

## Gastric bipartition for palliative treatment of advanced stomach cancer: case report

### *Bipartição gástrica para tratamento paliativo de câncer de estômago avançado: relato de caso*

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Arruda JF, Lima DL, Furtado RS, Cordeiro RN, Meira MRL. Gastric bipartition for palliative treatment of advanced stomach cancer: case report / *Bipartição gástrica para tratamento paliativo de câncer de estômago avançado: relato de caso*. Rev Med (São Paulo). 2020 March-April;99(2):202-8.

**ABSTRACT:** *Introductions:* Gastric Cancer (GC) is the fourth most commonly diagnosed cancer and the second leading cause of cancer death worldwide. Median survival rarely exceeds 12 months, and, in metastatic form, 5-year survival is less than 10%. Most patients present an advanced stage of the disease, often with obstructive and unresectable distal tumors, requiring palliative treatment, whose objective is to give the patient a higher quality of life. *Case Report:* A 59 years old male patient, retired, smoker, alcoholic. The patient went to the emergency room with post-prandial vomits, associated to epigastric pain and loss of approximately 8 kgs in the last 20 days. In the physical exam, a palpable mass was identified in the epigastrium and mesogastrium, painful and solid. The patient had as an initial diagnostic hypothesis of pyloric syndrome secondary to gastric neoplasia. CT scan of the abdomen showed presence of a solid expansive process, infiltrative, involving the gastric wall, in the antrum, inclusive promoting signs of liquid stasis. A heterogeneous nodule in contact with the inferior vena cava, with 1.1 x 0.9 cm in its biggest diameters. With the diagnosis of advanced gastric adenocarcinoma, with invasion of the inferior vena cava, pancreas and hepatic metastasis, with no curative surgical or oncological intervention, it was opted to feed the patient with parenteral nutrition. The surgical team opted for the gastric bipartition with gastrojejunostomy, open technique, with total surgical time of 90 minutes. Patient was discharged in the fourth POD, in good clinical conditions, good oral intake, with no nausea or vomits. The patient died 16 months after the surgery due to gastric hemorrhage secondary to the advanced tumor and sepsis. *Conclusão:* The technique of bipartition can be considered an effective and safe technique, providing fewer symptoms, such as nausea and vomiting, oral diet maintenance and quality of life for patients who doesn't have a curative intervention.

**Keywords:** Stomach neoplasms; Palliative care; Case reports.

**RESUMO:** *Introdução:* O Câncer Gástrico (CG) é o quarto câncer mais comumente diagnosticado e a segunda principal causa de morte por câncer em todo o mundo. A sobrevida mediana raramente ultrapassa os 12 meses e, na forma metastática, a sobrevida de 5 anos é inferior a 10%. A maioria dos pacientes apresenta-se em estágios avançados da doença, frequentemente com tumores distais obstrutivos e irremediáveis, demandando tratamento paliativo, cujo objetivo é dar ao doente maior qualidade de vida. *Relato do caso:* Paciente, sexo masculino, 59 anos, aposentado, tabagista e etilista. Procurou Serviço de Pronto Atendimento com queixa de vômitos pós-prandiais, associados a dor abdominal epigástrica e perda de aproximadamente 8kg nos últimos 20 dias. Ao exame físico, foi identificada massa palpável em regiões de epigastro e mesogastro, dolorosa e de consistência sólida. Paciente teve como hipótese diagnóstica inicial Síndrome Pilórica secundária a neoplasia. A tomografia de Abdome mostrou presença de um processo expansivo sólido, de aspecto infiltrativo, envolvendo a parede gástrica, na região do antro, inclusive promovendo sinais de estase líquida. Nódulo heterogêneo, entrando em contiguidade com a veia cava inferior, chegando a medir cerca de 1,1x0,9 cm, em seus maiores diâmetros. Diante do diagnóstico de Adenocarcinoma Gástrico avançado, com invasão de veia cava inferior, pâncreas e metástase hepática, sem proposta cirúrgica ou oncológica curativa, foi optado por nutrir o paciente de forma parenteral. A equipe cirúrgica optou pela cirurgia de Bipartição Gástrica com gastrojejunostomia anastomose, sob a técnica aberta, com duração aproximada de 90 minutos. Paciente recebeu alta hospitalar no quarto DPO, em boas condições clínicas, boa aceitação de dieta via oral, sem náuseas ou vômitos. Paciente veio a falecer 16 meses após a cirurgia devido a hemorragia digestiva alta secundária ao tumor avançado e sepse. *Conclusão:* a técnica da bipartição pode ser considerada uma técnica efetiva e segura, proporcionando um menor número de sintomas como náusea e vômitos, manutenção de dieta via oral e qualidade de vida para os pacientes sem proposta curativa.

