

Echocardiographic Assessment and Management of Infective Endocarditis: Experience at The Prince Charles Hospital

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Introduction:

Infective endocarditis (IE) is a common pathology requiring admission for in-patient management. Current guidelines recommend transthoracic echocardiography (TTE) for suspected IE and transoesophageal echocardiography (TOE) for patients with prosthetic valves, equivocal TTE or high clinical suspicion of IE.

Methods:

A retrospective audit of patients admitted for active IE at The Prince Charles Hospital (Brisbane, Australia) between July 2016 and January 2018 was performed.

Results:

One hundred and twenty-five (125) patients were identified with suspected IE. One hundred and six patients (106) had echocardiography performed at TPCH or available through external report (n=5).

Demographics

Mean age was 57 ± 19 years (SD). Sixty-seven (67) patients had TTE and seventy-three (73) patients had TOE (Figure 1). There were thirty-five (35) patients who had TTE initially and went on to have subsequent TOE within thirteen (13) days. Twenty (20) patients had a history of intra-venous drug use (IVDU).

Echocardiography

Ninety-four (94) patients had IE confirmed by echocardiography (Figure 3 & 4). Left-sided IE (n=48) was more common with isolated aortic (n=24) and mitral valve (n=24) being the most commonly affected valves (Figure 2). Fifty-eight (58) patients had native valve IE, thirty (30) patients had previous cardiac surgery (valve replacement/repair, n=24; congenital heart disease repair, n=4; aortic surgery, n=1; heart transplant, n=1) and six (6) patients had a cardiac device infection (AICD/PPM).

Management & outcomes

Forty-nine (49) patients were managed conservatively with anti-microbials with an average duration of 43 ± 21 days. Forty-five (45) patients required surgical intervention. Of the patients who underwent surgery, twenty-two (22) required TOE for diagnosis of IE after TTE yielded equivocal results (Figure 5 & 6).

There were fifteen (15) deaths at the end of the study, of which four (4) were in-hospital.

Discussion:

Infective endocarditis is a life-threatening disease associated with a high mortality rate (12% in our study). Echocardiography plays a key role in the diagnosis of IE (75% in our study). Transthoracic echocardiography is used in the first instance in patients with suspected IE, as it is non-invasive and can determine IE severity. The use of transoesophageal echocardiography is reserved for certain situations such as: equivocal TTE findings, high clinical suspicion of IE, para-valvular complications, prosthetic valves, and left-sided IE. A significant proportion of our patients with suspected IE underwent subsequent TOE following TTE (25%). In the group of patients who underwent surgery for IE, 49% required subsequent TOE for IE diagnosis after prior TTE.

Conclusion:

Echocardiography remains a useful tool in the diagnosis of patients with suspected IE. In cases where TTE results are equivocal or a high clinical suspicion remains, TOE is then performed to confirm a diagnosis of IE.

