Conservative management of iatrogenic oesophageal perforations — a viable option

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Abstract

**Objective:** Iatrogenic Oesophageal perforations are a dreaded complication and there is no consensus as to their best management. The aim of our study was to assess the results of conservative management in these cases. **Methods:** Twenty-six patients with iatrogenic perforations of the oesophagus treated over a 10-year period were reviewed retrospectively. They were managed conservatively by keeping them nil by mouth on intravenous fluids and intravenous antibiotics. Out of these 26, nine were patients of carcinoma of the oesophagus while the remaining 17 had benign pathologies. Twenty-two were diagnosed within 6 h, while the remaining four were diagnosed over 24 h after perforation. Twenty-three of the 26 were caused by oesophageal dilatations. **Results:** Twenty-two (84.6%) of the 26 survived on this regimen. Out of the four that died, two had advanced carcinomas and died of chest complications, one died of a myocardial infarction and the fourth was an old debilitated man who died of renal failure. All four who died had extension of the leak into the pleural cavity. Early diagnosis and treatment is of critical importance and is only possible by maintaining a high index of suspicion. **Conclusions:** Conservative management when applied to cases of iatrogenic oesophageal perforations gives results comparable to or better that those reported in series where early surgical intervention was practised. Extension of the leak into the pleura carries a worse prognosis.

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Keywords: Oesophageal perforations; Iatrogenic; Conservative management

1. Introduction

Oesophageal perforation has always been a dreaded problem and despite advances in treatment, this condition is associated with a mortality of 20-30% [1], this is due to the anatomical location of the oesophagus which predisposes patients to mediastinitis which carries a high mortality. This condition was inevitably fatal if managed conservatively before the antibiotic era. Thus, initially operative treatment was thought to be the only option ever since Barrett and Olsen described the first successful repair in 1947 [2]. Over the last 40 years the incidence of iatrogenic oesophageal perforation has increased due to the increase in the number of endoscopic procedures and these account for over 70% of the cases in reported series [1]. The diagnosis of this condition can be difficult and is thus often delayed. Early diagnosis and treatment is important as it limits soiling of the mediastinum. Mengoli and Klasser [3] were the first to describe the conservative management of oesophageal perforations and over the last few years it has become a recognised option especially for small localised iatrogenic perforations.

At Hairmyres Hospital, we manage most iatrogenic perforations conservatively. Thus, the aim of this study was to analyse the results of conservative management in these cases. Thus, all 26 patients of iatrogenic perforation seen at Hairmyres Hospital over a 10-year period which were all treated conservatively were reviewed retrospectively and their outcome was studied.

2. Materials and methods

All 26 cases of iatrogenic perforations of the oesophagus, irrespective of the oesophageal pathology treated at our Unit over a 10-year period were reviewed retrospectively, by going through their notes. All pre- and postoperative features and their effect on morbidity and mortality were noted. The average age of the patient was 59 years (ranging between 16 and 92 years). There were 12 men and 14 women. In 23 patients (88.4%), oesophageal perforation occurred after flexible endoscopies with dilatations, six of them had biopsies taken as well. One case resulted from a simple endoscopy, while another had a foreign body in the oesophagus that was a guidewire. The 26th case occurred during cauterisation of a bronchial stump. Nine patients (34.6%) had underlying oesophageal malignancies and 10 (38.4%) had gastro-oesophageal reflux with or without...
oesophageal strictures. Four had benign strictures and of the remaining three one had a congenital short oesophagus with stricture, the second had a neuro-muscular in coordination and the last had a normal oesophagus.

All of the endoscopies were performed under general anaesthetic and thus the patients had been prepared by keeping them nil by mouth 6 h before the anaesthetic. Nineteen (73%) of these perforations occurred at our hospital, while the remaining seven were referred to us from other hospitals. Being a regional centre we are referred a large number of difficult oesophageal strictures and thus a large number of difficult dilatations are attempted.

2.1. Presentation and diagnosis

The diagnosis was made early in most cases by maintaining a high index of suspicion. The commonest symptom was chest pain soon after the procedure, which was present in 84% of the patients. Back pain or radiation of pain to the back was noted in 30.7%. In 50% of the patients pyrexia was one of the presenting features. Surgical emphysema in the neck was present in 30% and another 30% presented in shock. One patient was completely asymptomatic. Details of the clinical features noticed are described in Fig. 1. A chest X-ray was performed on all patients and the commonest findings were pneumomediastinum in 42%, pneumothoraces in 30% and pneumoperitoneum in 30%. The perforation was confirmed with a water soluble contrast swallow in 24 patients. Thirteen (50%) had local mediastinal extravasations, three patients (11.5%) had extravasations into the pleura and four patients (15.3%) had sub-diaphragmatic extravasations. One patient had a tracheo-oesophageal fistula. The contrast swallow was not performed in the five patients where the perforation was seen at the time of the initial endoscopy. Seventeen perforations (65.3%) were thoracic in location, eight (26.9%) were in the abdominal oesophagus and the remaining three (7%) were in the cervical region.

