



## Perforated Peptic Ulcer: Surgical Management in the University Hospital of Maracaibo, Experience in 4 Years

Mariana Añolis<sup>1\*</sup>, Andrés Reyes<sup>1</sup>, Adel Al Awad<sup>1,2,3</sup> and María Matera<sup>1,4</sup>

<sup>1</sup>CEDIAH: Comunidad Estudiantil Para la Difusión e Investigación de la Anatomía Humana, Medicine School, Universidad del Zulia, Maracaibo, Venezuela

<sup>2</sup>Attending on the General Surgery Service, Promote Tower Paraíso, Maracaibo, Venezuela

<sup>3</sup>Retired Professor of Human Anatomy, Chair of Human Anatomy, Medicine School, Universidad del Zulia, Maracaibo, Venezuela

<sup>4</sup>Free Professor of the Chair of Human Anatomy, Facultad de Medicina, Universidad del Zulia, Maracaibo, Venezuela

**\*Corresponding Author:** Mariana Añolis, CEDIAH: Comunidad Estudiantil Para la Difusión e Investigación de la Anatomía Humana, Medicine School, Universidad del Zulia, Maracaibo, Venezuela.

**Received:** October 06, 2021

**Published:** October 26, 2021

© All rights are reserved by **Mariana Añolis, et al.**

### Abstract

Peptic ulcer perforation is a frequent emergency, which must be resolved on time. It is closely related to *Helicobacter pylori* infection, smoking and the consumption of NSAIDs. The aim was to determine the surgical management and the description of the intraoperative findings in patients admitted with the diagnosis of perforated peptic ulcer in the General Surgery Service of the University Hospital of Maracaibo. The clinical history of 42 patients diagnosed with Perforated Peptic Ulcer, admitted in the General Surgery service of the University Hospital of Maracaibo in a period from January 2016 to June 2019, was reviewed. The average age of onset was  $44.88 \pm 6.04$  years. 88.09% of the patients belonged to the male sex. On the other hand, the most frequent location of the ulcer corresponded to those of grade III, according to the classification of peptic ulcers described by Johnson. The techniques implemented for the closure correspond to, simple closure in 5 (11.90%), ulcrraphy + Graham patch omentopexy in 29 (69.04%) and Heineke-Mikulicz pyloroplasty in 8 (19.04%) cases. Mortality was located at 16.66% associated with sepsis. It was concluded that the management of the perforated peptic ulcer was carried out mainly by ulcrraphy + Graham patch omentopexy, then by pyloroplasty, and lastly by simple ulcer closure.

**Keywords:** Peptic Ulcer; Perforation; Surgery Management; Graham Patch; Ulcrraphy

### Introduction

Peptic ulcer perforation is a life-threatening emergency that requires urgent surgical care [1]. Its intervention is very common in general surgery, however, if it is not performed in time, it can

bring great repercussions such as septicemia or septic shock [2]. Peptic ulcer is generated when a circumscribed alteration occurs that involves the mucosa, submucosa and muscular layers [3]. Its pathophysiology is complex and includes several factors involved.

Its etiology is generally associated with *Helicobacter pylori* infection or excessive intake of non-steroidal anti-inflammatory drugs (NSAIDs) [4]. Likewise, these ulcers can occur due to the presence of risk factors such as abnormalities in gastric secretion, smoking, alcohol, glucocorticoids and high salt intake [1,5].

Its incidence has decreased after the introduction of proton pump blocking drugs and antibiotic therapy against *Helicobacter pylori* [6-8]. On the other hand, perforation occurs in 2 to 10% of patients with peptic ulcer disease, which in turn represents a mortality that ranges between 10 and 40%, associated with presence of comorbidities, delay in diagnosis and treatment [5,9]. Also, peptic ulcer usually affects older ages, particularly in males [10].

