CASE REPORT

A woman who lost weight at the cost of her heartbeat

Rushikesh Shah,¹ Nidhi Bansal,² Divey Manocha²¹Department of Internal Medicine, SUNY Upstate Medical University, Syracuse, New York, USA²SUNY Upstate Medical University, Syracuse, New York, USA**Correspondence to**
Dr Rushikesh Shah,
rushishah.17@gmail.com

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SUMMARY

With increasing prevalence of obesity worldwide, the number of patients undergoing bariatric surgery is also rising. Although the incidence of adverse outcomes associated with bariatric surgery has reduced, the physiological compensatory changes occurring after weight loss can lead to some unavoidable outcomes. One such condition is sinus bradycardia. The pathophysiology behind this is well studied but there is little awareness about this outcome. Sinus bradycardia in this clinical setting is generally asymptomatic and does not require any treatment. Extensive cardiac workup and unnecessary treatment can be avoided by increasing awareness among healthcare providers.

BACKGROUND

Mesalamine has a relatively good safety profile but has been found to cause side effects such as hypersensitivity pneumonitis, myocarditis and interstitial nephrotoxicity. Hepatotoxicity, though rare, can also occur with the use of Mesalamine. Although Mesalamine induced hepatotoxicity is reversible upon cessation of the drug in most cases, it can, however, be fatal if not identified early on in the course. Community physicians and internists should be aware of this possibility.

CASE PRESENTATION

We present the case of a 46-year-old woman who presented to the ER with episodes of lightheadedness and syncope for the past 3 months. Her medical history included hypertension (HTN), osteoarthritis, morbid obesity and s/p Roux-en-Y (RNY) gastric bypass surgery 5 months earlier. She denied taking any medication which would affect cardiac rhythm. Symptoms would appear at any time during the day without any triggers. After RNY her body mass index (BMI) improved from 49.9 to 28.1. She felt very active and had no complaints. Physical examination during the episode revealed irregular heart rate of 34/min, blood pressure of 100/70. She denied any family history of cardiovascular disorder. She denied smoking, consumption of alcohol or use of illicit drugs.

INVESTIGATIONS

ECG showed sinus bradycardia with intermittent pauses. Echocardiogram showed normal ejection fraction and, surprisingly, revealed normalisation of left ventricular hypertrophy, which was reported in a study conducted 6 months prior to surgery. Metabolic profile, thyroid function and cortisol levels were within normal limits. The patient was

evaluated by cardiology for bradycardia but the workup was negative. Bariatric services were also consulted and finally it was concluded that her symptoms were due to an increased resting vagal tone and decreased resting metabolic oxygen demand after massive weight loss in the post-operative period. This condition is considered to be benign, has good long-term prognosis and does not require pacemaker placement. She was started on a scopolamine patch with complete resolution of bradycardia and other symptoms.

DIFFERENTIAL DIAGNOSIS

The patient's symptoms along with significant sinus bradycardia initially suggested a cardiac aetiology behind her presentation. Extensive cardiac work up was negative for acute coronary syndrome, any structural abnormality and conduction pathway abnormality. At this point, after consulting cardiology and bariatric surgery, the diagnosis of sinus bradycardia secondary to her significant weight loss was made and she was treated with an anticholinergic agent for her symptoms.

TREATMENT

The patient was treated with an anticholinergic agent for symptomatic bradycardia, which resulted in resolution of her symptoms. No further work up was done for her bradycardia.

OUTCOME AND FOLLOW-UP

The patient was followed up in our cardiology clinic 12 weeks later and was asymptomatic with heart rate ranging from 70 to 80. She was continued on a scopolamine patch with routine follow-up.

DISCUSSION

Obesity is a global pandemic and estimated prevalence of overweight and obesity in 2015 will be close to 2.3 billion and >700 million, respectively.¹ Obesity has been associated with increase in incidence of coronary artery disease, HTN and metabolic syndrome, which all lead to increase in morbidity and mortality. Bariatric surgery is offered as a treatment for morbid obesity and has shown favourable outcomes in terms of cardiovascular and all-cause mortality.² As perioperative outcomes are improving, the number of patients undergoing bariatric surgery is increasing.

A linear correlation between heart weight and body weight has been well-established and bariatric surgery has been shown to decrease ventricular mass indices.³ This favourable change was also

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observed in our patient on her echocardiogram. Resolution or improvement in cardiac systolic and diastolic function has also been reported after bariatric surgery, which has been hypothesised to be secondary to the role of enterocardiac axis. Glucagon-like peptide-1 levels rise after surgery and lead to increased myocardial glucose uptake and improvement in cardiac systolic function.⁴ Obese populations have high amounts of adipokines, cellular mediators released by adipocytes, which are known to have adverse effects on the cardiovascular system.

Patient's perspective

With increasing number of patients undergoing bariatric surgery, they should be informed about this possible physiological and unavoidable outcome associated with the surgery.

Learning points

- ▶ With increasing prevalence of obesity, the number of patients undergoing bariatric surgery is increasing. Along with other favourable outcomes, bariatric surgery also leads to some expected physiological changes.
- ▶ Sinus bradycardia is one such change that happens due to the effect of surgery on the enterocardiac axis. This condition is, in most cases, asymptomatic and does not require any treatment intervention.
- ▶ Increasing awareness among community physicians and internists about this fact can help to avoid unnecessary diagnostic work up or treatment intervention.

Leptin is one of the main adiponectins, and its role with associated tachycardia is well established. Obese patients with high leptin levels have significantly higher HR.⁵ After bariatric surgery the concentration of leptin decreases and leads to a decrease in HR.⁶ The drop in leptin level is proportional to the reduction in BMI, which could explain the association of magnitude in the drop in BMI and development of sinus bradycardia.⁶ Weight reduction has been shown to reduce sympathetic stimulation and augment parasympathetic drive resulting in improved resting cardiac vagal tone. The combination of these effects is believed to contribute to development of sinus bradycardia in postbariatric surgery patients. Sinus bradycardia is generally asymptomatic and does not require treatment. Even when it produces symptoms, as seen in our patient; it can be easily managed with parasympatholytics and does not require pacing.

Contributors RS and NB were the primary residents on the team taking care of the patient and did the primary write up. DM was a GI fellow on the case and helped to diagnose and proofread the manuscript.

Competing interests None.

Patient consent Obtained.

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