In 22 out of the 26 patients (84.6%) diagnosis was made and treatment was started within 6 h of perforation, while in the remaining four (15.3%) diagnosis was made over 24 h after the injury. The conservative regime followed comprised keeping patients nil by mouth on intravenous fluids and intravenous broad spectrum antibiotics, cefuroxime, gentamycin and metronidazole. This was commenced on the slightest suspicion of perforation. All the patients were managed in our surgical ward and were nursed propped up. They were all given chest physiotherapy and analgesics were administered as needed. Eight patients with pneumothoraces and pleural effusions on chest X-ray required chest intubation. Eight patients had to be commenced on total parenteral nutrition. This decision was based on the nutritional state of the patient and on the length of treatment.

Patients were kept nil by mouth for 7.5 days on average and they required intravenous fluids and antibiotics for an average of 8.5 days. All patients had check contrast swallows routinely performed after 7 days, before being commenced on oral fluids. One patient out of the 26 underwent an operation for drainage and oesophageal repair 3 days after diagnosis due to uncontrolled sepsis as a result of extensive mediastinal soiling. Six patients underwent late operations, four of which were resections for carcinomas after the perforations had healed on conservative management, the fifth was for a congenital short oesophagus and the sixth was an oesophageal bypass (Table 1).

3. Results

Twenty-two of the 26 patients (84.6%) survived on this regime and their perforations healed. Table 2 gives details of the mortality in this series. A total of four patients died

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**Table 1**

<table>
<thead>
<tr>
<th>Time elapsed between injury and treatment</th>
<th>Conservative</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6 h 22/26</td>
<td></td>
</tr>
<tr>
<td>&lt;24 h 4/26</td>
<td>15.3%</td>
</tr>
</tbody>
</table>

| Nil by month | 26/26 | 7.5 days |
| IV fluids    | 26/26 | 8.5 days |
| IV antibiotics | 26/26 | 8.5 days |
| TPN          | 8/26  |         |
| NG tube      | 4/26  |         |
| Chest drainage | 8/26 |         |
| Operations   | Early 1/26 | Late 5/26 |

**Table 2**

<table>
<thead>
<tr>
<th>Mortality on location and aetiology</th>
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</thead>
<tbody>
<tr>
<td>Cause</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Benign</td>
</tr>
<tr>
<td>Carcinom</td>
</tr>
<tr>
<td>Foreign body</td>
</tr>
<tr>
<td>Total</td>
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<td></td>
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Fig. 1. Clinical findings in cases of iatrogenic oesophageal perforations.
(15.3%). All four were thoracic in location; two of them had advanced carcinoma of the oesophagus and died from sepsis resulting from chest complications. The other two had benign strictures due to gastro-oesophageal reflux; one died from a myocardial infarction which was proved at post-mortem examination and the other was a debilitated, bed ridden 92-year-old man who died of renal and heart failure. All the four patients who died had extension of the leak into the pleural cavity and had chest drains inserted for pneumothoraces.

3.1. Morbidity

Table 3 gives details of all complications encountered in these patients. The commonest complication was chest infections, which were seen in 46% of patients. Seven patients (27%) had chest X-ray features of pneumonias and in one bronchopneumonia progressed to systemic sepsis, which was ultimately fatal. Another patient developed ARDS and ultimately multi-organ failure due to systemic sepsis that also proved fatal. As mentioned both of them had advanced malignancies. Chronic complications were quite rare. One patient developed a lung abscess and another developed a chronic empyema.

3.2. Follow-up

All patients were followed up in the outpatients and the follow-up period ranges from 3 months to 3 years. Seven out of the 15 patients with benign oesophageal strictures who survived, required further dilatations and one underwent a late operation for a congenital short oesophagus with stricture after his perforation had healed. Two of these were later diagnosed as having carcinoma. Out of the nine cases with diagnosed carcinoma seven survived on this regime and four of them had surgical resection after their perforations had healed on conservative treatment. Their survival after surgery ranged from 8 months to 3 years.

4. Discussion

Most authorities agree that early operations are the best form of management for spontaneous perforations of the oesophagus diagnosed early, but the debate on conservative versus surgical management for iatrogenic perforation is far from over. Surgery was initially the preferred method as conservative management was always fatal before the antibiotic era. Conservative management was proposed and recommended by many authors in varying circumstances [3–6] as surgery in these cases carries a high morbidity and mortality. Different surgical procedures proposed include primary repair [2], reinforced repair [7], complete oesophageal resection [8], T-tube drainage, exclusion and diversion [9], celestine intubation [10], thoracoscopic repair [11], and delayed primary repair.

