

Dumping Syndrome as a Complication of Laparoscopic Nissen Fundoplication in an Adult

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ABSTRACT

Background: Dumping syndrome is a recognized complication of various gastric surgical procedures, such as vagotomy, pyloroplasty, and gastrojejunostomy. However, it has not to date been reported following laparoscopic Nissen fundoplication in adults.

Case Report: We describe the case of a 34-year-old woman who developed late dumping syndrome following an uneventful laparoscopic Nissen fundoplication for gastroesophageal reflux disease.

Conclusion: This condition should be considered in patients who develop hypoglycemic symptoms following laparoscopic fundoplication.

Key Words: Nissen fundoplication, Laparoscopy, Dumping syndrome.

INTRODUCTION

Fundoplication as a surgical treatment for gastroesophageal reflux disease (GERD) was first described by Nissen in 1956.¹ Over the ensuing decades, a number of modifications were made to the original procedure, and in the early 1990s, progress in minimally invasive surgery facilitated the development of laparoscopic fundoplication. The laparoscopic approach offered a potentially more acceptable surgical option for patients with GERD with equivalent results to that of the open procedure.²⁻⁴ This resulted in many symptomatic patients, who previously did not wish to undergo open antireflux surgery, opting for laparoscopic fundoplication.

A number of recognized complications are associated with fundoplication surgery; these include dysphagia, gas-bloat syndrome, abnormal gastric motility, gastric hypersensitivity, and return of GERD symptoms.⁵ Dumping syndrome has been documented as a complication of open fundoplication⁶ and also in pediatric laparoscopic fundoplication.^{7,8} However, a literature search yielded no report of this as a complication of laparoscopic fundoplication in adults.

We report the case of a 34-year-old patient who developed late dumping syndrome following laparoscopic Nissen fundoplication.

CASE REPORT

A 34-year-old woman presented with a 6-year history of GERD. She did not wish to be on life-long medication with a proton pump inhibitor and sought a permanent surgical solution. Endoscopy demonstrated a small 3-cm to 4-cm hiatus hernia and evidence of moderate reflux esophagitis. Esophageal manometry and pH studies were undertaken that confirmed reflux disease.

A laparoscopic Nissen fundoplication was performed with a short 360-degree wrap secured with Ethibond incorporating the esophageal wall. The patient's hiatus was also repaired with plication of the crura over an intraesophageal bougie. Both vagus nerves were identified and left intact. She had an uneventful recovery and was discharged on the third postoperative day.

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At outpatient review 6 weeks later, she complained of mild dysphagia to solids as well as gas bloating and went on to have this successfully treated with endoscopy and balloon dilatation. She was re-referred by her general practitioner 5 months postoperatively with symptoms of postprandial dizziness, sweating, and light-headedness. This tended to occur 2 hours to 3 hours after meals. An opinion was sought from an endocrinologist who felt her symptoms might be related to a reactive hypoglycemia. A prolonged oral glucose tolerance test confirmed a hypoglycemic dip at 150 minutes to 180 minutes post glucose challenge, and a diagnosis of late dumping syndrome was made. The instigation of a low carbohydrate diet resulted in resolution of her symptoms.

DISCUSSION

Dumping syndrome falls into 2 types, early (osmotic) and late (hypoglycemic). In both instances, a large volume of gastric content is delivered to the duodenum or jejunum resulting in symptoms of dumping. Where the anatomy of the pyloric sphincter has been altered by pyloroplasty, or bypassed by gastrojejunostomy, dumping syndrome can be explained by the direct unhindered passage of gastric content to the small bowel. However, where the pylorus is intact, the exact mechanisms are poorly understood, but hypotheses include damage to the vagus nerve^{3,9} and disruption of gastric motility.⁵

Symptoms can broadly be divided into vasomotor (including tachycardia, sweating, palpitations, flushing, and dizziness) and gastrointestinal (nausea, cramping abdominal pain, and diarrhea). Early dumping, which occurs up to 45 minutes after a meal, is thought to result from the passage of a large volume of osmotic material into the small bowel, causing an influx of fluid from the intravascular space. The subsequent reduction in circulating volume, combined with the release of vasoactive substances, such as vasoactive intestinal polypeptide, causes the symptoms.

In late dumping, a similar set of symptoms occurs. However, they do not arise until 2 hours to 4 hours after a meal and are due to an entirely different mechanism. Here, a rapid delivery of sugars into the duodenum and consequent rise in blood sugar causes an excessive serum insulin response with subsequent rebound hypoglycemia.⁹ Symptoms of late dumping tend to be much more subtle and nonspecific than in the early syndrome, and the diagnosis may not always be considered. Confirmation is made by demonstrating a rebound hypoglycemia following a prolonged oral glucose tolerance test.

We have been unable to find any previous reports of late dumping syndrome in adults following laparoscopic Nissen fundoplication in the literature. The condition was described in 1983 following open fundoplication,⁶ and there have been several case reports and small studies of dumping syndrome following laparoscopic Nissen fundoplication in pediatric surgery.^{7,8} Reasons for this apparent prevalence in children are unclear. In their study of infants undergoing fundoplication, Samuk et al⁸ reported that almost 50% had major associated disorders, ie, neurological impairment, familial dysautonomia, or more than one disease. In addition, 86.6% of the patients developing dumping syndrome in this study had also undergone simultaneous gastrostomy, which was suggested by the authors to be a possible predisposing factor.

CONCLUSION

This is the first reported case of late dumping syndrome in an adult following laparoscopic Nissen fundoplication. The apparently high incidence of this in the pediatric literature might suggest that it is an underdiagnosed complication in adults. Clinicians should therefore be aware that this as a possible complication, and we would advocate early investigation by glucose tolerance testing, which is a relatively cheap and easy way to exclude postprandial hypoglycemia.

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