Mini-Gastric Bypass Using Single or Reduced Number of Ports

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19.1 Introduction

Obesity has become a major pandemic, and young individuals are affected in equal proportions as compared to adults. As a whole, obese individuals are viewed as having a physical, emotional and moral impairment, and they hugely suffer discrimination in diverse domains.

The attitude towards undergoing bariatric surgery, which is one of the most powerful tools to tackle morbid obesity, is not very positive, and we as one bariatric surgical community are operating on only 1% of the morbidly obese out of many who deserve the surgery. Considering the taboo associated with obesity and its treatment, most individuals feel comfortable in concealing it.

Use of single incision and reduced port surgery are in demand, because scar-less operations are preferred by many undergoing elective abdominal surgery [1, 2]. Unmarried males and females prefer a scar-less weight loss bariatric procedure, given the option.

Pelosi MA [3] described the first SILS surgery known at that time as single puncture appendectomy. With the increased acceptability of MGB [4], single incision MGB is becoming one of the frequently performed procedures, because it is preferred by young unmarried females who want bariatric metabolic surgery.

Laparo-endoscopic single-site surgery (LESS) is the term coined by a multidisciplinary consortium in 2008 for single-incision laparoscopic surgery [5]. Single incision laparoscopic surgery (SILS) is the term commonly used to describe the

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Fig. 19.1 Gel Point Port

Fig. 19.2 SILS port—Covidien®

single incision abdominal approach [6]. These are complementary technologies with similar difficulties of access, lack of triangulation and inadequate instrumentation as of date [7].

SILS is an extremely popular procedure and surgeons have performed cholecystectomies, adrenalectomies, hernia, and colorectal surgeries by this approach [8–11]. SILS is a good bridge between Natural Orifice Transluminal Endoscopic Surgery (NOTES) and laparoscopic surgery [12]. SILS are of two types. It can be a single incision multi-port or a single incision-port based surgery where multiple ports are inserted on a SILS port based platform [13]. The overall concept of the surgical technique remains the same, but the learning curve and certain major technical challenges faced during the procedure still remain one of the major deterrents for the single incision MGB.

Apart from single incision, a reduced port approach is also preferred by some of the surgeons [14, 15]. Multiple ports for single incision surgery are available commercially, but a Gel Point Port (Fig. 19.1) and a SILS port-Covidien

(Fig. 19.2) are the most frequently used ports. The concept of making a long gastric tube with a wide gastro- jejunal anastomoses remains the mainstay of the MGB [16]. The anastomoses can be performed hand-sewn or by a stapled approach [17].

19.2 Selection of the Patient

The patient should be carefully selected for the single incision approach. The following can be the selection criteria:

1. The Body Mass Index (BMI) of the patient: The BMI of the patient is an important consideration for choosing patients for the single incision approach [18]. BMI >50 can become a difficult approach due to more amount of visceral mesenteric fat and greater peritoneal fat. A good BMI is between 35 and 50 where it becomes more feasible to perform surgery via this approach [19].
2. The xiphoid umbilical distance: The xiphoid umbilical distance between 15 and 25 cm is a good option for the single incision approach. The more the xiphoid umbilical distance, the more is the difficulty in working at areas close to the gastro-esophageal junction [7, 20].
3. The liver preparation: A good liver preparation is required for the single incision and is of utmost importance. Fatty liver and massive liver can obstruct vision, making dissection difficult.
4. Laxity of abdominal wall: A lax abdominal wall is more suitable for the single incision. Muscular abdomen can cause a large amount of torque during dissection and can make surgery difficult. Also, a lax abdominal wall gives more space to work inside the abdomen due to optimal pneumoperitoneum.
5. A young unmarried female patient is more suitable for the single incision procedure considering the liver, laxity of abdominal wall, and quality of visceral fat. The demand for cosmesis [21] is more with young unmarried females [19, 22].
6. No previous abdominal surgery is a favorable condition but not strictly necessary. The more the adhesions, the more will be the difficulty in performing a SILS procedure [7, 17].

19.3 Instrumentation

Conventionally, the SILS was performed with articulating instruments and a complicated system. However, the development of newer type of SILS ports with more ease of working has made it simpler to use this as a modality without the complicated articulating instruments [8].

