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BARIATRIC

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UNIVERSITY OF UTAH BARIATRIC STUDY: New Findings in 2- and 6-Year Data

by Ted Adams, MD

The Division of Cardiovascular Genetics, University of Utah School of Medicine, has received ongoing funding from the National Institutes of Health (NIDDK DK-55006) to conduct a study on the mortality and morbidity of severe obesity and its treatment by Roux-en-Y gastric bypass (RYGB). With reference to the morbidity aspect of this study, 416 severely obese (BMI > 35 kg/m²) subjects were examined before undergoing Roux-en-Y gastric bypass (RYGB) surgery. In addition, 419 severely obese subjects who sought surgery but did not have it (primarily because their insurance companies would not pay), and 321 randomly ascertained severely obese control subjects from the Utah population were examined. Participants from all three groups were then examined at 2 and 6 years followup. Clinical endpoints examined at all three examinations included cardiovascular (CV) risk factors (hypertension, hyperlipidemia, diabetes), cardiac function and morphology (measured by echocardiography), coronary calcium (measured at 6 years on a sub-sample of participants), resting metabolic rate, maximal exercise treadmill time, sleep-related parameters, and self-reported dietary, quality of life, and physical activity surveys.

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Laparoscopic Sleeve Gastrectomy

by Alfons Pomp, MD

Introduction

Laparoscopic sleeve gastrectomy (LSG) is gaining popularity as a primary, staged, and revisional operation for its proven safety as well as short-term and mid-term efficacy. Laparoscopic sleeve gastrectomy was originally conceived as a bridging procedure for high-risk patients in order to achieve significant weight loss prior to a definitive procedure.¹ Early results of patients who deferred another procedure were promising and the operation is now proposed itself as a definitive procedure. Nonetheless, there is considerable variation in surgical technique and additional long-term efficacy data are needed. This operation is the only truly irreversible bariatric procedure, and complications like leaks, while infrequent, are difficult to treat.²

Published Data

The mechanisms accounting for the beneficial effects of LSG on glucose homeostasis are not well understood and remain speculative. Laparoscopic sleeve gastrectomy results in diabetes remission at one year in up to 66.2% of morbidly obese (MO) patients with type 2 diabetes (T2DM), with improvement in another 26.9%.³ It has also been shown to result in remission in up to 50% of non-MO, poorly (medically) controlled T2DM patients at 1 year.⁴ The mechanism is associated with a decrease of insulin resistance and an increase of early insulin response rather than with an increase in total insulin secretion.⁴

Some long-term data on this procedure was extrapolated from Johnston's reports on the Magenstrasse and Mill operation, an open "sleeve-like" procedure.⁵ While there is no consensus, some reports indicate that LSG is associated with weight regain and reflux symptoms in long-term followup. This seems to be independent of low plasma ghrelin levels, which persist for 5 years after surgery.⁶ Weight regain can most likely be partially avoided by tighter followup, and can be managed successfully by completion of a duodenal switch (DS) procedure at a later stage.⁷

Discussion

There is data that laparoscopic DS is better at promoting short- and long-term weight loss in super-obese patients,⁸ and it appears logical that if LSG is used as a bridge procedure, consideration should be given to DS as the secondary operation. While initial reports focused on weight loss after LSG, there is now sufficient evidence that this surgery plays an important role as a metabolic therapy for patients with T2DM. Preoperative upper endoscopy may be mandated prior to surgery because there is support in the literature that patients

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Alternative Mechanisms for Diabetes Resolution

by Francesco Rubino, MD

We are at a point in science, with regard to the disease states of obesity and diabetes and our growing understanding of the mechanism of action of the gut, that is exciting and overwhelming and historical all at once.

At this intersection of science and surgery, we must be guided by some basic tenets that are emerging from our ongoing research. So what do we now know as we make our way through the science and the research, the procedures and the data?

