Conservative management of a transdiaphragmatic fistula

I Gee, G M Wood

Abstract

Case reports of transdiaphragmatic fistulas connecting subphrenic collections and empyemas are uncommon. We report the rare complication of a fistulous connection between a subphrenic collection and the bronchial tree.

(Thorax 2000;55:438–439)

Keywords: transdiaphragmatic fistula; subphrenic abscess

Case report

An 82 year old man was admitted following an episode of coffee ground vomiting. He had experienced a dull ache in the epigastrium for one week and had a history of a duodenal ulcer 20 years previously. He looked pale with a regular pulse of 100 bpm and there was mild epigastric tenderness. His haemoglobin was 123 g/l.

Gastroscopic examination showed a dilated stomach with fluid residue and the pylorus was narrowed to a pinhole; the duodenum could not be seen. He was started on lansoprazole and over the following week his condition stabilised. His haemoglobin fell to 107 g/l but he did not pass melaena.

He then became unwell with a pyrexia of 38°C, was tachypnoeic, and developed coarse crackles in the right lower chest. A diagnosis of right basal pneumonia was made and he was treated with intravenous cefuroxime and clarithromycin. Blood cultures were taken which subsequently grew a coagulase negative Staphylococcus, thought to be a skin contaminant. His temperature settled and his chest radiograph showed only patchy shadowing at the right base. An abdominal ultrasound scan, requested because of an increase in the serum level of alkaline phosphatase, was normal. His condition improved over the next four weeks and his chest signs and symptoms resolved. He had no further vomiting and was discharged home.

Six weeks later he was re-admitted with a haemoglobin of 59 g/l. He was transfused with six units of blood and discharged home three days later with a haemoglobin of 134 g/l. A barium enema examination was ordered to investigate further the cause of his recurrent anaemia.

Two weeks later he was re-admitted with a one week history of a cough productive of purulent sputum. On examination he was apyrexial, had peripheral oedema, and the right base was dull to percussion and associated with decreased breath sounds. Abdominal examination was normal.

His haemoglobin was 125 g/l, white cell count 6.5 × 10⁹/l, and chest radiography showed cardiac failure with upper lobe venous diversion and bilateral pleural effusions, with a homogenous opacity at the right base which was thought not to be entirely caused by the effusion.

He was started on co-amoxiclav and erythromycin but attempted intercostal aspiration of the pleural fluid was unsuccessful. A barium enema was performed and indicated early diverticular disease in the sigmoid colon and a tiny outpouching at the hepatic flexure with some possible tethering. The significance of this was uncertain but possible causes included the previous perforation of a colonic diverticulum.

Bronchoscopic examination of the right bronchial tree indicated some inflammatory changes in the right lower lobe. A foul faeculent smell was noted and the possibility of a transdiaphragmatic fistula was raised. An abdominal ultrasound examination demonstrated a 12 cm collection of fluid lateral to the liver, suggestive of a subphrenic abscess. Later that day a pigtail drainage catheter was inserted into the subphrenic collection and thick pus was drained.

Two days later a tubogram was performed to assess the size of the abscess cavity. A small subphrenic cavity was demonstrated before the patient started to cough up contrast medium. Radiography showed a fistula between the subphrenic cavity and the bronchial tree (fig 1).

Pus from the subphrenic abscess cavity yielded heavy growths of methicillin resistant Staphylococcus aureus and Enterococcus spp. Both sputum and bronchial washings yielded methicillin resistant S aureus. The patient was treated with teicoplanin and the cavity drained externally. Subsequent tubograms over the following week showed that the fistula had closed and the abscess cavity became smaller.

Following drainage of the abscess the patient made a good recovery and his chest symptoms resolved. He was discharged home and was well when seen two months later.
Mechanism of osteoporosis in patients with cystic fibrosis

In a recent issue of Thorax, Haworth and coworkers reported that low bone mineral density—that is, osteoporosis—commonly occurred in patients with cystic fibrosis. These results supported previous reports of osteopenia in patients with cystic fibrosis. However, the mechanism of bone loss in these patients has not been elucidated.

