

Reduced consciousness and hypoventilation

A case of reduced consciousness and hypoventilation

A Pandurengan, C M Thorpe

Answers on p 245.

A 45 year old housewife was admitted to hospital after a fall at home, after which she had had three fits. Although her eyes were open, she was not responding to questions and her husband gave the history. A month previously she had been admitted with haematemesis and had undergone emergency surgery, which entailed partial gastrectomy along with vagotomy and pyloroplasty for a duodenal ulcer. For a week before this admission she had complained of abdominal discomfort, severe vomiting, and progressive weakness.

On examination she was drowsy, maintaining her airway but with slow breathing. She had generalised rigidity along with coarse twitches of facial and hand muscles. Her pupils were equal and reactive to light and her tendon reflexes were brisk. She had no neck stiffness and was apyrexial. Clinically she was dehydrated with a pulse rate of 104 beats/min and a blood pressure of 110/80 mm Hg.

Initial investigations revealed blood glucose of 9.6 mmol/l, sodium 136

mmol/l, potassium 4.0 mmol/l, calcium 2.59 mmol/l, creatinine 474 μ mol/l, urea 22.9 mmol/l, haemoglobin 130 g/l, and serum albumin 38 g/l.

Computed tomography was performed followed by a lumbar puncture, both of which were normal.

Arterial blood gases were taken while breathing air (point A in fig 1) and showed a pH 7.57, carbon dioxide pressure ($p\text{CO}_2$) 9.56 kPa (71.9 mm Hg), oxygen pressure ($p\text{O}_2$) 6.25 kPa (47 mm Hg), bicarbonate 65.5 mmol/l, and a base excess of 37.7 mmol/l. At this point she was started on 35% oxygen.

Four hours later (point B) her pH was 7.6, $p\text{CO}_2$ 78.7 mm Hg (10.45 kPa), $p\text{O}_2$ 95 mm Hg (12.6 kPa), bicarbonate 76.8 mmol/l, and base excess 47.6 mmol/l. At this point she was started on intravenous saline with potassium, and her oxygen was increased to 60%.

Eight hours later (point C) her conscious level improved and arterial gas analysis showed a pH of 7.53, a $p\text{CO}_2$ of 82 mm Hg (10.9 kPa), a $p\text{O}_2$ of 78 mm Hg (10.4 kPa), a bicarbonate of 69.9 mmol/l,

and base excess of 39.9 mmol/l. At this point acetazolamide was added and fluid replacement with saline and potassium continued.

Twenty four hours from admission her condition had improved considerably. Unfortunately she then experienced a sudden deterioration with respiratory distress. Blood gas analysis on 100% oxygen (point D) revealed a $p\text{O}_2$ of 57.1 mm Hg (7.59 kPa), along with a $p\text{CO}_2$ of 48 mm Hg (6.4 kPa), a pH of 7.51, a bicarbonate of 37 mmol/l, and a base excess of 12 mmol/l. A chest radiograph was taken (fig 2). She required tracheal intubation and ventilation at this point.

Thirty six hours after admission her oxygenation had improved and she was extubated.

During her admission she had large amounts of gastric aspirate through her nasogastric tube, which had a low pH despite her previous operation.

QUESTIONS

- (1) What is the diagnosis on admission? What other electrolyte result is essential in management of this condition?
- (2) Explain the effect of supplemental oxygen on the arterial blood gas result (point A to point B).
- (3) Explain the action of saline (point B to point C) and acetazolamide (point C onwards)?
- (4) What is the cause of her hypoxia at point D? How could this have occurred?

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Figure 1 Graph illustrating the change in $p\text{O}_2$, $p\text{CO}_2$, and hydrogen ion (H^+) concentration over time. Dotted lines illustrate normal values: 100 mm Hg (13.3 kPa) for $p\text{O}_2$; 40 mm Hg (5.3 kPa) for $p\text{CO}_2$ and 40 nmol/l (pH 7.4) for H^+ concentration.



Figure 2 Chest radiograph.

Respiratory medicine

Dyspnoea and a subcutaneous swelling

H Ansari, R Bell

Answers on p 245.

An 81 year old electrician was admitted with exertional dyspnoea and weight loss. His exercise tolerance was decreased to 50 yards. He did not smoke, and denied chest pain or haemoptysis. On examination there were decreased movements of the left

hemithorax, decreased left sided air entry and was dull to percuss.

QUESTIONS

(1) What does the initial radiograph show (fig 1)?

- (2) What does the radiograph after the chest drain demonstrate (fig 2)?
- (3) What is its significance?
- (4) What is shown on the chest photograph (fig 3)?
- (5) What is the unifying diagnosis?

