

## REVIEW

# Managing a patient with excessive belching

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## ABSTRACT

A 50-year-old man with end-stage renal failure was referred by his general practitioner with dyspeptic symptoms. On further questioning the patient complained of a 10-year history of frequent belching. This was noticeably worse after meals and during times of stress. He did not have nocturnal belching and episodes of belching were less frequent when the patient was talking or distracted. There was no history of gastro-oesophageal reflux, vomiting, dysphagia, loss of appetite or weight loss. He was diagnosed with excessive, probably supragastric, belching. Further investigation was not deemed necessary. His symptoms have since settled with simple reassurance and explanation of their origin provided during the clinic visit.

## INTRODUCTION

Belching, also known as eructation, is the audible escape of air from the oesophagus into the pharynx.<sup>1</sup> During each swallow between 8 and 32 mL of air is swallowed and enters the stomach.<sup>2</sup> Excessive gastric distension due to swallowed air is avoided through reflux of air during belching. Distension of the stomach leads to transient lower oesophageal sphincter relaxation, a vagally mediated reflex, which allows air to enter the oesophagus through a relaxed sphincter, with subsequent expulsion orally.<sup>1 3–5</sup> Therefore, belching is part of daily experience and can only be considered a disorder when the symptoms become frequent and distressing, particularly in social situations, for the patient.<sup>1 6</sup> Community surveys suggest people rarely consult their general practitioner with this symptom.<sup>7</sup>

It had been assumed for many years that excessive belching was due to excessive swallowing of air into the stomach or aerophagia, with reflux of gas from the stomach and belching as a consequence. However, it has become clear that

aerophagia and excessive belching are distinct conditions with different pathophysiological mechanisms.<sup>1</sup> Excessive belching can be divided into excessive gastric or supragastric belching.<sup>8</sup> Gastric belches are usually physiological, involuntary and occur up to 30 times a day.<sup>1</sup> Supragastric belches occur as a result of rapid flow of air into the oesophagus that does not reach the stomach.<sup>8</sup> Supragastric belches are voluntary and can be considered behavioural.<sup>1</sup> Patients presenting with excessive belching as their main symptom usually have an increased frequency of supragastric, but not gastric, belches. Patients with aerophagia, a rarer condition, swallow large quantities of air, have abdominal distension and bloating, and as a result may have an increase in gastric belching.<sup>9</sup>

Excessive belching can accompany both gastro-oesophageal reflux disease (GORD) and functional dyspepsia with a reported incidence of between 40 and 80%, although other symptoms predominate.<sup>5 10 11</sup> It has been proposed that supragastric belching is the patient's response to an unpleasant oesophageal sensation, as supragastric belching may occur a few seconds after the onset of a reflux episode, although belching has also been noted to induce reflux episodes in some patients.<sup>12</sup> Aerophagia may complicate continuous positive airway pressure therapy when used for obstructive sleep apnoea.<sup>13</sup>

Psychological and behavioural factors play a key role in patients with excessive belching. Belching episodes are significantly reduced when patients with excessive belching are unaware that they are being observed and also when they are distracted.<sup>14</sup> Symptoms of belching then increase when patients know they are being observed.<sup>14</sup> Finally, supragastric belches are almost absent during sleep.<sup>15</sup>

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**CLINICAL FEATURES**

Patients with excessive supragastric belching may report belching up to 20 times a minute.<sup>16</sup> They may additionally describe epigastric discomfort, nausea and vomiting, early satiety, abdominal bloating and abdominal distension.<sup>1 16-19</sup> Given the association of belching with GORD, patients may present with typical gastro-oesophageal reflux symptoms of heartburn and regurgitation.<sup>5</sup> Patients with excessive supragastric belching characteristically exhibit excessive belching during the consultation. Symptoms are often long standing before a diagnosis is reached with a lack of awareness of particularly supragastric belching a contributory factor.<sup>17 19 20</sup> Proposed diagnostic criteria for aerophagia and excessive belching are listed in box 1.

Patients with belching disorders report significant anxiety, and excessive belching has been described in patients with psychiatric disorders, such as obsessive compulsive disorder and eating disorders.<sup>17 21 22</sup> Patients with supragastric belching have impaired health-related quality of life. This is due to a combination of impaired social functioning and isolation, impaired mental health and vitality and increased body pain. Belching can be loud and socially disruptive, leading to embarrassment and increasing social isolation.<sup>16 23</sup>

**DIAGNOSIS AND INVESTIGATION**

A thorough history is usually the key to diagnosing the cause of a patient's excessive belching. The history should focus on the frequency of belching, the occurrence during sleep or other activities—for example, after meals, the effect of stress and the presence of dysphagia, weight loss, gastro-oesophageal reflux symptoms, dyspepsia, abdominal distension and psychiatric comorbidity.<sup>1</sup> Box 2 describes a typical plan of investigation for a patient with excessive belching.

