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## Research Article

### SLEEVE FIXATION IN LAPAROSCOPIC SLEEVE GASTRECTOMY FOR MORBID OBESITY - TECHNIQUE AND BENEFITS

**Ankit Raikhy., Annu Babu\*, Partha Sarathi Nayak., Homagni ghosh.,  
Abhishek Bhartia and Bhartia V. K**

Department of Minimal Access and Bariatric Surgery, CMRI, Kolkata

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#### ABSTRACT

Sleeve gastrectomy is one of the most commonly performed procedure for treatment of morbid obesity. The surgery evolved from two step procedure of biliopancreatic bypass/duodenal switch. The procedure is safe and associated with symptoms of gastroesophageal reflux, food intolerance and vomiting. These symptoms are attributed to the improper sleeve position and deformity, due to the loss of natural attachments of the stomach. We here by present a case with morbid obesity in which we did sleeve gastrectomy with sleeve fixation. Post operatively patient had benefit from complications which are previously attributed due to sleeve rotation .Our patient was 51 year old male with the history of morbid obesity since 10 years with the BMI of 44.20 . Patient has the history of Smoking, hypertension, Obstructive sleep apnea, Diabetes Mellitus with renal failure. After preoperative workup and anaesthetic check up patient was taken up for surgery and sleeve gastrectomy procedure with sleeve fixation was done. Gastrograffin study done on post op day 1 was normal and Patient was started orally liquids on day 1 and discharged on day 2. On follow up patient was doing fine, lost 36 kg weight in 8 months. There was no problem of gastroesophageal reflux, heart burn, food intolerance and vomiting.

**Aim** - To devise the gastric sleeve fixation for the laparoscopic sleeve gastrectomy.

**Technique** - The gastric tube is fixed along the new greater curvature with the gastrocolic omentum using the PDS 3-0 in continuous fashion. The interrupted suture is used to fix at the lower part of the tube with the transverse mesocolon near the lower edge of pancreas.

**Conclusion** - the gastric fixation strategy is safe and easy. It can reduce the problems arising from the improper gastric tube position, reducing the incidence of food intolerance and gastroesophageal disease.

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#### INTRODUCTION

Laparoscopic Sleeve gastrectomy has become the first option in treating the morbid obesity world wide. The first open sleeve gastrectomy was done as a part of more complex operation known as duodenal switch, was done by Doug Hess in Bowling Green Ohio, in the year 1988. Lawrance L Tretbar described the weight loss associated with fundoplication of reflux surgery. He suggested the fundoplication causing the creation of stomach tube can cause weight loss. Dr Hess used the concept of tubularised stomach, from extended plication to the actual longitudinal or vertical gastrectomy. In the year 1997 [Almogly G, et al](#) operated on a 13 year girl with CBD calculi but as the calculi could not be cleared, he did the open sleeve gastrectomy so that later on ERCP can be done on patient. After this surgery he performed on 21 morbidly obese patient

and found upto 50 % of excess weight loss (EWL) in these patient before a definitive procedure. [Gagner et al](#). did the first laparoscopic sleeve gastrectomy in patient with very high BMI of 50-71 kg/m<sup>2</sup>. This procedure was the first part in reducing the weight and was followed by definitive procedure later on. From the year 2001-03 seven cases with high BMI was done. The results of Mills and Magenstrasse. Procedure was published by [Johnson et al](#). There were 100 patient with the 5 year follow up and 60% effective weight loss. First the sleeve gastrectomy was done followed by the definitive ROUX - En - Y surgery was done. This sleeve gastrectomy has evolved from the duodenal switch to open sleeve gastrectomy to the laparoscopic sleeve gastrectomy. The procedure is simple but is associated with the early complication of bleeding and leak are point of concern. ([Trelles N G et al 2008](#), [Campanile F C et al 2013](#), [Lalor P F et al 2008](#)) Symptoms of food intolerance

\*Corresponding author: **Annu Babu**

Department of Minimal Access and Bariatric Surgery, CMRI, Kolkata

are uncommon as the stomach tube is calibrated using the bougie. Gastro esophageal reflux has been the most common postoperative complication. (Carter P R *et al* 2011, Chiu S *et al* 2011, Howard D D *et al* 2011)

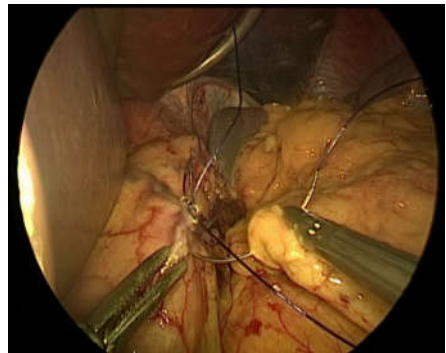
In view of the current studies this technique helps in the fixation of the stomach tube and prevents the improper position and twist of the stomach tube. Also the procedure provides the better anatomic and physiologic fixation of the stomach bringing it to the natural habitat.

