

# Long-Term Results Of Simple Closure Of Perforated Duodenal Ulcer In The Era Of Proton Pump Inhibitor And Anti-H.Pylori Therapy

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## Citation

N Gujar, P Chougule, S Bhosale, H Mane, S Paighan, V Balachandran. *Long-Term Results Of Simple Closure Of Perforated Duodenal Ulcer In The Era Of Proton Pump Inhibitor And Anti-H.Pylori Therapy*. The Internet Journal of Surgery. 2012 Volume 28 Number 3.

## Abstract

**Background:** A simple closure of duodenal ulcer perforation followed by proton pump inhibitor therapy and treatment for *Helicobacter pylori* is the standard treatment at many centres, but the literature is silent on long-term results. **Objective:** This study was conducted to determine the long-term results of a duodenal ulcer perforation treated by a simple closure, proton pump inhibitors and an anti-*Helicobacter pylori* treatment. **Methods:** A prospective study involving 50 patients of perforated duodenal ulcer treated with simple closure, proton pump inhibitors and triple regime for *Helicobacter pylori* was undertaken. An annual follow-up was conducted and patients were graded according to modified Viscik's grading. **Results:** Out of 50 patients, 47 got complete follow-up evaluations for 12 to 15 years (mean follow-up period 12 years). Excellent and good results were obtained in 78.72% patients. Seven patients (14.89%) had moderate symptoms easily controlled by medication and only 3 (6.38%) patients were on constant medication and needed definitive surgery. **Conclusion:** Perforated duodenal ulcer treated with simple closure along with proton pump inhibitors and anti-*Helicobacter pylori* treatment is not associated with a high rate of recurrence in long-term follow-ups and the cumulative relapse rate increases with an increase in the follow-up period.

## INTRODUCTION

Prior to the use of H<sub>2</sub> blockers, simple closure of perforated duodenal ulcer was associated with recurring ulcer symptoms in 40 to 80% of patients and about 40 to 60% required subsequent definitive operation.<sup>1,2</sup> The efficacy of simple closure of perforated peptic ulcers has been compared with definitive surgery in several randomized trials.<sup>2</sup> Ulcer recurrence has been reported to occur in 61% and 6% of cases following simple closure and definitive surgical treatment, respectively.<sup>3</sup> This high recurrence rate after simple closure of the ulcer has been the basis of argument in favour of the addition of some definitive surgical procedure.<sup>4</sup>

However, there is an obvious return from definitive anti-ulcer surgery to simple closure of the perforation followed by anti-secretory and antibacterial medication in recent years.<sup>5,1,6</sup> Simple closure followed by H.pylori eradication may become the optimum treatment for the majority of cases of duodenal ulcer perforation.<sup>1</sup> On the other hand, with the advent of potent acid-suppressing agents, more patients are treated with simple patch repair and maintained on long-term

acid suppressing drugs, although the effectiveness of this strategy in the long-term has been insufficiently studied.<sup>4</sup>

It therefore seemed appropriate to review the long-term results of duodenal ulcer patients treated with simple closure followed by PPI and anti-H.pylori treatment in this hospital. Hence, a follow-up study was conducted to document the recurrence of subsequent ulcer symptoms, and in the light of these findings, to reassess our operative strategy in these patients.

## MATERIALS AND METHODS

**Study type and setting:** A prospective study was conducted on 50 cases of duodenal ulcer perforation treated by simple closure along with proton pump inhibitors (PPI) and anti-H.pylori treatment during 1993-1997 in the Department of Surgery, Krishna Hospital and Medical Research Center, Karad, Maharashtra, India. These cases were followed for a period of 12 to 15 years.

The study was approved by the Ethics Committee of Krishna Hospital and Medical Research Center, Karad, and informed

patient consent was obtained.

**Inclusion and Exclusion criteria:** All patients of perforated duodenal ulcer treated by simple closure along with PPI and anti-H.pylori treatment were considered for sampling. Patients treated conservatively, with definitive surgery, or those patients with sealed perforations at the time of laparotomy were excluded from the study.

Simple random sampling was employed to select the 50 cases for the study and SPSS software v1.0 was used to facilitate statistical analysis.