**Descritores:** Neoplasias gástricas; Cuidados paliativos; Relatos de casos.

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## INTRODUCTION

**G**astric Cancer (GC) is the fourth most diagnosed and the second biggest cause of death by cancer worldwide<sup>1,2</sup>. Although the general incidence and the mortality of this disease have decreased drastically in the last few decades, it continues to be a major public health problem<sup>3</sup>.

Gastric carcinoma is the result of the accumulated genomic damage, which affects the cellular functions that are essential to cancer development. These genomic changes can arise from two distinct genomic instability pathways: microsatellites and chromosomal instability<sup>1,3,4,5</sup>. Furthermore, infection with *H.pylori*, obesity, tobacco, meat ingestion, food conserved with salt, low intake of fresh food, and alcohol are major risk factors in the development of gastric cancer<sup>4</sup>.

Countries with high incidence of gastric cancer have triage programs for high risk groups, but clinical evidence is insufficient to recommend the endoscopic screening worldwide<sup>6</sup>. The survival of patients with resectable gastric cancer is higher than that of patients with an irresectable disease. However, even in the resectable group, more than 50% of patients in developed countries (excluding Japan) die<sup>1,2</sup>. The decision to treat should be individualized, considering the tumor characteristics, symptoms, and functional capacity, measured by the *performance status (PS) table* and life expectancy<sup>3</sup>.

In the palliative treatment of cancer, improvement in the quality of life is the primary goal and needs to be evaluated when new strategies and procedures are proposed. The alleviation of obstructive symptoms is the most important parameter to evaluate the clinical effect or result of a treatment. However, the prognosis of these patients is unsatisfactory. The results of the palliative solutions should be known by surgeons so they can propose the best strategy for the patient.

Based on the symptoms and PS or the score of Karnofsky or Zubord, we can offer many possible avenues of treatment. Among the available therapeutic choices, the following are highlighted for palliative care: gastric resection or bypass, endoscopic therapies (protheses, photodynamic therapy, laser, and dilatation), chemotherapy, radiotherapy, and intratumor injections<sup>7-12</sup>.

The gastrojejunostomy is the modality of palliative surgical treatment most performed for gastric obstruction due to malignancy.

In the palliative bypass procedure, the gastrojejunostomy described by Wölfer in 1881 has been the gold standard for irresectable gastric cancer. However, occasionally, this procedure is not completely effective and the patients do not show improvement. Among its disadvantages are late gastric emptying, the risk of tumoral bleeding as the tumor keeps contact with food, and the

risk of a new obstruction of the gastric outlet if the tumor grows.<sup>7</sup>

In the 90s, Kaminish et al. introduced the gastric bipartition technique, partially dividing the stomach in inferior and superior and connecting these parts by a 3-cm portion in the lesser curvature to create a gastrojejunostomy with the proximal stomach. Thereby, there is a reduction in the upper digestive bleeding and symptoms, and it allows for a faster progression of oral food intake prior to hospital discharge<sup>5,13</sup>.