**Technique**

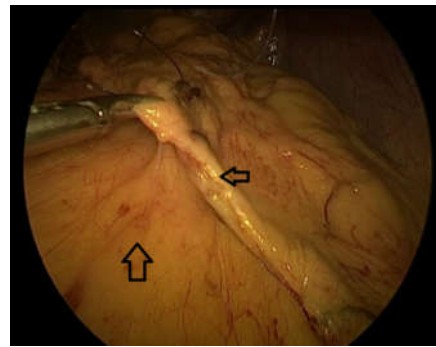
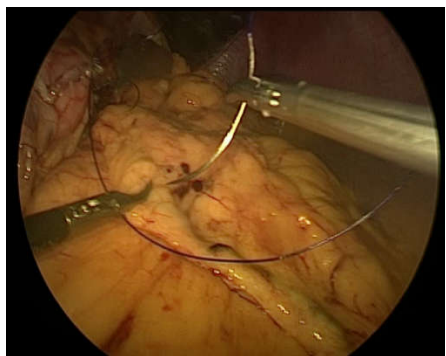
The newly created greater curvature is utilized for the fixation of the gastric tube with gastrocolic omentum. The suturing is started near the gastroesophageal junction invaginating the gastric suture line at the level of gastroesophageal junction and the proceeding distally as continuous suture. We use absorbable suture PDS 3-0. On the gastrocolic omentum side the suture must contain enough of the omentum to prevent cut through by suture. The lower part of the gastric tube is fixed to transverse mesocolon at the inferior part of pancreas using interrupted suture with PDS 2-0. Care is taken that it does not involve the vessels.



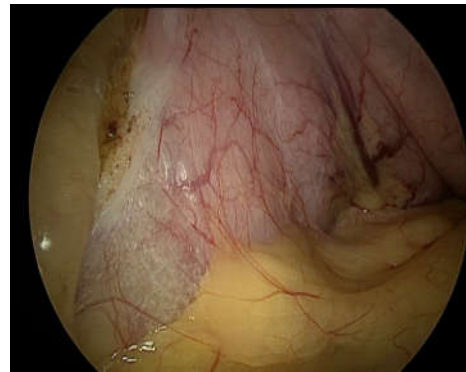
**Figure 1** Invaginating of the gastroesophageal junction with PDS 3-0.



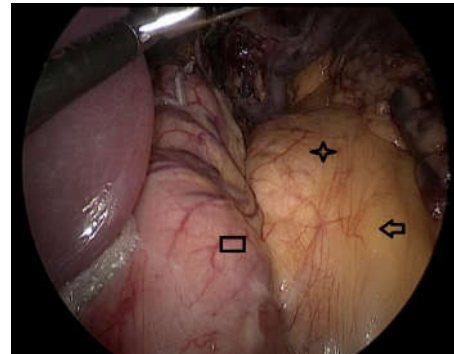
**Figure 2** Continuous running suture with PDS 3-0 on the new greater curvature with the gastrocolic omentum.



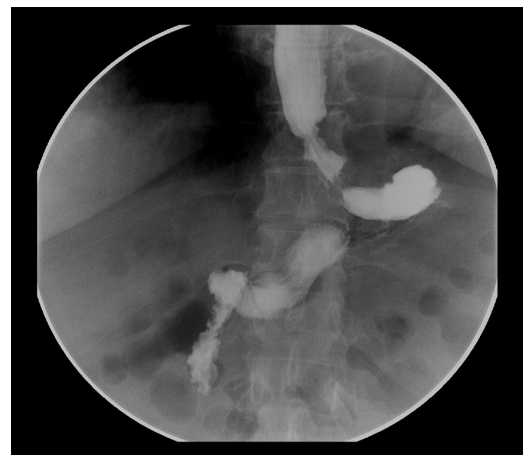
**Figure 3 and Figure 4** Interrupted suture with PDS 2-0 suturing the distal stomach tube with lower margin of pancreas and root of transverse mesocolon



