

# Ward Round - Sudden increase of breathlessness in a patient with pneumocystis pneumonia (PCP) and haematemesis

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A 43 year old man presented to Queen Elizabeth Central Hospital in January 2007 with a 2 week history of exertional dyspnoea, palpitations, left sided pleuritic chest pain and fevers. There was no associated cough or weight loss and no known history of TB. The patient's HIV status was not known. Examination revealed him to be in respiratory distress, without cyanosis. The respiratory rate was 64 breaths per minute, with use of accessory muscles of respiration. The oxygen saturation (pulse oximeter) when breathing room air was 64%. The pulse was regular at 156/min; BP was 100/60. Chest examination was normal.

Investigations revealed a blood haemoglobin concentration of 12.1 g/dl, white cell count of  $3.9 \times 10^9/l$  and platelets of  $623 \times 10^9/l$ . CXR had a 'ground glass' appearance consistent with *Pneumocystis jiroveci* pneumonia (PCP). HIV antibody testing was positive. Treatment for PCP was commenced with co-trimoxazole 1920mg qds and prednisolone 60mg od; aspirin which he was on prior to admission was stopped. Oxygen, delivered via nasal cannulae at a rate of 5 litres/minute, improved the digital oxygen saturation to 88%.

Following an initial clinical response, on day 3 of treatment he started to experience epigastric pain. Oral lansoprazole 30mg (a proton pump inhibitor) was prescribed to reduce gastric acidity. The epigastric pain improved over the next 3 days, but on day 7 of PCP treatment an episode of haematemesis occurred. This did not recur and he remained haemodynamically stable. Two days later he developed fever ( $38.7^\circ\text{C}$ ), tachycardia (144 bpm, regular) and increased tachypnoea. The BP was 103/71 and oxygen saturation was 90% on oxygen delivered at 4l/ min.

With this new deterioration of his condition, another erect PA chest film was taken (see Figures 1 and 2).

Figure 1 Close view of lower left chest



Figure 2 Close view of upper left chest



- 1. What does the Xray show?**
- 2. What additional physical sign would you now expect to be able to find?**
- 3. What might have happened to cause this situation?**

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## Discussion of the case

1. The Xray shows collections of **air in the subcutaneous tissue of the chest wall and neck, in the mediastinum and below the left diaphragm.**
2. The additional physical sign (which was identified at the bedside) was **surgical emphysema** in the neck and chest wall.
3. This patient had three risk factors for the escape of air into the mediastinum and adjacent tissue spaces:
  - (a) **PCP**, which may lead to rupture of hyperinflated lung tissue causing either pneumothorax or pneumomediastinum;
  - (b) **high-dose corticosteroid therapy (preceded by aspirin)** that could have caused mucosal ulceration, leading to both haematemesis and rupture of a lesion in the oesophagus, stomach or duodenum; and
  - (c) **vomiting**, which may have caused mechanical oesophageal rupture with pneumomediastinum (Boerhaave's syndrome)].

The distribution of escaped air in this case is unusual, with collections below the diaphragm (clearly outlining the curve of the left diaphragm), within the mediastinum, and outside the thorax/abdomen (with subcutaneous surgical emphysema). Wherever the source and direction of the escaped air, it has tracked throughout the tissue spaces extending between abdomen and neck. Because of the patient's condition, we were unable to investigate any further

the source of the leakage of air into the tissues.

Management of a patient with these complications is difficult. We asked the patient to take nothing by mouth. We passed a nasogastric tube by which to continue therapy with the high-dose proton pump inhibitor, and gave both fluids and antibiotics intravenously. We explained the situation to the patient and discussed the problems and the aims of our treatment. Sadly this patient died within 24 hours of the diagnosis of pneumomediastinum being made.

The usual cause of death in a pneumomediastinum is sepsis; however this patient remained afebrile. Surgical emphysema may lead to laryngeal oedema through obstruction of venous return; this may have caused his death.

*Points of note.* Several cases of pneumomediastinum linked with peptic ulcer disease in adults have been reported in the world literature. I could not, however, find any such case in which the peptic ulcer was attributed to either prednisolone or NSAIDs. Pneumomediastinum has been linked with PCP pneumonia in HIV since the late 1980's<sup>1</sup>.

## References

1. Villalona-Calero MA, Schrem SS, Phelps KR. Pneumomediastinum complicating *Pneumocystis carinii* pneumonia in a patient with AIDS. *Am J Med Sci.* 1989 May;297(5):328-30.