

## TITLE

### PERFORATED MARGINAL ULCER AS A COMPLICATION OF PANCREATICODUODENECTOMY

## ABSTRACT

Complications at the gastrojejunal anastomosis are challenging in terms of diagnosis, therapy, and prevention. Perforated marginal ulcer after pancreaticoduodenectomy (PD) is a delayed complication. One case of perforated marginal ulcer after PD was reported at our hospital. The patient was treated with direct suture and omental patch, and no mortality was reported. This study aims at identifying these complications and discussing their management. Gastrojejunal anastomotic complications are frequent and occur within the first few days or up to several years after surgery. Stenoses or marginal ulcers are usually successfully treated nonoperatively. Laparoscopic repair, meanwhile, is an appropriate therapeutic option for perforated ulcers.

## KEY WORDS

Keywords: Marginal ulcer; Marginal ulcer perforation; Gastrojejunal anastomosis

## INTRODUCTION

Marginal ulcer (MU) is defined as ulcer on the distal antimesenteric side of the gastrojejunostomy anastomosis. Most MUs are managed medically but those with complications like bleeding, stenosis or perforation require intervention. Prevention and early diagnosis is important to improve survival.

## CASE

We present a 70-year-old patient, who came to the emergency room for severe abdominal pain of several hours of evolution. As personal antecedent underwent a pylorus-preserving pancreaticoduodenectomy (PPPD) for an ampuloma 5 years ago, without complication. She is smoker and does not take any drugs. Abdominal CT is performed where pneumoperitoneum and free abdominal fluid are observed (Fig1). The patient required emergency surgery, finding a 1 cm marginal ulcer on the distal antimesenteric side of the gastrojejunostomy (Fig.2).

Performed direct suture and omental patch. Postoperative without complications and was discharged 8 days after surgery.

## DISCUSSION

The pylorus-preserving pancreaticoduodenectomy (PPPD) is a variant to the Whipple resection in the treatment of ampuloma. It is characterized by keeping the pylorus and the entire stomach intact with the intention of favoring the nutritional status of the patient. The most common early complication is delayed gastric emptying, which may appear up to 30% of patients, and generally results in longer hospital stays than the standard Whipple procedure<sup>1</sup>.

Marginal ulcer (MU) is defined as ulcer on the distal antimesenteric side of the gastrojejunostomy (GJ) anastomosis. The risk of developing a chronic marginal ulcer is 4.6% (1 to 25%). The incidence of perforation is 1.4%. The average time of appearance is 12 months<sup>2</sup>.

Recent studies have suggested that the use of non-absorbable suture materials, smoking, chronic anticoagulation, non-steroidal anti-inflammatory drugs (NSAIDs) or corticosteroids, as well as *Helicobacter pylori* infection may be involved in its etiopathogenesis. High blood pressure and diabetes also increase ulcer risk in some studies<sup>3</sup>, although their causal relationship is unclear.

It should be noted that the jejunum does not innately possess an acidic buffer, which is why it is an important factor for the development of an ulcer in the context of a gastrojejunostomy. When diagnosed, in most cases they respond to treatment with PPIs, which can lead to stenosis due to scarring and consequent obstruction if the treatment is not effective, requiring in this case endoscopic dilations<sup>4</sup>.

Marginal ulcer is a relevant long-term complication after pancreatoduodenectomy that occurs more frequently after proton pump inhibitor (PPI) therapy is discontinued<sup>5</sup>. The ulcer can be presented early, seen in a control endoscopy after the first postoperative month, and late marginal ulcer, evidenced after the first year<sup>6</sup>. The most frequent symptoms were digestive bleeding and abdominal pain<sup>7</sup>. The best performing diagnostic method was endoscopy. The best treatment is prevention. Educate the patient to stop smoking, endoscopic control if symptoms present. Extended prophylaxis with PPIs is indicated only in patients at risk (smokers, NSAIDs, etc.). Ulcers should always be treated with PPI and their healing confirmed by endoscopy. For ulcers resistant to this treatment, the association with sucralfate can increase the healing rate. Non absorbable sutures at the base of the ulcer should be removed endoscopically<sup>8,9</sup>. Surgery is necessary if medical treatment fails.

Marginal ulcer perforation is a complication with a low incidence but with a high potential for mortality. Treatment with direct suture and omental patch (Graham patch) is sufficient enough, demonstrated greater effectiveness and safety in the case of rupture of the ulcer with massive bleeding<sup>10</sup>. The laparoscopic approach is feasible. Mortality rate is 10%.

## CONCLUSION

Gastrojejunal anastomotic complications are frequent and occur within the first few days or up to several years after surgery. It is therefore important to recognize the danger of marginal ulcer after PD due to significant mortality. It is a pathology that should be suspected in those patients with risk factors. When suspected, it requires adequate monitoring to avoid perforation. Laparoscopic repair, meanwhile, is an appropriate therapeutic option for perforated ulcers.

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## FIGURE LEGENDS

**Fig.1. Abdomen CT with pneumoperitoneum and free abdominal fluid.**

Fig.2. Perforated marginal ulcer on the distal side of gastrojejunal anastomosis.