**Box 1 Rome III diagnostic criteria for belching disorders<sup>6</sup>**

*Diagnostic criteria for aerophagia\**  
 Must include all of the following:  
 1. Troublesome repetitive belching at least several times a week  
 2. Air swallowing that is objectively observed or measured

*Diagnostic criteria for unspecified excessive belching\**  
 Must include all of the following:  
 1. Troublesome repetitive belching at least several times a week  
 2. No evidence that excessive air swallowing underlies the symptom

\*Criteria fulfilled for the past 3 months, with symptom onset at least 6 months before diagnosis.

The reported age at diagnosis varies between 46 and 58 years and although the risk of malignancy is very low, upper gastrointestinal endoscopy should be undertaken when excessive belching is accompanied by other upper gastrointestinal symptoms that meet criteria for investigation.<sup>17 19 24</sup> Additional investigations may be necessary to exclude other disorders such as GORD or rumination. The most useful investigation when GORD may be contributing and there is no response to a trial of a twice daily proton pump inhibitor (PPI) is ambulatory oesophageal pH and impedance monitoring. Excessive belching may accompany GORD, and in some cases belching may induce GORD, and therefore this is an important diagnosis to rule out and treat appropriately with PPIs.<sup>6 10 12</sup> On pH/impedance monitoring patients with GORD characteristically will have an excessive number or duration of acid reflux episodes associated with gas or liquid reflux, whereas patients with supragastric belching will have numerous episodes of swallowed gas being immediately refluxed.

If the diagnosis remains uncertain, the combination of high-resolution manometry (HRM) with impedance monitoring will differentiate between gastric and supragastric belches and rumination.<sup>25</sup> Gastric belches are characterised by lower oesophageal sphincter relaxation, retrograde airflow into the oesophagus, simultaneous oesophageal pressure increase (common cavity phenomenon) and upper oesophageal sphincter relaxation after the onset of the retrograde airflow.<sup>25</sup>

Two mechanisms underlie supragastric belching—air pushing and air sucking. First, contraction and aboral

**Box 2 Clinical investigation for excessive belching<sup>1 16</sup>**

**History**  
 Frequency of belching  
 Occurrence of belching during sleep or other activities  
 Effect of stress  
 Presence of gastro-oesophageal reflux disease (GORD), dyspepsia, dysphagia, weight loss, psychiatric comorbidity

**Physical examination**  
 No abnormalities

**Abdominal x-ray examination**  
 No abnormalities

**Oesophageal impedance studies**  
 Supragastric belches in high frequency  
 Normal air swallowing

**Treatment**  
 Dietary advice  
 Behavioural therapies  
 Proton pump inhibitor, if indicated  
 Upper gastrointestinal endoscopy if indicated to rule out organic pathology

movement of the diaphragm creates an increased negative pressure in the thoracic cavity and the oesophagus, with subsequent relaxation of the upper oesophageal sphincter resulting in inflow of air into the oesophagus followed by the immediate retrograde expulsion of air through straining (air sucking). The second mechanism, found in a minority of patients, involves simultaneous contraction of the muscles of the base of the tongue and the pharynx resulting in inflow of air with subsequent expulsion due to straining (air pushing).<sup>1 8 25</sup>

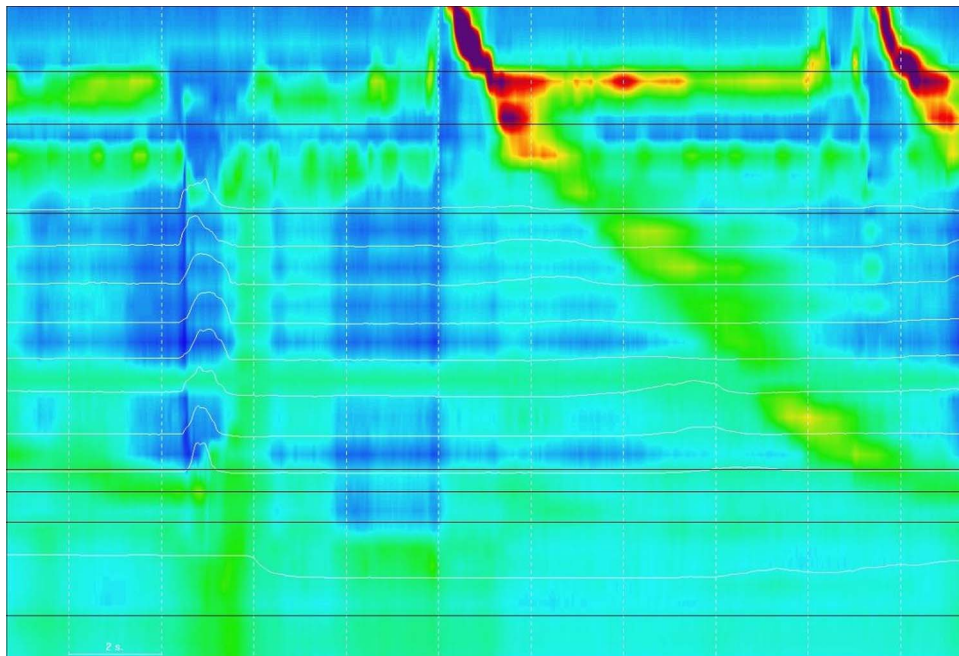
Repetitive supragastric belching occurs in the majority (70%) of patients with excessive belching, with belches occurring up to every 2 s.<sup>25</sup> This repetitive pattern is not seen with gastric belching. In rumination, combined HRM with impedance monitoring classically shows an abrupt rise in intragastric pressure (abdomino-gastric strain) of at least 20 mm Hg above baseline with associated retrograde pressure gradient and movement of gastric contents across the lower oesophageal sphincter up to the mouth within 10 s of the strain event. This is followed by primary or secondary oesophageal peristalsis to return oesophageal contents to the stomach.<sup>20</sup> Figure 1 is a combined HRM and impedance study in a patient with excess belching and gastro-oesophageal reflux symptoms. Supragastric belching induced multiple acid reflux episodes in this patient.