The gastrointestinal (GI) tract is acting as an endocrine organ, and is therefore physiologically important in the regulation of body weight, hunger, satiety, and insulin secretion and sensitivity. The alimentary tract has been shown to play a role in energy homeostasis, a vital function of the body. This is a very important concept, and one that we—clinicians, patients, hospital systems, and insurers—should embrace now not only because it will direct our efforts moving forward, but because it is the foundation for the rationale of metabolic surgery as a treatment for diabetes. Traditionally and historically, the alimentary

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tract has not been viewed as a part of the endocrine system, but rather its purpose was nutrient transit and absorption. But as our understanding of its endocrine role expands to that of key player in

energy homeostasis and the regulation of body weight and sugar metabolism, then intuitively, it follows that manipulation of the stomach and small intestine via metabolic surgery produces profound effects on glucose metabolism. In this way, surgery can treat metabolic disease. The alimentary tract's physiological importance is supported by scientific evidence that the stomach,

duodenum, bowel, and colon produce hormones and increase those incretins that regulate appetite, hunger, and insulin secretion and sensitivity. Misunderstanding of this very point builds the boundaries to surgery, and hinders acceptance from physicians, patients, and insurers.

Bariatric surgery is not a mechanical approach to a lifestyle condition. Obesity is a disease. Surgery is a treatment option for the disease of obesity. Obesity stems from a behavioral problem. Much like the behavioral issue of smoking develops into cancer, so do overeating and a sedentary lifestyle develop into obesity. This issue is important because the word *behavioral* connotes the idea of a voluntary condition. But by the time a patient is obese, he or she no longer has a condition; he or she has full-blown disease. Many patients reach a point of no return, whereby they are no longer overeating, but still cannot control their weight and now have added comorbidities. When the disease of obesity is full-blown, it is critical to approach the disease beyond the lens of lifestyle modification, for that does not treat the disease itself.

"Bariatric surgery" is no longer an appropriate name for this type of surgery. The term *bariatric*, from the Greek term *baros*, meaning "weight," underscores the surgery goal as that of losing weight. This should be the goal for those who are massively overweight, but there are other goals to be considered that surgery achieves: decrease in mortality risk, decrease in comorbidities, and metabolic alterations, all of which speak to a surgical approach to improve metabolic control. These outcomes are a result of the surgery, not byproducts of excess weight loss (EWL).

There must be a paradigm shift in both the defined goals and the outcome measures of surgery. The current goal we have of a "successful outcome," as defined by 50% EWL, is arbitrary and applies one formula to many types of patients. How much weight loss is necessary to achieve meaningful results? The answer is different amounts for different patients. By current definition of success, does this mean that the patient who achieves 25% EWL, a reduction of all cardiovascular comorbidities, and an

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Dear Colleagues,

The annual Minimally Invasive Surgery Symposium (MISS) just completed its 11th year in February at the Grand America Hotel in Salt Lake City. Since our first meeting in 2001, our mission has been the same: to bring together world-class experts in minimally invasive and laparoscopic surgery to share knowledge and expertise on exciting developments in an informal, collegial fashion. Additional benefits include the lively and informative discussions generated by our attendees, who also share valuable expertise. Key areas of focus have included the latest advances in MIS bariatric, foregut, hernia, and colon surgery. For many years, attendees have suggested that we disseminate highlights of the meeting for those who could not attend. So for the first time, in this supplement provided by an educational grant from Ethicon Endo-Surgery, we showcase some of the key presentations related to advances in bariatric surgery from MISS 2011. Highlights of foregut, hernia, and colon presentations will be featured in future supplements. Please give us your feedback regarding this supplement by emailing comments to info@cmhmedia.com. Hope to see you at MISS 2012, February 20-25, 2012 at Grand America Hotel, Salt Lake City (www.miss-cme.org). Mark your calendars now!