Every attempt was made to follow the patients either through letters, phone, personal contacts or through hospital workers and relatives. History regarding duration of pain, previous similar episodes, alcohol consumption, tobacco chewing or smoking, working time, occupation, history of anti-inflammatory drug intake, history of treatment of acid peptic ulcer disease and other associated diseases were noted.

During the follow-up period, patients were interrogated about recurrence of ulcer symptoms and graded as follows:

**Modified Visick's grading:**

Grade I: No symptoms, excellent results

Grade II: Mild symptoms, good results

Grade III: Moderate symptoms, easily controlled by medication.

Grade IV: Severe symptoms, requiring constant medication or reoperation

Any associated conditions with duodenal ulcer like H.pylori, pancreatitis, gallstones etc. were noted. Patients were reviewed to ascertain their social status, dietary history and any bad habits contributing to the development of ulcers.

Investigations such as barium meals or upper gastro-intestinoscopy were carried out whenever indicated and relevant investigations were done in patients with associated diseases (e.g. ultrasonography for gallstones and pancreatitis).

All the patients who did not have any symptoms during the follow-up period were not advised any treatment. Those with symptoms were treated accordingly.

## RESULTS

**Age distribution:** The present study showed highest incidence in the 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> decade.

**Sex distribution:** There were 43 males (86%) and seven females (14%). Males were affected 6.14 times more often than females.

**Seasonal Variation:** Peak incidence in this study occurred in the months of September, October, November and December.

**Associated factors:** In the present study, 90% of patients gave a positive history of tobacco use in any form and 58% were alcoholics.

**Ulcerogenic drugs:** 10% of patients gave a definite history of consumption of ulcerogenic drugs.

**History suggestive of acid peptic disease prior to perforation:** Out of 50 cases, 24 (48%) gave history of acid peptic disease prior to perforation and the remaining 26 cases (52%) presented as duodenal ulcer perforations. Among the former 24 cases, 21 cases gave a history of dyspepsia and three patients gave a history of intractable pain. Three cases were on proper anti-ulcer treatment while the rest of them had used some local remedies for the same.

**Pain to surgery interval:** In the present study, incidence of complications increased with an increase in pain to surgery interval in hours. The incidence of complications was minimal if surgery was undertaken within 12 hours of the onset of pain.

**Figure 1**

**Table 1: Pain Surgery Interval**

Time interval in hours	No. of cases	Post-Operative Complications	
		No. of cases	Percentage
0-11	39	7	17.9
12-24	7	3	42.7
25-48	3	2	66.7
>48	1	1	100

**Post-operative Complications:** Wound infection was seen in eight patients (16%), chest infection was seen in seven patients (14%), burst abdomen occurred in one patient (2%), paralytic ileus was seen in one patient (2%), sub-phrenic abscess developed in one patient (2%), pelvic abscess developed in one patient (2%), no post operative complications were seen in 19 (38%) patients.

Hypertrophied scar developed in two patients (4%) and incisional hernia in two patients (4%) as a late complication.

Associated Conditions: In the present series, H.pylori infection was found in 27 patients (54%), renal stones in one patient (2%) and gall stones in one patient (2%).

Follow-up:

During the follow-up period, out of 50 patients, 47 patients got complete follow-ups, one died in the immediate post-operative period, one died due to other medical causes within the first five years and one patient was lost in the follow-up.

There were no additional deaths due to perforated duodenal ulcers or due to ulcer-related complications.

Post-operative follow-up ranged from 12 to 15 years.

Mean follow-up period was 12.91 years.

Our results according to Modified Visick's grading were as follows:

**Figure 2**

Table 2: Modified Visick's Grading of Study Group

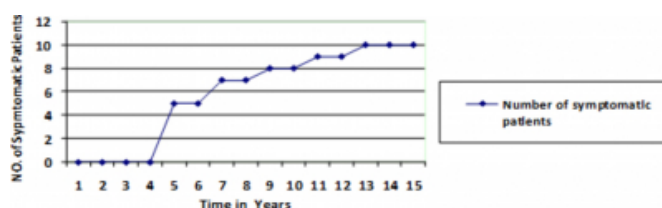
Grades	No. of Patients	Percentage %
I	18	38.29
II	19	40.42
III	7	14.89
IV	3	6.38

Excellent and good results were seen in: Grade I + II = 18 + 19 = 37 patients (78.72 %)

Seven patients (14.89%) were having moderate symptoms which were easily controlled by medication and only three patients (6.38%) needed constant medication or definitive surgery.