## CASE REPORT

A 59-year-old male patient, smoker, and alcoholic presented with post-prandial vomits, associated with epigastric pain and loss of approximately 8 kgs in the last 20 days. He denied bleeding and other comorbidities. In the physical examination, a palpable, solid, painful mass was identified in the epigastrium and mesogastrium. The diet was suspended, a nasogastric tube was placed, and anti-emetics were started. The patient was submitted to an Upper GI endoscopy and ultrasound (Figure 1). His initial diagnostic hypothesis was a pyloric syndrome secondary to a gastric neoplasia or foreign body.



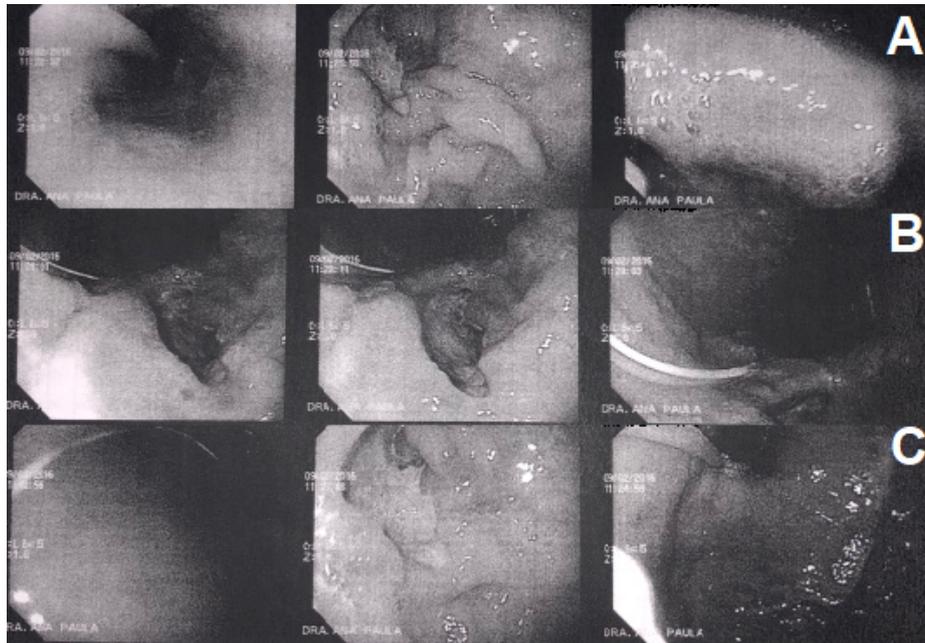
**Figure 1** – Ultrasound of the abdomen: anechoic Image in the stomach, heterogeneous, of 9,0 cm

The patient was submitted to an Upper GI endoscopy which showed the following: Esophagus with a thick mucosa with erosions and white plaque in the distal two-thirds. In the stomach, there was an ulcerated and infiltrative lesion in the antrum, circumferential, extended to the pylorus with irregular borders and the fundus with areas of necrosis. It was not possible to characterize and to pass through the pylorus (Figure 2).

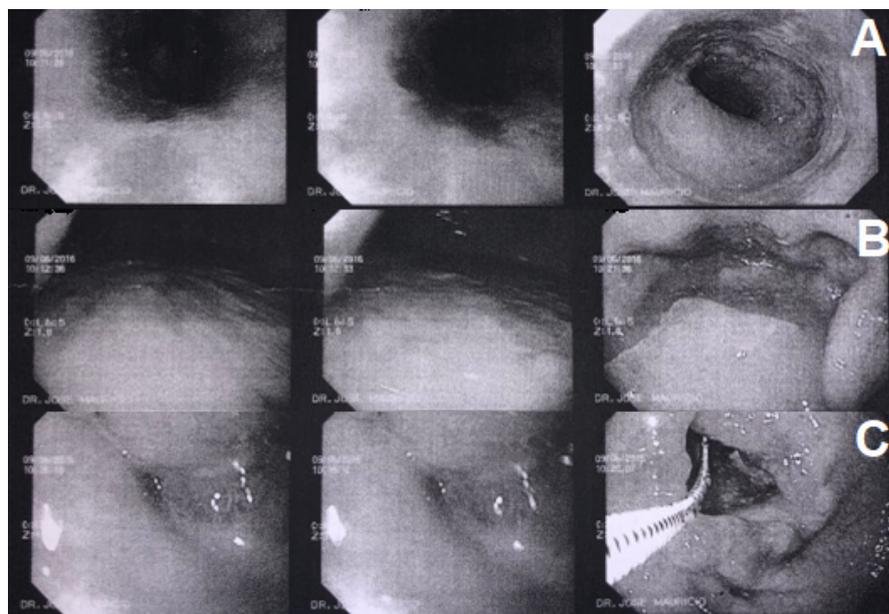
The patient was admitted in the general surgery infirmary and had high drainage in the nasogastric tube, with a high level of malnutrition (BMI 16.4 kg/m<sup>2</sup>), still with abdominal pain and the impossibility to place a nasoenteric tube guided by endoscopy due to the pyloric

