# ENDGAMES

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## PICTURE QUIZ A farmer with fever and right upper quadrant pain

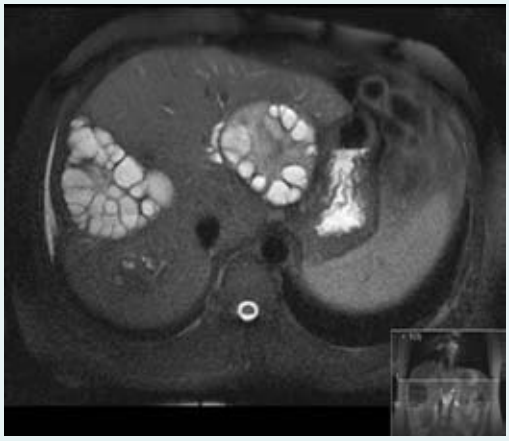

Fig 1

A 22 year old Asian man presented with right upper quadrant pain and associated nausea, fever, and dark urine. He had worked as a farmer in Pakistan before moving to the United Kingdom in 2004. He was icteric with a 3 cm hepatomegaly. His blood tests showed a white blood cell count of $10.9\times10^9$/L (reference range 4.0-11.0), eosinophil count of $2.1\times10^9$/L (0.04-0.4), and a C reactive protein of 26 mg/L (0-5). His bilirubin was 105 µmol/L (‹21 µmol/L), with alkaline phosphatase 220 U/L (30-130) and aspartate aminotransferase 101 U/L (0-32). He had no relevant medical history.

Despite treatment with broad spectrum antibiotics, he developed biliary sepsis with tachycardia and hypotension. He underwent various tests including imaging of his abdomen (fig 1).

1 What does the magnetic resonance imaging scan show and what is the probable diagnosis?
2 How would you confirm the diagnosis?
3 How is it acquired?
4 What treatment options are available?

Submitted by Vivek Chhaya and Sanjay Gupta
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## CASE REPORT

### A persisting puzzling pneumonia in a young man

A 23 year old immunocompetent man with a history of childhood asthma was referred to the respiratory physicians with a four week history of productive cough, painful throat, fever, rigors, generalised myalgia, and vague discomfort in his left chest. He also had slight abdominal tenderness in the left upper quadrant.

He was a non-smoker, with no history of recent foreign travel, seizures, or misuse of alcohol or drugs. There was no family history of note.

A chest radiograph organised by his general practitioner showed multiple cavities and consolidation in the left lower lobe. A radiological diagnosis of cavitating pneumonia in the left lower lobe was made.

On examination he had a fever (39°C), looked unwell, and had a respiratory rate of 16 breaths/min, resting oxygen saturation of 96% on air, and blood pressure of 130/72 mm Hg. He was tachycardic (112 beats/min), with reduced chest expansion, dullness on percussion, and reduced breath sounds over his left lower lobe.

Blood tests confirmed an acute phase response, with a raised C reactive protein of 187 mg/L (normal range 0-4), white cell count $17.2\times10^9$/L (4.0-10) (with neutrophilia $15.3\times10^9$/L), urea 4.7 mmol/L (3.4-7), and albumin 35 g/L (37-49). The results of urinalysis and electrocardiography were normal. Blood and sputum cultures were consistently negative.

Despite antibiotics (oral amoxicillin) given as per regional guidelines, his fever continued over the next four days and he underwent computed tomography of the chest. This confirmed left lower lobe basal segment consolidation, with multiple air and fluid filled cavities, and associated left hilar and subcarinal lymphadenopathy. In addition, an 18 mm lesion was seen in his left lower lobe bronchus. Bronchoscopy was performed and the lesion biopsied.

The bronchoscopic biopsy samples confirmed a diagnosis of pulmonary carcinoid tumour.

1 What are the causes of a non-resolving pneumonia?
2 How do pulmonary carcinoid tumours most commonly present?
3 How should pulmonary carcinoid tumours be managed?
4 What other conditions are associated with carcinoid tumours?

Submitted by John Baker, David McClelland, and O J Dempsey
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## STATISTICAL QUESTION Meta-analyses: tests of heterogeneity

Researchers investigated the association between consumption of white rice and type 2 diabetes. They performed a meta-analysis of prospective cohort studies that reported the relative risk of type 2 diabetes by intake of white rice (high *v* low). In total, four publications were identified that included seven distinct prospective cohort analyses in Asian and Western populations. Rice intake and type 2 diabetes were identified through self report. A total of 13 284 incident cases of type 2 diabetes were ascertained among 352 384 participants with follow-up periods ranging from four to 22 years.

For each study the researchers identified the relative risk of type 2 diabetes for high consumption of white rice compared with low intake. Statistical tests of heterogeneity were undertaken across the seven sample estimates (Cochran's Q test, P=0.001; $I^2$=72.2%). The overall relative risk was 1.27 (95% confidence interval 1.04 to 1.54). The researchers concluded that higher consumption of white rice was associated with a significantly higher risk of type 2 diabetes.

**Which of the following statements, if any, are true for the statistical test of heterogeneity?**

a) Null hypothesis: heterogeneity exists between the sample relative risks as estimates of the population parameter
b) Statistical heterogeneity existed between the seven sample estimates of the population relative risk
c) A random effects model was appropriate for the calculation of the overall relative risk

Submitted by Philip Sedgwick
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