The Multidisciplinary Management of a Cardiothoracic Patient: A Case of Infective Endocarditis complicated by Haemorrhagic Stroke

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BACKGROUND: Infective endocarditis (IE) is an uncommon yet potentially fatal condition with an incidence of 3-7 per 100000 person-years (1) and up to 15-30% in-hospital mortality (2). IE remains a diagnostic challenge and delays in diagnosis are common (3). Important complications include valve regurgitation, heart failure and septic embolism. Risk of embolism in IE is high (4) with neurological complications reported in 20-40% of cases (5). This report describes a case of *Staphylococcus aureus* mitral valve (MV) endocarditis complicated by haemorrhagic stroke requiring emergency neurosurgical and cardiothoracic surgical intervention.

CASE REPORT: A 27-year-old man with severe anxiety treated with sertraline presented with a 3-day history of fever, polyarthralgia, diarrhoea, vomiting and a rash following an uncomplicated dental procedure a month previously. He felt unwell for one week but denied recent travel or intravenous drug use. Examination revealed fever (38.1C), heart rate 118 bpm, blood pressure 108/77 mmHg, respiratory rate 18/min and oxygen saturation 96% on air. He had a widespread vasculitic rash, multiple tender joints, bilateral clear lung fields and normal heart sounds. Blood tests showed a raised CRP 258mg/l, lactate 2.83 mmol/L and creatinine 156umol/l. Three blood cultures grew *Staphylococcus aureus*. Viral and immunology screen were negative. He was started on intravenous Vancomycin 1g BD and Clindamycin 600mg QDS according to sensitivities. He developed acute abdominal distension and computed tomography (CT) whole body showed markedly distended colon suggestive of obstruction. The General Surgeons attributed his abdominal distension to pseudo-obstruction secondary to sepsis managed conservatively with a flatus tube.

On Day 5 he deteriorated and was transferred to Intensive Therapy Unit (ITU). A new systolic murmur, bi-basal pulmonary crackles and splinter haemorrhages prompted transthoracic echocardiography (TTE) which confirmed vegetations on MV and moderate mitral regurgitation. He was reviewed by Cardiology and diagnosed with *Staphylococcus aureus* infective endocarditis. On Day 8, he developed acute right-sided hemiparesis, aphasia, confusion and drowsiness. CT Head demonstrated a left frontal intra-cerebral haematoma with mass effect (Figure 1). CT angiogram did not reveal any obvious vascular abnormality. He was urgently transferred to the tertiary Neurosurgery centre and underwent an uneventful emergency left frontal craniotomy and evacuation of haematoma. Antibiotics were then switched to intravenous Meropenem 2g TDS and Gentamicin 100mg TDS.

He deteriorated again on Day 34 with hypotension and pulmonary oedema and was transferred to ITU. Repeat TTE and transoesophageal echocardiogram showed large vegetations on MV and severe mitral regurgitation (Figure 2). In view of progressive valve disease, heart failure and uncontrolled infection refractory to medical therapy he was referred for cardiac surgery. On Day 37 he underwent mechanical MV replacement and tricuspid valve repair.

DISCUSSION: Neurological complications in IE negatively impact on outcome, with intracerebral haemorrhage associated with poorer prognosis (5). The optimal timing of cardiac surgery in these cases is unclear. The risks of haemorrhagic transformation or extension of infarct with heparinisation and cardiopulmonary bypass during valve surgery must be balanced against the risks of haemodynamic instability, uncontrolled infection and high risk of new embolisation unoperated. Prior studies suggest a higher risk of neurological complications in early valve surgery

(7, 8), however more recent data supports no increase in risk of post-operative neurological impairment in surgical intervention less than 14 days from diagnosis of IE (6, 8). A multidisciplinary approach is crucial in the management of IE with neurological complications and when considering timing of cardiac surgery. The successful outcome in this complex patient is likely due to the input from regular weekly multidisciplinary team meetings.