**Figure 5** Retrogastric space utilized for the inferior fixation of the stomach with pancreas



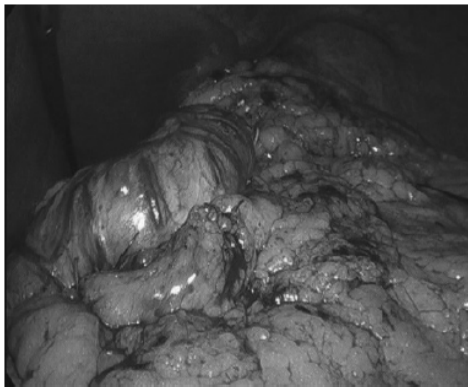
**Figure 6** The stomach is shown by square, star shows the pancreas and the horizontal arrow shows the root of transverse mesocolon. Interrupted suture with absorbable suture like PDS 2-0 is taken with the stomach and root of transverse mesocolon.



**Figure 7** Day 1 gastrograffin study, In Laparoscopic sleeve gastrectomy without fixation, shows twist in the stomach tube.



**Figure 8** Day 1 gastrograffin study, In Laparoscopic sleeve gastrectomy with sleeve fixation technique, shows the normal position of stomach tube



**Figure 9** Inside view of the stomach In Laparoscopic sleeve gastrectomy with sleeve fixation technique, showing the proper C shape of the stomach tube

## DISCUSSION

The fixation to the gastric tube has been proposed, aimed to reduce the improper position of the gastric tube, symptoms of food intolerance and gastro esophageal reflux. The procedure keeps the stomach in more functional and anatomical position. The correct mechanism is still under the study, the symptoms may emerge in the postoperative cases which may cause worsening of daily life of the patient and may require the treatment. (Braghetto I *et al* 2010) The proposed causes according to the studies include loss of gastric complacency, hiatal hernia, impairment of the lower sphincter function, and mechanical and functional obstruction along the gastric tube. (Braghetto I *et al* 2010, Kuper M A *et al* 2009) The studies have shown that the loss of natural stomach fixation results in the rotation of the gastric sleeve whenever there is food in the pouch, this causes persistent food intolerance and reflux. (Lazoura O *et al* 2011) Cases of gastric volvulus and twisting have also been reported postoperatively after sleeve gastrectomy, patient was treated by antrectomy and gastroileal bypass.

There are severe changes in the gastric emptying due to compromised peristaltic activity. (Melissas J *et al* 2007, Baumann T *et al* 2011, Carbone S F *et al* 2011) Areas of functional stenosis, mainly at the level angular incisura, proximal dilation are associated with the emptying difficulties and result in postoperative food intolerance and gastroesophageal reflux. (Keidar A *et al* 2010, Goitein D *et al* 2009) There is growing evidence that improper position of the gastric tube leads to the these symptoms. Parikh *et al.* studied

the role of functional stenosis associated with twisting of gastric tube. On endoscopy in these patients there was no anatomical deformity and the endoscope passed easily. (Parikh A *et al* 2012)

The stomach is normally fixed to the gastrohepatic, gastrosplenic, and gastrocolic ligaments. These are natural attachment of the stomach. (Askew A R *et al* 1978) The distention caused by presence of food in the stomach causes rotation of the stomach tube due to loss of the natural attachment. (Wastell C *et al* 1971, Sevcik W E *et al* 1999) In a study by Santoro *et al.* loss of natural fixation of stomach along the greater curvature caused altered shape and placement of the stomach tube, this leads to the emptying disorders. There is tendency of gastric tube to coil which can be prevented by using suturing with greater omentum. (Santoro S *et al* 2007) The greater omentum does not provide the sufficient fixation to the gastric tube. The fixation to greater curvature with gastrocolic omentum with gastroepiploic vessels in the suture provides better fixation and greater stability. In another study, has shown the gastric tube migration in 36% patient shown in CECT abdomen. (Baumann T *et al* 2011)

## CONCLUSION

The stomach fixation strategy is safe and seem to provide suitable and reliable refixation. This may reduce the occurrence of reflux and intolerance related to improper positioning of the gastric tube.

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