## MANAGEMENT

Unfortunately, the evidence for the management of excessive belching is limited. However, a thorough explanation of the cause of the patient's symptoms and reassurance are important parts of the initial management and may be all that is required.

There is some evidence for a role for behavioural therapies in the treatment of patients with excessive belching. Speech therapy focusing on glottal movements and control of breathing led to a significant symptom reduction in over 50% of patients with excessive supragastric belching.<sup>19</sup> However, this was a small, open study involving just 11 patients. Other behavioural therapies such as diaphragmatic breathing, cognitive behavioural therapy and biofeedback have been reported to be effective.<sup>20 22 26–29</sup> Hypnosis has been reported to be beneficial in a single case report.<sup>30</sup> Unfortunately, a shortage of therapists familiar with these therapeutic approaches means that such treatments are not widely available.

More recently however, an office-based behavioural therapy has been reported, with good response rates (80%) in a case series of five patients.<sup>31</sup> Patients were positioned supinely and asked to breathe slowly (approximately eight breaths a minute) and diaphragmatically (with their abdomen but not their chest moving as they breathe) with their mouth open wide to prevent swallowing. If this was successful patients



**Figure 1** Combined high-resolution manometry, pH and impedance monitoring in a patient with excessive belching and gastro-oesophageal reflux symptoms. The upper oesophageal sphincter is at the top of the figure and the lower oesophageal sphincter and stomach at the bottom. Contraction and aboral movement of the diaphragm creates an increased negative pressure in the oesophagus, with subsequent relaxation of the upper oesophageal sphincter. This results in an inflow of air into the oesophagus, seen as a progressive rise in impedance progressing down the oesophagus, followed by the immediate retrograde expulsion of air (air sucking). The supragastric belch is associated with lower oesophageal sphincter relaxation and reflux of acid into the oesophagus on the pH trace (the lowest white line) in the lower part of the figure.

were asked to perform the same technique whilst sitting and continue daily practice at home. At home patients were asked to keep their mouth open initially but when in public asked to keep it slightly ajar. Wide mouth opening was used to abort a belching attack.<sup>31</sup> Anecdotally, asking a patient to protrude their tongue or keeping their mouth slightly ajar has been noted to stop an attack of belching during a consultation.

Dietary modification is often recommended in patients with excessive belching. This includes the avoidance of chewing gum and carbonated drinks, drinking through a straw, eating slowly and encouraging small swallows.<sup>6</sup> Baclofen (an agonist of the  $\gamma$ -aminobutyric acid receptor) has recently been shown to be effective in reducing the symptoms of supragastric belching by increasing lower oesophageal sphincter pressure and decreasing swallowing rate.<sup>32</sup> Side effects of drowsiness and difficulties concentrating, although mild, were reported in 33% of patients in the study, limiting its benefit as a potential therapeutic agent. Clonazepam has been successfully used to treat aerophagia in children, with a reported remission rate of 66.7%.<sup>33</sup>

If it is thought from the patient's symptoms or investigations that GORD might be a contributory factor in excessive belching, then PPI therapy should be started. If belching remains a major concern then the above behavioural measures can also be instituted. Anti-reflux surgery will reduce the frequency of gastric belching but is likely to result in bloating with retained swallowed air owing to the impairment in belching after surgery and is not indicated outside the treatment of GORD.<sup>16 23</sup>

**CONCLUSIONS**

Excessive belching is the result of excessive supragastric or gastric belches or aerophagia, and can occur as a symptom associated with GORD. When patients present with belching as the predominant symptom, supragastric belches are the main cause with a typical pattern seen on HRM and impedance studies. Excessive belching, especially supragastric, can be considered a behavioural or functional disorder, with organic pathology rarely found. There is a lack of controlled trials of effective treatment, although behavioural therapies appear promising.

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