

Opinions & Letters

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Specimen Extraction After Lap Sleeve Gastrectomy: Simple Is Better

How We Do It

By Marius L. Calin, MD, John C. Kollar, DO and Vadim Gritsus, MD

Obesity surgery is one of the most popular subjects in the current surgical era. Laparoscopic gastric sleeve (LGS) resection has become one of the main procedures in the bariatric surgery armamentarium. The minimally invasive approach is a must in this field, and attention has been focused on using the smallest trocars possible. Efforts are being made to decrease the number and size of the trocars, but there are some technical limitations of the size of the stapler devices that still require a 12-mm trocar. The other concern is that the specimen extraction can be challenging and time consuming when done through a smaller trocar site.

In this article, we present our approach for stomach extraction during LSG. This involves using scissors to cut the specimen in the peritoneal cavity and extracting it in one piece through one of the 12-mm trocars. We used this approach in 49 of 182 LSG patients without any postoperative intraabdominal abscess, wound infection, staple-line hematoma or leak, or trocar site hernia. There were no reoperations and no mortalities. The discomfort at the 12-mm trocar extraction site was well tolerated by the patients. Our approach for specimen extraction after LSG resection is safe, feasible and inexpensive and can be done quickly. Our technique has produced good cosmetic outcomes and is easily reproducible.



Figure 1. Cutting the specimen along the staple line through both walls.



Figure 2. Specimen is cut along the staple line to create a narrow strip.

To date, multiple techniques have been described for removal of the gastric specimen: use of a retrieval bag with or without trocar site enlargement, simple extraction through 15-mm trocar,¹⁻³ use of the morcellator⁴ or transgastric transoral extraction.⁵ One study included 25 patients in whom extraction of the specimen was performed through a 12-mm trocar. However, the study authors did not provide technical details about how this was accomplished.⁶ We present a

simple and cost-effective method of extraction of the resected part of the stomach via a 12-mm trocar.

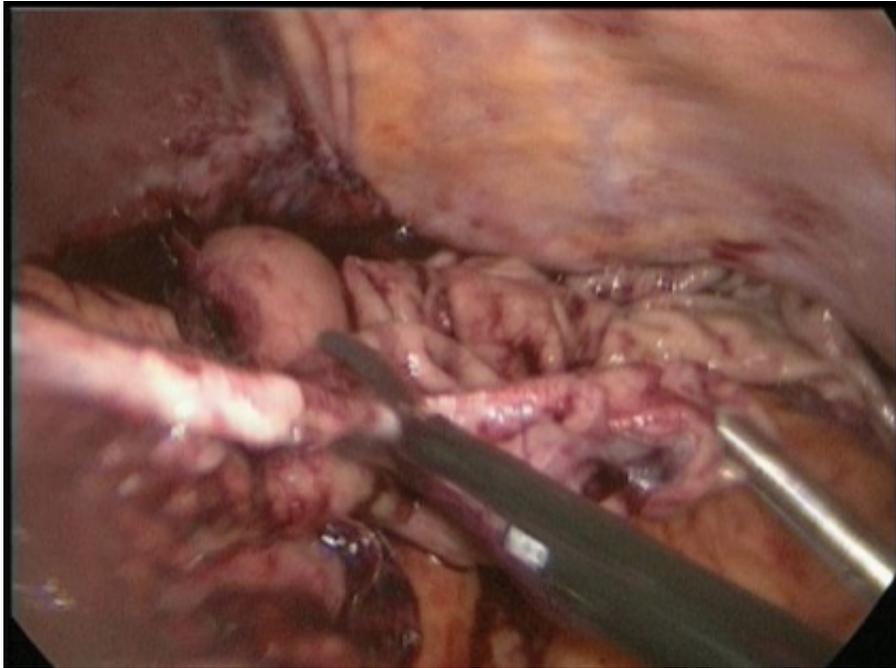


Figure 3. Cutting the specimen along gastric wall in zigzag.

