CASE REPORT - OPEN ACCESS

International Journal of Gastroenterology Hepatology and Endoscopy DOI: https://dx.doi.org/10.51521/IJGHE.2021.1101

Contents lists available at bostonsciencepublishing.us

International Journal of Gastroenterology Hepatology and Endoscopy

Rumination Syndrome: The Forgotten Offender

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A R T I C L E I N F O

Article history:
Received 13 September 2021
Revised 18 October 2021
Accepted 20 October 2021
Published 25 October 2021

A B S T R A C T

Rumination syndrome is a condition that is underdiagnosed and not well understood. It's a repetitive and effortless habit but becomes a subconscious process that affects children and adults that are developmentally challenged as well as healthy patients of all ages. It carries social stigmata and impacts one's health. We describe a case of a middle-aged woman suffering from this for majority of her life and once successfully diagnosed, she underwent biofeedback therapy and diaphragmatic breathing technique with remarkable improvement in her quality of life.

KEYWORDS: Motility, Esophagus, Manometry, Rumination

Introduction

Rumination syndrome is a condition that is usually underdiagnosed and not very well understood by many clinicians. It is a repetitive and effortless habit, although it becomes a subconscious process, that not only affects children and adults that are developmentally challenged but also impacts otherwise healthy patients of all ages [1]. The process of rumination is one that is surprisingly involuntary learnt behavior, and can be diagnosed with the aid of combined esophageal impedance-manometry testing. Pathophysiologic mechanism involves contraction of the abdominal wall muscles, which translates into an increase in the intra-gastric pressure followed by relaxation of the lower esophageal sphincter and the process of regurgitation of the recently ingested food particles [1-3]. To allow the upper esophageal sphincter to open, a forward extension movement of the head can also be seen simultaneously [1,2]. This is an important condition to diagnose as it not only carries social stigmata but also impacts one's health and can lead to weight loss, and poor dentition. The mainstay of treatment is noninvasive and inexpensive. Here we describe a case for a middle-aged woman who was suffering from rumination syndrome for majority of her life (48 years' duration) and once she was successfully diagnosed, she underwent biofeedback therapy and diaphragmatic breathing technique with a remarkable improvement in her symptoms and quality of life.

CASE REPORT

A 68-year-old female with past medical history significant for Gastroesophageal Reflux Disease (GERD) and diabetes mellitus, who presented to the esophageal motility clinic with chief complaint of chronic regurgitation for more than 48 years, of food immediately after she eats, causing her a lot of social distress. She would have to re-chew the regurgitated food and this could last for up to 2 hours. In addition, she was complaining of postprandial heartburn and cough, but she denied dysphagia, chest pain or weight loss. As a result, her social and functional status was significantly impaired as she worked as a tour guide. She had an extensive evaluation in the past with unremarkable upper endoscopy, barium esophagram, gastric emptying study and a normal high-resolution esophageal manometry. Examination was unremarkable except for moderate obesity and severe dental caries. Esophageal manometry revealed an unremarkable study with normal contraction amplitude seen for liquid and viscous swallows, complete bolus transit and normal LES profile. 24-hour pH-impedance reflux monitoring testing while on acid suppression revealed poor gastric acid control and a slightly abnormal upright acid exposure (1.6%) suggestive of retrograde movement of the gastric contents. However, it did reveal a normal recumbent esophageal acid exposure. A total of 94 reflux episodes were seen (50 non-acid, 44 acid related) during the study. A symptom index (SI) showed positive association for cough (SI = 21/23) and a negative association for indigestion (SI = 0/2). Baclofen 10 mg TID was tried for 1 month, however there was only a minimal response. The patient was asked to bring a meal that provokes her regurgitation symptoms to the laboratory. The high-resolution manometry-impedance catheter was advanced to 5-cm below the lower esophageal sphincter to have it situated within the gastric cardia to measure intra-gastric pressure. Over the 1-hour study, total of 39 episodes of regurgitation were observed (Figure 1). The episodes were preceded by an increase in intra-gastric pressure (>30 mmHg), and followed immediately by a normal swallow to clear up the regurgitated food. These events were typical for rumination syndrome, and the patient was complaining of cough shortly after the rumination events. The patient underwent Biofeedback therapy where she was shown the occurrence of rumination episodes and was explained the mechanism behind it, including the involuntary

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increase in gastric pressure followed by opening of the lower esophageal sphincter and increase in the intra-esophageal pressure to the same extent as the stomach (common-cavity phenomenon). Diaphragmatic breathing (DB) technique was then used as adjunctive modality for treatment. Initially, patient was instructed to perform DB for 3 different 5-minutes segments when encountering the rumination symptoms while eating and also at bedtime. Within few months she had impressive improvement in quality of social life (70-80% as per patient) and encountered significant relief of symptoms starting 1 month of DB therapy. A Likert scale was used to quantify patient's symptoms improvement, where she had considerable improvement in regurgitation, heartburn, belching, acidic taste in the mouth and bloating sensation especially with the combined use of biofeedback and diaphragmatic breathing technique (Figure 2). Repeat manometry after ingestion of a meal, 5-months later, showed only 9 episodes of rumination (4.3 folds decrease in rumination events). 14 cough symptoms were reported during the repeat manometry-impedance testing, but none was associated with rumination episodes.