Sincerely,

Phil Schauer

Executive Director, MISS

Director, Advanced Laparoscopic & Bariatric Surgery,
Bariatric & Metabolic Institute, Cleveland Clinic

Gastrointestinal Surgery and Diabetes Mellitus Control: 6 Simple Truths

by Ricardo M. Cohen, MD

1 There is evidence that there are weight-independent effects of gastrointestinal (GI) surgery in morbidly obese patients. Several papers have shown that after Roux-en-Y gastric bypass (RYGB), there is an important weight-independent anti-diabetes effect (Table 1). In that population, long-term diabetes remission may be more prevalent if massive weight loss is achieved and sustained. Decreased insulin resistance is mainstream for the morbidly obese patients with diabetes who remain diabetes-free long-term.

TABLE 1. T2DM remission after RYGB in morbidly obese patients

| Author | N | BMI | F/U (years) | %EWL | HbA1c | Resolved Improved Unchanged |
|----------|-----|-----|-------------|------|------------|-----------------------------|
| Pories | 330 | 49 | 10 | 54% | 12.3 v 6.6 | R = 89% I = 7% U = 4% |
| Schauer | 191 | 50 | 4 | 60% | 8.2 v 5.6 | R = 83% I = 17% |
| Torquati | 117 | 49 | 1 | 69% | 7.7 v 6.0 | R = 74% I = 26% |

2 This anti-diabetes effect is more pronounced in operations that reroute the food through the GI tract. Two systematic reviews were published by Brethauer and by Sharma on sleeve gastrectomy and its effects. Initial weight loss is important and can be credited for type 2 diabetes mellitus (T2DM) improvement. All reviewed papers have short followup and there is no evidence of any hormonal background other than weight loss for improvement of diabetes. The same was shown in 2008 by Dixon et al. In a randomized fashion, his group demonstrated superior T2DM control directly related to better weight loss.

3 There is evidence of decreased mortality after bariatric surgery. Several papers (Table 2) have shown long-term mortality reduction after bariatric surgery. Recently, Sjöström

TABLE 2. Effect on long-term mortality compared to non-operated controls

| Study | Procedure | F/U | Mortality Reduction |
|------------------|-----------|---------|---------------------|
| MacDonald (1997) | RYGB | 9.0 yrs | 88% |
| Flum (2004) | RYGB | 4.4 yrs | 33% |
| Christou (2004) | RYGB | 5.0 yrs | 89% |
| Sowemimo (2007) | RYGB | 4.4 yrs | 50% |

reported a decreased mortality (24%) secondary to cancer and cardiovascular events after bariatric surgery. Adams also reported 92% diabetes-related decreased mortality and 40% decreased all-cause mortality after bariatric surgery.

The literature supports earlier surgical intervention for T2DM.

4 The literature supports earlier surgical intervention for T2DM. In 2010, two papers by Di Giorgi and Chikwungo addressed the durability of diabetes remission after bariatric surgery. Durability was correlated to younger patients with milder diabetes and recurrence was associated with weight regain. As T2DM is a binomial relationship between insulin resistance and β -cell dysfunction, one should expect weight regain as a major parameter of increased hepatic and peripheral resistance, associated with a poor β -cell function, and thus leading to T2DM recurrence. A critical analysis of those papers empowers the idea of “the sooner the better” intervention over the diabetic population, while some β -cell function is preserved and patients can profit from long-term diabetes remission.

5 We have evidence of antidiabetic effects via GI surgery in low body mass index (BMI) diabetes patients. Cohen in 2006 and Chiellini in 2009 reported excellent results in treating patients with T2DM with RYGB and biliopancreatic *(continued on page 8)*

Alternative Mechanisms *(Rubino continued from page 2)*

increased life expectancy did not achieve success? Our “success” criteria cannot be tied simply to an arbitrary weight loss percentage; we must have a goal shift to a more clinically meaningful definition that encompasses outcomes by these other measures.

