

# ENDGAMES

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Fig 1 | Patient's urine on admission

## Laboratory test results on admission

		Reference range
Haemoglobin (g/L)	74	130-170
Mean red cell volume (fL)	93.3	80-100
White cell count ( $\times 10^9/L$ )	6	4-10
Platelets ( $\times 10^9/L$ )	190	150-400
C reactive protein (nmol/L)	85.72	0-57.14
Urea (mmol/L)	10.4	0-7.5
Creatinine ( $\mu\text{mol/L}$ )	229	62-115
International normalised ratio	2.6	Target value 2-3
Reticulocyte count ( $\times 10^9/L$ )	167.6	20-120
Total bilirubin ( $\mu\text{mol/L}$ )	41	0-17
Conjugated bilirubin ( $\mu\text{mol/L}$ )	9	1-5
Haptoglobin (g/L)	<0.3	0.5-2.6
Ferritin (pmol/Lng/mL)	1939.84	49.43-733.53

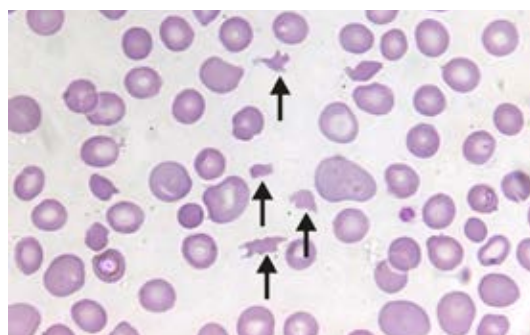


Fig 2 | A representative blood film showing red cell fragments (arrows)

## CASE REVIEW

### A man with rust coloured urine and normocytic anaemia

A 65 year old man presented to the emergency department with a 10 day history of dark urine, general malaise, and progressive shortness of breath. He had a history of rheumatic heart disease and had been on warfarin since he had a metallic mitral valve replacement in 1984. He was a retired teacher, drank a minimal amount of alcohol, and was a non-smoker. He had no family history of cancer.

On examination he was jaundiced with a sinus tachycardia (120 beats/min) and a pansystolic murmur. His other vital signs were normal. On examination, his other systems were normal except for mild suprapubic tenderness, as were the results of a digital rectal examination.

His urine was rust coloured (fig 1) with no blood clots. Urine dipstick was positive for blood (3+), protein (3+), and leucocytes (3+), but negative for nitrites. No red blood cells or casts were noted during microscopy.

The table shows the results of his initial laboratory investigations. A peripheral blood film showed red cell fragments, polychromasia, and normal platelets (a representative smear is shown in fig 2). The results of chest radiography, computed tomography of the kidneys, and ultrasound of the urinary tract were also unremarkable. Serial sepsis screens and three sets of blood cultures for endocarditis were all negative.

1. What are the causes of dark urine?
2. What are the causes of mechanical haemolytic anaemia?
3. What is the most likely diagnosis in this patient?
4. How would you further investigate this patient?
5. How should this patient be managed?

Submitted by Sarah Case, Thomas J Johnston, Michael O'Sullivan, Will Thomas, and Oliver J Wiseman

Patient consent obtained.

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## STATISTICAL QUESTION

### Uncertainty in sample estimates: standard error

The efficacy of nicotine patches among pregnant smokers was investigated using a randomised placebo controlled trial. The intervention was the administration of 16 hour nicotine patches after recruitment until the time of delivery. Participants were pregnant women over 18 years who smoked at least five cigarettes a day and whose babies were between 12 and 20 weeks' gestation. In total, 402 women were recruited from 23 maternity wards throughout France and randomly allocated to the intervention (n=203) or placebo patches (n=199).

The outcome measures included achievement of complete abstinence until delivery and birth weight. The proportion of women who achieved complete abstinence was higher in the nicotine patch group than in the placebo group, although the difference was not significant (11 (5.5%) v 10 (5.1%); odds ratio 1.08, 95% confidence interval 0.45 to 2.60; P=0.87). The mean birth weight was higher in the nicotine patch group, although the difference was not significant (3065 g (standard error 44 g) v 3015 g (44 g); difference 50 g, -71.1 to 172.3; P=0.41). It was concluded that the nicotine patch did not increase smoking cessation rates or birth weights when compared with placebo.

Which of the following statements, if any, are true?

- a) The standard error of the mean birth weight for a treatment group provides a measure of the accuracy of the sample mean as an estimate for the population parameter.
- b) If the sample size for the nicotine patches group increased, the size of the standard error would generally be expected to decrease.
- c) The standard error of the mean birth weight quantified the variation in measurements of birth weight in the population.

Submitted by Philip Sedgwick

Cite this as: *BMJ* 2015;350:h3078

## ANATOMY QUIZ

### Computed tomography angiogram of the thoracic vessels

Identify the structures labelled A, B, C, D, and E in this computed tomography angiogram of the thoracic vessels.

Submitted by Ke-Hua Pan and Ming-Hua Zheng

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