obstruction, even after trying again 5 days after gastric emptying (Figure 3).

The team opted to start the parenteral diet and a new CT scan of the abdomen and thorax were ordered.



**Figure 2.** A. Upper GI endoscopy: Esophagus. B e C. Body and Antrum of the stomach with gastric stasis and an infiltrative tumor in the antrum

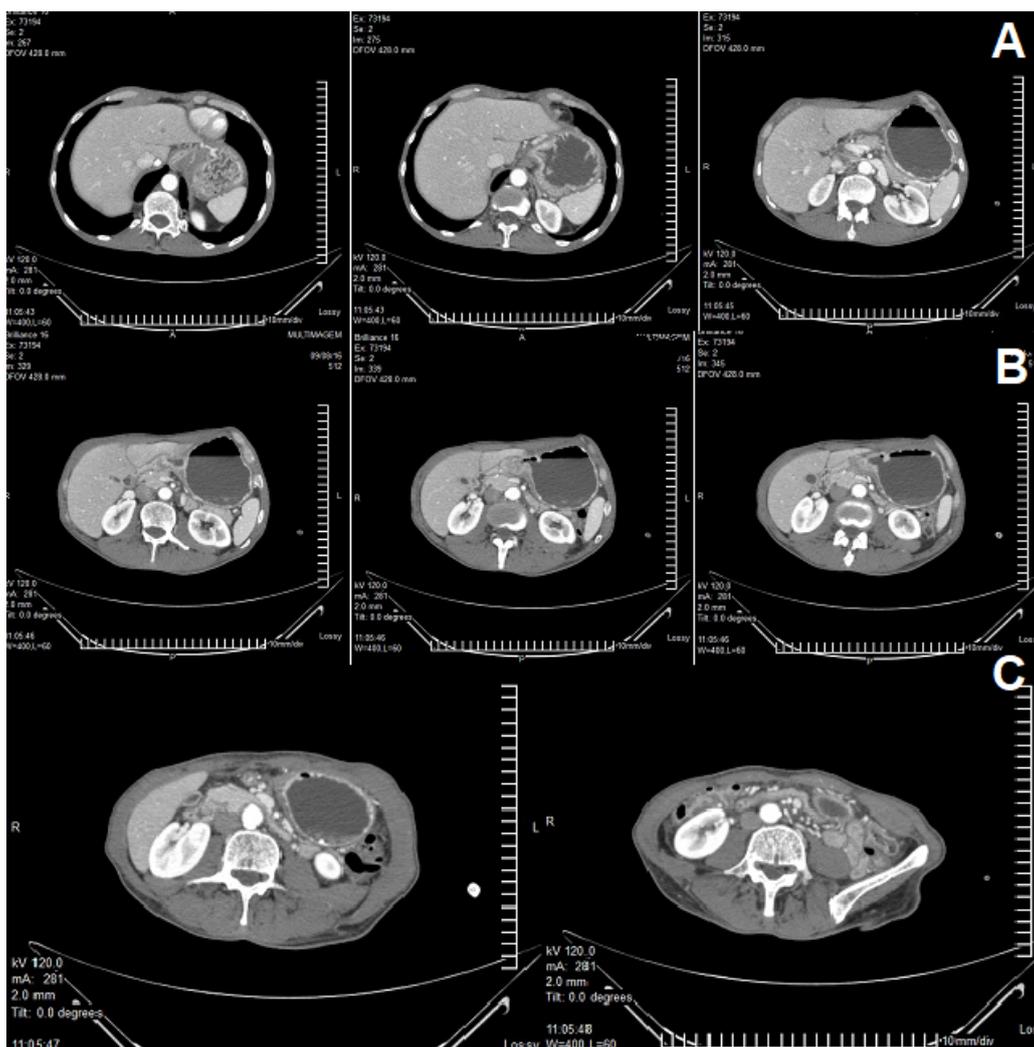


**Figure 3.** A. Endoscopy: Esophagus with diffuse erosive esophagitis. B. Stomach with gastric stasis. C. Stomach with an infiltrative tumor in the pylorus

The CT scan of the abdomen showed the presence of an expansive, infiltrative, and solid process, involving the gastric wall in the antrum, promoting signs of liquid stasis. A heterogeneous nodule, with areas of calcification, located in the superior margin of the caudate lobe in contiguity with the inferior vena cava, measuring 1.1 x 0.9 cm, in its largest

diameters; small hypodense areas with undefined borders, involving the hepatic parenchyma, mainly the left lobe.

