Obesity has far-ranging negative ramifications for patients’ health and remains a serious problem in the United States. Bariatric surgery has become a popular option for patients seeking to lose weight, but it is an invasive procedure with its own set of risks, leading patients and researchers to investigate potential alternatives such as gastric embolization. In this Q&A, Jafar Golzarian, MD, discusses the studies conducted thus far on gastric embolization, which remains an investigational procedure, and he offers his thoughts on where the research might lead. Dr Golzarian is the Director of Interventional Radiology and Vascular Imaging at the University of Minnesota in Minneapolis. He has been granted an investigational device exemption (IDE) to study gastric embolization, and he spoke about gastric embolization on Wednesday, February 7 at the International Symposium on Endovascular Therapy.

**VDM: How does gastric embolization for obesity work?**

**Dr Golzarian:** Gastric artery embolization has been proposed as an alternative to bariatric surgery for weight loss. The rationale is that people feel hungry when the hormone ghrelin is released by the fundus of the stomach. Researchers thought that reducing the blood supply to the fundus of the stomach might slow the release of ghrelin so that people feel less hungry and eat less.

A series of animal studies has examined the role of embolization of the left gastric artery in reducing weight. The first study was in swine and used liquid embolic agents. The researchers realized that the animals that were embolized gained less weight than those in the control group. Typically, younger animals grow and increase their weight, but the younger animals grew slower in the group that was embolized. These researchers also studied the concentration of ghrelin in the blood and found a reduction of ghrelin. In addition, they found that particles are better than liquid. More studies have shown that particle embolization may result in less complications and better outcomes than liquid embolics.

Recently, a nice study in 4 groups of animals showed that results are better if you embolize more vessels (between 2 and 4). Overall, animal studies show a consistent reduction of ghrelin and show that the technique is safe.

**VDM: Have there been any studies conducted or underway in humans?**

**Dr Golzarian:** There have been a few studies in humans. One group looked at patients who have left gastric embolization for gastrointestinal bleeds and compared them retrospectively with another group of patients who had embolization for other celiac branches for bleeding. They found that the patients who had left gastric embolization lost more weight than the patients who had embolization of other branches of celiac trunk.

A few studies are currently underway. One author from Georgia treated 6 patients. In their experience, left gastric embolization led to weight control and up to 10% reduction of weight over 6 months. A study from Dayton, Ohio from Dr. Sayed Mubin showed that 4 patients who had been embolized lost weight, but interestingly, they did not have a consistent reduction of ghrelin. However, there was a very good outcome for a diabetic patient. After embolization, that patient’s HbA1c was under control. This result is intriguing because it raises the possibility that even a 10% weight loss can help patients control their diabetes and may also help with other risk factors such as hypertension or hyperlipidemia. It’s possible that gastric embolization might one day be given not to morbidly obese patients but to patients who need help stabilizing other chronic diseases such as diabetes and hypertension.

The leading group studying gastric embolization is from Johns Hopkins with Dr Cliff Weiss. They have an IDE and have studied 5 patients for safety and 15 patients for safety and efficacy. Their data were recently presented and show that, on average, weight loss in their patients was about 12% at 1 month and up to 17% at 12 months. On average, the level of ghrelin in their patients was below the level prior to embolization.

Internationally, there was a study from China on 5 patients, and it showed successful results both in controlling weight and in controlling ghrelin. There is also a group in Egypt that studied 7 patients, and a group in Lebanon has studied 22 patients. These groups had good results and consistent weight loss in the majority of patients, though there were 2 patients who did not lose weight.
**VDM:** Have there been any concerns about complications from the procedure?

**Dr Golzarian:** Thus far, reported complications are mostly limited to small gastric ulcers. There have been 1 or 2 more major complications, such as splenic infarct or pancreatitis.

**VDM:** Under what circumstances should gastric embolization currently be performed?

**Dr Golzarian:** My recommendation is that the procedure should only be performed within an FDA-approved IDE protocol. Although gastric embolization seems interesting as an alternative to major surgery, it’s important not to jump to any conclusions or skip phases of research. We have to wait for the studies to be complete.

**VDM:** In the future, which patients might be good candidates for gastric embolization as opposed to gastric surgery?

**Dr Golzarian:** Right now, we don’t know which patients are ideally suited for gastric embolization. However, in our IDE we’ve decided that we want to look at patients with a BMI of 30 and above. Identifying the best candidates for the procedure is a work in progress. The best candidates are likely a specific group of patients, and the studies underway should help us to understand them better.

**VDM:** Does having the embolization procedure prevent the patient from having gastric surgery in the future?

**Dr Golzarian:** That’s an excellent question. We don’t know the answer. We are actually currently working on a study to answer that question.

**VDM:** What personally made you choose to get involved in this area of research?

**Dr Golzarian:** I’m very interested in research in the area of embolization, and we’ve been working with bariatric surgeons since 2012 on some protocols and have had our IDE approved by the FDA.

The complexity of bariatric surgery is recognized by everybody, and the patient needs to have some type of alternative treatment. I think minimally invasive procedures such as gastric embolization are preferable if they are safe and efficacious. However, prevention of obesity is more important than treatment. There are big problems in our country related to the food industry, the cost of good food, and the overabundance of sugar and flour in our diets. I’m personally extremely interested in those issues, and I believe every physician should be interested in them. Prevention and lifestyle changes make a major difference for patients.

**VDM:** What is the main takeaway from your presentation?

**Dr Golzarian:** The main takeaway is that while the results so far are interesting, we don’t yet know much about it; the mid- and long-term effects of gastric embolization are not known. It’s important that physicians interested in studying the procedure do so as part of a very controlled research protocol.

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Editor’s Note: Jafar Golzarian, MD, is a consultant for Boston Scientific, BTG, Guerbet, Medtronic, Penumbra, and Sirtex. He also discloses grant/research support — Guerbet, Sirtex; speakers’ bureau — Boston Scientific, Guerbet, Medtronic, Penumbra; major stock shareholder — Embomedics.