**Figure 3**

Graph 1: Relapse rate during follow-up period



In this study, cumulative relapse rates increased with the increase in the follow-up period as shown in above figure.

## DISCUSSION

Taking into account the various data from literature and comparing it with the present series, a few interesting facts were revealed.

Age distribution: The present study showed the highest incidence in 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> decade of life. The 4<sup>th</sup> decade was the one with highest number of cases. Similar results were observed in other studies.<sup>5</sup>

One study reported most of the patients with perforated duodenal ulcers in the third decade of life.<sup>7</sup>

There is a shift of age towards elderly patients in other parts of the world. It may be due to the difference in life styles such as smoking, alcohol, psychological stress etc.<sup>8,5</sup>

Sex: In the present series, 43 patients (86%) were male and seven patients (14%) were female. Therefore males were affected 6.14 times more often than females which was comparable to most studies.<sup>9</sup>

Occupation: As the majority of the patients coming to our hospital were from lower socio-economic groups engaged in manual work or agriculture, a reliable incidence cannot be given. In the present series, almost all the patients were farmers and did heavy work.

Langman, in 1974, noted that since 1959 both gastric and duodenal ulcers had become more frequent in lower socio-economic groups in the UK and USA.<sup>10</sup>

Seasonal variation: The peak incidence in this series occurred in the months of September, October, November and December; 60% of perforations occurred in these months.

According to Aird et al. from Edinburgh, perforations were most frequent in mid-winter.<sup>11</sup>

A peak incidence in the month of December was reported

from the south-west areas of Scotland and Glasgow.<sup>13</sup>

The Pooja and Diwali festivals in October and Christmas in December may have a part to play. This has been attributed by various authors to various factors such as heavy meals or increased alcohol consumption in winter.<sup>12, 13</sup>

Mackay has also reported such a peak incidence during Christmas and Mitra reported 60% of perforations occurring during October to March.<sup>13, 12</sup>

**Associated factors:** A noteworthy association was found between perforations and a positive history of tobacco smoking or chewing. A statistical association with cardio-respiratory pathologies was also present.

In the present series, 90% of patients gave a positive history of tobacco use in any form and 58% were alcoholics. As such, a positive history of tobacco was reflected in the high morbidity and mortality rates in the present series. All patients with associated respiratory disease gave a positive history for tobacco usage.

Twenty patients (42.55%) who gave a history of persistent symptoms of acid peptic disease post-operatively were found to be chronic smokers or alcoholics. Similar associations were observed in other studies.<sup>12, 13</sup>

**Ulcerogenic drugs:** Non-steroidal anti-inflammatory drugs (NSAID) increase the risk of perforation by five to eight times.<sup>14</sup> In one study, seven patients (20.5%) had a history of taking NSAIDs.<sup>15</sup>

In the present series, there were five patients (10%) who gave a definitive history of consumption of ulcerogenic drugs. Out of these drugs, three (6%) had taken phenylbutazone for arthritis and two (4%) had taken steroids.

**History suggestive of acid peptic disease prior to perforation:** Duodenal ulcer symptoms (exceeding three months) were not uniformly available and were totally missed out in a few cases. Out of the 50 cases, 24 (48%) gave a history of previous acid peptic disease prior to perforation and the remaining 26 (52%) presented as duodenal ulcer perforations.

Similar findings were observed by Mitra (1982).<sup>12</sup>

**Pain to surgery interval:** The delay before surgical treatment is a strong determinant for increased mortality and morbidity

rates, not mentioning hospital costs.<sup>16</sup>

Complications occurred mostly in the group where pain to surgery interval was more than 12 hours. In the present series, all patients (100%) who had a pain-surgery interval of more than 48 hours had complications; 66.6% of complications occurred when the interval was between 25 to 48 hours, 42.9% when the interval was between 12 to 25 hours and 17.9% when the interval was less than 11 hours.

