

FREQUENCY OF DUODENAL ULCER PERFORATION WITH RADIOLOGICAL EVIDENCE OF PNEUMOPERITONEUM

Ahsan Masood Butt, Ahmed Khan Chaudhry, M Awais Mughal, Taukeer Nasir,
Javaria Bint Zafar, Khawar Rehman

Combined Military Hospital Rawalpindi

ABSTRACT

Objectives: To determine the frequency of duodenal ulcer perforation with radiological evidence of gas under the diaphragm on X-ray chest.

Study design: Descriptive

Place and Duration of study: Department of Surgery Combined Military Hospital (CMH) and Military Hospital (MH), Rawalpindi, from Nov, 2005 to May 2006.

Patients and Methods: Patients with acute abdomen presenting as emergency at CMH and MH Rawalpindi were evaluated. Preoperatively X-ray chest PA view, in standing posture, was done in all cases and presence or absence of pneumoperitoneum noted. The patients were then followed by laparotomy to confirm or otherwise a perforation of duodenum. Only 30 patients were included in the study where duodenal perforation was confirmed per-operatively.

Results: Pneumoperitoneum on X ray chest PA view was found in 25(83.3%) out of 30 patients with duodenal ulcer perforation; The remaining 05 patients i.e. 16.67% did not show pneumoperitoneum.

Conclusions: X-ray chest is a helpful tool in diagnosing majority of patients with a perforated duodenal ulcer. However there is a significant number of patients where the clinical acumen of the doctor would help in an early diagnosis and prompt treatment.

Keywords: Perforated duodenal ulcer, Pneumoperitoneum, Surgical intervention

INTRODUCTION

Perforated peptic ulcer is an emergency and requires early surgical intervention¹. In majority of patients perforation occurs in long standing symptomatic chronic duodenal ulcers. There is history of previous dyspepsia or identified ulcer in 50–60 % of patients². Eighty percent of chronic peptic ulcer disease (without perforation) occurs in duodenum out of which 80% occurs in males especially in their 30s and 40s. Females are relatively immune to duodenal ulceration before menopause and especially during pregnancy³.

First operation of peptic ulcer was performed by Ludwig Heusner in Germany in 1892. Henry Percy Dean from London was the first surgeon to perform a successful repair of perforated duodenal ulcer in 1894⁴.

The incidence of perforated peptic ulcer fell steadily from 1970s⁵ due to introduction of H2 receptor antagonists and proton pump

inhibitors but now it is relatively constant for several years³. Perforations complicate peptic ulcer about half as often as haemorrhage⁶. Recent ingestion of NSAIDs or steroids is its significant aetiology². Overall morbidity and mortality in patients with a perforated duodenal ulcer is 28% and 9.6 % respectively⁷. X-ray chest will reveal free gas under the diaphragm in 50%⁸ to 70%^{8,9} of patients. According to a study at Zagreb Croatia, the most common cause of pneumoperitoneum was perforated duodenal ulcer in elderly male patients¹⁰.

Although free peritoneal gas is seen from perforation of any hollow organ, in practice right sided sub-diaphragmatic free air is virtually pathognomonic of gastro-duodenal perforation. If pneumoperitoneum is not seen radiologically, the diagnostic problem is to differentiate between a sealed perforation with minimal localized soiling and an acute pancreatitis¹¹. In a study of 146 gastro-duodenal perforations at Naples, Italy, free peritoneal gas was not evident in 12 cases¹². Serum amylase is slightly or moderately increased in 10–20% of

Correspondence: Maj Ahsan Masood Butt, Surgical Specialist CMH Gilgit

Email: ahsan.masood123@yahoo.co.uk

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duodenal perforations but is uncommon to find it in excess of 700 Somogyi units, as is usually seen in acute pancreatitis¹¹. Standard treatment for patient with perforated peptic ulcer is urgent repair of the perforation¹³.

Western studies showed the frequency of perforated duodenal ulcer with pneumoperitoneum to vary from 50 to 70 percent^{8,9}. No local data was available at the time of this study. There was a need to review the diagnostic tools of perforated duodenal ulcer so as to compare the Western figures with a local study to understand the disease setup in our country, to have a better preoperative diagnosis and eventually be able to offer prompt and efficient health care. This study will be the first step towards achieving this goal.