The idea that any procedure goes for any patient must be abandoned, and we must embrace the fact that diabetes is not the same beast in everyone. While it is daunting to think of all that we still do not know about diabetes and obesity, we do know that not all patients are the same, and not all patients have the same goal in surgery. A rational approach to patient and procedure selection will ideally be adopted, one that encompasses recognition of disease status and its characteristics and that is guided by the acknowledgment that operating on this organ, the alimentary tract, has profound endocrine influence on physiology of body weight regulation. The future knowledge we will gain by testing our current hypotheses on mechanism of action may enable us to develop new operations that are based on mechanistic data as opposed to guessing on restriction and malabsorption variance, and will be built more on science-based considerations. 🦋

Introducing the Sleeve-en-Y

by Mitchell S. Roslin, MD, FACS

Vertical sleeve gastrectomy (VSG) has gained increasing momentum as a procedure of choice for bariatric surgery. Numerous trials have shown weight loss approaching that of RYGB, without requiring intestinal manipulation. Himpens reported 5-year data that demonstrated 51% excess weight loss (EWL). Others have shown better results at the 3-year level.

It is our contention that the sleeve is an excellent gastric-only weight loss procedure. But for super-morbid obesity and when more weight loss is desired, it can be combined with an intestinal bypass and provide for an additional 25 to 30% of total EWL. Thus, instead of attaching the small bowel to a small pouch close to the gastroesophageal (GE) junction, one would divide the duodenum and attach it to the first portion of the duodenum. This operation has been done for years and is called a duodenal switch (DS). The long-term data shows better weight loss, better maintenance of weight loss, and better resolution of comorbidities such as diabetes. A recent report from University of Chicago shows that DS comorbid condition resolution exceeds RYGB for all conditions besides gastroesophageal reflux disease (GERD). Numerous surgeons are concerned that DS causes malabsorption. In fact, preservation of the pylorus causes less malabsorption. The cause of frequent bowel movements is the amount that is eaten and the amount of intestine that is bypassed. We typically perform our sleeve for a DS, or sleeve-en-Y, with a 38 Fr bougie, and have


It is our contention that the sleeve is an excellent gastric-only weight loss procedure.

a 150cm alimentary limb and a 125cm common channel. With this approach, our patients rarely have more than three bowel movements in a day. Even more encouraging is the fact that even patients with severe super-morbid obesity achieve a BMI of less than 40, with many approaching 30 or below.

As bariatric surgery advances, it will be essential to contemplate the physiologic difference between procedures and analyze which procedure meets the objectives of each patient. Today, the

procedure performed is commonly based on patient preference and the bias or opinion of the bariatric surgeon. VSG has been shown to be an effective gastric-only bariatric procedure. Intestinal bypasses do not have to be distal or lead to diarrhea to be effective. The combination of a sleeve with a shorter intestinal bypass is an effective bariatric procedure. Now that we know

how effective the sleeve is, it is clear that a very distal bypass is not required. A more proximal bypass will allow for the metabolic benefits without frequent bowel movements.

While we are pleased with the results discussed here, we anticipate that an even longer common channel may be effective; however, data is needed to determine ideal lengths. Our practice preference for stapling procedures is sleeve or sleeve-en-Y. We believe that sleeve allows the option for later conversion to sleeve-en-Y. It is our contention that sleeve-en-Y is a more effective and durable procedure than RYGB. We believe that the preservation of the pylorus leads to a more sustainable restrictive procedure, and conclude that pyloric preservation will become an important principle in bariatric surgery. 

Laparoscopic Sleeve Gastrectomy (*Pomp continued from page 1*)


with esophageal pathology and endoscopic evidence of GERD should only judiciously be considered for LSG. Given the possible evolution to cancer requiring esophagectomy, it is intuitive that LSG is contraindicated in patients with Barrett's esophagitis.

After Saber's initial report,⁹ there have been several expert surgeon single site laparoscopic sleeve case series published. Liver retraction and adequate visualization of the hiatus

remain issues that need to be addressed with this technique. Regarding single site surgery, most authors describe increased operative difficulty and operating time for what is at present a modest cosmetic benefit. This approach continues to be evaluated and may require prospective randomized comparative data to draw appropriate conclusions.