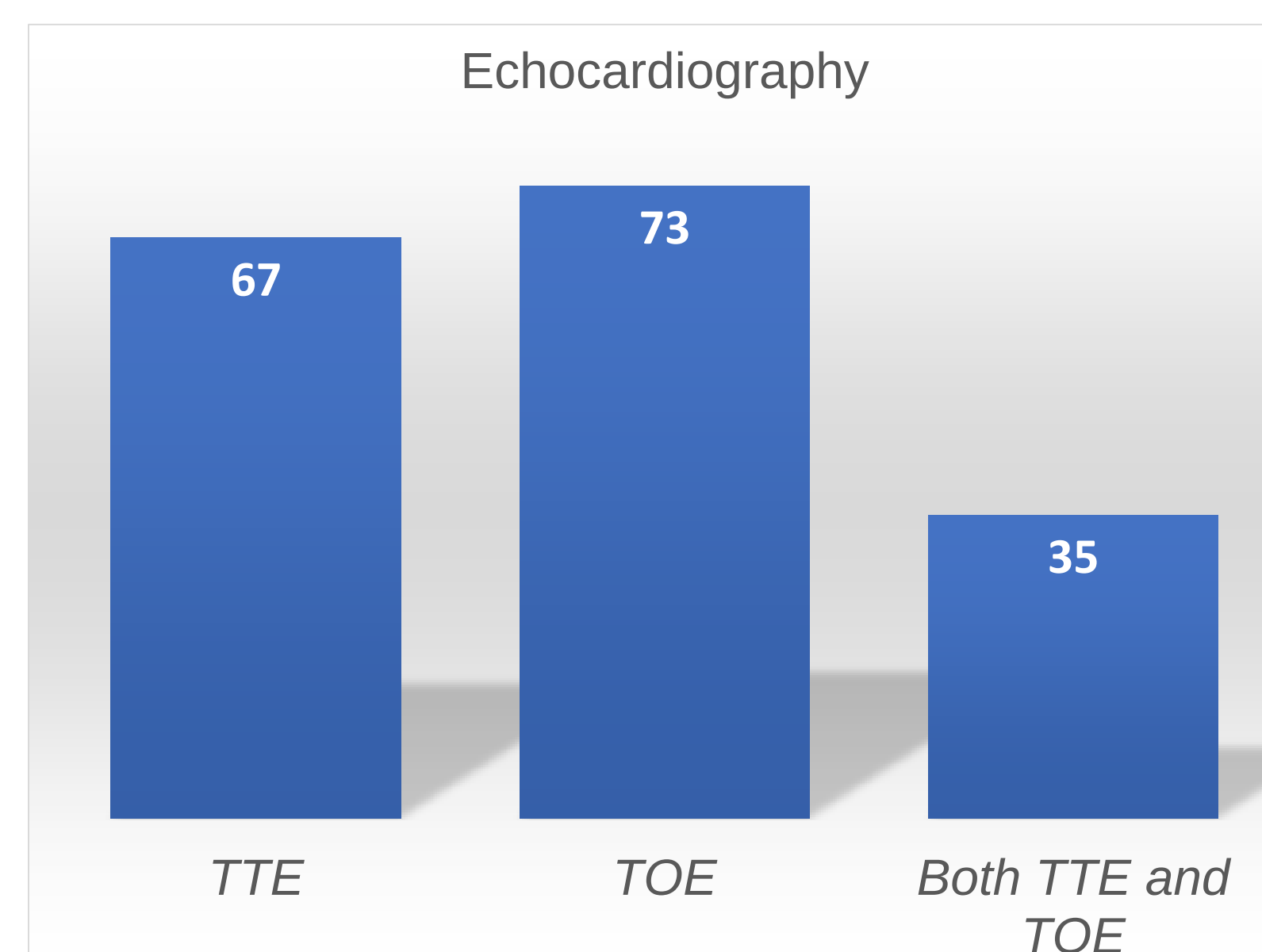


Figure 1: Echocardiography in the assessment and subsequent management in patients with suspected IE.

