

## OUTPATIENT MORNING REPORT

**Postprandial Abdominal Pain in a Young Anorexic Woman**

Kevin Quinn, MS4 (presenter); Mohamed Zghouzi, MD (discussant, in italic); and Priya Radhakrishnan, MD

*Dr. Quinn is a fourth-year medical student from Creighton University rotating through St. Joseph's Hospital & Medical Center, and Dr. Zghouzi is a second-year resident in internal medicine at St. Joseph's Hospital & Medical Center in Phoenix, AZ. Dr. Radhakrishnan served as senior author on this case.*

**A**n 18-year-old female with anorexia nervosa and irritable bowel syndrome presents to clinic as a new patient with a complaint of abdominal pain after eating. She states that she experiences severe abdominal pain after eating and drinking even small amounts of food or liquid. Associated symptoms include postprandial fullness, bloating, and nausea. The patient states that she feels as if the food “just sits in her stomach.” She has a six-year history of anorexia nervosa requiring several hospitalizations for intensive management. This woman currently purges daily and states that self-induced vomiting helps to relieve her abdominal pain and anxiety. In addition to the abdominal pain, she complains of weakness, recent weight loss, nausea, vomiting, diarrhea, constipation, amenorrhea, and anxiety. Her medications include colace, ducosate, omeprazole, K-Lor, and seroquel.

*This patient presents with likely complications from a long history of anorexia nervosa (AN). AN is a common psychiatric disorder most prevalent among female adolescents and young women. This disorder affects up to 1% of college-aged women and has a female to male ratio of 20:1.<sup>1</sup> AN is characterized by an inability or unwillingness to maintain a weight that is normal or expected for age and height. This is associated with a distortion in body image and an intense fear of gaining weight. AN is divided into two subtypes: restricting type and binge-eating/purging type. In restricting AN, individuals maintain a low body weight by limiting caloric intake or exercising excessively.*

*Binge-eating/purging AN is characterized by episodes of excessive eating and/or purging behavior, including self-induced vomiting and inappropriate use of laxatives or diuretics.<sup>2</sup> The management of patients with AN can be a real challenge for physicians due to its often persistent course, psychiatric co-morbidities, medical complications, and high mortality. Thus, it is important to be familiar with AN, the medical complications that may arise, and the treatment available for these patients.*

Physical examination reveals a very thin woman who appears younger than her stated age with a blood pressure of 111/75 mmHg, heart rate of 98 beats/minute, weight of 82 lb, and BMI of 15.49 kg/m<sup>2</sup>. Nine months prior, she had a documented weight of 109 lb. On physical exam, the patient appears cachectic with bitemporal wasting. Other pertinent findings include a scaphoid abdomen with epigastric tenderness to deep palpation. Review of her records shows a history of hospital admissions due to malnutrition and related complications, including bradycardia and various electrolyte abnormalities.

*Cardiovascular complications contribute to the high mortality in patients with AN. These complications may present with both structural and functional abnormalities of the cardiovascular system. Structural abnormalities include decreased ventricular mass and size, pericardial effusions, and an increased incidence of mitral valve prolapse (MVP).<sup>2</sup> Extreme weight loss in patients with AN leads to atrophy of the myocardium and a resulting decrease in both heart*

*mass and ventricular size. This results in decreased cardiac output, hypotension, decreased capacity for exertion, and fatigue.<sup>2</sup> MVP is also common due to atrophied myocardium in the presence of mitral valve structural tissue that remains unchanged in size. MVP often presents as chest pain or palpitations in these individuals.<sup>1,2</sup>*

*Functional cardiovascular changes include bradycardia, hypotension, arrhythmias, and QT prolongation. Sinus bradycardia is the most frequently encountered cardiovascular abnormality in AN. This represents an adaptive response of the heart to a decrease in caloric intake and is thought to be due to increased vagal activity. These patients present with weakness and lightheadedness secondary to decreased cardiac output. In the setting of coexisting arrhythmias or QT prolongation, however, serious complications, including sudden death, may occur. There is controversy as to whether QT prolongation in the setting of AN is directly associated with AN or due to an associated electrolyte abnormality or underlying congenital long QT syndrome. Regardless, QT prolongation predisposes individuals to life-threatening ventricular arrhythmias, including torsade de pointes.<sup>2</sup> Due to cardiac arrest secondary to such arrhythmias, AN has the highest mortality rate of all mental disorders.<sup>1</sup> Thus, these patients need to be closely monitored and treated appropriately to prevent cardiovascular-associated mortality. Most cardiovascular abnormalities associated with AN eventually resolve with*

