REVIEW

Managing a patient with rumination

Benjamin Disney, Nigel Trudgill

Department of Gastroenterology,
Sandwell General Hospital,
Lyndon, West Bromwich, UK

Correspondence to

Dr N J Trudgill, Department of
Gastroenterology, Sandwell
General Hospital, Lyndon,
West Bromwich B71 4HJ, UK;
nigel.trudgill@nhs.net

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Clinical case

A young woman with persistent vomiting was referred by her general practitioner. On detailed questioning, the patient reported an 8-month history of daily regurgitation of undigested food within minutes of eating. There was no preceding nausea. She reported no abdominal pain; however, she had lost 19 kg from a weight of 75 kg before her illness. Her family were concerned that she had an eating disorder, which was ruled out after a psychiatric evaluation.

In view of her significant weight loss, she underwent extensive investigation, including an oesophagogastroduodenoscopy, barium follow-through, CT and MRI head and synacthen test, all of which were normal. Standard oesophageal manometry and a 24 h pH study were also normal. She had recurrent admissions to hospital and required periods of enteral feeding for nutritional support. Proton pump inhibitors and antiemetics were of no symptomatic benefit. She was eventually referred for high-resolution manometry (HRM) and impedance monitoring with a test meal, which confirmed the diagnosis of rumination syndrome. The patient subsequently responded well to behavioural therapy.

associated with gastro-oesophageal reflux disease (GORD), or in some cases as an eating disorder.^{1–3} The exact prevalence of the condition is unknown. Patients are often referred to several different physicians, undergoing multiple and often repeated investigations, and have symptoms for up to 6.5 years before a diagnosis is made.^{1–3} In one study, up to 11% of patients with rumination syndrome had symptoms for greater than 5 years prior to diagnosis, with only 4% having a diagnosis made within 6 months of symptom onset.² Rumination syndrome is classified as a functional gastroduodenal disorder. Historically, rumination syndrome was considered a disorder of childhood, or in subjects with significant neurodevelopmental delay, or it was associated with eating disorders.^{1–4–5–8} It is now recognised in patients of all ages (in one study, the age range was 18–68 years) and cognitive abilities, with a higher incidence among females (up to 74%).^{1–3–7–9–10} Although the exact aetiology is unclear, patients often report the onset of symptoms following acute infection, surgery, psychological stress or major life events.^{2–6–11} Despite this, rumination occurs in the absence of such precipitating factors in most patients.¹⁰

INTRODUCTION

Rumination is derived from the Latin ‘ruminare’, the literal translation being to chew the cud. It has long been recognised in animals (eg, sheep and cattle) in whom food is regurgitated, rechewed and reswallowed, as an essential part of the digestive process.¹

Rumination syndrome is the voluntary, albeit subconscious, return of gastric contents into the mouth followed by remastication, reswallowing or expulsion.² It is underdiagnosed, probably due to limited awareness of the condition, and is often misdiagnosed as dyspepsia, persistent vomiting, gastroparesis, regurgitation

CLINICAL FEATURES

Typical clinical features of rumination syndrome are summarised in box 1. Effortless regurgitation of recently ingested food and liquid is the cardinal symptom of rumination syndrome. This is usually not preceded by nausea or retching.^{6–7–10} Symptoms often start within minutes of eating and last for 1–2 h postprandially.^{1–3–6–9} The regurgitant is often recognisable undigested food, and is typically not described as acidic, bitter, or sour in taste. Sufferers often rechew, and up to 50% of sufferers reswallow the regurgitant.^{1–6} The patients make a conscious decision regarding the regurgitant once it is present in the

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oropharynx, which may depend upon the social situation at the time.¹² Symptoms generally cease when the regurgitant becomes acidic. Halitosis is often a reason for referral.⁶ Weight loss is seen in a significant proportion (37–42%) of patients.^{1–3} Symptoms of postprandial ‘vomiting’ and weight loss in an adolescent predominantly female population often raise the question of an eating disorder.⁸ Many patients have prior admissions to hospital, and a small proportion (11% in one study) of patients require enteral or parenteral feeding for nutritional support.⁹ The symptoms of rumination syndrome may have a severe impact on a patient’s quality of life.^{3–9}

