este de asemenea normala, in jur de 3.44 % din timp
– numar de episoade de reflux in impedanta – n = 47 – usor peste limita superioara a normalului (n=40), dar mult sub valoare considerata cert patologica (n=80)
– 31 de refluxuri au fost acide, si 15 nonacide, majoritatea refluxurilor au fost postprandial si in ortostatism
– MNBI –1220 ohmi, ceea ce sustine diagnosticul de boala de reflux gastroesofagian
– pe parcursul examinarii pacientul a raportat 1969 evenimente


Imp1
a
Imp2
Imp3
Imp4
Imp5
Imp6
pH
06:38:21
b
18:25:43
18:26:03
18:26:23
c
16:14:55
16:15:05
16:15:15

SGB and GERD

Belching – NOT a typical symptom of GERD!

- Both GB and SGB can trigger reflux episodes
- Gastric belches are related with meals being often observed postprandially. In contrast, SGBs seem not to be related with meals.
- 40% of patients with excessive SGB have pathological esophageal acid exposure
- 30% of refluxes seem are induced by SGBs.
- 18% of SGBs occur during reflux episodes[1]
- the burden of belching in patients with GERD complaining of severe belching - caused by excessive SGBs[2]



[1]Hemmink GJ, et al. Supragastric belching in patients with reflux symptoms. Am J Gastroenterol 2009

[2]Kessing BF, et al. Supragastric belches are the main determinants of troublesome belching symptoms in patients with gastro-oesophageal reflux disease. Aliment Pharmacol Ther 2012

Comprehensive assesement and treatment options in SGB

1 Comprehensive Assessment

- recognizing the condition, correct classification – important for guiding treatment
- a comprehensive assessment is recommended to identify the circumstances that trigger or precipitate belching

2 Psychological therapies

- Speech therapy
- CBT
- Diaphragmatic breathing exercises

3 Medical treatment

- Baclofen
- Fundoplication – reduces belching

Steps in the treatment of SGB through speech therapy

1 Learning the difference between GB and SBG

- GB – a reflex through which air accumulated in the stomach is expelled
- SGB – not a reflex – it does not ventilate the stomach, air does not enter or exit the stomach; the air moves from the oropharynx, to the esophagus, and back to the oropharynx
- An essential step for patients
- SGBs are rapid and very frequent, appearing small and superficial compared to GBs
- SGB < 5s – considered a single episode
- SGB > 13/24 hours – pathological

2 Self-awareness

- Identifying triggers
  - Body position
  - Diet
  - Lifting weights
- Identifying sensations that precede air influx: increased intrathoracic pressure, epigastric bloating
- Awareness of the mechanism by which air enters the esophagus – aspiration/pushing – realizing they are performing SGB
- Reassure the patient that these are attempts to alleviate symptoms

Lisa Bolden, Department of Audiology and Speech Pathology, University of California, Los Angeles, CA.
https://www.youtube.com/watch?v=TePp6O9xZSk

Steps in the treatment of SGB through speech therapy

3 Rescue breathing

- Goal: to replace a behavior that causes tension/discomfort for the patient with another behavior – normalizing the behavior
- **Place the tongue on the roof of the mouth behind the teeth, with lips slightly apart – "Resting happy face," "resting smile“**
- Focus attention on the abdomen, on full inhalation and complete exhalation
- Count a few seconds during inhalation and exhalation to maintain slow breathing