PATIENTS AND METHODS

A descriptive study was conducted in the Department of Surgery, at CMH and MH Rawalpindi from 23 Nov 2005 to 23 May 2006 (06 months). In emergency set up a clinical diagnosis of acute abdomen was made in adult patients presenting with all or most of the features of moderate epigastric or sudden severe onset of generalized abdominal pain, vomiting, tachycardia, guarding, board like rigidity and absent bowel sounds. X-ray chest in standing posture was done in all patients and presence or absence of free gas under the diaphragm noted and recorded. Exploratory laparotomy was performed. The patients who had duodenal ulcer perforation (30 in number) underwent simple closure with omental patch by vicryl 2/0 stitches and peritoneal lavage. These 30 patients were included in our study. Those patients who had a lesion other than duodenal perforation presenting as acute abdomen were excluded. A proforma was filled and data analysed for a total of 30 patients with confirmed duodenal ulcer perforations against their preoperative radiological presence or absence of pneumoperitoneum.

Data was entered in SPSS Version 10. Descriptive statistics was used to calculate frequency (percentage) of pneumoperitoneum in these 30 patients with confirmed perforated duodenal ulcer. Mean, standard deviation and

frequencies were calculated for age (demographic variable).

RESULTS

A total of 30 patients were included in the study of proven perforated duodenal ulcer. Mean age was 49.23 years, median was 51, and standard deviation was 13.98. The youngest patient 25 and oldest was 72 years old (Figure). All patients were male.

In our study pneumoperitoneum was seen on X Ray chest PA view in 25 (83.3%) out of 30 patients of proven perforated duodenal ulcer. In all these 25 cases, X Ray chest showed free crescent shaped gas under diaphragm on both sides, clearly distinct from the stomach gas shadow on the left. However 05 (16.67%) patients did not reveal free gas under the

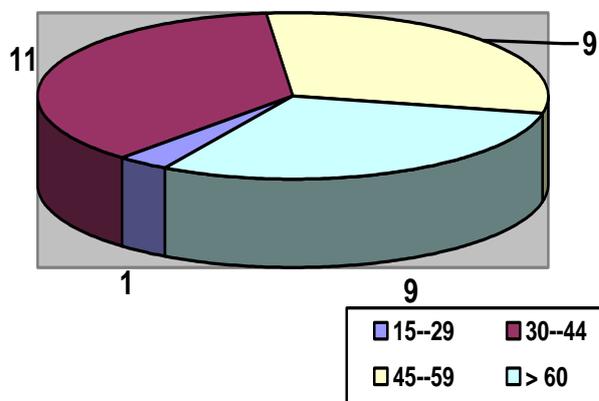


Figure: Frequency of presentation in different age groups.

diaphragm pre-operatively.

DISCUSSION

Perforated duodenal ulcer is a surgical emergency where mortality is directly proportional to the delay before treatment. Therefore, early diagnosis and urgent treatment is required to avoid catastrophes. X ray chest is the single most useful investigation for the majority of the patients. When there is visible gas under diaphragm on X Ray chest in erect posture, the usual course is an early operation, closure of perforation and thorough peritoneal lavage. This can be a lifesaving procedure for the patient. In our study 83.3% patients had pneumoperitoneum in perforated duodenal

ulcer which is significantly high compared to figures reported from the Western countries i.e. 50 to 70 %. Reasons for this difference may well be a small sample size (30 patients) in our study, delay in seeking medical advice, social and economic constraints or a different ulcer pattern in our population. This study, therefore, stimulates future researcher to undertake a multicentric study in Pakistan, with a large sample size, over a longer period to get more precise results.

When there is no gas under diaphragm on X ray, the surgeon needs to be more vigilant for other pathologies as well as duodenal ulcer perforation because in 16.67% patients in our study and 30⁹ to 50%⁸ in Western countries there was no radiological evidence of pneumoperitoneum in cases of perforated duodenal ulcer. In such cases, it is mainly the clinical judgment of the doctor that will decide the diagnosis of duodenal ulcer perforation and an early operation.

Morbidity and mortality in perforated duodenal ulcer is directly related to delay in treatment¹⁴ which is a laparotomy and an early closure of perforation. This clearly describes that at least in cases where there is pneumoperitoneum on X Ray chest, even a junior resident working in emergency can easily clinch the diagnosis of perforation and a subsequent prompt laparotomy by surgeon can avoid morbidity and mortality. Only few selected patients are subjected to conservative treatment by a few surgeons¹⁵ when it has been confirmed that perforation is sealed. The reported mortality after conservative treatment is 10¹⁶ to 11.5%¹⁷ and sometimes even 20%¹³ which is too high to make a safe treatment option. The matter is still under debate and research is being continued to come to conclusions about safety of this regimen.

The unusual sex distribution of our study (all male patients) might be explained by the fact that most of the subjects were military personnel belonging to the lower ranks of army

and they tend to keep their families in their villages due to economic and social reasons.

CONCLUSION

X-ray chest is helpful in diagnosis of patients (4 out of every 5 patients) of perforated duodenal ulcer where there is radiological evidence of pneumoperitoneum.

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