Conclusion

There is now a substantial body of literature that LSG is an effective operation that deserves a place in the bariatric

surgery armamentarium. Ongoing studies on longitudinal outcome will evaluate whether this operation's results on weight loss and metabolic comorbidity resolution are durable. Details regarding surgical technique, including single site surgery, and strategies to minimize complications warrant further investigation. 

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Based on published data, the early results of laparoscopic sleeve gastrectomy ARE COMPARABLE TO GASTRIC BYPASS.

MISS 2011 Banding: A Summary of Presentations

by John B. Dixon, MD

There were several very important aspects of laparoscopic adjustable gastric banding (LAGB) presented and discussed at 2011 MISS. LAGB is now a well-established therapy for obesity with a strong track record in safety, efficacy, and cost effectiveness. This has earmarked an important new era for bariatric devices and contrasts with the very difficult experiences of drug therapy for weight loss. In 2010, one drug was withdrawn from the market and the only three new medications examined specifically for weight loss in the last decade were not approved by the FDA because of concerns regarding safety in the context of modest efficacy.

Refinements in band placement technique, adjustment protocols, and some technical refinements in currently used bands have reduced the complication of band slippage, erosions, and adjustment port issues over the last 15 years. Focus in recent years has been management of esophageal problems and symmetrical gastric pouch dilatation following band placement. Dr. Christine Ren-Fielding reviewed the issues at MISS and emphasized the importance of hiatal hernia and crural laxity detection and repair at the time of band placement. Several surgeons have noted reduced revision rates in patients who have had repairs at the time of surgery. These issues will continue to be the focus of further refinement and research.

LAGB is now a well-established therapy for obesity with a strong track record in safety, efficacy, and cost effectiveness.

Dr. George Fielding provided frank and open discussion of laparoscopic single site gastric banding. Surprisingly, patient demand for this approach is not high, but those who have a single, well placed incision appreciate the effort. Single site gastric banding is technically difficult and its use should not compromise patient safety or the appropriate positioning of the band. Perhaps not as hot a topic as 2 years ago, single site gastric banding is finding its place in selected patients by some surgeons.

No bariatric surgical procedure is perfect, and weight regain remains an issue with banding. The anatomical integrity of surgery needs to be preserved to maintain efficacy. Putting a band on a dilated gastric pouch following RYGB has been shown to be effective, and more recently, dilatation following sleeve gastrectomy has been supported by banding. These bariatric revision surgery

techniques are not the standard of care, but have been shown to be effective in a few small, published series. More studies are needed to determine long-term effectiveness.

Dr. Eric Finkelstein presented the health economic benefits of bariatric surgery using LAGB data, but explained similar impressive results were available for RYGB. After highlighting the economic burden of obesity to the community, he modeled the benefits of surgery by examining the time it would take to provide a return on investment (ROI). Looking at health costs and savings alone provides just part of the picture; when he added broader benefits such as reduced absenteeism and greater efficiency or productivity at work, the return on investment after 4 to 5 years was impressive. This data should be a wake-up call to employers and payers. On the other hand, one must reflect on some of the realities of treating severe complex obesity—a chronic disease. What other valuable therapies (medical or surgical) for any chronic disease have to show ROI? As surgeons, do any other procedures you perform provide ROI? Bariatric surgery sets a very high standard in safety, efficacy, improved health, quality of life, and life expectancy. It provides ROI. Why has it not become a standard of care? Why are we currently treating less than 2%?

The MISS meeting continues to lead in setting a high standard for the breadth of bariatric surgical education. More than just an update, it has once again provided an excellent and topical program with the provision of plenty to reflect on as bariatric procedures move forward. 🍷

Why has bariatric surgery not become a standard of care? Why are we currently treating LESS THAN 2%?