Our Approach

As part of an observational study, we used the following approach in our group of 49 LSG patients.

After the LSG is completed, the stomach remnant is oriented in the cranial-caudal position in the peritoneal cavity. The stomach is then opened with endoshears at one end and the contents are suctioned. Usually there are minimal gastric contents present as the stomach normally is suctioned before a gastrectomy is performed. The process continues by cutting longitudinally along the staple line first through both walls (anterior and posterior) of the stomach with endoshears as this is the thickest component of the specimen. In this step, both the staple line and buttress material are cut off from the rest of the specimen and this initial “strip” of stomach tissue is extracted through a 12-mm trocar without having to remove the trocar from the abdominal wall. Then, the stomach wall is cut longitudinally through one wall, but in a zigzag fashion using the endoscissors with the aim to create “strips” no more than 2 cm in width, until the entire stomach becomes a long narrow strip. These steps all take place inside the peritoneal cavity at the end of the procedure, and ultimately the specimen is removed through the 12-mm trocar, not the trocar site, in one piece (Figures 1-7).

The trocar stays in place the entire time so there is no contact between the stomach and the subcutaneous fat. We do not close the fascia for the 12-mm trocar fascia defect made with a bladeless trocar. After removal of the specimen, the area of omentum and small bowel exposed to the gastric mucosa is irrigated with saline and suctioned.

This is a retrospective observational study of 182 LSG patients operated between January

2012 and February 2014. The new approach described in this article for extracting the specimen was used in 49 patients (26.92%). In 133 patients (73.07%), the specimen was extracted intact through a 15-mm trocar site with subsequent closure of the fascia. All the procedures were performed by the same surgeon.

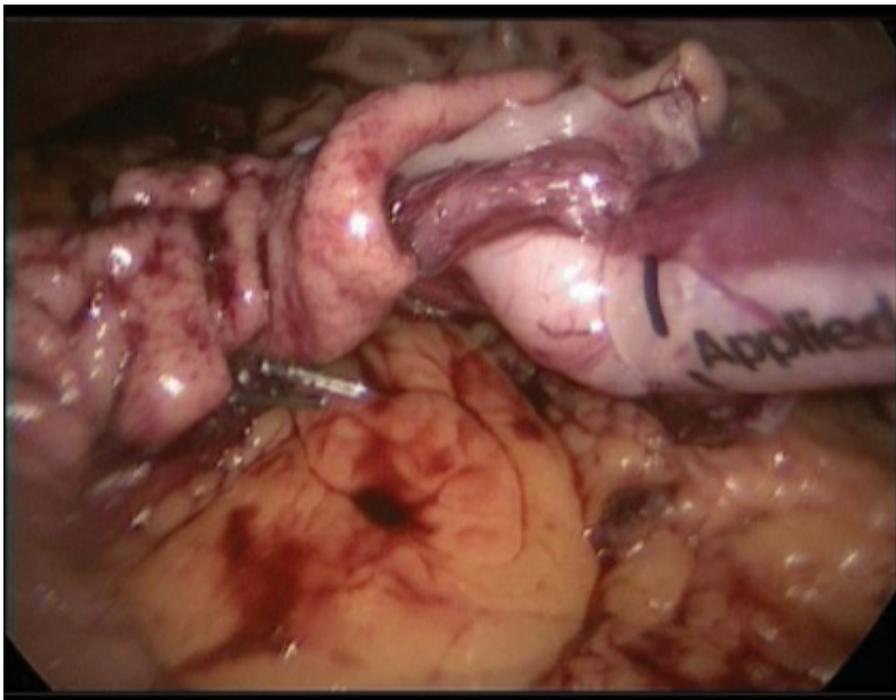


Figure 4. Extraction starting with the staple line first.

Our Results

Neither group of patients reported postoperative intra-abscess formation, wound infection, staple-line hematoma or leak, trocar site hernia, or reoperations. There were no mortalities. One patient received a blood transfusion due to trocar site bleeding, which was not the site used for extraction of the specimen. All patients were discharged home on postoperative day 1 or 2 and gradually returned to their baseline activities. The patients were followed in a clinic according to the guidelines from the American Society of Metabolic and Bariatric Surgery Center of Excellence.