Boey et al. from Hong Kong (1982) observed that old age and late exploration significantly increased the risk of infection. Neither peritoneal soiling nor a positive culture was likely to be clinically important when exploration was likely to be performed within two days of perforation.<sup>17</sup>

**Post-operative complications:** In one study, post-operative complications were recorded in 54 (38%) patients. The most common complications were chest infections in 35 (24%) patients, followed by wound infections in 14 (9%), burst abdomen in three (2%) patients and fistulas in two (1.5%) patients.<sup>18</sup>

In another study, post-operative complications were seen in 65 patients (24.2%). Pneumonia and wound infections were the commonest complications in 40 (37.04%) and 20 (18.52%), respectively, followed by sepsis in nine patients (8.34%), leakage in six patients (5.55%), intra-abdominal abscesses in two patients (1.86%) and bleeding in one patient (0.92%).<sup>19</sup>

In the present series, wound infection was seen in eight patients (16%) and chest infection in seven patients (14%), burst abdomen occurred in one patient (2%), paralytic ileus was seen in one patient (2%), sub-phrenic abscess developed in one patient (2%) and pelvic abscess developed in one patient (2%). In total, postoperative complications were seen in 19 patients (38%). Hypertrophied scar developed in two patients (4%) and incisional hernias in two patients (4%) as a late complication.

**Associated conditions:** In the present series, H.pylori infection was found in 27 patients (54%), renal stones in one patient (2%) and gall stones in one patient (2%).

The mean prevalence of H.pylori infection in patients with perforated peptic ulcers was only 65-70%, which contrasts with the near 90-100% figure reported in non-complicated ulcer diseases.

However, H.pylori infection rates in various studies range

markedly from 0 to 100%. This suggests possible differences in variables such as sample size, type of diagnostic methods used to diagnose H.pylori infection, the frequency of non-steroidal anti-inflammatory drug intake etc., which may be responsible for the low prevalence reported in some studies.<sup>4</sup>

There is a continuing debate in literature regarding the preferred surgical procedure for patients with perforated duodenal ulcers. Simple closure of perforation can be readily performed by relatively inexperienced surgeons often operating on an ill patient.<sup>20</sup>

Prior to the use of H<sub>2</sub>-blockers, simple closure of perforated duodenal ulcer was associated with recurrent ulcer symptoms in 40 to 80 % of patients and about 40 to 60% required subsequent definitive surgeries.<sup>1,2</sup>

It is the high incidence of recurrent symptoms following simple suturing of perforated duodenal ulcer that makes some authors advocate definitive operation at the time of initial surgery.<sup>21, 22</sup>

However, in our study, excellent and good results were obtained in: Grade I + II = 18 + 19 = 37 (78.72 %) patients.

Seven patients (14.89%) were having moderate symptoms which were easily controlled by medication and only three patients (6.38%) required constant medication or definitive surgery.

The higher satisfactory result in the present series was attributed to the advent of H<sub>2</sub>-receptor antagonists and proton pump inhibitors like omeprazole and the relatively recent discovery of H.pylori and treatment for it; which is comparable with other studies.<sup>1,4</sup>

In this follow-up study, the cumulative relapse rate increased with increase in follow-up period which is comparable with other studies.<sup>9</sup>

Illingworth showed that the number of symptomatic patients increased with each year of follow-up and also complications occurred after 5 years of the original operation in 50 cases and outcome of plication was more favourable in patients with a short history of symptoms prior to perforations.<sup>23</sup>

Limitations of the study: The limitations of the study include the exclusion criteria of perforated duodenal ulcer patients treated conservatively, with definitive surgery and with sealed perforations at the time of the laparotomy.

Additionally, the small sample size is also a limitation of the study and a further extension of the study with a bigger sample size or multi-center trial can verify or refute our findings with greater accuracy.

## CONCLUSION

A simple closure of the perforation reinforced by omental patch and followed by eradication of H.pylori is an effective way of treating perforated duodenal ulcers and is not associated with high recurrence in long-term follow-ups. This may reduce the requirement for emergency definitive surgery for preventing recurrences of the ulcer and cumulative relapse rates increased with increase in the follow-up period.

## ACKNOWLEDGEMENTS

The authors heartily thank the Dean, Krishna Medical College and Research Center Karad, and all the surgical staff for their co-operation in this study.

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