Although the pathogenesis of osteoporosis is probably multifactorial in patients with cystic fibrosis, the increased production of cytokines—primarily tumour necrosis factor alpha (TNF-α)—may play a critical role in adult patients. Among the important factors implicated in the pathogenesis of bone loss are circulating cytokines such as TNF-α, interleukin (IL)-1, and IL-6. TNF-α is a potent inhibitor of bone collagen synthesis and stimulator of osteoclastic bone resorption, the net effect of which is to cause bone loss. Experimental animal studies have also shown that the neutralising antibody to TNF-α slowed the bone elongation rate and bone mineral density in the cystic fibrosis population. The putative mechanism of bone loss is probably multifactorial in patients with cystic fibrosis. Low bone mineral density is common in patients with cystic fibrosis after previous treatment with an oral corticosteroid induced bone pain and the level of TNF-α in patients with cystic fibrosis. The measurement of serum levels of cytokines including TNF-α may therefore provide a means of identifying cystic fibrosis patients who are at risk of rapid bone loss.

SHINJI TERAMOTO
Department of Internal Medicine, Sauwa Hospital, International University of Health and Welfare, 3-35-14 305, Itabashi-ku, Tokyo, Japan 171-0014
email: shinjit@umin.ac.jp

CHARLES HAWORTH
KEVIN WEBB
Manchester Adult Cystic Fibrosis Unit, South Manchester University Hospitals NHS Trust, Wythenshawe Hospital, Manchester M23 9LE, UK

3 Teramoto S, Matsuse T, Ouchi Y. Increased cytokines may be responsible for the pamidronate-induced bone pain in adult patients with cystic fibrosis. Lancet 1999; 354:1753–4.

AUTHORS’ REPLY We thank Shinji Teramoto for his continued interest in our work and note his current (and previous) comments about the possible role of pro-inflammatory cytokines in the development of low bone mineral density in patients with cystic fibrosis. As stated in our discussion, our previous factor α, interleukin 1, and interleukin 6 may influence osteoclast activity in patients with cystic fibrosis. In fact, the significant negative relationship between the mean bone mineral density Z score and the C reactive protein concentration in our study provides the first evidence of an association between chronic pulmonary infection/inflammation and low bone mineral density in the cystic fibrosis population.

Cystic fibrosis patients with low bone mineral density do not necessarily have osteoporosis. It is important to emphasise that the precise histomorphometric characteristics of cystic fibrosis bone have not been comprehensively described. In our study 38% of patients were vitamin D insufficient, which may predispose them to osteoporosis, but 7% of patients had 25-hydroxyvitamin D levels associated with osteomalacia. Thus, some patients could have both osteoporosis and osteomalacia. Furthermore, a recent report suggested that the bone disease of cystic fibrosis was complex and possibly unique.

We have previously reported that bone pain is common in patients with cystic fibrosis after intravenous pamidronate administration and that it might be prevented by the concomitant use of oral corticosteroids. It is important to clarify that this was a retrospective observation and has not been evaluated prospectively.

1 Teramoto S, Matsuse T, Ouchi Y. Increased production of TNF-α may play a role in osteoporosis in cystic fibrosis. Chin J 1997; 112:574.
Spirometry in primary care

Contrary to Dr Pearson’s assertion in his reply in the May 1999 issue of Thorax, spirometry and peak expiratory flow (FEV1, FEV1) are not yet here to stay in general practice. The evidence is just not good enough. We were concerned by the inaccuracies in his letter which simply serve to underline our unease with the chronic obstructive pulmonary disease (COPD) guidelines. We will come to these later but, firstly, how is FEV1 related to peak expiratory flow rate (PEFR) in patients with COPD? Is FEV1 really essential in the day to day management of COPD?

