# Isoperistaltic Gastric Tube for Palliative Treatment of Esophageal Cancer - Postlethwait Technique: Proposal for a Videolaparoscopic Approach

# Tubo Gástrico Isoperistáltico no Tratamento Paliativo do Câncer do Esôfago - Técnica de Postlethwait: Proposta de Abordagem por Videolaparoscopia

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#### ABSTRACT

**Introduction**: To demonstrate the laparoscopic technique for establishing a retrosternal bypass for the palliative treatment of advanced esophageal cancer by constructing a isoperistaltic gastric tube of greater curvature. **Methods**: The technique involves creating a bypass with a 3 cm wide gastric tube, with an average length of 30 cm and preservation of the right gastroepiploic vessels. The stomach is sectioned into "V", in a line parallel to the greater curvature with the aid of linear mechanical stapler, and a circular stapler in the antrum. The gastric tube made of the greater curvature is positioned retrosternally through the creation of an area below the xiphoid process to the sternal notch. The anastomosis of the proximal stump of the cervical esophagus with the proximal end of the gastric tube is performed a with a 25 mm intraluminal stapler. **Conclusion**: Isoperistaltic gastric tube by laparoscopy is feasible and reproducible and it is a good surgical method for the palliative treatment of advanced esophageal cancer.

Key words: Gastric tube, Postlethwait, Esophagus, Dysphagia.

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# INTRODUCTION

**C**arcinoma of the esophagus is a very common disease in regions with low income populations and those accustomed to excessive ingestion of alcohol and tobacco abuse.<sup>1,2</sup> Over the past 40 years cure rates for esophageal carcinoma in Brazil have not improved significantly. With dysphagia the principal symptom, the diagnosis of esophageal cancer still occurs late when there is little chance of curative treatment.<sup>1,3,4</sup>

The palliative treatment of advanced or metastatic disease involves radiation therapy, use of prostheses and surgery. Radiation therapy offers a transitory improvement of the dysphagia in 50% to 70% of the patients who are able to complete the treatment (some 20% of cases are unable to complete radiation therapy).<sup>4,5</sup> Esophageal stenosis (26%), esophagotracheal fistulas (5%) and profuse

hemorrhage (3%) are complications of radiation therapy, which worsens the clinical status of the patient.<sup>6</sup> Those who receive prostheses face restrictions in what foods they can eat and many have a sensation of a foreign body in the esophagus. Some 5% to 30% of cases have immediate complications such as perforations and bleeding; 7% to 34% experience late complications of migration or obstruction.<sup>6,7</sup> Mortality ranges from 0% to 29%.<sup>6,8,9</sup> The high cost of the prostheses/prosthetics means this treatment is not available in the majority of the public hospitals. Surgical procedures such as gastrostomy,<sup>10</sup> jejunostomy, and transpositions with the colon, jejunum or stomach<sup>6</sup> have been used for years for palliation, but are not free of complications. Among these, the isoperistaltic gastric tube has become one therapeutic option for treating the dysphagia and the esophagotracheal fistulas,<sup>14</sup> restoring the patient's pleasure in being able to feed himself by mouth.

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The first reference to the isoperistaltic gastric tube perfused by the right gastroepiploic artery was by Dengel in 1930, who attributed the concept to Rutkowiski.<sup>11</sup> Only in 1979, did Postlethwait report the use of the isoperistaltic gastric tube to bypass an esophagus with advanced neoplasia.<sup>12</sup> Now with advances in the use of videosurgery in the treatment of cancer patients, we propose a videolaparoscopic approach for the surgery recommended by Postlethwait.

#### OBJECTIVE

To demonstrate a bypass procedure in a patient with advanced esophageal cancer, in which an isoperistaltic gastric tube of the greater curvature is positioned retrosternally with a cervical anastomosis as proposed by Postlethwait in 1979. The authors propose a videolaparoscopic approach for this technique.

#### TECHNIQUE

The technique involves the creation of a gastric tube close to 3 cm in width and with an average length of 30 cm and preservation of the right gastroepiploic vessels, which are responsible for its nutrition. The patient is placed in a lithotomy position, with a low pressure pneumoperitoneum, with the peritoneum in low pressure (10 mmHg) in order to prevent subcutaneous emphysema. The procedure begins with the passage/placement of five trocars (Figure 1). The first trocar (11 mm) is positioned in the umbilical scar for use of the optic and the occasional laparoscopic stapler. The second epigastric 5 mm trocar is for the vacuum and the spreader. Three more 12 mm trocars are placed in the right and left subcostal margins and left flank (which later will be withdrawn to permit the introduction of the 21 mm intraluminal stapler).

After positioning the surgeon between the legs of the patient and the first assistant on the left side (with the optic and the vacuum), one begins by sectioning the gastrocolic ligament so that the greater gastric curvature is isolated, preserving the arch of the right gastroepiploic artery in the direction of the short vessels to the angle of Hiss, completely freeing the spleen. This stage of the surgery is completed with the identification of the gastroduodenal artery close to the head of the pancreas and freeing possible adhesions of the pancreas to the stomach, which can hamper the mobilization of the tube toward the cervical region.