Although pain level was not quantified and no statistical analysis was performed, we observed that patients who had surgery with the new extraction technique generally had less postoperative discomfort than those who underwent surgery with the older approach. In the new technique group, none of the patients complained of more postoperative pain or discomfort at the 12-mm extraction trocar sites compared with the rest of the trocar sites, including the 5- and 12-mm trocars. In the second group, all of the patients complained of various degrees of pain at the 15-mm trocar site, with some patients reporting the pain as incapacitating. All of the patients in the 15-mm trocar group said the pain at extraction site was significantly worse, lasted longer and was more bothersome than the discomfort they had at the other trocar sites.



Figure 5. Extraction of the specimen through the trocar outside view.



Figure 6. Specimen after extraction.

Advantages of the Technique

We believe there are several advantages to the new extraction technique in addition to it being easily reproducible and less expensive. Parietal wall trauma and excessive stretching of the trocar sites can be avoided, reducing the risks related to trocar-site trauma complications such as hernia, pain or infection. Removal of the specimen through the 12-mm trocar that stays in place during the procedure avoids direct contact of the stomach mucosa with the subcutaneous tissue, reducing the risk for surgical site infection. There is also no need for additional equipment such as morcellator or endobag.

In our experience, the average duration of the extraction process was about three minutes, which we believe is acceptable compared with the additional time needed to close an extended incision or with a difficult extraction by stretching a 15-mm trocar site.

We also must mention that one of the reasons we began performing specimen extraction using this procedure was patient dissatisfaction due to pain at the trocar site when the enlarged 15-mm trocar site with subsequent fascia closure was used. In our experience, simple extraction through a 15-mm trocar site can be difficult when the resected stomach specimen has a larger

volume.