A Gel-point port (Applied Medical®) Fig. 19.1 or a SILS port (Medtronic®) Fig. 19.2 are two prominently used ports for SILS Bariatric procedures across the world. Some procedures are performed with single incision multi-port technique. It depends on the expertise of the surgeon and the center's experience.

19.4 Technique

A trans-umbilical incision 3 cm long is made. The Gel-point platform is a wax-based platform, and a maximum up to four ports can be inserted on it. The subcutaneous tissue is dissected, and the fascia is cut open. Once the peritoneum is breached with the knife, the abdomen is open. The Gel-point port is inserted and carbo-peritoneum is achieved. The lesser omentum is opened at the area 2–3 cm below the crow's foot. Once the lesser sac is entered, the adhesions between the pancreas and the posterior wall of the stomach are dissected for the space to be clear to insert the stapler.

One horizontal blue load is fired of size 6 cm, and then vertical firing is done with the blue load until the remnant is separated. A gastric calibration tube of size 38 French is used to calibrate the pouch. The long vertical pouch is made free of fat on the posterior wall. A gastrotomy is made using a harmonic scalpel. The ligament of Treitz is then traced and a bowel of length 175 cm is counted with a sterile ruler introduced inside the abdomen through one of the ports.

An enterotomy is made, and anastomosis of size 4–6 cm is made using a blue cartridge. The anastomosis is made posterior to the staple-line of the stomach. The gastro-enteral defect is closed with a 2–0 Vicryl. Hemostasis of any staple-line bleeding is achieved with titanium clips.

19.5 Difficulties Encountered During the Procedure

1. Lack of triangulation: Due to a single incision approach, there is insufficient triangulation, which we get substantially in conventional laparoscopy [17].
2. Swording of instruments is a common problem with the single incision approach. As there is a limited space to maneuver, the swording effect is pronounced.
   (a) Vision becomes challenging at the specific angles in the SILS approach with limited space for the camera.
   (b) Articulating staplers are the necessity, as without them the stapling becomes very difficult.
   (c) Suturing requires more skill and practice to do a safe and secure anastomosis. The umbilical incision is closed meticulously to avoid umbilical scarring.

There are multiple published reports of single incision gastric bypass, and different techniques are described by different authors [14, 17, 18]. Most of them have concluded the single incision approach as feasible and cosmetic for young patients.

19.6 Complications

Just like in conventional laparoscopy, the SILS approach can also have complications. Leak from the staple-line or anastomotic line, bleed, stenosis and stricture are surgical complications which have been noted [19]. Early and late post-operative

complications may occur, but the incidence in most studies is similar to the laparoscopic counterpart [23].

SILS MGB is a technically challenging procedure. The main challenge is suturing the gastro-jejunal defects.

With the bile pouring through the complex anastomoses area, it is pertinent to have a robust and leak-proof anastomosis.

The learning curve to perform a Single Incision MGB is steep. There is a totally stapled technique to perform a Single Incision MGB as shown in Figs. 19.3, 19.4, 19.5, 19.6 and 19.7.

Use of conventional laparoscopy Instruments, energy source andcamera system for SILS.

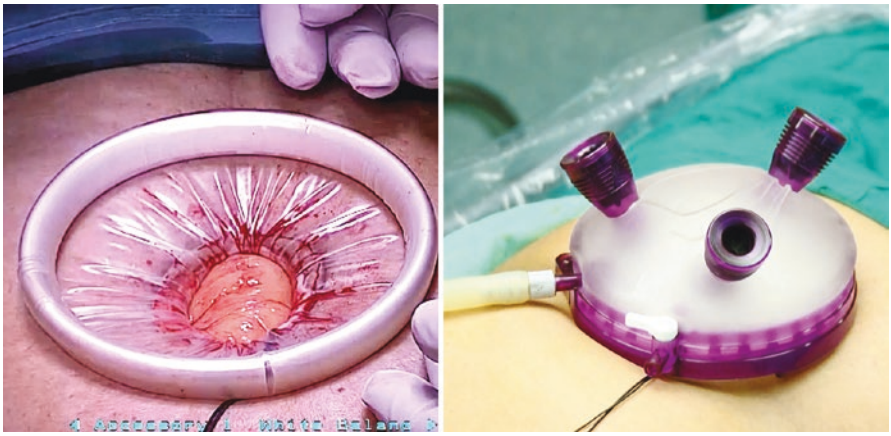


Fig. 19.3 Use of conventional laparoscopy instruments, energy source, and camera system for the SILS procedure