Laparoscopic Gastric Plication for the Treatment of Obesity

by Stacy Brethauer, MD

Introduction

Currently, bariatric procedures that rely on some form of gastric restriction include the laparoscopic adjustable gastric band, gastric bypass, and sleeve gastrectomy. Placement of an implantable device, the addition of an intestinal bypass, or the irreversible resection of gastric tissue, however, limits the acceptance of these procedures by some patients and referring physicians. More recently, endoluminal technologies have been developed to achieve a similar restrictive effect without subjecting the patient to the risk of surgery.¹⁻³ In their current form, though, these endoscopic therapies rely on mucosa-to-mucosa apposition and are not durable. Recently, a procedure called *laparoscopic gastric plication* has emerged that addresses some of the limitations of other commonly performed bariatric procedures. In this procedure, the stomach is infolded to establish serosa-to-serosa apposition and gastric restriction without resection, bypass, or an implantable device. At the 11th Annual MISS, we shared the available literature on this procedure and results from our initial experience.

Published Data

This concept was initially evaluated by Fusco et al. in a rat model.^{4,5} Wistar rats were divided into three groups (sham anesthesia, a sham laparotomy, and greater curvature gastric plication [GCP]), and investigators showed a significant decrease in weight gain in the GCP rats at 21 days. The same group then compared

Based on a limited amount of published data, the early results of laparoscopic greater curvature plication are encouraging, with over 50% EWL at one year.

GCP to anterior gastric plication (AGP) without division of the greater curve vessels. There was no difference in weight between these two groups at 28 days.

Ramos and colleagues recently reported their results in 42 patients

who underwent laparoscopic GCP (LGCP).⁶ Mean operative time was less than one hour and hospital length of stay (HLOS) was 36 hours. Early weight loss was excellent and mean excess weight loss (EWL) was 62% in the nine patients who had 18 months of followup. Talebpour and Amoli have published the largest series (n=100) to date utilizing the LGCP technique. The mean preoperative BMI was 47kg/m² (range 36-58), and mean

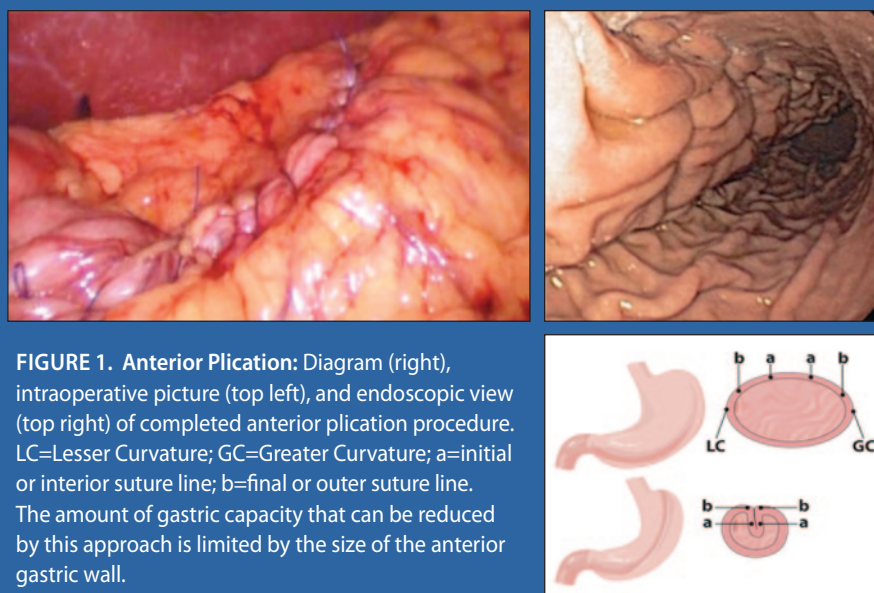


FIGURE 1. Anterior Plication: Diagram (right), intraoperative picture (top left), and endoscopic view (top right) of completed anterior plication procedure. LC=Lesser Curvature; GC=Greater Curvature; a=initial or interior suture line; b=final or outer suture line. The amount of gastric capacity that can be reduced by this approach is limited by the size of the anterior gastric wall.