4 Applications in daily life

- Plan
- Repeat
- Practice daily

haled

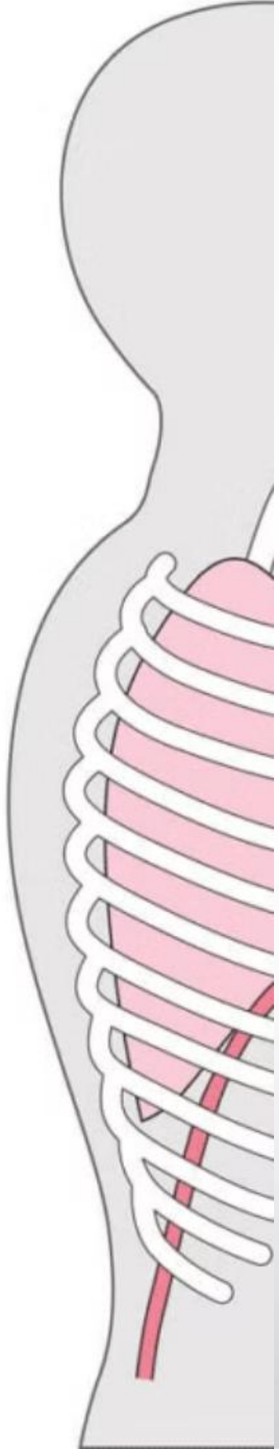
hest expands

ung

bcage

iaphragm

iaphragm
ontracts



Diaphragmatic breathing exercises

1

Restoring gastroesophagian pressure-gradient

Slow, diaphragmatic breathing with an open mouth can restore the gastroesophageal pressure gradient.

2

Improves belches

- 60% of the patients reported a 50% reduction in the VAS score for belching compared to the control group

3

Long-lasting Effects

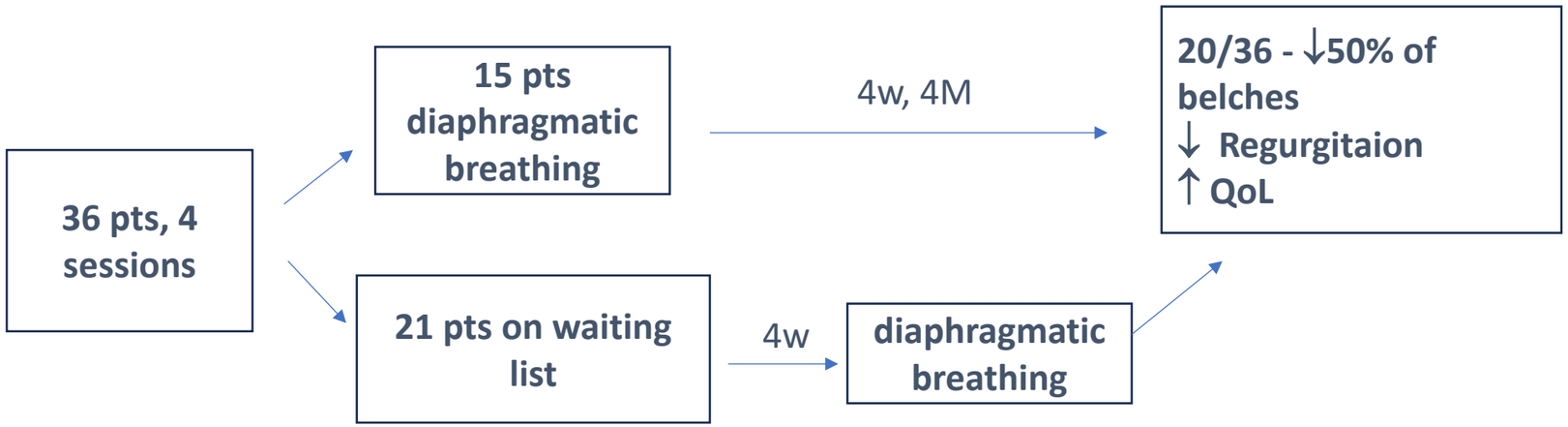
- Favorable effect for 4-6 months[1,2]
- Improves depression, anxiety QoL[1,3]

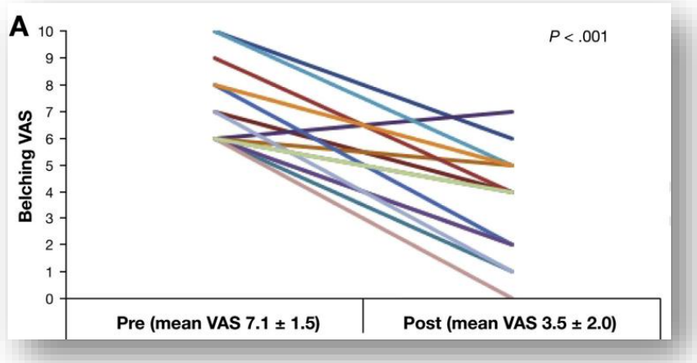
1. Halland M et al. Neurogastroenterol Motil 2016
2. Ong AM et al. Clin Gastroenterol Hepatol 2018
3. Punkkinen J et al. Neurogastroenterol Motil 2021