There are numerous forms of clinical presentation and different prognosis of the disease. Symptoms range from sudden onset abdominal and burning character, tachycardia, cold extremities, peritonitis due to fluid release into cavity, as well as fever and hypotension [11]. Once peptic ulcers are perforated, pneumoperitoneum can develop, as well as upper gastrointestinal bleeding [3,4]. The diagnosis is made taking into account the clinical manifestations of the individual simultaneously with the evaluation of the paraclinical test. The physical examination should be oriented for looking signs of peritonitis. Imaging studies such as radiology and tomography can reveal the presence of pneumoperitoneum, while ultrasound is useful to locate the perforation site [12-15]. Endoscopy stands out as the diagnostic method of choice since it allows the performance of biopsies [3].

Surgical intervention can be performed using the open or laparoscopic approach. At the present, there are two trends in surgical treatment: firstly, suturing with epiploplasty (omentoplasty or omentopexy) and secondly, simple closure of the ulcer [8,16].

**Aim of the Study**

The aim of this research is to determine the surgical management and the description of the intraoperative findings of patients admitted with perforated peptic ulcer in the General Surgery Service of University Hospital of Maracaibo.

**Materials and Methods**

This research was conducted using a retrospective cohort study. 42 patients were admitted with the diagnosis of perforated peptic

ulcer, in the General Surgery Service in the University Hospital of Maracaibo during the period from January 2016 to June 2019, in order to describe the surgical management implemented and the description of the intraoperative findings.

The following parameters were taken into consideration: age, sex, clinical manifestations, admission diagnosis, intraoperative findings like, classification of the perforated ulcer according to Johnson, surgical intervention, size of the perforation and mortality. Exclusion criteria was pediatrics cases. The data obtained were distributed in absolute figures and percentage, to later be tabulated and represented by tables and figures in a spreadsheet of Microsoft Excel 2019®.

**Results**

The average age of the 42 patients was 44.88 ± 6.04 years, with an age range that fluctuated between 21 to 69 years old. Regarding the distribution according to gender, 37 patients (88.09%) were male, while 5 patients were female. In turn, the clinical manifestation reported (Table 1), the physical examination, and a meticulous collection of medical history, guided the diagnosis of perforated peptic ulcer in 39 (92.87%) patients, while 3 (7.14%) were admitted with the diagnosis of acute appendicitis.

Clinical manifestation	N° (%)
Abdominal pain	37 (90.47%)
Nauseas	10 (23.80%)
Vomits	9 (21.42%)
Upper gastrointestinal bleeding	2 (4.46%)

**Table 1:** Clinical manifestations reported in patients at the time of being assessed by the general surgery service.

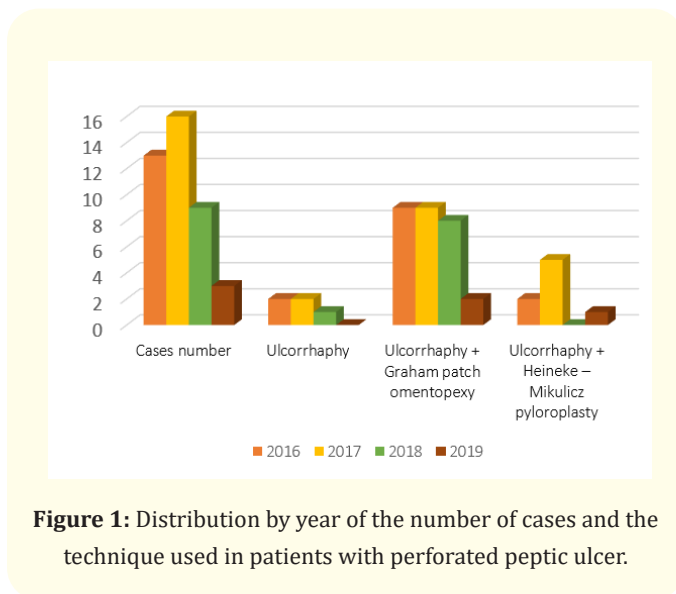
N°: Cases number.

Regarding to the therapeutic management, 42 patients (100%), underwent the conventional approach through laparotomy. The intraoperative variables found were observed in table 2. Likewise, there was a satisfactory recovery in 35 patients (83.33%). However, 7 patients (16.66%) died from causes associated with sepsis during the postoperative period. Referring to mortality and the technique, 5 patients (11.90%) with ulcography + Graham patch omentopexy died, while simple closure of the ulcer was associated with 2 (4.76%) deaths.

