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MANAGEMENT OF PERFORATED DUODENAL ULCER IN A RESOURCE POOR ENVIRONMENT

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ABSTRACT

Background: The majority of literature on the management of perforated duodenal ulcer comes from the west. However, this is not necessarily appropriate in the developing world where perforated ulcers occur in younger patients, there is a strong association with cigarette smoking, and presentation is often delayed.

Objective: An attempt to guide management of perforated duodenal ulcer in the developing world using the best evidence available.

Data sources: Review of the literature on perforated ulcers and retrospective chart review of cases from a rural African hospital.

Study selection: Relevant studies from the western and developing world literature.

Data extraction: Med-line search.

Data synthesis: Assessment of relevance to clinical management of perforated duodenal ulcers in the developing world.

Conclusions: Due to recognition of *Helicobacter pylori* (HP) as a causative agent in duodenal ulcer disease many western surgeons are questioning the need for definitive ulcer surgery in the acute management of perforated duodenal ulceration. This philosophy may not be appropriate in the developing world due to poor HP eradication rates, conditions fostering re-infection with HP, problems with patient compliance in taking medications, and difficulties with follow-up. It is suggested that selected patients, without preoperative risk factors, are offered definitive surgery but those at any risk of postoperative mortality be treated with conservative surgery and treatment for HP. These patients will have to be followed closely to check ulcer healing. Attention will also need to be paid to stopping smoking.

INTRODUCTION

Perforation of duodenal ulcer is a common problem in the developing world. However, most of the world literature pertains to the situation in the west where the disease is largely confined to elderly patients taking ulcerogenic medications. In the developing world the situation is different, the disease occurring predominantly in young men, and is strongly associated with smoking.

The situation in the west has been summed up by Johnson: "The surgeon's major role in the management of peptic ulcer disease will be the performance of life-saving emergency operations in elderly unfit patients"(1). In contrast in the developing world the patients are younger, present later, and have a life-time of potentially useful activity ahead of them. This review of the available literature attempts to answer the question as to what the best treatment is for a perforated duodenal ulcer in the developing world.

Epidemiology and aetiology: In the developing world the patient population is young, there is a high male: female ratio (8:1); patients present late, and there is a strong association with smoking(2) (Table 1). In the west the patients tend to be elderly (mean age 60-70 years) and there is a high incidence of ulcerogenic drug ingestion (40 to 50%)(3).

Table 1

Characteristics of 20 patients presenting to Kijabe with perforated duodenal ulcer

Mean age	37
Sex	Male-20, Female-0
Smoker	Yes-9, No-11
Hypotension	10 (50%)
Mean duration of perforation prior to presentation	57 hours
Serious concomitant medical illness	5 (25%)
Hypotensive or perforation >24 hours	16 (80%)

Helicobacter pylori (HP) is found in association with 70 to 92% of perforated ulcers, these studies coming from United Arab Emirates, China and Japan(4-6). Infection rates in the general population are also high 70% in Asia and South America, and 69-85% in Africa(7-10).

From western studies it is known that appropriate treatment of HP results in healing of uncomplicated duodenal ulcers in greater than 90% of cases(11,12). In the developing world, however, there is a high incidence of resistance of HP to metronidazole, poor eradication rates and a high incidence of reinfection even if eradicated (13-15).

Assessment of operative risk from perforated duodenal ulcer is important in deciding upon management. The

operative mortality from perforated peptic ulcer is dependent upon the presence or absence of several risk factors. Although there are more complex methods of assessing individual risk the most practical in the developing world is noting the presence or absence of delayed treatment (greater than 24 hours), preoperative shock (systolic BP less than 100 mmHg), and serious concomitant medical illness. When all three are present the mortality rate with even conservative surgery approaches 100%(17-19).

MANAGEMENT

Non-operative: Since the landmark paper by Crofts *et al*(19) there has been considerable interest in the non-operative management of perforated duodenal ulcer. This study showed that in a selected group of Hong Kong patients approximately 70% could be treated with a combination of intravenous fluids, nasogastric suction, and close observation. The selection criteria included patients under the age of 70 years who were haemodynamically stable, had been perforated for less than 24 hours, and could be closely monitored. This would represent a small proportion of patients in the developing world (20% at Kijabe, Table 1). Thus, this form of management is probably best restricted to those with multiple risk factors as mentioned above.

Operative: Traditionally the management of perforated duodenal ulcer has been surgical with the surgeon performing a thorough lavage of the abdomen and sealing the perforation with an omental patch. This has been associated with a variable mortality averaging 10-25% in most studies(3,18,20,21).

The main disadvantage of this approach has been the high proportion of patients who continue to have ulcer symptoms after surgery (25-87%)(22-24). For this reason strong interest has been shown in performing definitive ulcer surgery at the time of presentation of the perforation. This has been shown to be safe and effective in selected patients without the risk factors for mortality mentioned above. The preferred operation is a highly selective vagotomy (HSV) which in experienced hands is associated with a less than one per cent mortality rate and a four to eleven per cent recurrent ulcer rate(25-28). However, few surgeons are experienced with HSV and truncal vagotomy and drainage is an acceptable alternative which is familiar to most surgeons(2,29).

The patients who seem to benefit most from immediate definitive surgery are those with a chronic ulcer history (>3 months) or with evidence of a chronic ulcer at laparotomy. These are the patients who had the highest rate of recurrent ulcer disease following conservative surgery in the pre-HP era(24,30). Since the clarification of the role of HP in duodenal ulcer disease there has been a move towards the use of simple omental patching followed by treatment of the HP infection with antibiotics(1,31). This approach has been supported by a recent randomised controlled trial(32).

Although omental patching and post-operative HP eradication may work well in developed countries, it may not work so well in the developing world due to HP antibiotic resistance, high reinfection rates, poor patient compliance and difficulties with follow up. Thus there may be a role for more widespread definitive ulcer surgery in selected patients. However, the majority of patients who present with a perforated duodenal ulcer in the developing world present late due to treatment delays, ignorance, or transport difficulties(Table 1)(20). Thus, few patients are suitable for a definitive operation and are thus best treated with a simple patch closure and antibiotic treatment to attempt to eradicate HP. For those few patients with none of the above risk factors immediate definitive surgery should seriously be considered especially if the patient has already been treated for HP.

In conclusion, due to recognition of HP as a causative agent in duodenal ulcer disease many surgeons are questioning the need for definitive ulcer surgery in the acute management of perforated duodenal ulceration. This philosophy may not be appropriate in the developing world due to poor HP eradication rates, conditions fostering reinfection with HP, problems with patient compliance in taking medications, and difficulties with follow-up. It is suggested that selected patients, without preoperative risk factors, are offered definitive surgery but those at any risk of postoperative mortality be treated with omental patching and treatment for HP. These patients will have to be followed closely to check ulcer healing by barium meal or endoscopy. Attention will also need to be paid to stopping smoking.

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