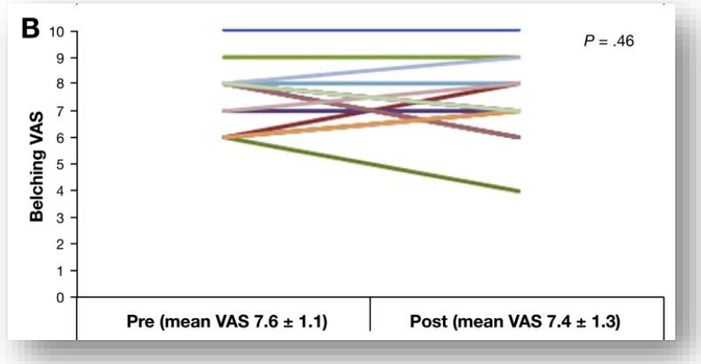
Clinical Gastroenterology and Hepatology 2017;■:■–■

Diaphragmatic Breathing Reduces Belching and Proton Pump Inhibitor Refractory Gastroesophageal Reflux Symptoms

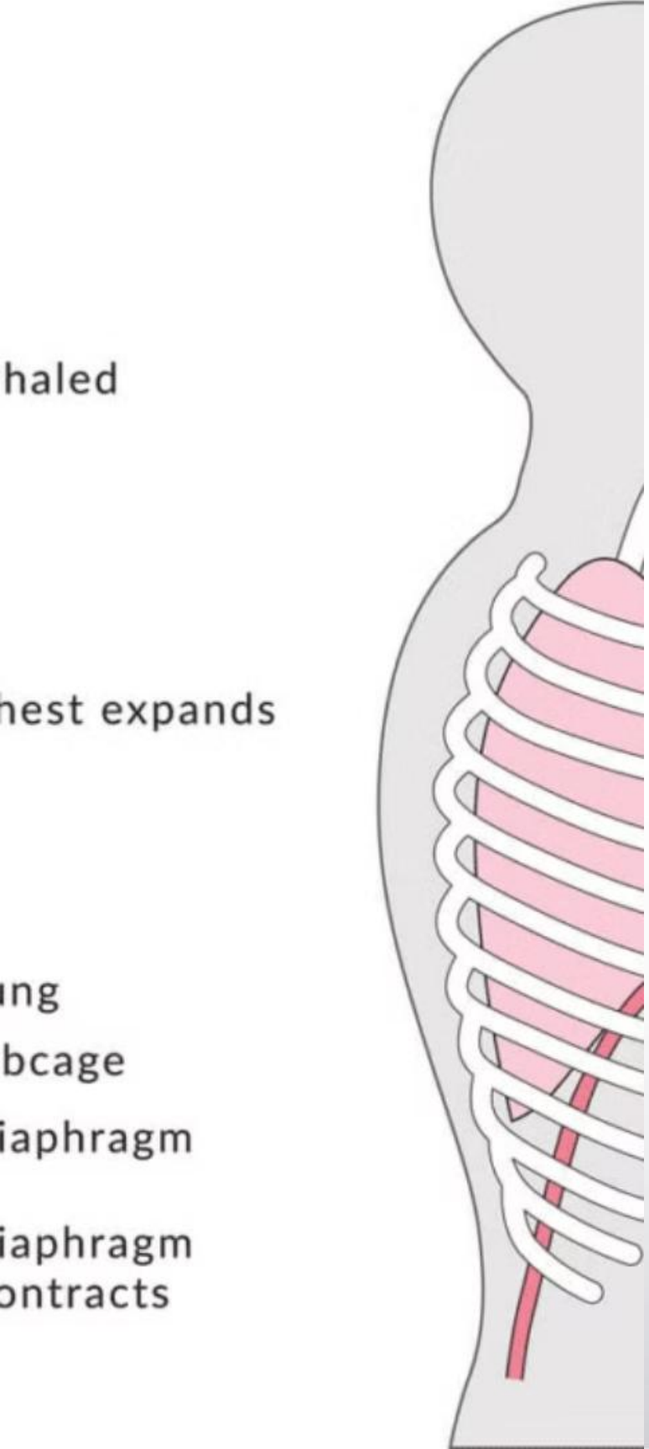
Andrew Ming-Liang Ong,[*,‡] Laura Teng-Teng Chua,[§] Christopher Jen-Lock Khor,[*,‡] Ravishankar Asokkumar,[*,‡] Vikneswaran s/o Namasivayam,[*,‡] and Yu-Tien Wang[*,‡]