Spirometry is central to the accurate diagnosis of COPD in many patients. The ratio of FEV1 to FVC is indispensable in differentiating restrictive from obstructive patterns of lung disease. But, what is FEV1? It is the best current method for assessing the severity of airflow limitation due to obliterating fibrosis and hyperinflation, where FEV1 represents the maximal flow during the first second of forced expiration whereas PEFR represents the maximal flow rate (usually attained in the first 100 milliseconds). Both are derived from the flow-volume curve, whereas PEFR is more reproducible on a single occasion than PEFR.

The basis for using spirometry rather than PEFR to the day to day management of COPD demands a much more rigorous approach than is evident from either the COPD guidelines or Dr Pearson’s letter. First, there is no evidence that FEV1 is more reproducible on a single occasion than PEFR. The papers by Malo et al and Verschelden et al relate to home recordings and hardly seem relevant to this issue. We refer Dr Pearson to another paper by Malo in which he showed that FEV1, is similar to PEFR in terms of non-validated recordings. Finally, NEP has not been shown to be superior to PEFR as a diagnostic tool and, in fact, the evidence suggests that PEFR may be more important than FEV1.

The issue is far from resolved and current evidence is an inadequate basis on which to recommend widespread practice of spirometry in primary care.

PATRICK W'T WHITE
DERMOT NOLAN
Department of General Practice and Primary Care, Guy’s, King’s and St Thomas’ Medical School, West End Education Centre, London SE1 9PG, UK

5 Paggiaro PL, Moscato G, Giannini D. Relationship between peak expiratory flow and FEV1, Eur Respir J 1997;10:39–41S.

Author’s reply

Dr White and Nolan argue that spirometry is essential for the diagnosis of COPD and, on this basis alone, I would stand by the recommendations that GP’s need to have access to spirometry. The COPD guidelines set out three options: GP owned spirometers, a mobile service visiting practices intermittently, or open access services at hospital. Whichever option is preferred locally, the spirometric tests must be performed by trained staff to ensure adequate quality control. Single measures of peak expiratory flow (PEF) are not adequate. It is colleagues in primary care who have encouraged those involved in guidelines to believe that PEFR would provide a valid measurement of lung function. This has surely nothing to do with the validity of the data. Furthermore, Lebowitz’s observation that the FEV1 and PEFR show close correlation in healthy individuals emphasises the reliability and reproducibility of PEFR.

There is no evidence that FEV1 is more reproducible on a single occasion than PEFR. The basis for using spirometry rather than PEFR to the day to day management of COPD demands a much more rigorous approach than is evident from either the COPD guidelines or Dr Pearson’s letter. The issue is far from resolved and current evidence is an inadequate basis on which to recommend widespread practice of spirometry in primary care.

5 Paggiaro PL, Moscato G, Giannini D. Relationship between peak expiratory flow and FEV1, Eur Respir J 1997;10:39–41S.
Letters to the editor

Respiratory questionnaires in COPD

The use of health status as an outcome measure in chronic obstructive pulmonary disease (COPD) is becoming more popular. We therefore welcome the publication of information which improves the choice of appropriate questionnaire. The recent paper by Rutten-van Molken and colleagues could have made an important contribution to this area. However, we are seriously concerned about the validity of their comparison between the St George’s Questionnaire (SGRQ) and the Chronic Respiratory Questionnaire (CRQ).

The clinical usefulness of the CRQ is limited because it is interviewer led while the SGRQ is self-administered. The development of a validated self-administered version of the CRQ would be a major advantage for clinical trials and clinical practice. The authors give the impression that a validated self-administered version of the CRQ already exists and have used this in their study. However, such a version is not described in the original reference as claimed and has never been disseminated by publication.

We have recently been working with original authors of the CRQ to develop and validate a self-reported CRQ and the results have so far only been published in abstract form. We therefore believe that the results described in the paper are devalued by the misleading implication that a self-report version of the CRQ has been correctly developed.