Intraoperative finding	Study group
<b>Ulcer location</b>	
Johnson I	8 (19.04%)
Johnson II	2 (4.76%)
Johnson III	23 (54.76%)
Johnson IV	9 (21.42%)
<b>Ulcer size</b>	
Small (0.5 cm)	21 (50%)
Large (1 - 2 cm)	20 (47.61%)
Very large (3 cm)	1 (2.36%)
<b>Surgical technique</b>	
Ulcorrhaphy	5 (11.90%)
Ulcorrhaphy + Graham patch omentopexy	29 (69.04%)
Ulcorrhaphy + Heineke - Mikulicz pyloroplasty	8 (19.04%)

**Table 2:** Intraoperative findings in patients diagnosed with perforated peptic ulcer.

Likewise, to refer to the year-by-year distribution of patients diagnosed with perforated peptic ulcer, as well as the surgical techniques implemented for its repair, the figure 1.



**Figure 1:** Distribution by year of the number of cases and the technique used in patients with perforated peptic ulcer.

### Discussion

The treatment of peptic ulcer disease is based mainly on the implementation of acid suppressing drugs, resulting in a decrease

in surgical treatment [17]. Therefore, the role of surgery has been limited to managing its complications. Perforated peptic ulcer is a rare but fatal entity [19]. This remains a major health problem, being one of the most frequent emergencies that warrant surgery [20].

A marked increase in the incidence of perforation has been shown in young men [9]. According to Araujo [4], 75% of peptic ulcers occur in men earlier than in women, this because they have a higher risk of infection by *Helicobacter pylori*. This research showed that perforated peptic ulcer is more frequent in men 88%, for a 7:1 ratio, this probably due to the fact that it is frequently subjected to toxic substances such as alcohol and cigarettes.

On other hand, the average age of perforation ranges from the fourth to fifth decade of life, between 55 and 65 years [13,21]. The subjects studied had ages ranging from 21 to 69 years, with average of 44.88 ± 6.04.

Perforated peptic ulcers are classified into five according to their location, these described by Johnson which are grade I; those that are located in the first level of the lesser curvature, grade II; if it is gastroduodenal, grade III; if it is prepyloric, grade IV; if it is juxta-esophageal and grade V; related to NSAID intake [4,10]. Araujo expose that grade I are usually the most frequent [4]. However, it was evidenced in the research carried out that most of the patients had grade III ulcers. This last type of ulcer is usually more common in males [16]. That agrees with the results obtained, on the other hand, grade I, was presented mainly in women. It was reflected that those of grade II were presented in a lower proportion in relation to the other grades. Grade IV ulcers along with grade I ulcers are associated with less gastric acid secretion [22].

For the approach to perforated peptic ulcer, traditional surgery corresponds to laparotomy with primary closure or Graham patch. Closure using laparoscopic surgery is as safe as the open approach, in addition, there are advantages related to laparoscopic surgery compared to conventional surgery [18]. Studies have been reported in the literature where the chance from the approach to open surgery is recorded in 19.4% of laparoscopic surgeries [9]. Laparotomy remains the gold standard, while laparoscopic surgery should be considered in cases where the expertise and skill the surgeon allow its practice [22].

Currently, the best technique for ulcer closure is still under discussion. Although primary closure with the Graham patch is safe, certain authors are in favor of performing definitive procedures in the first instance [20]. This procedure consists of placing a plug on the ulcer taken from the omentum that reduces the risk of leakage, accelerates healing and inhibits recurrence [4,23].

Taking into account the size of the ulcer, those that are 2 cm > the surgery of choice is Graham patch omentopexy, while the use of simple closure is accepted in those perforations with a size < 2 cm. It is suggested that the omental patch has an advantage in preventing potential leaks [24].

Closure from the Graham patch is associated with a high recurrence of the ulcer, reported in up to 63%, when *Helicobacter pylori* infection is not eradicated [25]. Despite the uncertainties of certain specialist to abandon the omental patch and perform only simple closure, works are described in the literature where it is plausible to repair perforations using simple closure individually [17,26]. This simple closure is based on repairing the perforation using a continuous suture technique, also called primary closure [22].

