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From bariatric surgery to a radical total gastrectomy: A change in the proposed surgical procedure due to intraoperative diagnosis of carcinoid tumour[☆]

De cirugía bariátrica a gastrectomía total radical: Cambio del procedimiento quirúrgico previsto por hallazgo operatorio de un tumor carcinoide

Gastric carcinoid tumors (GCT) are benign neuroendocrine cell tumors of the glands of the body and fundus of the stomach. Some 70% of these tumors are located in the digestive tube (more in the small intestine and appendix). The probability of lymph node invasion depends on tumor size: 2% in tumors smaller than 1 cm, between 10% and 15% in those measuring 1–2 cm, and 60%–70% in tumors larger than 2 cm.^{1–4} The most frequent locations are the body and fundus of the stomach; when there is associated pernicious anemia, 50% are multifocal. Treatment depends on size, possibility of lymph node involvement and whether there are multiple foci. In our case, in a patient who was a candidate for bariatric surgery, preoperative gastroscopy revealed a gastric wall lesion, whose final pathology was GCT. Gastroscopy before bariatric surgery can significantly reduce the number of potentially malignant gastric lesions, which may inadvertently remain in the gastric remnant in cases of bypass surgeries without gastric resection, such as gastric bypass.³

The patient is a 28-year-old woman who had been referred to the Obesity Unit due to progressive weight gain after her first pregnancy and failed attempts to lose weight with low-calorie diets and physical activity (weight 110.5, height 152 cm, BMI 47). She reported having extrinsic asthma. She provided a gastroscopy report from a study done in another hospital 1 year before, which described a 3 mm polypoid lesion in the prepyloric antrum (biopsy: compatible with chronic antral gastritis with intestinal metaplasia and *Helicobacter pylori*+). After being assessed by the Obesity Unit, she was considered

as candidate for bariatric surgery, and preoperative studies were initiated in accordance with the hospital protocol. *H. pylori* was eradicated.

The study of the gastric mass was completed with another gastroscopy, which detected a raised, umbilicated lesion measuring 2 cm on the posterior side of the body of the stomach. Biopsy was non-specific. Endoscopic ultrasound showed a subepithelial mass on the posterior side of where the body and fundus meet, with central ulceration and slight depression. In the area of the lesion, a hypoechoic image was observed with central hyperechogenicity; it was round, measured 14 mm×10 mm, and appeared to depend on the longitudinal portion of the fourth layer or *muscularis propria* (Fig. 1).

The remaining preoperative studies showed no notable alterations.

The case was discussed with the Digestive Department, and the most probable diagnosis of the lesion was thought to be a 1.4 cm GIST tumor. Its location would enable a vertical gastrectomy to be done with resection of the lesion in the gastrectomy specimen as it seemed to be located on the posterior side toward the greater curvature of the stomach at the junction of the body and fundus.

The findings from the gastroscopy and endoscopic ultrasound were explained to the patient. Bariatric surgery was proposed, including resection of the gastric mass. The most likely surgical options would be either vertical sleeve gastrectomy or gastric bypass with gastric resection, and we explained to the patient that the final technique would depend on the intraoperative findings.

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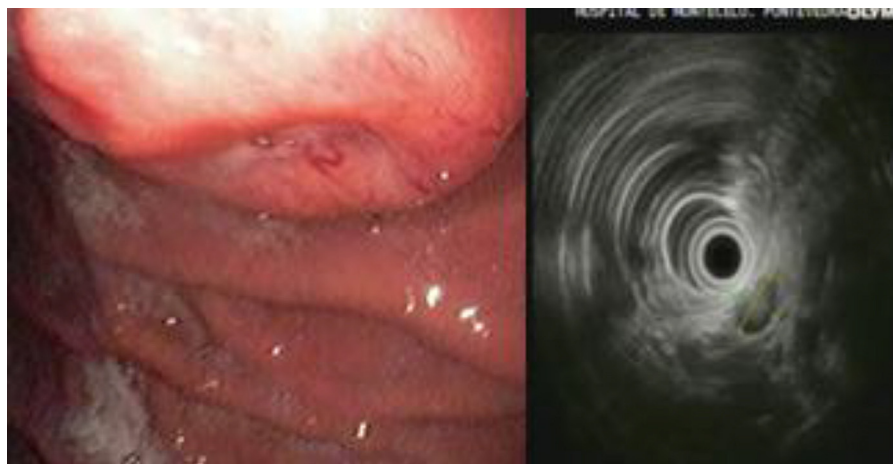


Fig. 1 – Umbilicated tumor found in gastroscopy and endoscopic ultrasound image.

The surgical intervention was begun with exploratory laparoscopy, exposing the posterior gastric side with aperture of the gastrocolic ligament. We found lymphadenopathies that were stone-hard in appearance in the region of the left gastric blood vessels (Fig. 2). Lymphadenopathies were sent for intraoperative pathology diagnosis, and intraoperative gastroscopy was carried out. By means of a combine vision provided by the gastroscope and laparoscope, the lesion was identified in the lesser curvature of the stomach 4 cm from the cardias (this differed from the preoperative gastroscopies). The pathology diagnosis of the lymphadenopathies was metastatic carcinoid tumor, so we assumed that the gastric lesion was the primary carcinoid tumor. Given the suspected diagnosis of GCT with lymph node infiltration near the cardias, we decided to perform total laparoscopic gastrectomy with D2 lymphadenectomy and Roux-en-Y reconstruction with a 100 cm intestinal loop. The postoperative period was uneventful, and the patient was discharged on the 4th day post-op.