J WILLIAMS S J SINGH M D I MORGAN
Department of Respiratory Medicine, Glenfield General Hospital, Leicester LE3 9QD, UK

Authors’ reply

Patients with asthma clearly vary in their response to drugs and it is possible that smaller detailed studies will allow the identification of patients more likely to respond to a particular drug. For such a test to be useful in practice, however, it would need to be easily accessible, reliable, and have a very high predictive value. History suggests that it is often more practicable for the patient to undergo a trial of a drug, rather than to undergo an indirect assessment which is unlikely to be 100% predictive of the response and hence may result in some patients not receiving a drug from which they would benefit.

A E TATTERSFIELD T HARRISON
Division of Respiratory Medicine, University of Nottingham, City Hospital, Nottingham NG5 1PB, UK

Asthma guidelines

One problem with large studies that focus on a limited number of patient relevant outcomes endorsed by Tattersfield and Harrison is that the mean response to a given drug may hide a wide variability in individual response. This is particularly likely to occur in patients with symptomatic asthma despite treatment with low/moderate doses of inhaled corticosteroids. Studies have shown marked heterogeneity of airway inflammation and disordered airway function in these patients and therefore wide differences in the effects of the candidate drugs on these measures. Smaller crossover studies comparing the effects of different treatments in patients who have been extensively characterised are needed to establish whether important heterogeneity of response occurs. Such studies may uncover easily identifiable patient characteristics that predict a response to an individual drug.

R H GREEN I D PAVORD
Department of Respiratory Medicine & Thoracic Surgery, Glenfield Hospital, Groby Road, Leicester LE3 9QD, UK

Athletes and fenoterol

In a review of doping in athletes by Dr Dekhuizen published recently in Thorax the substance fenoterol was included in table 2 which listed respiratory drugs permitted by the International Olympic Committee (IOC). However, according to the IOC fenoterol is prohibited. Only salbutamol, salmeterol, and terbutaline are permitted by inhaler to prevent or treat asthma or exercise induced asthma. A written notification is necessary.

To prevent positive doping cases caused by misinformation of athletes and their advisors which might cause questions of regress, it is necessary to print a correction.

M K HENZE
Deutsche Sporthochschule Köln, 50933 Köln, Germany


Authors’ reply

We thank Dr Henze for this correction. As in the case of formoterol, there is no scientific reasoning given by the IOC for fenoterol not to be permitted by inhalation, in contrast to salbutamol, terbutaline, and salmeterol. There are no specific pharmacological or pharmacodynamic characteristics of inhaled fenoterol or formoterol that would predict a relevant stimulating effect on the respiratory system. For clarity we reproduce here the correct list of permitted respiratory drugs.
Table 2  Respiratory drugs permitted by the IOC (shortened and adapted from IOC)

<table>
<thead>
<tr>
<th>Short acting</th>
<th>Long acting</th>
<th>Anticholinergics</th>
<th>Inhaled corticosteroids*</th>
<th>Expectorants and cough suppressants</th>
<th>Antihistamines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol</td>
<td>Budesonide</td>
<td>Ipratropium bromide</td>
<td>Fluticasone</td>
<td>Bromhexine</td>
<td>Choline theophyllinate</td>
</tr>
<tr>
<td>Terbutaline</td>
<td>Fluticasone</td>
<td>Ammonophylline</td>
<td>Budesonide</td>
<td>Dextromethorphan</td>
<td>Codeine</td>
</tr>
<tr>
<td>Long acting</td>
<td>Beta agonist bronchodilators</td>
<td></td>
<td>Budesonide</td>
<td>Pluticasone</td>
<td>Terbutaline</td>
</tr>
<tr>
<td>Budesonide</td>
<td>Metaproterenol</td>
<td></td>
<td>Budesonide</td>
<td>FLUTICASONE</td>
<td>FLUTICASONE</td>
</tr>
<tr>
<td>Formoterol</td>
<td></td>
<td></td>
<td></td>
<td>Bromhexine</td>
<td></td>
</tr>
</tbody>
</table>