Simple closure of the ulcer, without patching, is a viable option in patients who meet criteria based on time of onset of symptoms, ASA score and size of the perforation [27]. However, both the prospective and retrospective review of 13 and 12 studies respectively prepared indicate that the relevant method for closure should be considered according to the properties of the ulcer edges [28]. In this study, Graham patch omentopexy was recorded as the most used surgical technique.

Perforated peptic ulcer is considered dangerous as a result of its relationship with sepsis [18]. This is consistent with what was reported in this research, which yielded a 16.6% mortality. The same study indicates that mortality is related to a greater presence of comorbidities. In other investigations emphasize that advanced age, cancer, hypoalbuminemia, lung diseases, cardiopulmonary diseases, and severe postoperative complications are factors associated with higher mortality.

Chung and Shelat [22], indicate that perforated peptic ulcer is significantly associated with postoperative morbidities and mortality, regardless of surgical technique. Despite the fact that there

was a greater number of patients who died after surgery with the Graham patch, it must be considered that 29 patients were operated on using this technique, which indicates a mortality of 17.24%, compared to simple closure of the ulcer, were registered which resulted in a mortality of 40%. However, this does not suggest that surgical technique played a fundamental role in the death of the patients [29,30].

## Conclusion

It was possible to determine the surgical management of perforated peptic ulcers in the General Surgery Service of the University Hospital of Maracaibo, which is based on the closure of the ulcer using Graham patch omentopexy, simple closure and Heineke-Mikulicz pyloroplasty. Graham patch omentopexy is the most applied for its repair. The age group most associated with perforated peptic ulcers remains the same as the described in the literature. However, there is an increase in the appearance of perforated peptic ulcers at younger ages. Peptic ulcer perforation is a surgical emergency that, if not solved on time, can trigger complications that lead to the death of the patient. It is necessary to control or reduce the risk factors associated and, its appearance and recurrence.

## Conflict of Interest

We declared that we have not conflict of interest.

## Bibliography

1. Arora Bhavinder K., *et al.* "Modified Graham's repair for peptic ulcer perforation: reassessment study". *International Surgery Journal* 4.5 (2017): 1667-1671.
2. Shi Yi-Jun. "Curative effect of laparoscopic surgery on acute gastric perforation". *Journal of Acute Disease* 6.2 (2017): 57.
3. Silva Rocío Arias. "Úlcera gastroduodenal". *Revista Médica Sinergia* 1.7 (2016): 10-13.
4. Araujo-López Adán., *et al.* "Casuismo comparativo entre el uso de parche de Graham y parche de Cellan Jones en cirugía abierta en hospitales de segundo nivel". *El Residente* 14.1 (2019): 4-10.
5. Thorsen Kenneth., *et al.* "Epidemiology of perforated peptic ulcer: age-and gender-adjusted analysis of incidence and mortality". *World Journal of Gastroenterology: WJG* 19.3 (2013): 347.