continued on page 2

## OUTPATIENT MORNING REPORT

continued from page 1

*weight restoration and correction of electrolyte abnormalities.<sup>1,2</sup>*

Prior to her last admission three months ago, the patient was found to have several electrolyte abnormalities, including hypokalemia, hypophosphatemia, and hypochloremic metabolic alkalosis.

*Electrolyte abnormalities are common in binge-eating/purging AN, while electrolytes in restricting AN are generally normal. Hypokalemia is relatively common and is a result of excessive vomiting and diuretic or laxative misuse. Hypochloremic metabolic alkalosis often occurs with hypokalemia in individuals who vomit excessively or abuse diuretics. However, in the setting of laxative abuse, the loss of excessive potassium and bicarbonate in the feces leads to hypokalemic, hyperchloremic metabolic acidosis.<sup>3</sup> Hypophosphatemia, hypomagnesemia, and hypocalcemia may also occur as a result of AN or as part of the refeeding syndrome.<sup>3</sup> Additionally, patients with AN may have a reduced glomerular filtration rate, leading to an inability to concentrate the urine and subsequent dehydration. Prior to refeeding, patients should be properly rehydrated, and electrolytes should be repleted.<sup>2</sup>*

Further history and workup reveals a several-month history of amenorrhea, hypoglycemia, and abnormal thyroid function testing ( $T_4$  4.5  $\mu\text{g/dL}$ ,  $T_3$  53  $\text{ng/dL}$ , and TSH 4.86  $\text{mU/L}$ ).

*Amenorrhea is present in more than 95% of all females with AN.<sup>1</sup> In patients with AN, the normal pulsatile release of gonadotropin-releasing hormone from the hypothal-*

*amus is reduced. This leads to decreased follicle-stimulating hormone and luteinizing hormone release from the pituitary and ultimately to decreased levels of estrogen. This functional hypothalamic amenorrhea prevents ovulation.<sup>2</sup> The best way to restore menses is weight gain, although 10% to 30% of patients remain amenorrheic despite return to normal weight.<sup>1,2</sup>*

*A number of other endocrine complications are associated with AN. Mild hypoglycemia is common due to depleted hepatic glycogen stores and disruption of hepatic gluconeogenesis as a result of dietary restriction, weight loss, and excessive exercise.<sup>2</sup> Although usually asymptomatic, severe hypoglycemia suggests a poor prognosis.<sup>1</sup> Thyroid function test abnormalities are also common. This typically presents as euthyroid sick syndrome, which consists of low to normal serum  $T_4$  and  $T_3$ , normal TSH levels, and increased levels of reverse  $T_3$ . Thyroid replacement therapy is not indicated in this setting, as these abnormalities correct with weight gain.<sup>1</sup>*

Upon further review, a DEXA scan in the last year shows the presence of osteoporosis in the patient's lumbar spine and osteopenia in her left hip.

*Osteoporosis is seen in up to 50% of females with AN and is of big concern due to potentially permanent complications, including an increased risk of debilitating fractures.<sup>1</sup> The lumbar spine is the most affected site, and bone loss in patients with AN is thought to occur at a rate of 4% to 10% per year.<sup>2</sup> The pathogenesis of osteopenia and osteo-*

*porosis is multifactorial. The severity of bone density loss appears to be closely linked to amenorrhea age of onset and duration along with the degree of weight loss.<sup>4</sup> In addition to hypoestrogenemia, however, other factors attributed to the development of osteoporosis include severe malnutrition, decreased calcium intake, excessive exercise, hypercortisolemia, and decreased levels of IGF-1. It is recommended that any patient with AN and amenorrhea for more than six months should undergo testing for baseline bone mineral density with a DEXA. Repeat testing should be done every two years.<sup>1,2</sup> The most important treatment is early weight restoration and resumption of menses. Other therapies include supplemental calcium and vitamin D. Although controversial, supplemental estrogen and bisphosphonates may have a role in more severe cases.<sup>1,4</sup>*

Due to chronic postprandial abdominal pain, the patient is referred to a gastroenterologist and eventually undergoes an upper endoscopy to assess the nature of her dyspepsia. EGD shows mild gastritis and poor gastric fundus accommodation likely secondary to AN.