DISCUSSION

Rumination is often misdiagnosed for other upper gastrointestinal disorders due to the lack of clinical awareness. Disorders like GERD, dyspepsia, eating disorders like bulimia, gastroparesis and chronic intestinal pseudo-obstruction are important clinical mimics due to the similar symptomatology on presentation [2]. There is a known association between bulimia and rumination syndrome that has been described and should be evaluated for eating disorders if they are suspected [2]. The timing of the regurgitation is an important aspect of the history as in rumination the symptoms occur early in relation to the meal (within 10 minutes after eating or even during the meal) as opposed to disorders like GERD In which it occurs an hour or later after the meal [2]. Hence the regurgitated food in rumination syndrome tastes similar to when initially ingested until it becomes acidic in nature [2]. Patients also don't usually report pain but there is often associated weight loss [2]. Rumination tends to occur with almost every meal that is ingested and even occurs after intake of liquids as well [1]. Diagnostic studies like endoscopy and esophageal pH-impedance monitoring can be used to aid in the diagnosis. However, endoscopy can be very non-specific as it may reveal some esophagitis and that can be seen in rumination syndrome in addition to other disorders [1]. Esophageal 24-hour pH-impedance monitoring could reveal multiple episodes of reflux followed by a clearance swallows, with lack of these events nocturnally [1]. Despite the high magnitude of reflux and regurgitation that is seen, there is only a small portion of the time where esophageal pH goes below 4 due to the food counteracting the acidic gastric fluid [1]. On manometry, (with advancing the catheter further down into the stomach) an increase in the intra-gastric pressure is usually seen before or just at the same time as retrograde movement of intra-esophageal contents that is detected on impedance measurement [1]. The pressure at the level of the lower esophageal sphincter (LES) must be lower than that of the intra-gastric pressure to allow for the retrograde movement of the gastric contents. The low pressure at the level of the LES can be secondary to a prolonged lowering of the pressure seen postprandially vs. transient relaxations of the lower esophageal sphincter (TLESR) [1]. The combined use of esophageal manometry and impedance study is highly useful for diagnosis of rumination syndrome and to help differentiate it from disorders like GERD. Combined multichannel intraluminal impedance and manometry (MII-EM) can depict the increase in the intra-abdominal pressure and the associated retrograde movement of gastric contents into the esophagus independent of the changes in pH that occur in patients with rumination and can help to differentiate that from GERD [4]. During stationary and ambulatory manometry, peak gastric pressure > 30 mm Hg are seen in all cases of rumination syndrome but such elevated pressures are not seen in cases of GERD [3]. This pressure threshold has been used to aid in the diagnosis of rumination syndrome [3]. There are three subtypes of rumination syndrome based on stationary manometry. In primary rumination syndrome, there is a rise of intra-gastric pressure that precedes the retrograde movement of gastric contents into the esophagus [3]. Secondary rumination resembles the primary, however there is initially a spontaneous gastro esophageal event prior to the rumination [3]. Supragastric-belch associated rumination involves the rise of intra-gastric pressure which occurs during expulsion of air and heralds the retrograde movement of gastric contents [3]. Repetitive episodes of rumination can occur and can be seen as primary or supragastric belch associated rumination. Once a diagnosis is successfully established, appropriate treatment can be implemented.

There are various approaches to treatment for rumination syndrome including behavioral therapy targeted to counteract this subconscious habit, medical and surgical measures aimed at increasing the tone of the lower esophageal sphincter [1]. Behavioral therapy and biofeedback both effectively inhibit the urge to regurgitate. Prior to initiating therapy an informed discussion must be held to educate the patient on the nature of their condition. The most effective therapy is behavioral modification using diaphragmatic breathing in which the patient is taught to use this technique in prandial and post-prandial phases to alleviate the involuntary contraction of the