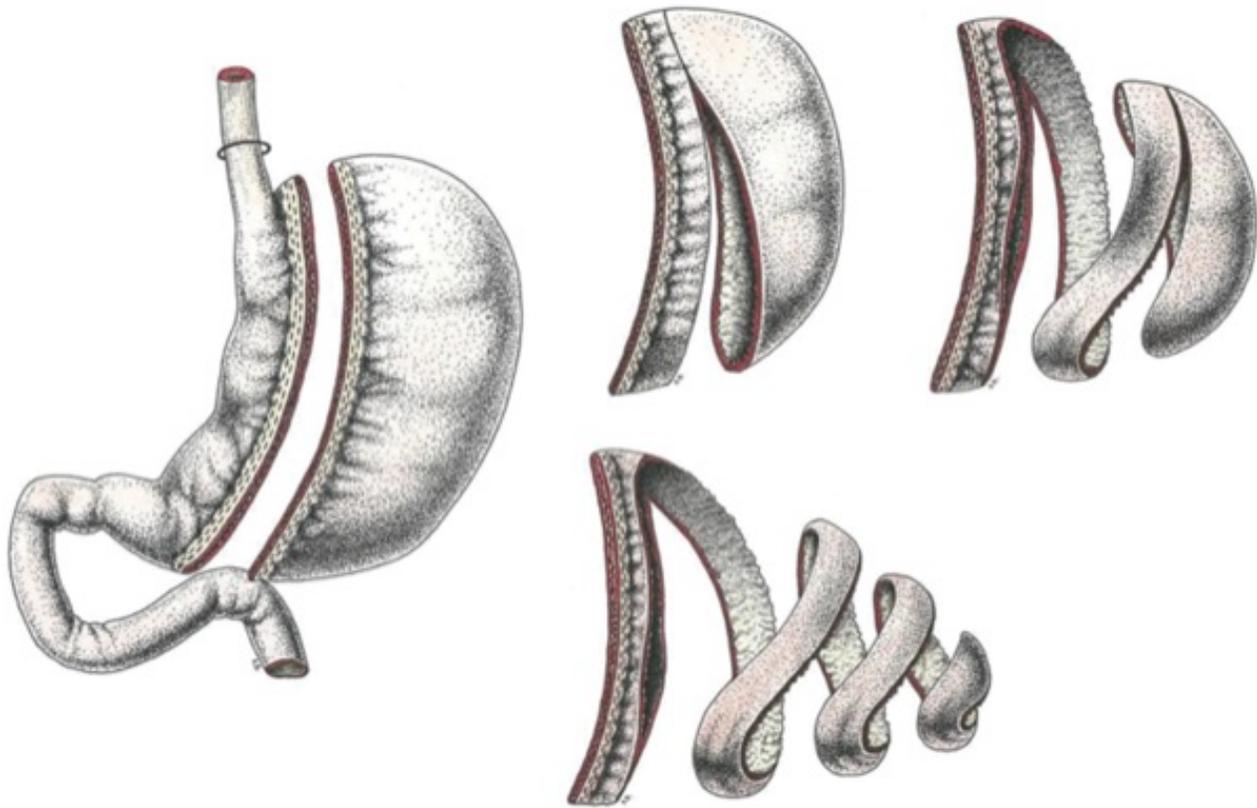


Figure 7. Drawing of the cutting directions of the specimen.

Conclusion

Our approach for specimen extraction after LSG has proven to be safe, feasible and inexpensive, and can be done quickly; it has shown good cosmetic outcomes and is easily reproducible. The most important aspect is patient satisfaction and acceptance related to less postoperative pain and discomfort at the extraction site. Although we do not have a comparative group to statistically prove the efficiency, the outcomes of the patients on whom we have operated so far have given us the confidence to use it routinely in our practice.

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Disclosure

The authors declared that they have no relevant financial conflicts of interest.

Dr. Calin is from the General Surgery Department, Bronx Lebanon Hospital, Bronx, New York; Drs. Kollar and Gritsus are from the General Surgery Department, Valley Hospital, Ridgewood, New Jersey.

Expert Commentary

Edward Felix, MD

Medical Director, Clovis Community Bariatric Program, Clovis, Calif.



I will start by complementing the authors on trying such a bold approach to specimen retrieval. The objective was to safely remove an oversized specimen and reduce the morbidity of the extraction. The technique they described was to fillet the stomach into a spiral strip so that it could easily be extracted through the 12-mm trocar used for stapling. They demonstrated it was safe to cut open the excluded stomach in the abdomen without the use of an extraction bag and not cause infections. They successfully outlined the steps required to achieve this end, but was this elaborate process really necessary to reduce postoperative pain (the goal of the study)?

The increased pain of a 15-mm trocar compared with a 12-mm is caused by closure of the fascial defect. Although it is convention to close defects larger than 10 mm, it has been well demonstrated in bariatric patients that not closing the defects of 12-mm bladeless trocars does not result in trocar hernias. The surgeons, however, did feel it was necessary to close the 15-mm trocar incision to prevent a trocar hernia. This was appropriate because of the placement of the 15-mm trocar.

A simpler way to resolve the problem is one that we have used in our sleeve resections. When the 15-mm trocar is placed left subcostal after the abdomen is insufflated, the fascial defect will be at or above the costal margin when the trocar is removed. We have been using this approach for several years and have not seen any significant incidence of trocar hernias.

The specimen tip is brought up into the 15-mm trocar using a claw grasper. The specimen tip and trocar are removed as a unit to prevent the specimen from being stuck in the wound. If the stomach remnant cannot be shimmied out of the defect without opening it, the specimen tip is opened outside the abdomen. The stomach contents are aspirated to prevent rupture of the specimen and spillage. The stomach remnant is gradually extracted. Only rarely does the fascia need to be stretched or cut. When the abdominal gas is removed, the 15-mm defect collapses and retracts above the rib margin preventing the formation of a hernia. Because the defect is not closed, pain and morbidity of the larger trocar is identical to smaller ones. It is true that the skin incision is 2 mm larger, but this does not seem to make a cosmetic difference. The key to this quick and simpler approach is the placement of the trocar. If it is placed too far from the rib margin, it will need to be closed. This indeed leads to increased postoperative pain as described by the authors.

