

# Repeated echocardiography: essential in the management of *Staphylococcus aureus* endocarditis

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**Summary:** *Staphylococcus aureus* endocarditis in a previously healthy 25 year old man is described. Repeated echocardiography recorded rapid progression of aortic root and interventricular septal involvement and, even though the patient was clinically stable, early surgery was advised with a satisfactory outcome. This case report clearly demonstrates the vital role of repeated cross-sectional echocardiography in the management of such cases.

## Introduction

*Staphylococcus aureus* continues to be a major cause of infective endocarditis.<sup>1,2</sup> The clinical course on non-drug addicts is invariably aggressive with mortality rates of between 20–50%.<sup>3,4</sup> Increasing use is now made of cross-sectional echocardiography in the diagnosis of this condition<sup>5</sup> and we describe a case in which repeated echocardiography had a major impact on patient management.

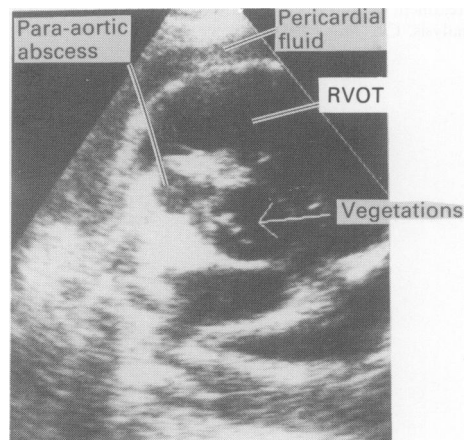
## Case report

A 25 year old man was admitted with a two day history of generalized malaise. One week prior to admission he sustained a small laceration to his left middle finger to which he applied a dry dressing.

He was previously healthy and had no past history of note. He did not smoke cigarettes and had a moderate alcohol intake. On admission he was pyrexial but looked generally well. A tender lesion in the pulp space of his left middle finger was noted and also a small area of dark discoloration on the distal aspect of his left hallux. Auscultation of his heart and lungs was normal. Twenty four hours later *S. aureus* was cultured from the blood and as it is our policy to use a combination of two antibiotics in these patients he was commenced on intravenous erythromycin and flucloxacillin. The organism was sensitive to all tested antibiotics except ampicillin.

He improved symptomatically but a low grade pyrexia persisted. On day five of his admission a

murmur of aortic regurgitation was audible and paravalvular abscess formation was suspected. However, cross sectional echocardiography showed no abnormality in the area of the aortic valve but a small pericardial effusion was evident. No vegetations were visible on his valves. Vancomycin was introduced in case the *in vitro* sensitivities to erythromycin and flucloxacillin did not correspond to *in vivo*. A low grade pyrexia persisted despite satisfactory vancomycin levels. Cross-sectional echocardiography was repeated 60 hours following the initial echocardiographic examination and this revealed dramatic deterioration. Vegetations were now visible on the aortic valve with one of the cusps prolapsing into the left ventricle. A large cavity was seen in the aortic valve annulus (Figure 1) which was thought to represent a para-aortic abscess. The



**Figure 1** Cross-sectional echocardiograph. Parasternal, short axis view. RVOT = right ventricular outflow tract.

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left ventricle was slightly dilated but left ventricular function was normal. The interventricular septum appeared deficient in the sub-aortic area and the pericardial effusion had increased. It was decided to proceed immediately with operative intervention because of the gross deterioration in echocardiographic findings. He remained clinically stable and there was no evidence of cardiac decompensation.

At operation, 500 ml of blood stained fluid was present in the pericardial cavity. The aorta was thickened and oedematous. The aortic valve was tricuspid and the left coronary cusp was involved in the infective process. A large abscess cavity involved the annulus with total separation of the aorta from the ventricle in the area of the right and left coronary cusps. The adventitia was intact preventing rupture into the pericardial sac. The superior part of the interventricular septum was also involved and a probe was passed easily into the right ventricle. The aortic valve was replaced with a 23 mm Medtronic valve and the aortic root and ventricular septal defect were repaired.

His post-operative recovery was complicated by a *Serratia marcescens* chest infection. He continued on antibiotics for a further 6 weeks. On discharge he was feeling well and his only medication was oral anticoagulants.

#### References

1. Thompson, R. Staphylococcal infective endocarditis. *Mayo Clin Proc* 1982, **57**: 106–114.
2. Chambers, H., Korzeniowski, O., Sande, M. with the National Collaborative Endocarditis Study Group. *Staphylococcus aureus* endocarditis: clinical manifestations in addicts and non addicts. *Medicine* 1983, **62**: 170–177.
3. Bayer, A. Staphylococcal bacteraemia and endocarditis. State of the art. *Arch Intern Med* 1982, **142**: 1169–1177.
4. Richardson, J., Karp, R., Kirkliw, J. & Dismukes, W. Treatment of infective endocarditis: a ten year comparative analysis. *Circulation* 1978, **58**: 589–597.
5. Stafford, W., Petch, J. & Radford, D. Vegetations in infective endocarditis. Clinical relevance and diagnosis by cross sectional echocardiography. *Br Heart J* 1985, **53**: 310–313.
6. Abrams, B., Sklaver, A., Hoffman, T. & Greenman, R. Single or combined therapy of staphylococcal endocarditis in intravenous drug abusers. *Ann Intern Med* 1979, **90**: 789–791.
7. Goodwin, J.F. The challenge and reproach of infective endocarditis. *Br Heart J* 1985, **54**: 115–118.

#### Discussion

*Staphylococcus aureus* endocarditis occurring in non-addicts involves predominantly the left sided valves and the mortality varies from 20–50%.<sup>3,4</sup> Early treatment is mandatory and the use of two synergistic antibiotics is usually recommended even though there is some evidence that a single agent is equally effective.<sup>6</sup> Surgery is usually recommended if haemodynamic deterioration occurs; however, many authors now favour early surgery in this condition.<sup>7</sup>

In this case under discussion cross-sectional echocardiography was essentially normal 60 hours prior to the examination that revealed the presence of a paravalvular abscess and disintegration of the interventricular septum. This occurred despite little change in clinical status. The decision to proceed to early surgery was based on these echocardiographic findings and, if surgical intervention was not prompt, aortic root rupture with a fatal outcome would have been inevitable.

The vital role of repeated echocardiography is clearly demonstrated even when the clinical condition of the patient is relatively stable and we would recommend at least daily echocardiography in these cases.