There were signs of compression of the superior mesenteric artery over the left renal vein, which was found to be dilated in its proximal segment (Figure 4).



**Figure 4.** A. CT scan: Thickening and dilation of the stomach. B. Tumor in the antrum with pyloric obstruction. C. Liquid stasis in the stomach which reaches the umbilicus

A histopathology exam showed an invasive, ulcerated, moderately differentiated adenocarcinoma. With the diagnosis of an advanced gastric adenocarcinoma with invasion of the inferior vena cava, pancreas, and hepatic metastasis, with no curative surgical or clinical oncologic approach, the team opted to feed the patient using the parenteral formula before the palliative surgical approach.

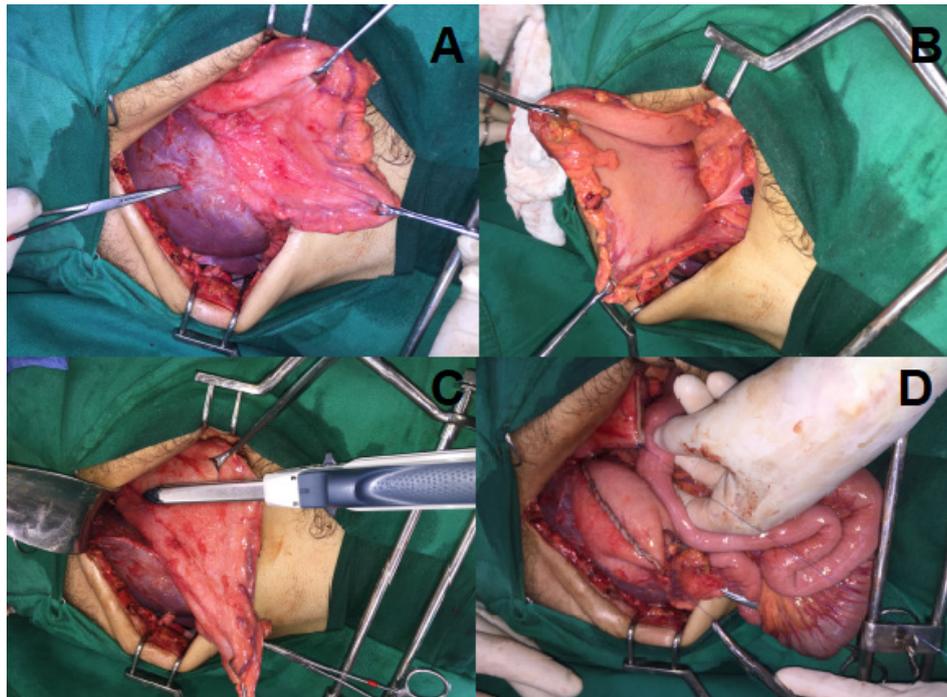
The team performed the gastric bipartition procedure with a gastrojejunostomy by laparotomy, with the total surgical time of 90 minutes.