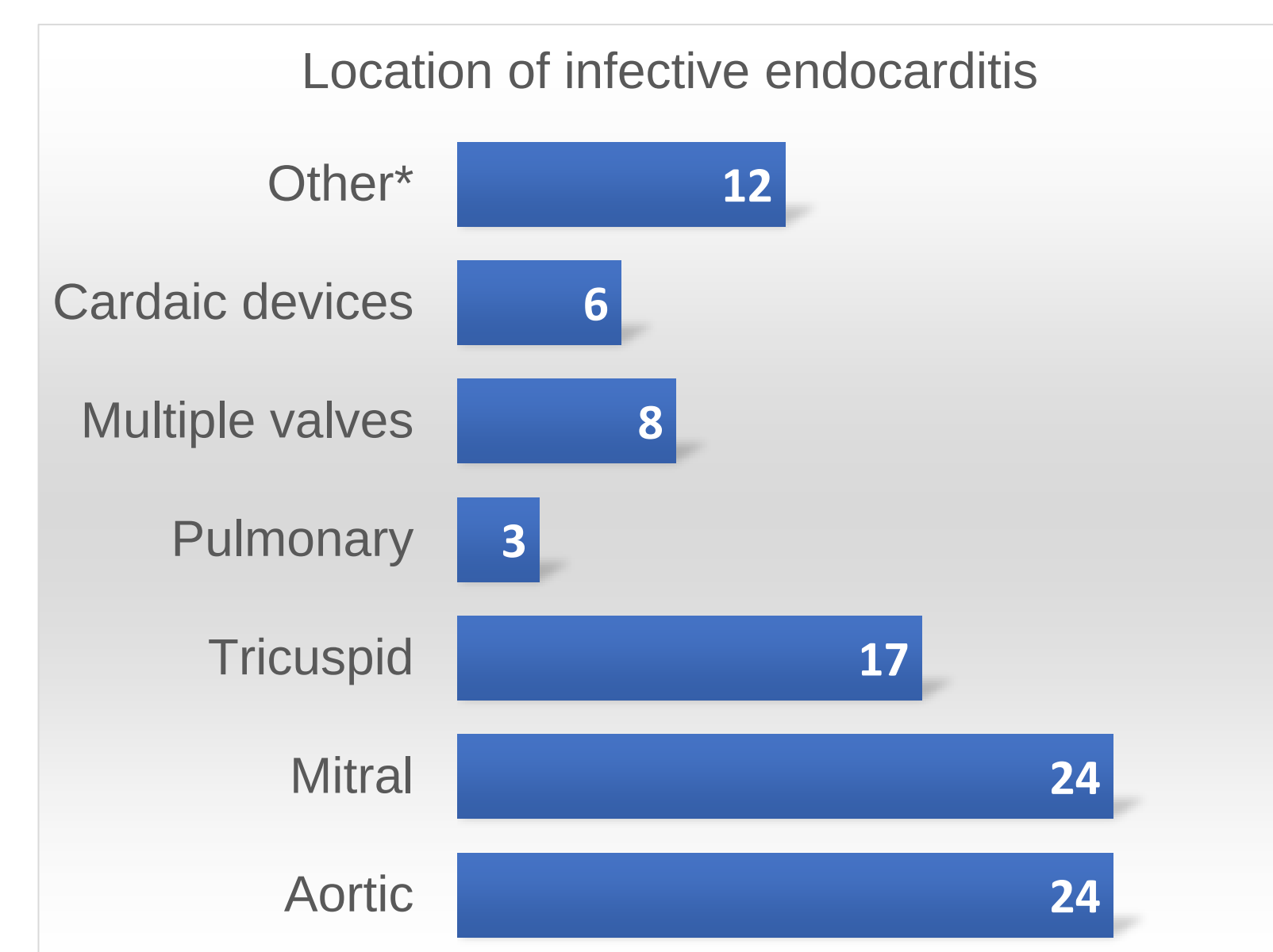


Figure 2: Location of IE in patients with IE confirmed on echocardiography (*includes aortic wall, muscle, cardiac transplant and unspecified sites).