*Gastrointestinal complications are common in AN. Frequent complaints include constipation, abdominal pain, bloating, early satiety, and nausea after eating. Many of these symptoms are the result of impairment in the upper part of the GI tract, leading to gastroparesis, or delayed gastric emptying, and prolonged GI transit time.<sup>4</sup> Gastroparesis occurs with food restriction and with weight loss of 10*

continued on page 3

## OUTPATIENT MORNING REPORT

continued from page 2

to 20 lbs. Typically gastroparesis resolves with weight restoration in four to six weeks. In the meantime, however, it can be managed conservatively with early ingestion of liquid food supplements, multiple small meals, and avoiding excessive fiber. Metoclopramide, which increases gastric emptying and motility, may also be useful.<sup>2</sup> Constipation that frequently accompanies weight loss in AN may also be managed conservatively with hydration, low doses of fiber, polyethylene glycol, and osmotic laxatives, such as lactulose, as a last resort.<sup>1,2</sup> Although both gastroparesis and constipation typically resolve with weight restoration, the accompanying symptoms of pain and bloating may hinder weight gain by discouraging eating.<sup>2</sup>

Despite regular follow-up involving several health professionals, this patient has continued to struggle with her AN. She continues to binge and purge regularly and has a current weight of 84 lb.

Management of AN is often difficult due to its protracted course and various medical and psychiatric comorbidities. Thus, this disease is best managed with a multidisciplinary approach, consisting of a primary care physician, psychiatrist, and dietitian, among other specialists. Despite this approach, prognosis remains poor, as 16% of patients still meet criteria for AN 10 years after initial diagnosis.<sup>1</sup> Mortality rates for all causes of death have been re-

ported to be up to six times higher than for the general population.<sup>4</sup>

Typically, AN can be managed on an outpatient basis with close follow up. However, in more severe cases or when certain complications are present, inpatient management may be necessary. Although no set guidelines exist, there are several generally accepted indications for inpatient treatment, including body weight 25% to 30% below ideal body weight, rapid and severe weight loss that fails outpatient management, heart rate less than 35 to 40 beats/minute, symptomatic hypotension, syncope, arrhythmias, or QT prolongation.<sup>5</sup>

As mentioned throughout, treatment for AN and its multitude of medical complications centers on weight restoration. Target goal weight is typically within 90% of ideal body weight.<sup>1</sup> To achieve this goal, outpatients and inpatients are encouraged to gain 1 lb and 2 to 3 lbs per week, respectively.<sup>1</sup> During this time, patients should be monitored very closely with weight checks and frequent measurements of electrolytes to avoid refeeding syndrome.<sup>1</sup>

### Key Points

- AN is a fairly common psychiatric disorder that may present with a number of acute and chronic medical conditions involving many organ systems. It is important to be familiar with these complications, available

treatment options, and indications for inpatient management.

- The most important treatment for AN is nutritional replenishment, as many of the associated medical complications resolve with weight restoration.
- Management of patients with AN requires a multidisciplinary approach, with active involvement of a primary care physician, psychiatrist, and dietitian, among others.

### References

1. Mehler PS, Krantz M. Anorexia nervosa medical issues. *J Women's Health* 2003; 12:331-40.
2. Mehler P. Anorexia nervosa in adults and adolescents: medical complications and their management. In: Yager J, ed. *UpToDate*. Waltham, MA: 2013.
3. Winston AP. The clinical biochemistry of anorexia nervosa. *Ann Clin Biochem* 2012; 49:132-43.
4. Meczekalski B, Podfigurna-Stopa A, Katulski K. Long-term consequences of anorexia nervosa. *Maturitas* 2013; 75:215-20.
5. Mehler PS. Diagnosis and care of patients with anorexia nervosa in primary care settings. *Series in Primary Care Internal Medicine* 2001; 134:1048-59.

SGIM