### Surgical Technique

The findings are as follows (Figure 5): There were no ascites. There was a petrous lesion measuring 2 cm in segment three of the liver. In the stomach, there was a 6-cm tumor in the antrum, with local invasion to the first and second duodenal portions, pancreatic head and liver. An omentectomy was performed with ligature of the

peri-colic veins in the greater curvature, resection of the greater curvature from the angle of His and release of the lesser curvature with ligature of the branches of the vagus nerve. A gastric bipartition was performed 5cm from the tumor with a linear stapler and a 2-3cm connection between the two resulting stomach chambers. A termino-lateral gastrojejunostomy was performed with jejunal loops 50cm from the angle of Treitz, using a linear stapler and manual sutures in two planes of a continuous suture.

The patient was discharged in the fourth post-operative day in good clinical conditions, good oral food intake, and with no nausea or vomits. Visits to the clinical oncology team were scheduled for follow-up. During the period of 15 months, the patient underwent chemotherapy (5-Fluoracil and Oxiplatina) in the first 6 months and a new cycle later. During this period, he had a satisfactory quality of life with no symptoms. After 15 months, the patient was admitted again due to upper GI bleeding, secondary to the advanced gastric cancer, with a respiratory sepsis, and died two days after the admission.



**Figure 5.** A. Gastric tumor with hepatic invasion; B. Gastric body and pancreatic tumoral invasion; C. Gastric Bipartition with margin of 5 cm to the tumor; D. Gastrojejunostomy after the gastric bipartition

## DISCUSSION

Despite the decline in the incidence of gastric cancer in the last few decades owing to the discovery of the dietetic and environmental risk factors and its association with the *helicobacter pylori*, it remains high and its diagnosis in advanced stages is prohibitive for a curative therapy. With patients who do not have a curative strategy, palliative treatment is the preferred choice, which can be a different surgical procedure in patients with obstructive symptoms or chemotherapy to provide the patient with better quality of life and comfort. The main goal here is to increase the possibility of oral food intake<sup>1,2,13</sup>.

The evaluation to quantify the gastric obstruction can be measured by the GOOSS score - *Gastric Outlet Obstruction Scoring System* - proposed by Adler et al.<sup>13</sup> This score is also used to evaluate the post-operative quality of life.

The PS is part of the clinical follow-up. A PS > 2, hepatic metastasis, peritoneal metastasis, and alkaline phosphatase > 100 are considered unfavorable prognostic factors<sup>14</sup>.

The palliative surgical options for patients with acute obstructive symptoms are the endoscopic prosthesis and the gastrojejunostomy, which is most often performed. The auto expansive, metallic endoscopic prosthesis are an alternative for gastric obstructions and are considered a less invasive, safe, and effective technique with good results in the long-term.<sup>10,15,16</sup> However, it has an elevated cost.

The gastrojejunostomy is considered a safe and fast

technique, described by Wölfer in 1881, and considered the gold-standard treatment of irresectable gastric cancer. It can be performed by laparotomy or laparoscopy with good results in the quality of life and allowing the patient to take food orally. The laparoscopic gastrojejunostomy has advantages compared to the open procedure as the former comes with a lesser need for analgesics, less length of stay, and less post-operative morbidity<sup>7,8,9,11,12</sup>.