At 4 months, there is a slight decrease in efficiency, but the majority of patients manage their symptoms well.



Diaphragmatic breathing exercises

1

Identifying the type of breathing and the muscles used

- Upper costal breathing – shallow breathing – uses thoracic muscles, neck, and shoulder muscles
- Diaphragmatic breathing – is deep and involves using the diaphragm, with the abdomen expanding during inhalation and contracting during exhalation

2

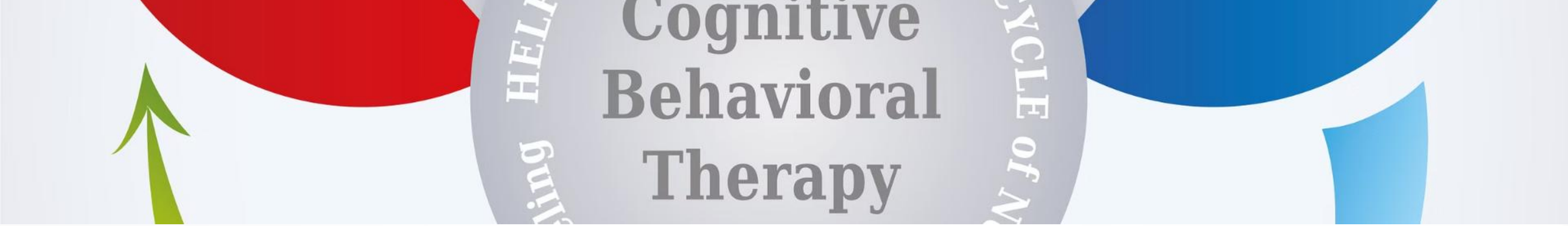
The Exercise

Patients are instructed to place one hand on their chest and the other on their abdomen to feel if they are performing the movement correctly.

3

Repeat

Daily practice of the exercise is recommended, along with using this type of breathing during speaking, exercising, or relaxing.



Cognitive behavioral therapy

Recognizing the triggers

It is the main focus in CBT, followed by performing exercises to prevent SGB.

Reduces the use of medical services, improves QoL[1,2]

Favorable effects up to 12 months

Factors associated with good outcomes

Reduced number of SGB episodes

Lower hypervigilance score

High competence score (assesses the patient's understanding and implementation of CBT exercises)[3]

Availability of Experts

Main disadvantage!

Available data and expert opinion – psychological therapies are effective and represent the main treatment option for SGB.

1. Bredenoord AJ. Clin Gastroenterol Hepatol 2013
2. Glasinovic E et al. Am J Gastroenterol 2018
3. Sawada A et al. Aliment Pharmacol Ther 2019

Take homme messages

1 Recognizing the role of psychological factors

- Learned behaviour
- Differentiating between SGB and GB is important

2 Diagnosis

Repeated, bothersome “small” belches
pH-impedance

3 Multidisciplinary Approach

- Gastroenterologists, psychologists, and speech therapists are essential for the successful management of SGB
- Diaphragmatic breathing exercises with an open mouth, CBT, speech therapy

THANK YOU!