EWL was 54% after 6 months (72 cases), 61% after 12 months (56 cases), 60% after 24 months (50 cases), and 57% after 36 months (11 cases). Nausea and vomiting were the most common complication, and the reoperation rate was 2.6% in this series (one suture line leak, one pre-pyloric perforation, one liver abscess, and one kinking of the stomach requiring revision).⁷ Another study reported 69.6% EWL in 100 patients with relatively low preoperative BMIs.⁸

Cleveland Clinic Studies

The Bariatric and Metabolic Institute at the Cleveland Clinic, Cleveland, has completed enrollment in two gastric plication studies and continues to prospectively enroll patients in a third IRB-approved protocol.

In the first study, we compared AGP to GCP. In one group (AGP, n=9), the anterior gastric wall was folded inward from the fundus to the antrum using at least two rows of running suture. The greater and lesser curvatures were approximated on the anterior surface of the stomach to create an intraluminal fold (Figure 1). In the second group (GCP, n=6), the short gastric vessels were divided similar to the dissection performed for a sleeve gastrectomy. After the fundus and body were completely mobilized, the greater curvature was folded inward with at least two suture lines to create a large intraluminal gastric fold. The fold was started just below the angle of His and continued distally to within 4cm of the pylorus (Figure 2).

Overall, the mean age was 42 years and the average preoperative BMI was 43kg/m². Mean HLOS was 37 hours. At one year, the

EWL for the AGP and GCP groups was 23.3% and 53.4%, respectively. The difference in EWL between the AGP and GCP groups across visits was statistically significant ($p=0.0078$).

Mean BMI decreased in the GCP group from 44 to 33, a 25% change in BMI at one year ($p<0.0001$). The percent change in BMI compared to the AGP group was statistically significantly different across visits ($p<0.0001$). There were no bleeding or infectious complications. The first patient in the GCP group required reoperation and plication reduction due to gastric obstruction two days after the initial procedure. Mild to moderate nausea occurred in all patients (2 severe) and resolved within 2 weeks in all patients.

In a second study, 43 patients have completed enrollment at three institutions (Cleveland Clinic, Ohio State University, and Charles University, Prague, Czech Republic). All patients underwent LGCP using a standardized technique. Early results are encouraging, with EWL consistent with the published reports mentioned earlier. Results of this trial will be published after all patients have completed three years of followup.

Discussion

There is currently a limited amount of published data available regarding the safety and efficacy of laparoscopic gastric plication.

Gastric plication is an investigational procedure and should be performed with IRB or equivalent oversight.

The available data for GCP, however, is encouraging and similar to the early outcomes we saw with sleeve gastrectomy. The initial experience with AGP is not as promising and we have not pursued this procedure because of the relatively low EWL reported in our pilot study.

While GCP is theoretically a safer option than the sleeve due to the absence of a long staple line, it is clear that gastric plication is not a leak-proof operation. The study from Iran reported two gastric perforations, and there have been anecdotal reports of several other gastric leaks after GCP. We therefore strongly encourage surgeons who perform this procedure to do so under IRB protocol or some equivalent type of safety monitoring oversight. Only with more experience and longer-term followup will we be able to make any definitive claims regarding its safety and efficacy.

Conclusion

Our initial experience suggests that reduction in gastric capacity can be achieved via plication of the greater curvature. Early weight loss results are encouraging, and this operation is promising from a risk/benefit standpoint and certainly warrants further investigation. 🦋