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Figure 1 Presenting chest radiograph.



Figure 2 Radiograph after chest drain.



Figure 3 Site of chest drain.

Gastrointestinal bleed

Recurrent gastrointestinal bleed

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Answers on p 246.

A 21 year old man was admitted with three episodes of recurrent haematemesis and colicky right upper quadrant abdominal pain. After the first bleed he developed jaundice, which was short lasting. This was associated with fever, chills, and rigors. There was a history of blunt trauma to the right chest a month before this admission. Subsequent to the injury he had had recurrent

pain localised to the epigastrium and the chest and he was managed with non-steroidal anti-inflammatory drugs. He was a smoker and had also consumed 50 g of alcohol almost every day, for the last five years.

On examination, the patient was pale with mild icterus. His liver was moderately enlarged and tender. Investigations showed a haemoglobin of 80 g/l, and

bleeding and clotting times and chest radiography were normal. Liver function tests showed a serum bilirubin 85.5



Figure 1 End-on view of ampulla.

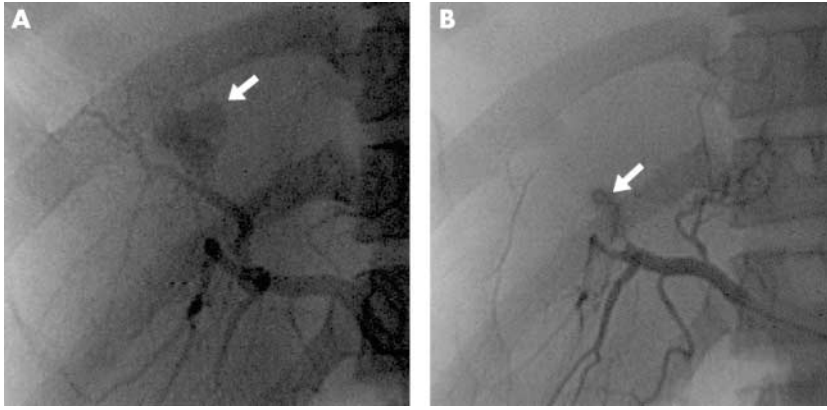


Figure 2 Transhepatic arterial catheterisation.

μmol/l, direct bilirubin 53.3 μmol/l, aspartate aminotransferase 223 IU/l, and alanine aminotransferase 164 IU/l. Ultrasound with Doppler showed a large 5 × 7

cm irregular well defined predominantly hypochoic lesion in the right lobe of the liver with a pulsatile vessel in the rim simulating a pseudoaneurysm.

QUESTIONS

- (1) What is the endoscopic diagnosis (see fig 1)?
- (2) What is the procedure and what does it show (see fig 2)?

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Infection

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Acute severe anaemia in an elderly patient with hereditary sphaerocytosis

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Answers on p 246.

A 63 year old man with known hereditary sphaerocytosis was admitted to our hospital with a two day history of fever up to 37.9°C and chills. On clinical examination, he was icteric and had splenomegaly. His blood pressure was 130/70 mm Hg, and his heart rate 72 beats/min. Haematological analysis revealed anaemia (haemoglobin 83 g/l), a raised reticulocyte count ($450 \times 10^9/l$), and thrombocytopenia ($95 \times 10^9/l$). A Coombs test was negative. Other laboratory findings were: alanine aminotransferase 56 IU/l, aspartate aminotransferase 40 IU/l, bilirubin 118.7 μmol/l with conjugated bilirubin 9.9 μmol/l, lactate dehydrogenase 685 U/l, the haptoglobin concentration was below the level of detection, and the

international normalised ratio was 1.3. Two days after admission the patient's temperature rose to 39.8°C, and severe anaemia was noted with a haemoglobin of 39 g/l and a significantly decreased reticulocyte count ($12 \times 10^9/l$). A bone marrow biopsy was performed. The specimen was hypercellular. Hardly any red cell precursors were seen, but there were a small number of giant cells with nuclei containing eosinophilic inclusions (fig 1).

QUESTIONS

- (1) What does the bone marrow biopsy show?
- (2) What is the most likely diagnosis?

- (3) Which investigations would you perform to confirm the diagnosis?

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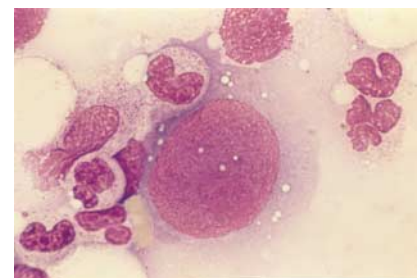


Figure 1 Bone marrow smear (Papanheim-staining, original magnification × 1000).