



## Original Article

# Balloon dilatation in patients with gastric outlet obstruction related to peptic ulcer disease



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## ABSTRACT

**Background and study aims:** Gastric outlet obstruction (GOO) is a rare complication of peptic ulcer disease (PUD). The endoscopic balloon dilatation (EBD) associated with medical treatment of *Helicobacter pylori* is a successful method in the management of pyloric stenosis. The aim of this study was to describe epidemiological, clinical, and endoscopic characteristics of GOO related to PUD and to evaluate the effectiveness, safety, and outcome of EBD.

**Patients and methods:** In a retrospective study of patients seen between 1999 and 2009 with symptoms of GOO secondary to PUD, pyloro-bulbar stenosis was confirmed by endoscopic examination. Balloon dilatation was performed when obstruction persisted after treatment with double-dose proton-pump inhibitor (PPI) intravenously for 7–10 days. The *H. pylori* status was assessed with histology, and eradication therapy was prescribed for infection.

**Results:** A total of 45 consecutive patients (38 males, 7 females median age, 51.9 years; range, 20–58 years) with symptoms of GOO secondary to PUD underwent EBD.

Median follow-up time of the 45 patients was 32 months (range, 4–126 months). The immediate success rate of the procedure was 95.5%. Clinical remission was noted in 84.4% of the patients. Remission without relapse was observed in 55.8%, 30 months after the dilatation. Pyloric stenosis relapsed in 15 patients (39.5%) after a median period of 22.9 months. The dilatation was complicated in three patients (6.7%, two perforations and one bleeding). A total of 13 patients (29%) underwent surgery. *H. pylori* was found to be positive in 97.7% of the patients, and was eradicated in 78.4% of them. Smoking and failure of *H. pylori* eradication were associated with the relapse of the stenosis.

**Conclusion:** EBD is a simple, effective, and safe therapy for the GOO related to PUD, producing short- and long-term remission.

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## Introduction

Pyloric stenosis is a rare complication of peptic ulcer disease (PUD), which has been reported in 5–12% of patients. It causes gastric outlet obstruction (GOO) [1–3]. Surgery has been the conventional method of treatment, but it is associated with significant morbidity and mortality [4]. Endoscopic balloon dilatation (EBD)

with medical treatment (*Helicobacter pylori* eradication) showed short- and long-term efficacy and safety [5,6]. In this study, we report our experience of EBD in 45 consecutive patients presenting with symptoms of GOO secondary to PUD, and evaluate its effectiveness.

## Patients and methods

Over an 11-year period (January 1999–December 2009), we analysed data from 76 patients with PUD-related GOO, who were admitted in the Gastroenterology Department of Mohamed Tahar Maamouri Hospital (Nabeul) with a median prevalence of 4.1 patients/year (9%) (range, 1 patient in 2002 and 9 in 2009). Endoscopic examination was performed in all patients, and it

**Abbreviations:** GOO, gastric outlet obstruction; PUD, peptic ulcer disease; *H. pylori*, *Helicobacter pylori*; EBD, endoscopic balloon dilatation; NSAIDs, nonsteroidal anti-inflammatory drugs; PPI, proton-pump inhibitor; AST, antisecretory therapy; TTS, through the scope.

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demonstrated the presence of food residues in the stomach, which resulted in the inability to pass a 12-mm-diameter endoscope beyond the obstruction. Clinical, biological, and endoscopic characteristics were described. Malignancy was ruled out with biopsies in some patients. The patients received a double-dose proton-pump inhibitor (PPI) intravenously for 7–10 days and underwent a control endoscopic examination. If the obstruction persisted, an EBD was performed. A total of 45 patients (59.4%) were dilated. Through-the-scope (TTS) BD was performed intravenously and under direct visual control. Hydrostatic Rigiflex (CRE, Boston, USA) or microvasive balloons, inflated with water to different pressures (corresponding to different diameters: 12, 14, 15, 16, 18, and 20 mm), were used. Once positioned across the stricture, the balloon was inflated to the recommended pressure and kept in place for 1–2 min. A series of balloons of increasing diameter were used in the same session. The success of the procedure was confirmed by the passage of the endoscope into the second portion of the duodenum. Following dilation, the patient was monitored for signs of perforation or bleeding. Stable patients were allowed to take liquids after the procedure. The *H. pylori* status was assessed with histology. Patients with *H. pylori* infection were treated by acid-suppressive therapy (double dose of PPI or H2 blockers) associated with amoxicillin, and clarithromycin or metronidazole, orally administered for 1–2 weeks. *H. pylori* eradication was assessed with histology after 6 weeks.

Surgery (truncular vagotomy associated to gastroenterostomy or antrectomy) was indicated in case of perforation or failure of EBD. Patients were advised to stop smoking. They were administered H2 blockers or PPI for 4 weeks. They were followed up in outpatient clinics for symptom assessment. Follow-up endoscopies were performed 6 weeks after the procedure and in case of relapse of GOO. Other EBD sessions were indicated in case of recurrence.