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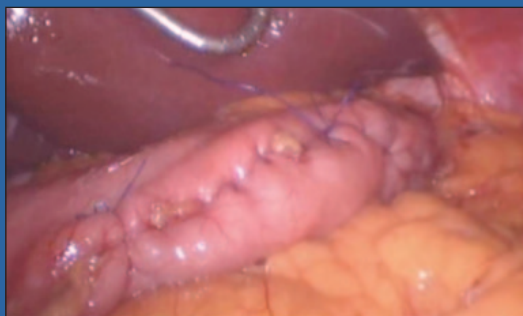
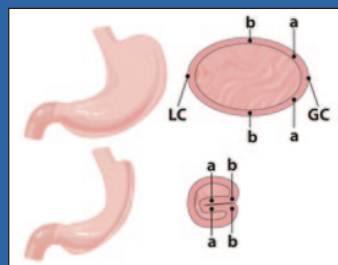


FIGURE 2. Greater Curvature Plication: Diagram (right), intraoperative picture (top left), and endoscopic view (top right) of completed greater curvature plication procedure. LC=Lesser Curvature; GC=Greater Curvature; a=initial suture line to invert the greater curvature; b=second, outer suture line to achieve a large intraluminal gastric fold.



New Findings in 2- and 6-Year Data

(Adams continued from page 1)

During the first grant funding cycle, we demonstrated that there is decreased total, CV, and cancer mortality following RYGB surgery compared with controls (average of 12 years of followup using National Death Index records). While cancer has long been known to be associated with obesity, long-term weight loss studies of cancer prevention have not been possible because of the inability to maintain long-term voluntary weight loss in individuals, whether by exercise, diet, or medication. However, RYGB is an excellent method to test cancer prevention since this procedure does entail long-term weight loss. We expanded our unexpected cancer mortality findings by linking our complete RYGB registry and driver's license records to the Utah cancer registry and verified that cancer incidence was decreased, while the case fatality rate was not, indicating that improved cancer treatment was not responsible for the decreased mortality. Further, we showed that weight reduction at 2 years was correlated with improvement in nearly all CV risk factors in the post-RYGB group compared to controls. Finally, there were significant improvements in remission of diabetes, hypertension,

We demonstrated
**DECREASED TOTAL, CV,
AND CANCER MORTALITY**
following RYGB surgery
compared with controls.

and hyperlipidemia, as well as a significantly lower incidence of these clinical disorders for the RYGB group.

Our group is now in the process of analyzing the 6-year follow-up data. Preliminary results show continued protection for developing diabetes and hypertension and

a maintaining of diabetes remission within the RYGB group compared to the control groups. Preliminary results suggest that the post-RYGB patients who participated in the sub-group study that examined coronary calcium had greater numbers of calcium scores equal to zero when compared to the sub-group of control subjects. This finding persisted for all age categories.

The 6-year findings also demonstrated improved cardiac function and morphology among the RYGB participants when compared to the controls. Finally, improved clinically related CV and metabolic parameters were found among the RYGB participants when compared to the two severely obese groups. These data are now being prepared for publication and in addition, NIH funding to conduct a 10-year followup of these three groups is being sought. For further questions, please email Ted Adams (ted.adams@utah.edu). 🦋

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diversion (BPD), respectively, each in a group of patients with BMIs below 35. In a recent protocol (duodenal exclusion with gastric preservation), and in association with Washington University researchers, our group showed that duodenojejunal bypass (DJJB) surgery in DM patients with overweight or class I obesity improves β -cell function and glycemic control in overweight and class I obese subjects with type 2 diabetes.

6 Based on what we know, it is necessary to find better tools for surgical indication. BMI does represent one conveniently calculated parameter of obesity. Several other parameters should be taken into account to properly assess the patient's risk and selectively indicate the better suitable treatment. Waist circumference, fat distribution and body composition are parameters that play a role in defining which patients bear "malignant obesity." It is unquestionable that the discriminatory BMI criteria must be revised soon.

Final Considerations

Animal and human experiments have shown that surgery may be a good option to treat selected uncontrolled cases of diabetes as the primary medical condition. There is no question that diabetes surgery is a new discipline, separate from bariatrics. There is also

no question that surgeons, diabetologists, and basic researchers should work together in order to define the best time to propose this therapeutic option. 🦋

Suggested Readings

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