The stomach is then divided in a line parallel to the greater curvature with the aid of a linear mechanical stapler. This division extends from the antrum to the gastric fundus. Initially we transfix the stomach (entire wall – anterior and posterior) to the antrum 5 cm from the pylorus using a 21 mm intraluminal stapler (which, with an expansion of the incision, is introduced in the position of the 12 mm trocar in the flank,). After stapling the stomach and removing the stapler, a "ring" is formed that is approximately 1.5 cm in diameter, surrounded with staples (Figure 2). Next, we fashion a tube using the greater curvature, introducing a blue cartridge linear laparoscopic stapler in the "ring" previously created in the antrum toward the gastric fundus. The sectioned stomach resembles a "V", in which the part corresponding to the lesser curvature drains the distal esophagus in relation to the tumor, and the greater curvature will correspond to the tube. The blood supply for the tube which measures 3 cm in diameter and has an average length of 30 cm, is supplied by the right gastroepiploic artery, (Figure 2).

Finally, a left neck incision, eight to ten centimeters long, is made along the inner border of the sternocleidomastoid muscle from the middle third of the neck to the sternal notch. The platysma and pre-thyroid muscles are sectioned, the thyroid gland is moved medially, and the left sternocleidomastoid muscle is displaced. After dissection and sectioning of the cervical esophagus, the distal end is amputated by manual suturing in a single plane. A purse is fashioned for the positioning of the "head" of a 25 mm intraluminal stapler in the "stump" of the proximal esophagus.

The gastric tube of greater curvature is passed through a retrosternal path by creating a space with the sectioning of the round and falciform ligament, followed with a 5 cm opening of the peritoneum and aponeurosis just below the xiphoid process. The identification of this boney structure is critical for the creation of this space. After dissection of the xiphoid, the dissection is maintained with a 10 mm LigaSure<sup>TM</sup>, preserving the plane of the sternum, until the surgeon's finger is identified in the sternal notch through the cervicotomy (Figure 3).



*Figure 1 - Trocar positions: 5mm epigastric, 11 mm umbilical, 12 mm at the right and left costal margins and the left flank.* 



*Figure 3 - Dissection of the retrosternal space, with visualization of the finger of the surgeon in the sternal notch.* 



**Figure**  $2^{14}$  - "Ring" in the antrum region with the stomach sectioned in the form of a "V", with the tube formed by the greater curvature with gastroepiploic vessels.

Cardiac tape or a Levine gastric tube is passed to attach to the tip of the tube, so that it can be pulled to the cervical region under direct vision with the optic. This helps to ensure that the tube is not



Figure 4 - Final appearance of the retrosternal gastric tube.

twisted and its anatomic position is maintained, and that the vascular arch is not subjected to excessive traction (Figure 4). One then proceeds with the anastomosis of the proximal stump of the cervical esophagus to the proximal end of the terminal-lateral gastric tube using a 25 mm intraluminal stapler. The excess tubing is sectioned using a blue load linear stapler. This procedure is completed with the positioning of a nasogatric feeding tube, which is removed postoperatively once the patient is able to swallow. We do not use drains in the thorax, nor in the abdomen.

## DISCUSSION

The videolaparoscopic reconstruction of esophageal bypass using an isoperistaltic gastric tube constitutes a therapeutic option for patients in clinical stages III and IV. These palliative surgeries seek to bypass the path that food normally transits in the esophagus, improving patients' quality of life. Given the difficulties many experience with stomas<sup>13</sup> just being able to feed oneself orally confers a psychological benefit. Performing the procedure laparoscopically seeks to diminish the morbidity, shorten the duration of hospitalization, and accelerate the recuperation of the patient.

#### CONCLUSION

We have shown that Postlethwait's surgery for the palliative treatment of advanced esophageal cancer, published in 1979,<sup>12</sup> can be completely reproduced using videosurgery. To date there is no such description cited in the Brazilian or international literature. We propose a new approach: the Postlethwait technique by videosurgery.

#### RESUMO

**Objetivo**: Demonstrar a técnica para confecção de um bypass com tubo gástrico isoperistáltico por via retroesternal, com a grande curvatura gástrica, para o tratamento paliativo do câncer de esôfago avançado por laparoscopia. **Métodos**: A técnica envolve a criação de um tubo de 3 cm de largura com preservação dos vasos gastroepiplóicos direitos. O estômago é seccionado em "V", em uma linha paralela à grande curvatura, com o auxílio de sutura mecânica linear e circular no antro. O tubo gástrico da grande curvatura é posicionado por via retroesternal, através da criação de uma área abaixo do processo xifóide até a fúrcula esternal. A anastomose do coto proximal do esôfago cervical com a extremidade proximal do tubo gástrico é realizado com grampeador intraluminal de 25mm. **Conclusão**: O tubo gástrico isoperistáltico por via laparoscópica é factível e reproduzível sendo um bom método para o tratamento cirúrgico paliativo do câncer de esôfago avançado.

Palavras-chave: Tubo gástrico, Postlethwait, Esôfago, Disfagia.

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