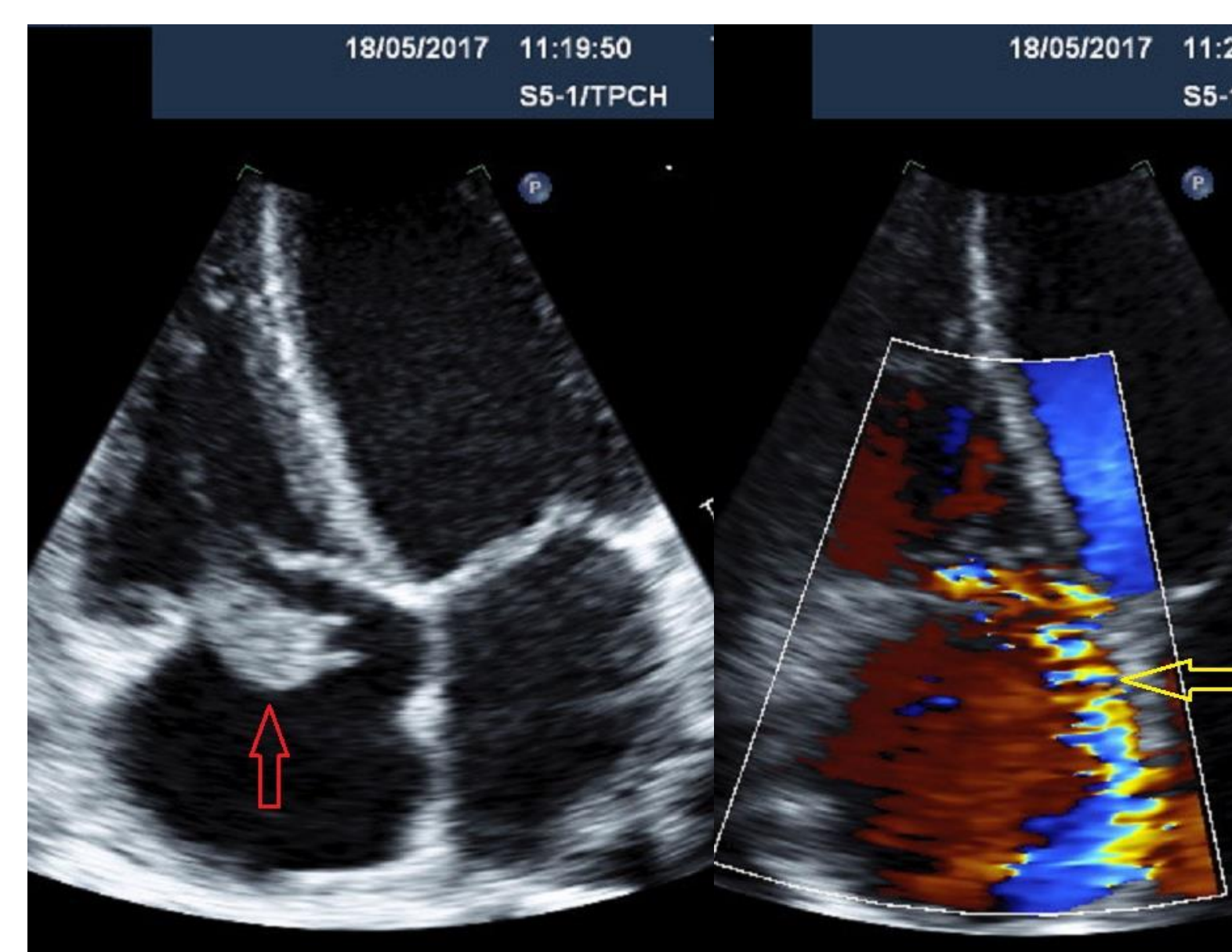


Figure 3: Transthoracic echocardiogram (tricuspid valve) showing a large independently mobile mass (red arrow) attached to the anterior leaflet of the tricuspid valve (1.5 x 2.5 cm). There is a large coaptation defect with associated eccentric, medially-directed severe regurgitation (yellow arrow).