CONCLUSION: This complex case of IE demonstrates the collaborative effort of the multidisciplinary team that successfully delivered timely medical and surgical care, culminating in the survival of this high-risk surgical patient. In addition to neurosurgical intervention and cardiac surgery, he also received care from Stroke, Cardiology, ITU, Microbiology, Radiology, General Surgery, Neuro-Physiotherapy, Speech and Language Therapy and the Nutrition team. Further research is needed to investigate the optimal timing of surgery for IE complicated by stroke.



Figure 1. Computed tomography of the head revealed a large (4cm maximum oblique transverese diameter) haematoma in the left frontal lobe with mass effect (arrow).

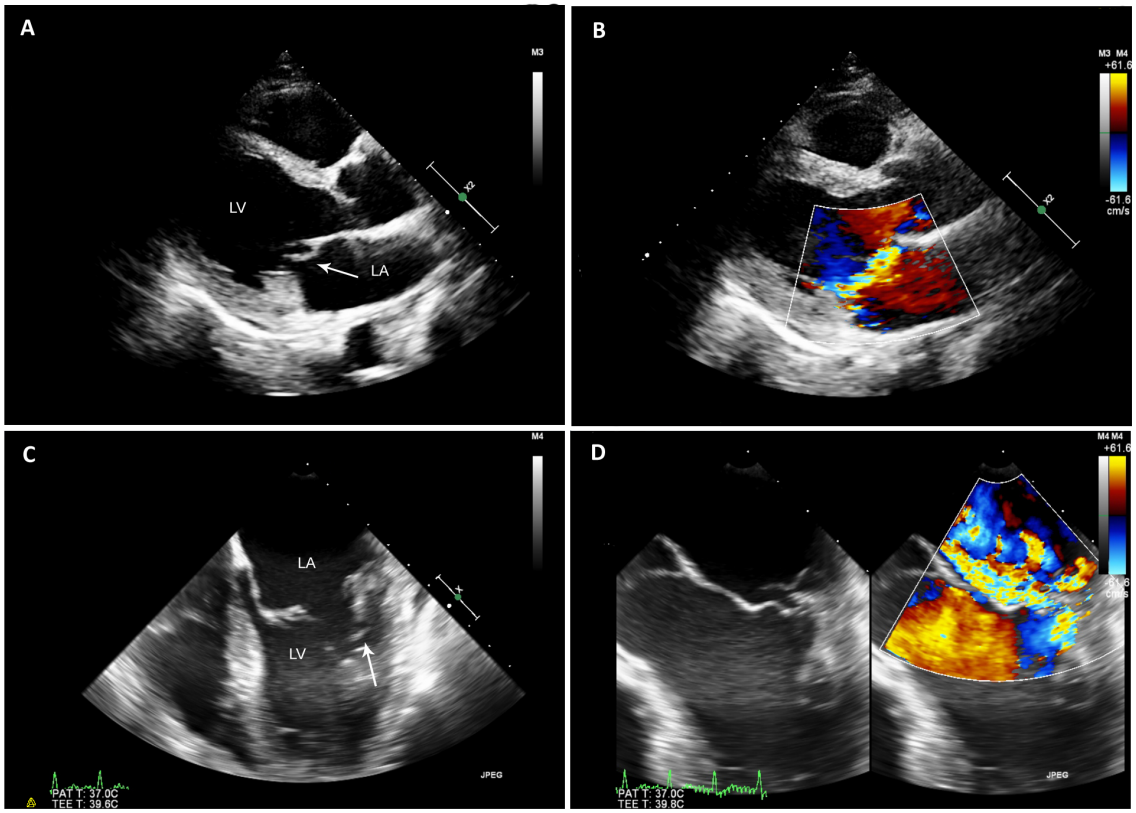


Figure 2. Transthoracic (Panels A, B) and transoesophageal (Panels C, D) echocardiography demonstrating a large vegetation on the mitral valve (arrow) and severe eccentric mitral regurgitation (Panels B, D). LA - left atrium, LV - left ventricle.

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