The definitive pathology study reported a well-differentiated neuroendocrine neoplasm (carcinoid tumor) that infiltrated

the *muscularis mucosae* and submucosal areas. In the gastric antrum, there were changes compatible with chronic gastritis and areas of intestinal metaplasia. Chronic lymphadenitis was evident in 15 lymph nodes of the lesser curvature as well as 12 in the region of the hepatic pedicle, and 1 lymph node presented metastatic infiltration of a carcinoid tumor (1/27).

After 24 months of follow-up, the patient weighed 74 kg, with a BMI of 32 kg/m². She presented a good general condition and had negative radiological and analytical tests (with chromogranin A) for tumor recurrence.

This case demonstrated the importance of an adequate study with preoperative gastroscopy prior to bariatric surgery, especially if a bypass technique is going to be used without gastric resection, such as gastric bypass (which would have been our technique of choice with a BMI above 45 and no risk factors). With this type of surgery, there is the risk that a premalignant lesion may inadvertently remain in the excluded gastric remnant, which would have been difficult to access after the procedure. The diagnosis of premalignant lesions, such as metaplasia, polyps, atrophic gastritis, gastrointestinal stromal tumors, carcinoid tumor, etc., may allow for some lesions to be treated endoscopically or may lead to a change in the surgical technique in cases in which gastric resection should be used.

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Fig. 2 – Image of pathologic lymph nodes during exploratory laparoscopy.

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Severe Liver Trauma and Diaphragmatic Rupture in a Bull Running Event[☆]

Traumatismo hepático grave y rotura diafragmática en encierro taurino

Bull gore injuries (*cornadas*) are the most frequent injuries caused by bulls during bull-related events. Blunt trauma caused by being struck by the bull's horns and/or head (known as *varetazos*) usually causes less serious injuries. We present the case of a patient who received blunt trauma from a bull horn, that caused diaphragm rupture and right hepatic avulsion requiring right hepatectomy, vena cava repair and diaphragm suture.

Case Report

The patient is a 72-year-old woman who was brought to our Emergency Department after blunt thoracoabdominal trauma that occurred during a bull running event. The bull had struck the patient on the right flank with its head and horns. The patient was pale, hypotensive (80/50 mmHg) and hypothermic (35.8 °C). Glasgow Coma Scale was 15; initial hemoglobin was 8.1 g/dl. Examination detected a large hematoma that was painful to the touch in the right hemithorax and guarding in the right hypochondrium. After initial resuscitation measures, a CT scan revealed 4 right rib fractures (7th to 10th), liver trauma with active bleeding (AAST grade V) and liver herniation in the right thorax (Figs. 1 and 2). Given these radiological findings and the unstable clinical situation of the patient, we decided on emergency surgery.

During surgery, we observed: a large hemoperitoneum, right diaphragm rupture, herniation of the liver into the thorax, retroperitoneal hematoma, complete avulsion of segments VI and VII and partial avulsion of V and VIII, a large laceration affecting segments V and IVb, and several tears on the anterior side of the vena cava caused by rupture of the veins draining segments 6 and 7. We performed right atypical hepatectomy, suture of the multiple orifices present in the inferior vena cava, hepatorrhaphy of the liver

laceration, suture of the diaphragm and placement of a right thoracic drain. Probably due to the transfusion of 6 blood and 2 plasma units, we were not able to achieve perfect hemostasis and we decided to use temporary packing.

In the beginning, the patient remained hemodynamically unstable, with mixed shock (hypovolemic and distributive) with good response to blood volume expansion and amines. Seventy-two hours later, when the patient was stable and coagulopathy was resolved, the perihepatic packing was withdrawn without complications.

Afterwards, the patient's progress was very torpid and complicated with right basal pneumonia due to methicillin-resistant *Staphylococcus aureus*. We used tracheostomy and mechanical ventilation disconnections, which were poorly tolerated. The patient presented tracheobronchitis due to *Stenotrophomonas maltophilia*, which impeded respiratory improvement. Dynamic radioscscopy of the diaphragm confirmed right diaphragmatic paralysis. Ventilatory mechanics improved progressively, with decannulation after 40 days. The patient was moved to the hospital ward after 45 days and discharged from the hospital after 50 days.

The medical literature about bull-related injuries is very limited.¹ In Spain, these trauma injuries are classified as either *varetazo* (caused when the subject is struck with by the bull's head/horns) or *cornada* (gore injury caused by the horns). The lesions are usually complex for several reasons: several injury mechanisms may interact; several wound paths may be found due to the circular movements of the animal while goring; there may be a large amount of tissue damage and/or foreign bodies lodged in the wounds; and, wound contamination is always a factor.^{1,2} The depth of gore wounds (*cornadas*) depends on the penetrating force of the horn into the patient as well as the weight and speed of the animal.^{1,2} Injuries caused by horn/head impact (*varetazos*) convert kinetic energy

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