**1 Permitted by inhaler only to prevent and/or treat asthma and exercise induced asthma. Written notice is required.**

**2 Permitted by inhaler only to prevent and/or treat asthma and exercise induced asthma. Written notice is required.**

**3 Permitted by inhaler only to prevent and/or treat asthma and exercise induced asthma. Written notice is required.**

**4 Permitted by inhaler only to prevent and/or treat asthma and exercise induced asthma. Written notice is required.**

**5 Permitted by inhaler only to prevent and/or treat asthma and exercise induced asthma. Written notice is required.**

**6 Permitted by inhaler only to prevent and/or treat asthma and exercise induced asthma. Written notice is required.**

---

### Asthma education

Drs Neville and Higgins ask what more can be done to provide better asthma care. They mention the importance of education but, before we can teach patients, we must resolve our own confusion about treatment.

Evidence shows that it is important to stamp out the inflammatory process in the bronchial tree as soon as the diagnosis of asthma has been confirmed, yet patients are still prescribed a short acting beta agonist bronchodilator as the drug of first choice. This is given partly as a diagnostic test and partly because step 1 of the BTS guidelines seems a good place to start. Although the guidelines state that treatment should start at the step most appropriate to the initial severity, little guidance is given as to how this should be assessed.

Bronchodilators have a dramatic short term effect so patients learn that these are the correct treatment for their asthma and rapidly become dependent on them; inhalations are repeated as symptoms recur and they start to take much more than the doctor realises or intended. It is then difficult to introduce steroids as additional treatment as patients feel these drugs are less effective because of their delayed action. The result is that most asthmatic patients persist in using short acting beta agonists on their own, or sometimes with an inadequate dose of inhaled steroids, to try to control their symptoms. Mucosal inflammation and bronchial hyperreactivity persist, the frequency of symptoms is not reduced, and optimal lung function is never achieved. These patients do not realise the importance of steroids and, when their symptoms become worse, they increase their bronchodilators but delay taking steroids until it is too late to prevent an acute attack.

Another approach to management is to start all new asthmatic patients at step 2 of the BTS guidelines, using a large dose of steroids as soon as the diagnosis has been confirmed by PFR monitoring. There is then no agonising over whether or not to give steroids or what dose to use. These patients learn that steroids are the correct treatment for their asthma. The large initial dose recommended stamps out the active inflammatory process and achieves symptom control with full reversibility and optimal lung function. The dose is then gradually reduced to the minimum necessary to maintain optimum lung function and freedom from symptoms. Beta agonist bronchodilators are not prescribed initially but kept in reserve for emergencies.

The latter approach is being increasingly adopted by asthma nurses and many thinking doctors but some still misinterpret the BTS guidelines and allow their patients to become addicted to beta agonists.

Perhaps we need guidance on the use of the guidelines:

GEORGE STRUBE
33 Geoff Park Road, Cranley, West Sussex RH11 8AX, UK

1 Neville RG, Higgins BG. Providing better asthma care: what is there left to do? Thorax 1999;54:813–817.

---

### NOTICE

**International Pediatric Respiratory and Allergy Congress**

The International Pediatric Respiratory and Allergy Congress will be held on 1–4 April 2001 at the Prague Congress Center, Prague, Czech Republic. For further information contact the Congress Secretariat at the Congress Centre, Czech Medical Society, JEP Sokolská 31, CZ-120 26 Prague, Czech Republic. Telephone +420 296889 or +4202 297271; fax +4202 294610 or +4202 24216836. Email: lonekova@cls.cz
Respiratory questionnaires in COPD

J WILLIAMS, S J SINGH and M D L MORGAN

Thorax 2000 55: 439
doi: 10.1136/thorax.55.5.439c

Updated information and services can be found at:
http://thorax.bmj.com/content/55/5/439.4

These include:

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/