

Staphylococcal infection of a left ventricular aneurysm

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Left ventricular aneurysm formation is a common complication of myocardial infarction. Depending on the definition used, the incidence in survivors of acute myocardial infarction is between 4% and 40%, with mural thrombi present in about half of all aneurysms.¹ Infection of these thrombi at times of bacteraemia might be expected to occur quite commonly but has been described only occasionally. We present such a case and review previously reported cases.

Case report

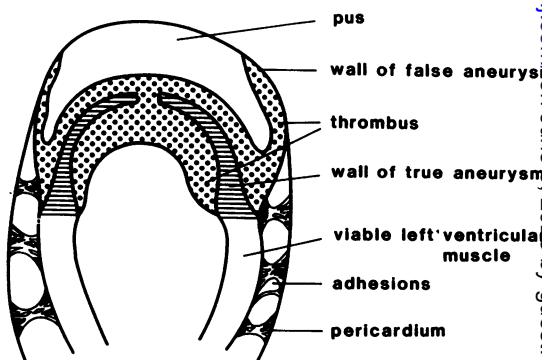
A 55 year old man was admitted to hospital 24 hours after the development of severe left pleuritic chest pain, delirious and with a pyrexia of 42°C. He had been admitted to a coronary care unit 11 weeks previously with an acute anterior myocardial infarction; after three days a pericardial friction rub was noted and his recovery was complicated by a moderate degree of cardiac failure requiring treatment with a diuretic. He had been discharged home after one week and remained well, apart from atypical exertional chest pain relieved by rest.

On examination he was toxic with a tachycardia of 130 beats/min, small volume peripheral pulses, and a blood pressure of 90/70 mm Hg. There was clinical cardiomegaly with paradoxical pulsation superior to the cardiac apex. Auscultation revealed a loud third heart sound but no cardiac murmurs. The jugular venous pressure was raised and auscultation of the chest revealed bilateral basal crepitations. There was no evidence of focal infection or any peripheral stigmata of infective endocarditis.

Investigations yielded the following results: haemoglobin concentration 12.3 g/dl, white cell count $17.8 \times 10^9/l$, erythrocyte sedimentation rate 79 mm in one hour, blood urea concentration 10.4 mmol/l (61.2 mg/100 ml), and normal electrolytes. Blood cultures grew *Staphylococcus aureus*. The electrocardiogram showed changes of extensive anterior myocardial infarction with persistent ST elevation and left axis deviation. The chest radiograph showed changes of pulmonary venous congestion and cardiac enlargement with a bulge on the left heart border suggestive of a left ventricular aneurysm.

Appropriate parenteral antibiotic treatment was started and the patient's temperature and mental state rapidly returned to normal. He remained hypotensive with poor urine output and was transferred to the regional cardiothoracic centre. A two dimensional echocardiogram was performed which confirmed the presence of a large anteroapical ventricular aneurysm and had appearances suggesting thrombus within. Shortly afterwards he had a recurrence of severe left sided chest pain and examination revealed a loud pleuropericardial rub. Emergency surgery was advised without any further investigation.

At operation the pericardium was found to be densely adherent to an anteroapical left ventricular aneurysm 12 cm in diameter. On mobilisation it was apparent that both true and a false aneurysm, each with thrombus within, were present and in communication with each other (figure). When the false aneurysm was entered 150 ml of pus (culture of which grew *Staphylococcus aureus*) was aspirated from an abscess cavity within the thrombus. Both the true and the false aneurysms were excised and the ventricle was closed between Teflon buttresses. The patient came off cardio pulmonary bypass easily with no inotropic support. The pericardium was washed out with 1 g of cloxacillin and the chest closed in routine fashion. The patient continued to have parenteral antibiotics for 10 days. After he had stopped



Diagrammatic representation of the operative findings, showing true and false left ventricular aneurysms, each with thrombus within, and an abscess cavity within the false aneurysm.

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Clinical details of present and previous cases of infection of a left ventricular aneurysm

Reference	Age/Sex	Time from MI	Symptoms	Organism	Source	Method of Diagnosis	Outcome
(Present case)	55 M	11 w	Fever Left chest pain	<i>Staphylococcus aureus</i>	?	Surgery	Alive
2	54 M	11 w	Fever	Gram positive coccus	?	Necropsy	Died
3	53 M	3 y	Fever Stroke	<i>Salmonella</i> sp	?	Necropsy	Died
4	53 M	6 y	Fever Chest pain	Non-haemolytic Streptococcus	Tonsil	Clinical, necropsy	Died
5	58 M	Uncertain*	Fever Diarrhoea & vomiting	<i>Salmonella infantis</i>	Gut	Necropsy	Died
6	59 F	At least 9 y	UTI persistent fever	<i>Escherichia coli</i>	Urine	Necropsy	Died
7	52 M	5 y	Enteritis fever left chest pain	<i>Salmonella typhimurium</i>	Gut	Clinical	Died at operation
8	54 M	24 d	Fever stroke	<i>S aureus</i>	?	Clinical, surgery	Alive
9	73 M	3 w	Fever CCF	<i>Pseudomonas aeruginosa</i>	Urine	Necropsy	Died
10	67 M	2 y	Fever	<i>Proteus mirabilis</i>	? Urine	Clinical, gallium scan, surgery	Alive

*No history or electrocardiographic evidence of myocardial infarction.
MI—myocardial infarction; UTI—urinary tract infection

the antibiotics there was no recurrence of fever and blood cultures were negative. He was discharged home and was well at follow up one month later.

Discussion

Infected thrombus in a cardiac aneurysm is rarely recognised and only nine cases have been published worldwide.²⁻¹⁰ The clinical details of the present case are compared with those of the previous cases in the table. Patients may present from a few weeks to many years after a myocardial infarction with a febrile illness, which either settles initially with antibiotic treatment and recurs later or fails to settle despite appropriate antibiotic treatment. The organisms and the initial source of infection, when known, have varied. In most of the reported cases the diagnosis was made at necropsy. In three recent cases^{7 8 10} the condition was suspected on clinical grounds and confirmed at surgery, which was successful in two.^{8 10} In the present case the diagnosis was not suspected before surgery, which was performed because the ventricular aneurysm was causing a low cardiac output and local discomfort rather than because the staphylococcal septicaemia was proving difficult to treat.

Any patient with a left ventricular aneurysm who develops bacteraemia may be at risk of developing an infected mural thrombus. Persistence or recurrence of fever despite appropriate antibiotic treatment should raise suspicion of this diagnosis. Definitive non-invasive diagnosis may be impossible. In one previous case¹⁰ a gallium 67 citrate scan showed uptake in the region of the cardiac apex. Medical cure of this condition may be difficult even with prolonged

parenteral antibiotic treatment and surgical resection of the aneurysm containing the infected thrombus should be undertaken early.

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