Most authorities agree that early recognition and prompt treatment is the most important factor affecting prognosis [12]. Twenty-two of our 26 patients were diagnosed within 6 h of the perforation and our results demonstrate the importance of early diagnosis. This is possible only by meticulous postoperative observation, especially in cases of oesophageal dilatations as they accounted for over 88% of the cases in our series. Although early diagnosis and treatment is crucial overall, three of the four patients diagnosed late in our series survived. This shows that conservative management can work in late cases as well. Advanced malignancy and advanced age are risk factors as they accounted for three of our four deaths.

The clinical features most prominently present in our patients were chest pain with possible radiation to the back and pyrexia. All patients with these symptoms after endoscopy should be treated as perforations unless proven otherwise. Surgical emphysema in the neck area is an important sign and was present in seven of our patients. This is more commonly seen in spontaneous perforations as compared to iatrogenic ones but should be looked for in suspected cases. Elevated white cell count is common in these patients but is not diagnostic. A chest X-ray is very helpful and it should be done in all suspected cases. Apart from being diagnostic in many cases, it is also essential in determining the need for chest intubation in cases of pneumothoraces and pleural effusions. It is important to remember that a normal chest X-ray does not rule out a perforation. All four of the patients who died had thoracic perforations where the leak was extending into the pleural cavity. Thus, this represents the group with the worst prognosis. A contrast swallow using a water soluble dye is safe and usually diagnostic. It delineates this site of the oesophageal leak [1] and also shows if the leak is locally into the mediastinum or extending into the pleural cavity. All the cases with localised leaks survived in our series while four of the eight cases with pleural extension died. All 26 patients in our series were treated conservatively. This was done irrespective of the cause, the underlying disease or the site of perforation. These factors do affect prognosis [13], but we think that if these cases are picked up early, conservative management gives good results irrespectively. Only four of the 26 patients died on our regimen of conservative management (15.3%). This includes a patient who was a frail 92 years old man and two patients with advanced carcinomas who were unfit for any aggressive management. Even then the mortality of 15.3% is comparable to the best results of any form of treatment in any series [1]. Jones and Ginsberg et al. [1] in their review article on
oesophageal perforations reviewed the results of all cases in series published over the last decade [14–23]. They found that the mortality of early primary repair was 15% as compared to 39% for exclusion and diversion and 29% for oesophageal resection. The mortality for non-operative management was found to be 22% but they stated that these were not controlled trials and the results might have been a reflection of more complicated disease rather than being the best mode of management by choice. D.R. Lawrence et al. reported a mortality of 10% for iatrogenic oesophageal perforations with a mixture of conservative and surgical management [23]. They recommended conservative management only if the contrast swallows demonstrated a localised mediastinal extravasation. Our series also supports this recommendation as we had no mortalities in the cases with local mediastinal extravasation. S. Ohri et al. also reported a 10% mortality with a 40% major complication rate with localised mediastinal extravasation. Our series also supports management only if a high index of suspicion is maintained in these cases. Thoracic perforations that are extending into the peritoneal cavity represent the sub-group that carries the worst prognosis.

Thus, our results are comparable to the mortalities in published series and our major complication rate is low compared to that of surgical management. Series of surgical management have reported up to 50% leak rates with repairs with a high morbidity and mortality especially in cases diagnosed late [11]. We thus recommend conservative management for most clean iatrogenic oesophageal perforations irrespective of cause, site or delay in diagnosis. We feel that keeping patients nil by mouth 6 h before the endoscopy is important as this minimises the chance of mediastinal soiling with gastric contents. Conservative management is, however, not the treatment of choice in cases of spontaneous rupture where there is soiling of the mediastinum and the pleura with food and gastric contents.

Our results also show that conservative management gives good results in oesophageal perforations in cases of carcinomas. We had nine such cases, as we believe that dilatation of oesophageal carcinomas is a very useful means of palliation and we practice it in inoperable cases as well as in cases awaiting surgery, while undergoing neoadjuvant chemotherapy. The fact that in seven of these nine patients the oesophageal perforations healed on conservative management and four out of them also underwent oesophageal resection later, demonstrates that oesophageal perforations in cases of carcinoma can be managed conservatively as well. Delayed surgery in these cases in our experience gives better results than emergency operations that are undertaken soon after the perforation, which have been reported to carry mortalities of up to 40% [10]. Our experience also shows that oesophageal perforations can heal with conservative management even in the presence of a distal stricture and thus emergency resections are not essential in these cases.

5. Conclusion

This study has shown that a policy of conservative management when applied to cases of iatrogenic oesophageal perforations gives results comparable to or better that those reported in series where early surgical intervention was practised. Early recognition and commencement of treatment is of paramount importance and this is possible only if a high index of suspicion is maintained in these patients. Thoracic perforations that are extending into the peritoneal cavity represent the sub-group that carries the worst prognosis.

References