In conclusion, there are many ways to solve the problem of specimen extraction and decrease postoperative morbidity. The authors have demonstrated that the specimen can be opened

intraabdominally if necessary without contaminating the field, but this time-consuming approach may not be required if care is taken when placing the 15-mm extraction trocar.

Richard Peterson, MD, MPH

Chief, Bariatric and Metabolic Surgery; Director, UT Medical Center for Bariatric and Metabolic Surgery; Director, Christus Weight Loss Institute, Westover Hills; Associate Professor of Surgery, University of Texas Health Science Center, San Antonio



I would like to thank the authors for developing innovations that work toward improving the overall quality of patient care. Since the more widespread use of the laparoscopic sleeve gastrectomy (LSG) as a primary weight loss operation in 2008, many techniques have been adopted for various aspects of the operation. There is little question that many patients' primary complaint after an otherwise uncomplicated LSG is specimen extraction site pain. This is related to the placement of a fascial suture to prevent hernia formation, either because of a larger trocar (15 mm), trocar site dilation, or both. The authors here look at a novel way of removing the specimen without the need for trocar site dilation.

The removal of the stomach through the 12-mm trocar is original. My concerns relate to the overall reproducibility of the technique (meaning the ability to spiral cut the specimen in one piece), the increased time that is required to do the actual spiral cutting of the specimen and the potential for intraabdominal infection either from spillage of the gastric contents or even left- behind remnants of gastric tissue.

From 'Innovative' to Simple: Views Through the Retrospectoscope

In our practice we began with using 15-mm trocar for two reasons. Initially, our choice of stapler required a 15-mm trocar for delivery and we continued to use that site for specimen extraction. We also began by using a laparoscopic bag retrieval system. With some difficulty in specimen extraction, we developed our technique of placement of a specimen-orienting stitch (the referenced "Tip-Stitch"). This helped, but by happenstance, when the bag ruptured in one of our cases we found that the stomach was more easily extracted without the hindrance of the plastic bag.

We then evolved our technique to a blunt dilation of the trocar site to facilitate the specimen extraction without a bag. This further evolved into a change and downsizing of the 15-mm trocar to a 12-mm when we switched to our newer stapling system. By this point, we became more comfortable with grasping the specimen by the most distal aspect with either laparoscopic graspers or a Kelly clamp through the abdominal wall and more quickly removed the specimen. We abandoned the Tip-Stitch altogether as it only added time and we found its usefulness waning as our experience improved.

Collectively, in more than 500 sleeve gastrectomies, we have had three gastric specimens open in the wound and have only seen one postoperative wound infection at that site secondary to spillage of gastric contents (the fascia was not dilated adequately, leading to difficult specimen extraction and tearing of the staple line on the specimen). Since that third gastric specimen spillage more than a year ago, we have used the Kelly clamp to spread the fascia of the 12-mm trocar site, which has facilitated the rapid and easy removal of the stomach. Additionally, although some patients complain about pain at the extraction site, in all but two patients it was self-limiting. These two patients were treated with an oral muscle relaxant for rectus muscle spasm with rapid relief of pain.

In essence, we ultimately tried to find an intricate solution to a problem that had a more simplified answer. Adequate dilation of the trocar site with specimen extraction can be completed in nearly all cases with very low infection rates. Placement of the fascial stitch using a transfascial suture-passing device adds very little time, and, with less than 0.4% morbidity related to trocar extraction site pain, it seems like a reasonable option in hindsight.

I think that it is important that we continue to strive to improve our techniques for the betterment of our patients but also understand that a simpler solution may have been in front of us the whole time, a lesson we learned the hard way.