### Statistical analysis

Patient characteristics in both groups were compared using chi-square distribution with Fisher's exact test for qualitative variables. The normality of data was assessed by Shapiro–Wilk and Kolmogorov–Smirnov tests. The Z Kolmogorov–Smirnov statistical analysis was used for nonparametric continuous variables. Countable variables were defined with numbers and percentages. Statistical significance was achieved when  $\alpha \leq 0.05$ . The survival curve was plotted by using the Kaplan–Meier method.

## Results

The median age of patients was 51.9 years (range, 20–85 years). There were 38 males (84.4%) and seven females (15.6%). A total of nine patients (20%) had a history of PUD, which was complicated in five of them (11.1%); and three patients (6.38%) were taking nonsteroidal anti-inflammatory drugs (NSAIDs) for rheumatic diseases. A total of 33 patients (73.3%), all men, were smokers. The predominant symptoms at presentation were abdominal pain (45 patients), vomiting (44 patients), and weight loss (31 patients). Dehydration and anaemia were observed in 19 (42.2%) and nine

(20%) patients, respectively. Characteristics of patients are summarised in Table 1. A total of 43 patients (95.6%) had pyloric stenosis and two (4.4%) had duodenal stenosis. Esophagitis was observed in 30 patients (66.7%), of which six were severely affected (13.3%).

The median number of dilations was 1.4 (range, 1–4). The median diameter of the balloon was 15.8 mm (range, 12–20 mm). The diameter of 16 mm was used in 25 patients (55.5%). Immediate success was reported in 43 patients (95.5%). Dilatation was not possible in one patient, because of tightness of the stricture. A total of three complications (6.7%) occurred: two perforations in the first and second sessions (diameters of 20 and 16 mm) and one case of bleeding, which was self-limited. The *H. pylori* status was assessed with histology in 42 patients (93.3%), and was found to be positive in 41 (97.6%). These patients received eradication therapy with a median number of cures of 2.1 (range, 1–3). *H. pylori* eradication was checked by histology in 37 patients (82.2%), and was successful in 29 of them (78.4%), after two sessions in 37.8%. The median follow-up time was 32 months (range, 4–126). All patients received antisecretory therapy (AST: H2 blockers in 60% and PPI in 40%) 4 weeks after dilation. Clinical remission rate without relapse was 81.6% at 6 months. A total of three patients (6.7%) had relapse between 2 and 6 months, of which two were successfully redilated. Clinical remission rate without relapse was 75.4% and 63.8% at 12 and 24 months, respectively. A total of seven patients had a first relapse between 6 and 12 months, of which six were successfully redilated. Only two patients had a second relapse at 18 months. Clinical remission without relapse was 55.3% at 30 months. The survey curve is depicted in Fig. 1. A total of five patients had a first relapse between 25 and 116 months. Only one patient had a second relapse at 40 months. Another one had a third relapse at 44 months. Totally, five patients were successfully redilated. A sum of 19 patients (44%) required AST maintenance for the following reasons: reflux esophagitis (six patients), need for NSAIDs and/or aspirin (four patients), and clinical and endoscopic remission (nine patients). Relapse was observed in 15 patients (39.5%) after a median period of 22.9 months (range, 2–116), with a median number of relapse/patient of 1.33 (range, 1–3). It occurred during the first 2 years. The majority of patients (24.4%) presented only one relapse. Peptic ulcer relapsed in seven patients (15.5%) and *H. pylori* was found to be positive in 10 (66.7%). Different parameters were analysed when relapse occurred: gender, smoking, use of NSAIDs and/or aspirin, *H. pylori* infection, ulcer, number of dilations  $\geq 2$ , and a balloon diameter  $\leq 14$  mm without significant difference. Relapse was more frequent in patients who were smoking and in whom *H. pylori* eradication was absent. Surgical treatment was indicated in 13 patients (29%): two for iatrogenic perforation, one for nonfeasibility of dilatation, two for other indications, and eight for failure of dilatation at short and long term. Surgery was required often when failure of *H. pylori* eradication, number of dilatations  $\geq 2$ , and a relapse of the stenosis with a significant difference occurred. Factors of relapse and need for surgery are summarised in Table 2.

## Discussion

Peptic ulcer is the major cause of benign gastro-duodenal obstruction [7]. The annual incidence of this complication in developed countries is 1–3 per 100,000. However, it is still relatively frequent in Africa with an annual incidence of 4–13 per 100,000 [8]. In Tunisia, it was reported in 14.5–40% of surgically treated complicated PUD [9]. The prevalence of *H. pylori* is 33–91% with an average of 69% [10–12]. It was 97.7% in our study and even higher in the other Tunisian series – 100% [13]. Eradication of *H. pylori* was alone sufficient for the treatment in some series, but it was more

**Table 1**  
Patients characteristics.

Symptoms	No. of patients (n)	Percentage (%)
Abdominal pain	45	100
Vomiting	44	97.7
Reflux	18	40
Weight loss	31	68.8
Dehydration	19	42.2
Anaemia	9	20

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