ENDGAMES

We welcome contributions that would help doctors with postgraduate examinations

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PICTURE QUIZ

A woman with sudden headache followed by collapse

A 41 year old woman was admitted with sudden onset of severe headache followed by collapse and decreased consciousness.

She had a history of frequent migraines but was not taking regular drugs. She was a non-smoker with no history of recreational drug use.

On admission her Glasgow coma scale was 7/15 (E1 V1 M5). Her pupils were unequal but reactive. Examination of her peripheral nervous system showed increased tone in all four limbs with brisk reflexes. Plantar reflexes were equivocal. Her blood pressure was 150/80 mm Hg, pulse was regular at 44 beats/min, and oxygen saturation was 99% on 10 l/min. Cardiovascular examination was normal. A respiratory examination was normal.

The patient was intubated. Computed tomography of the head excluded intracranial haemorrhage.

A lumbar puncture was performed, and cerebrospinal fluid was sent for analysis; it showed white blood cell count 0×10^6/l (reference range 0-5 (all lymphocytes, no neutrophils)), red blood cell count 23×10^6/l (0-10), protein 0.3 g/l (0.2-0.4), glucose 3.8 mmol/l (3.3-4.4 or about two thirds of the blood glucose concentration), and no xanthochromia. Magnetic resonance imaging (MRI) of the brain was performed one week later (fig 1).

Transoesophageal echocardiography was performed three weeks later (fig 2).

1 **What abnormality can be seen on magnetic resonance imaging of the brain, and what is the diagnosis?**
2 **What abnormality is seen on transoesophageal echocardiography?**
3 **How would you manage this patient acutely?**
4 **What other investigations are needed to confirm the cause?**
5 **How would you manage this patient in the long term?**

Submitted by Daniel A Jones, Fiona Walker, Neha R Chopra, Walter Serino, and Farhad Huwez
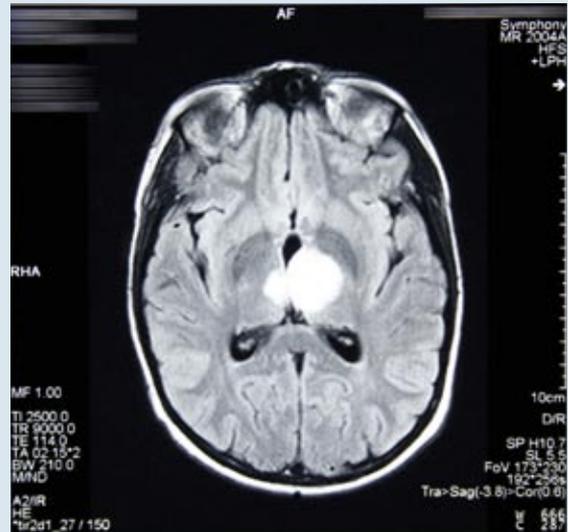Cite this as: *BMJ* 2009;338:b813

Fig 1 Magnetic resonance imaging of the brain

Fig 2 Transoesophageal echocardiogram with contrast

ON EXAMINATION QUIZ

Renal tubules

The answer to this question, and more questions on this topic, are available from www.onexamination.com/endgames until midnight on Wednesday. This week's quiz is on renal tubules and is taken from various examinations.

A 35 year old man presented with pain in his left loin and haematuria. He had experienced three episodes of similar symptoms in the past. On examination, he was afebrile and had mild pallor.

Investigations show:
Sodium 140 mmol/l (normal range 137-144)
Potassium 3.0 mmol/l (3.5-4.9)
Chloride 115 mmol/l (95-107)
Bicarbonate 12 mmol/l (20-28)
Calcium 2.5 mmol/l (2.2-2.6)
Urea 19 mmol/l (2.5-7.5)
Urinalysis: pH 6.5, protein 1+, red blood cell count 1+, white blood cell count 1+

What investigation should be done next?
- Bartter's syndrome
- Conn's syndrome
- Renal tubular acidosis type 1
- Renal tubular acidosis type 2
- Renal tubular acidosis type 4

STATISTICAL QUESTION

Uncontrolled studies

To measure the effect of a food supplement on headaches, a questionnaire survey was sent to a random sample of workers in one factory. People who scored in the top 20% for frequency of headaches in the previous two weeks were invited to "try a natural food supplement used to treat headaches." A follow-up questionnaire two weeks later showed markedly fewer headaches. Which, if any, of the following could affect the results?

a) **The Hawthorne effect**
b) **Regression to the mean**
c) **Healthy worker effect**
d) **Placebo effect**
e) **Confounding by indication**

Submitted by John Fletcher
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