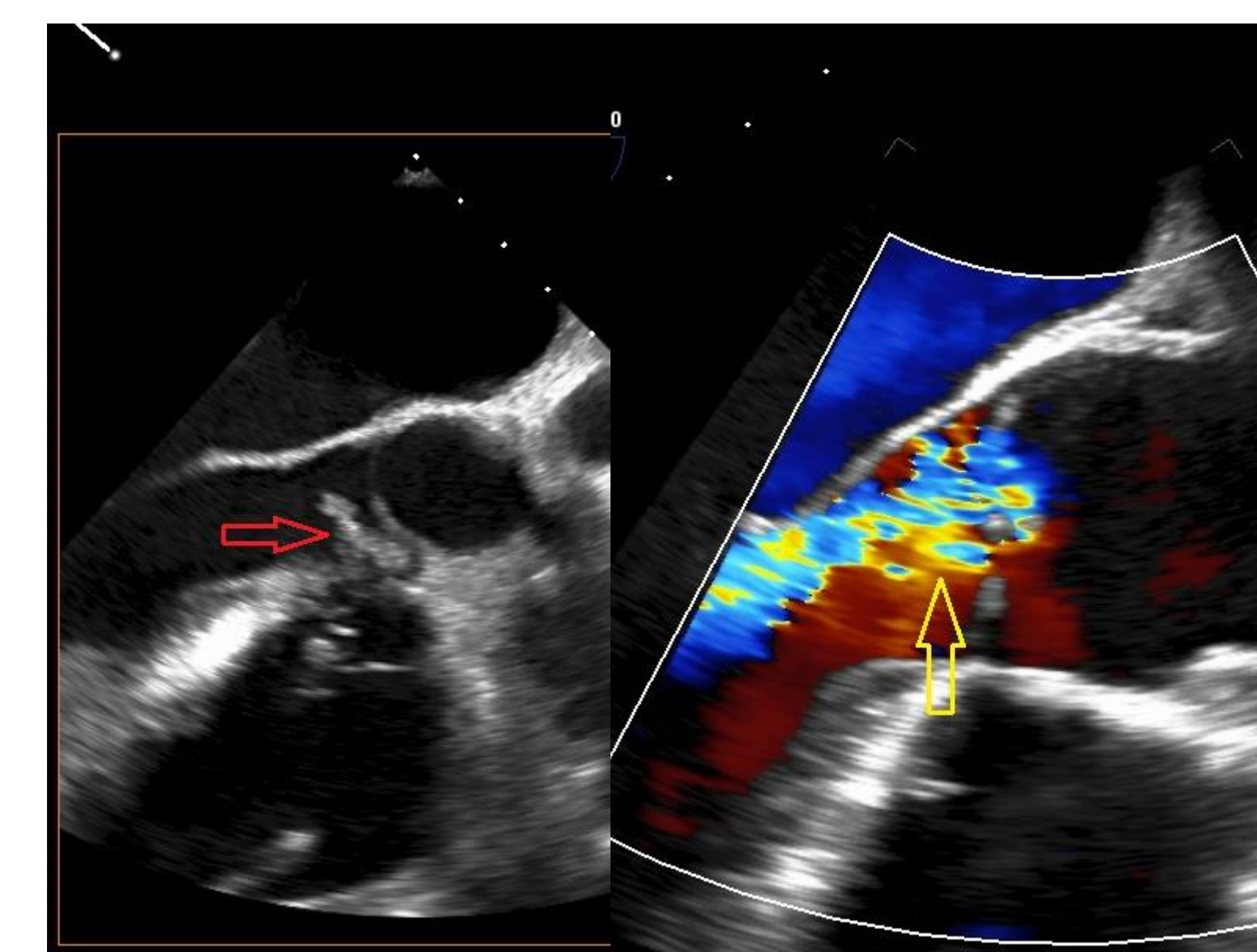


Figure 4: Transoesophageal echocardiogram (aortic valve) demonstrates an independently mobile mass (red arrow) attached to the LVOT aspect of the non-coronary cusp leaflet tip (20 x 5 mm). This was associated with moderately-severe aortic regurgitation at the commissure between the right and non-coronary cusps (yellow arrow).