6. Vakayil Victor, *et al.* "Surgical repair of perforated peptic ulcers: laparoscopic versus open approach". *Surgical Endoscopy* 33.1 (2019): 281-292.
7. Karydakis Periklis, *et al.* "Laparoscopic Management of Perforated Peptic Ulcer: Simple Closure or Something More?". *Open Journal of Gastroenterology* 6.11 (2016): 311.
8. Søreide Kjetil, *et al.* "Perforated peptic ulcer". *The Lancet* 386.10000 (2015): 1288-1298.
9. Johnson Charles HN, *et al.* "An evaluation of the epidemiology, management and outcomes for perforated peptic ulcers across the North of England over 15 years: A retrospective cohort study". *International Journal of Surgery* 64 (2019): 24-32.
10. Aguila Gómez, *et al.* "Úlcera gástrica perforada ¿Qué camino a seguir?: presentación de un caso y revisión de la literatura". *Revista Médica La Paz* 21.2 (2015): 54-59.
11. Quah Gaik S., *et al.* "Laparoscopic repair for perforated peptic ulcer disease has better outcomes than open repair". *Journal of Gastrointestinal Surgery* 23.3 (2019): 618-625.
12. Yamamoto Kazuki, *et al.* "Evaluation of risk factors for perforated peptic ulcer". *BMC Gastroenterology* 18.1 (2018): 1-8.
13. Barrientos Caridad Romero, *et al.* "Caracterización clínico-epidemiológica de pacientes ingresados con úlcera péptica". *Revista Información Científica* 95.5 (2016): 683-691.
14. Wang Shang-Yu, *et al.* "The relationship between computed tomography findings and the locations of perforated peptic ulcers: it may provide better information for gastrointestinal surgeons". *The American Journal of Surgery* 212.4 (2016): 755-761.
15. Søreide K., *et al.* "Strategies to improve the outcome of emergency surgery for perforated peptic ulcer". *Journal of British Surgery* 101.1 (2014): e51-e64.
16. Cabrera Cárdenas, *et al.* "Comportamiento de la úlcera gastroduodenal perforada". *Revista Cubana de Medicina Militar* 40.1 (2011): 12-21.
17. Wright G Paul, *et al.* "Cost-efficiency and outcomes in the treatment of perforated peptic ulcer disease: laparoscopic versus open approach". *Surgery* 156.4 (2014): 1003-1008.
18. Pan Chao-Wen, *et al.* "Simple laparoscopic repair of perforated peptic ulcer without omental patch". *Asian Journal of Surgery* 43.1 (2020): 311-314.
19. Søreide Kjetil and Kenneth Thorsen. "Management of Perforated Peptic Ulcer". *Acute Care Surgery Handbook*. Springer, Cham (2016.): 107-115.
20. Montalvo-Javé, *et al.* "Factores asociados con complicaciones posoperatorias y mortalidad en úlcera péptica perforada". *Cirugía y Cirujanos* 79.2 (2011): 141-148.
21. Saleh Adel Alhaj, *et al.* "Laparoscopic omental patch for perforated peptic ulcer disease reduces length of stay and complications, compared to open surgery: a SWSC multicenter study". *The American Journal of Surgery* 218.6 (2019): 1060-1064.
22. Chung Kin Tong and Vishalkumar G Shelat. "Perforated peptic ulcer-an update". *World Journal of Gastrointestinal Surgery* 9.1 (2017): 1.
23. Leusink Astrid, *et al.* "Laparoscopic surgery for perforated peptic ulcer: an English national population-based cohort study". *Surgical Endoscopy* 32.9 (2018): 3783-3788.
24. Siow Sze Li, *et al.* "Laparoscopic versus open repair of perforated peptic ulcer: Improving outcomes utilizing a standardized technique". *Asian Journal of Surgery* 41.2 (2018): 136-142.
25. Kumar Dinesh and Alok Nath Sinha. "Helicobacter pylori infection delays ulcer healing in patients operated on for perforated duodenal ulcer". *Indian Journal of Gastroenterology* 21.1 (2002): 19-22.
26. Ates M and A Dirican. "The simple suture laparoscopic repair of peptic ulcer perforation without an omental patch". *Surgical Endoscopy* 26.1 (2012): 289-289.
27. Lunevicius Raimundas and Matas Morkevicius. "Management strategies, early results, benefits, and risk factors of laparoscopic repair of perforated peptic ulcer". *World Journal of Surgery* 29.10 (2005): 1299-1310.
28. Lin Being-Chuan, *et al.* "Laparoscopic repair of perforated peptic ulcer: simple closure versus omentopexy". *Journal of Surgical Research* 220 (2017): 341-345.

29. Daniel Vijaya T, *et al.* "Predictors of mortality in the elderly after open repair for perforated peptic ulcer disease". *Journal of Surgical Research* 215 (2017): 108-113.
30. Thorsen K, *et al.* "Long-term mortality in patients operated for perforated peptic ulcer: factors limiting longevity are dominated by older age, comorbidity burden and severe postoperative complications". *World Journal of Surgery* 41.2 (2017): 410-418.

**Volume 4 Issue 11 November 2021**

**© All rights are reserved by Mariana Añolis, *et al.***