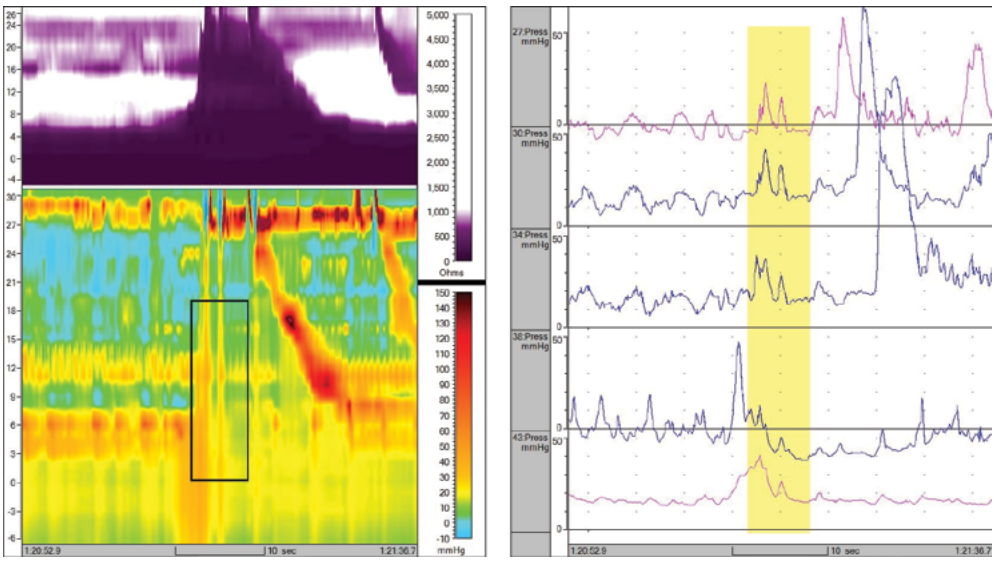

Figure 1: Esophageal high-resolution impedance-manometry showing sudden increase in intra-gastric and intra-esophageal pressure secondary to rumination, followed by a normal swallow to clear the regurgitated food (Left-hand side). Conventional manometry showing increased intra-gastric and intra-esophageal pressure followed by normal swallow (Right-hand side).

Likert scale for symptom assessment

	1 month (Baclofen only)	2 months (1 month of BF/DB)	5 months (4 months of BF/DB
Regurgitation	4/5	2/5	2/5
Heartburn	2/5	0/5	0/5
Belching	4/5	2/5	1/5
Acid taste in mouth	3/5	0/5	1/5
Bloating	2/5	2/5	0/5

Figure 2: Patient's symptom improvement on Likert scale (0=no symptoms, 5=most severe symptoms); 1, 2 and 5 months throughout the treatment. Five months throughout treatment, patient had 50% decrease in regurgitation, resolution of heartburn, 75% decrease in belching, 67% decrease in acid taste in mouth and resolution of bloating sensation with use of biofeedback (BF) and diaphragmatic breathing (DB).

Diaphragmatic breathing

(Chitkara, Van Tilburg, Whitehead, & Talley. Teaching Diaphragmatic Breathing for Rumination Syndrome, AJG 2006)

Figure 3: Diagrammatic representation of diaphragmatic breathing. Patient is taught to place a hand on chest and the other hand on abdomen. While breathing, the hand on chest should stay still and the one on the abdomen moves to involve the diaphragm, rather than the rib cage, in breathing pattern.

Rome IV criteria for Rumination Syndrome

Must include all of the following:

1. Repeated regurgitation and re-chewing or expulsion of food that:
   a. Begins soon after ingestion of a meal
   b. Does not occur during sleep
2. Not preceded by retching
3. After appropriate evaluation, the symptoms cannot be fully explained by another medical condition. An eating disorder must be ruled out.

** Criteria fulfilled for at least 2 months before diagnosis.

Figure 4: Rome IV Criteria for Rumination Syndrome.

abdominal musculature which initiates the process of rumination [1,2]. This process can be taught by a clinician/medical staff or a behavioral psychologist and involves placing a hand on the chest and the other hand on the abdomen so that movement of the abdomen during respiration is altered and only the hand on the abdomen should be moving during respiration (Figure 3) [1]. In cases of secondary rumination, treating the reflux with acid suppression in addition to the biofeedback therapy can help reduce the episodes of rumination [3]. For supragastric-belch associated rumination the use of speech therapy has also been shown to be effective [3]. Other techniques like chewing gum can be effective in children [1]. Medical measures like prokinetic agents like Levosulpiride and agents like Baclofen (increases pressure at LES post prandially and inhibits the transient relaxations of the LES (TLESR)) have also been used [1]. As acid reflux can prompt the episodes of secondary rumination, Nissen's fundoplication is a surgical measure that can be used in some patients, though it can lead to adverse effects like gas bloat syndrome, retching and gastroparesis and there is not sufficient evidence regarding it's benefit [1,3]. As rumination is a perplexing and distressful condition that can remain undiagnosed for prolonged periods, it requires a high clinical index of suspicion. It can be diagnosed with clinical symptomatology and criteria (Rome IV criteria-Figure 4) along with combined esophageal manometry and impedance testing. Once diagnosis is established, biofeedback and behavioral modification therapy with diaphragmatic breathing can be implemented to achieve reduction in symptoms and improvement in quality of life.

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