DIAGNOSIS AND INVESTIGATION

The major difficulty with diagnosis is often a lack of awareness of the condition.^{1–6,7}

The key to diagnosis is a thorough history, and in the majority of patients a typical history may be all that is required for a diagnosis of rumination syndrome.^{1–9,10} The diagnosis of rumination syndrome in adults should be based on the Rome III criteria¹² and include both the following:

1. Persistent or recurrent regurgitation of recently ingested food into the mouth with subsequent spitting or remastication and swallowing.
2. Regurgitation is not preceded by retching.

The supportive criteria for a rumination diagnosis are first, regurgitation events are usually not preceded by nausea; second, cessation of the process when the regurgitated material becomes acidic; and last, regurgitant contains recognisable food with a pleasant taste (box 2). The diagnostic criteria in adolescents and infants have similar features (box 2).

In patients with an atypical pattern of symptoms, for example, when nausea, gastro-oesophageal reflux symptoms, abdominal pain or swallowing difficulties are reported, GORD, achalasia, gastric outlet or small bowel obstruction and delayed gastric emptying should be considered and ruled out through endoscopy, gastric emptying studies, imaging of the stomach or small bowel and oesophageal manometry and pH studies.¹³ In patients in whom concerns are raised regarding the possibility of an eating disorder, a psychiatric evaluation should be sought. In the case of diagnostic uncertainty, and in cases of poor patient acceptance of a possible diagnosis of rumination, combined high-resolution manometry (HRM) and impedance monitoring with a test meal may confirm the diagnosis.^{2,10,14–17}

Rumination is thought to occur due to voluntary, although subconscious, abdominal wall contraction leading to increased intra-abdominal pressure and simultaneous lower oesophageal sphincter relaxation.^{11,18} Combined HRM with impedance monitoring classically shows an abrupt rise in intragastric pressure (abdominogastric 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 (figure 1). This is usually followed by primary or secondary oesophageal peristalsis to return oesophageal contents to the stomach. There may be an overlap with other gastrointestinal disorders such as GORD and belching.² Combining impedance studies with HRM helps to distinguish between rumination and belching-regurgitation, as it allows differentiation between the liquid reflux typically seen with rumination and the gas reflux seen with belching.¹⁶

MANAGEMENT

In many patients, recognition and explanation of the diagnosis of rumination syndrome and reassurance may be all that is required as treatment.⁶ It should be explained that rumination is precipitated by an involuntary habit, with subconscious contraction of the abdominal muscles causing the regurgitation.¹⁹

There is a lack of controlled data on effective therapies for rumination syndrome. Behavioural therapies, biofeedback and diaphragmatic breathing are the mainstays of treatment.^{3–9,19–23} These therapies aid relaxation of the abdominal wall and reduce the abdominal wall contractions, which may induce symptoms. Even a single, brief intervention can help suppress ruminating events.² Such behavioural interventions result in significant improvements in patients’ symptoms, with up to 30–43% of patients reporting complete symptom resolution and a further 28–55% reporting partial improvement.^{2,9}

Diaphragmatic breathing is easy to learn and can be demonstrated to a patient during a routine clinic visit. Patients are asked to sit in a relaxed position. One hand is placed on the chest and the other on the abdomen just below the rib cage at the bottom of the sternum. The aim is to keep the hand on the chest almost still, while the hand on the abdomen rises and falls with the diaphragmatic breath. Each breath should last at least 3 s. Patients are encouraged to practice, and use, this technique during meals and following an episode of rumination. As a result, this pattern of breathing will begin to feel natural and may occur subconsciously.¹⁹ If these brief interventions are not effective then referral to a specialist behavioural psychologist has been recommended.^{2,19}

Medications such as proton pump inhibitors (PPI) and antiemetics are often prescribed but are not of clear benefit in reducing symptoms.^{1–2,10} PPIs may, in fact, lengthen the period of rumination following a meal, which usually ceases when the food in the stomach becomes acidic.¹⁰ Chewing gum in the postprandial period has been shown to reduce rumination in the paediatric population.^{24,25} Baclofen (an agonist of gamma-aminobutyric acid receptor) has recently been shown to be effective in reducing the symptoms