However, gastrojejunostomy is not free of complications, some of which are as follows: elevated tumoral bleeding rate, difficulty of gastric emptying by anastomosis, and risk of a new obstruction by the tumor growth. In 1997, Kaminishi et al. described a modification in the original technique: they performed a gastric bipartition, keeping a previous gastric segment of approximately 3 cm in the lesser curvature, communicating the two gastric chambers that were separated by the horizontal stapling of the stomach. Then, there is a reduction in upper gastric bleeding, a decrease in symptoms such as nausea and vomiting, and a fast progression of the diet leading to fast hospital discharge<sup>7,15,17-20</sup>.

Our patient had symptoms of gastric obstruction due to a tumor in the antrum, advanced and with invasion of adjacent structures (pancreas and vena cava), and hepatic metastasis, characterizing an irresectable tumor. The patient was malnourished with a BMI of 16.3 kg/m<sup>2</sup>, with no possibility of oral food intake even by a nasoenteric tube, despite the repeated attempts of upper GI endoscopy. He had a PS 2 and a GOOSS score of zero.

With the presented case, in the absence of a curative

proposal, a palliative procedure was opted for. Initially, the endoscopic prosthesis was a possibility due to its advantages when confronted by the surgical procedure, as shown in the meta-analysis published by Nagajara et al.<sup>16</sup>

However, with a total obstruction of the antrum and pylorus, no lumen for the passage of the prosthesis, and the elevated cost of the procedure, which was not available in the department, the gastric bipartition with a gastrojejunostomy was decided to be performed. This is a promising palliative approach with better quality of life post-operation and less risk of complications<sup>7,12,15,17,18,20</sup>.

The patient had a good recovery with a fast progression of oral intake and with a GOOSS from 0 to 3 in four days of post-operative, and being discharged with good functional capacity (PS score 0) and Karnofsky 90% with no signs of slow gastric emptying, which is the main complication of the gastrojejunostomy with no gastric bipartition.

For post-operative complications, the Clavien-Dindo<sup>21</sup> classification was used and our patient was ranked grade I. The follow-up was of 461 days until his death. During this period, the patient had a satisfactory quality of

life with no complaints of gastric obstruction and GOOSS 3, and showing a survival higher than some presented in other studies.

The patient's death was due to a complication from the advanced tumor, presenting, in the last days of his life, upper digestive hemorrhage with no improvement after the therapies available at the moment.

## CONCLUSION

Gastric cancer prevails as one of the most common incidences in the world population and its diagnosis in advanced stages is common, mainly in undeveloped countries such as Brazil. Therefore, the palliative therapies have been highlighted. The gastric bipartition surgery has come as a new adapted gastrojejunostomy technique, offering good results to the antral and pyloric obstructions, with lower complication rates (bleeding, nausea, and vomiting), fast oral diet intake, early discharge from hospital, and improvement in the patient's quality of life. Thus, it must be taken into consideration, as the treatment of advanced gastric cancer with pyloric obstruction.

**Participação dos autores:** Informamos para devido fins que o artigo foi confeccionado em conjunto pelo grupo de autores com o grau de participação seguinte: Coleta de dados (*Julio Arruda, Diego Laurentino Lima* – residente cirurgia geral e *Raquel Nogueira Cordeiro* – acadêmica de medicina). Orientação organizacional e sobre a essência, argumentação e relevância do trabalho: (*Diego L Lima e Raquel Nogueira Cordeiro*). Análise, pesquisa dos artigos, leitura e exclusão de pesquisas não pertinentes ao envolvimento do tema escolhido: (*Romulo Furtado, Julio Arruda, Marconi Meira*). Leitura e escrita do conteúdo: (*Diego L Lima, Julio Arruda, Raquel N Cordeiro*). Revisão do texto quanto a integridade e veracidade quanto as fontes utilizadas: (*Marconi Meira, Romulo Futado*). Dessa forma, o grupo de autores certifica participação conjunta na confecção do artigo, esperando contribuir no tema em questão.

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Received: 2018 October 03

Accepted: 2019 December 11