Opening the lesser sac and mobilisation of omentum

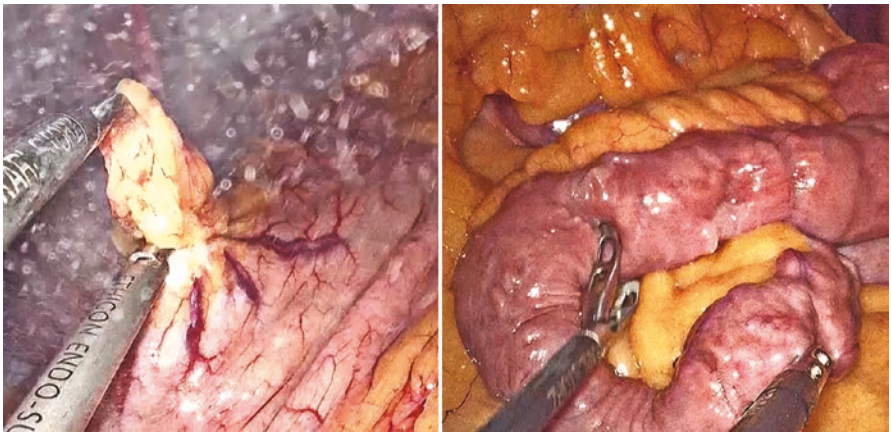


Fig. 19.4 Opening of the lesser sac and mobilization of omentum

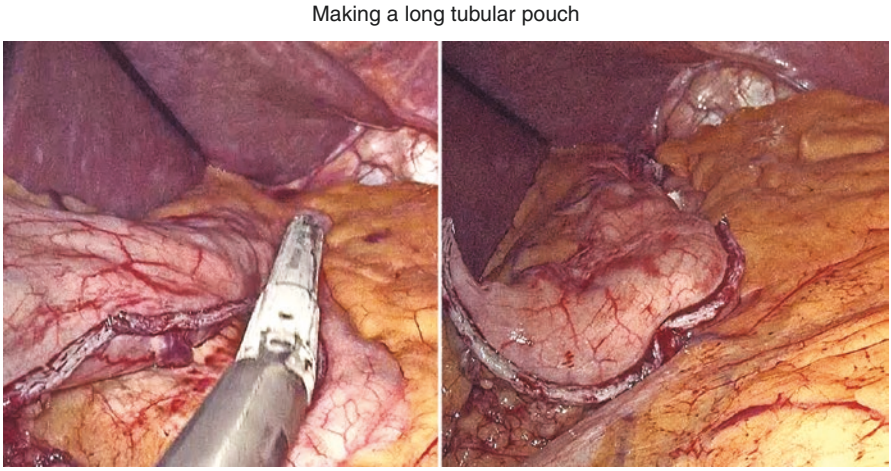
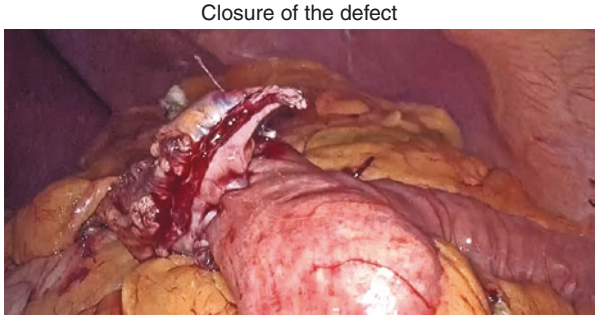


Fig. 19.5 Making a long tubular pouch

Fig. 19.6 Loop gastrojejunostomy

Fig. 19.7 Closure of the defect



19.7 Mini-Lap Approach to MGB

A mini-lap approach or reduced port approach may be used to perform a MGB. The size of the ports is reduced to 3 mm—a minimum to avoid potential scarring. The instruments with the latest development are sturdier and can assist adequate dissection (Fig. 19.8).

Fig. 19.8 Mini-lap instruments for MGB

Conclusion

Single incision MGB is being preferred by young individuals. It is technically more challenging than the conventional multi-port approach. If done with a wide-based single incision port with a standardized technique, it can be performed safely.

Use of conventional laparoscopic instruments is possible with the latest ports without compromising the safety of the single incision procedure.

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