Figure 1 Combined high-resolution manometry (HRM) and impedance monitoring following a test meal in a subject with rumination syndrome. The upper oesophageal sphincter is at the top of the figure and the lower oesophageal sphincter and stomach at the bottom. A sudden increase in intra-abdominal pressure due to subconscious abdominal muscle contraction is associated with lower oesophageal sphincter relaxation and there is retrograde movement of gastric contents on HRM and impedance. The rumination episode is followed by reswallowing of the regurgitant. (Figure courtesy of Dr J de Caestecker).

of rumination syndrome.²⁶ The reduction in rumination episodes with baclofen appeared to correlate with increasing basal lower oesophageal sphincter pressure rather than with reducing the number of transient lower oesophageal sphincter relaxations, but it is possible that central effects of baclofen play a more important role.²⁶ Unfortunately, baclofen's value in rumination may be limited by the common side effects of sedation and drowsiness with this agent. Low dose tricyclic antidepressants, to reduce gastric hypersensitivity, have been used as an adjunct, when pain is a significant symptom in combination with rumination.^{2, 27}

In patients refractory to medical and behavioural therapy, surgery in the form of a Nissen fundoplication has been reported to be an effective therapy for rumination syndrome.²⁸ However, reports of successful surgery for rumination are limited to one small case series, with another case series describing five patients who were diagnosed after having had antireflux surgery, three of whom had had unrecognised rumination as the indication for their surgery.^{2, 28} Surgery should be considered in refractory cases, particularly with significant nutritional problems, but appropriate counselling is important to mitigate the danger of the patient exchanging rumination for

troublesome postfundoplication symptoms such as gas-bloat.

CONCLUSIONS

Rumination syndrome is an under-recognised condition with a characteristic history. Although most diagnoses are made on symptomatic grounds, many patients undergo extensive investigation before a diagnosis is reached. Combined HRM and impedance studies after a meal can confirm the diagnosis. Once diagnosed, reassurance and behavioural therapies are the mainstay of therapy.

Box 1 Typical clinical features of rumination syndrome

- ▶ Recurrent effortless regurgitation of undigested or partially digested food
- ▶ Regurgitant lacking an acidic, bitter or sour taste
- ▶ Ability to swallow the regurgitant material
- ▶ Absence of nausea or retching
- ▶ Symptom onset within minutes of eating, lasting 1-2 hours
- ▶ Weight loss

Box 2 Rome III diagnostic criteria for rumination syndrome in adults, adolescents and infants (<http://www.romecriteria.org/>)

Rumination syndrome in adults

- ▶ Must include both of the following (criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis):
 - Persistent or recurrent regurgitation of recently ingested food into the mouth with subsequent spitting or remastication and swallowing
 - Regurgitation is not preceded by retching
- ▶ Supportive criteria:
 - Regurgitation events are usually not preceded by nausea
 - Cessation of the process when the regurgitant material becomes acidic
 - Regurgitant contains recognisable food with a pleasant taste

Rumination syndrome in adolescents

- ▶ Must include all of the following for the last 3 months with symptom onset 6 months prior to diagnosis:
 - Repeated painless regurgitation and re-chewing or expulsion of food that
 - Begin soon after a meal
 - Do not occur during sleep
 - Do not respond to standard treatment for gastro-oesophageal reflux
 - No retching
 - No evidence of an inflammatory, anatomic, metabolic or neoplastic process that explains the subject's symptoms

Rumination syndrome in infants

- ▶ Must include all of the following for at least 3 months:
 - Repetitive contractions of the abdominal muscles, diaphragm and tongue
 - Regurgitation of gastric content into the mouth, which is either expectorated or re-chewed and re-swallowed
 - Three or more of the following:
 - Onset between 3 and 8 months
 - Does not respond to management of GORD or to anticholinergic drugs, hand restraints, formula changes and gavage or gastrostomy feedings
 - Unaccompanied by signs of nausea or distress
 - Does not occur during sleep and when the infant is interacting with individuals in the environment

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