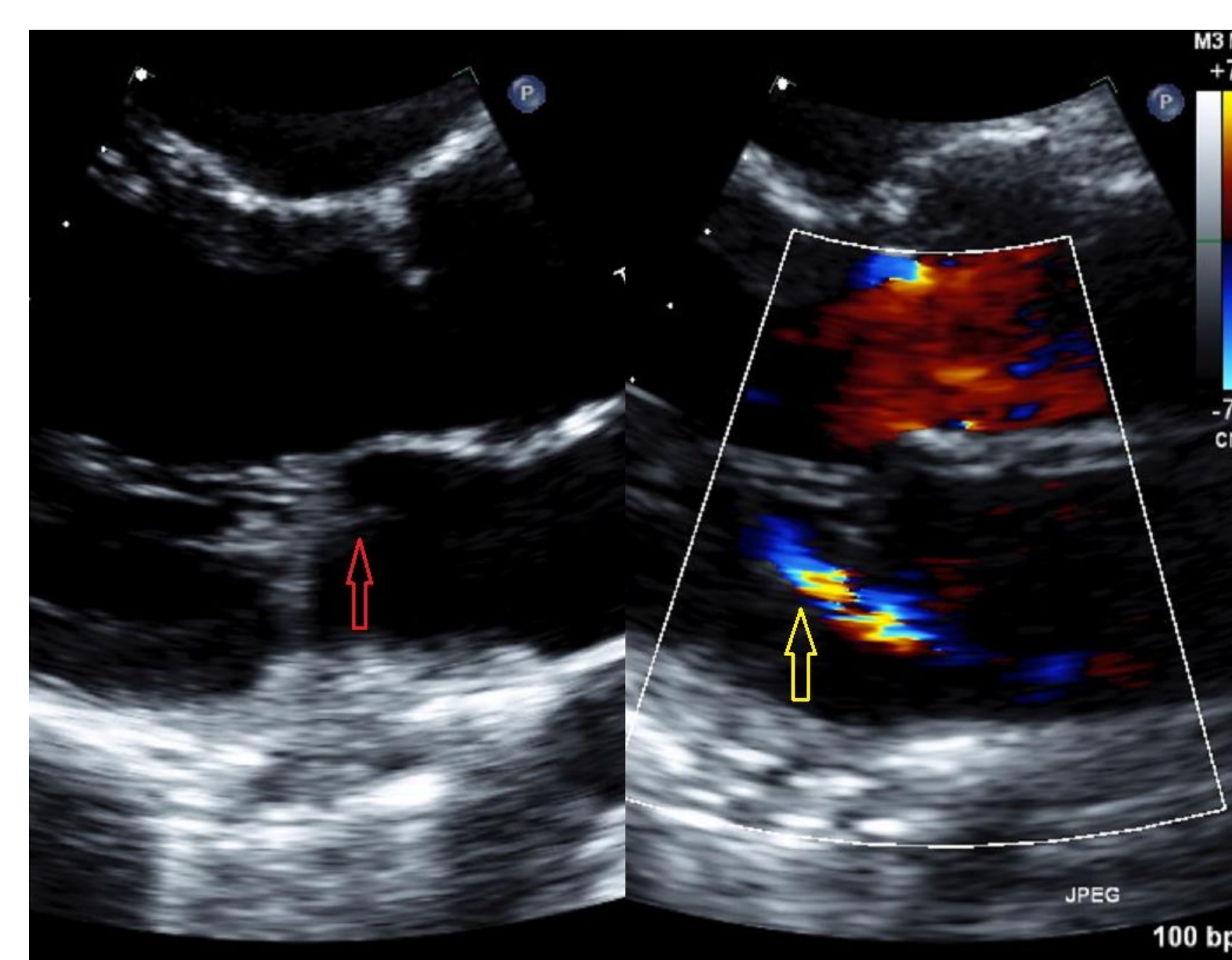


Figure 5: Patient A – Transthoracic echocardiogram demonstrated a myxomatous mitral valve. A mobile echo-density (red arrow) was seen attached to the posterior leaflet suspicious for endocarditis. There is an associated mild grade mitral regurgitation (yellow arrow).

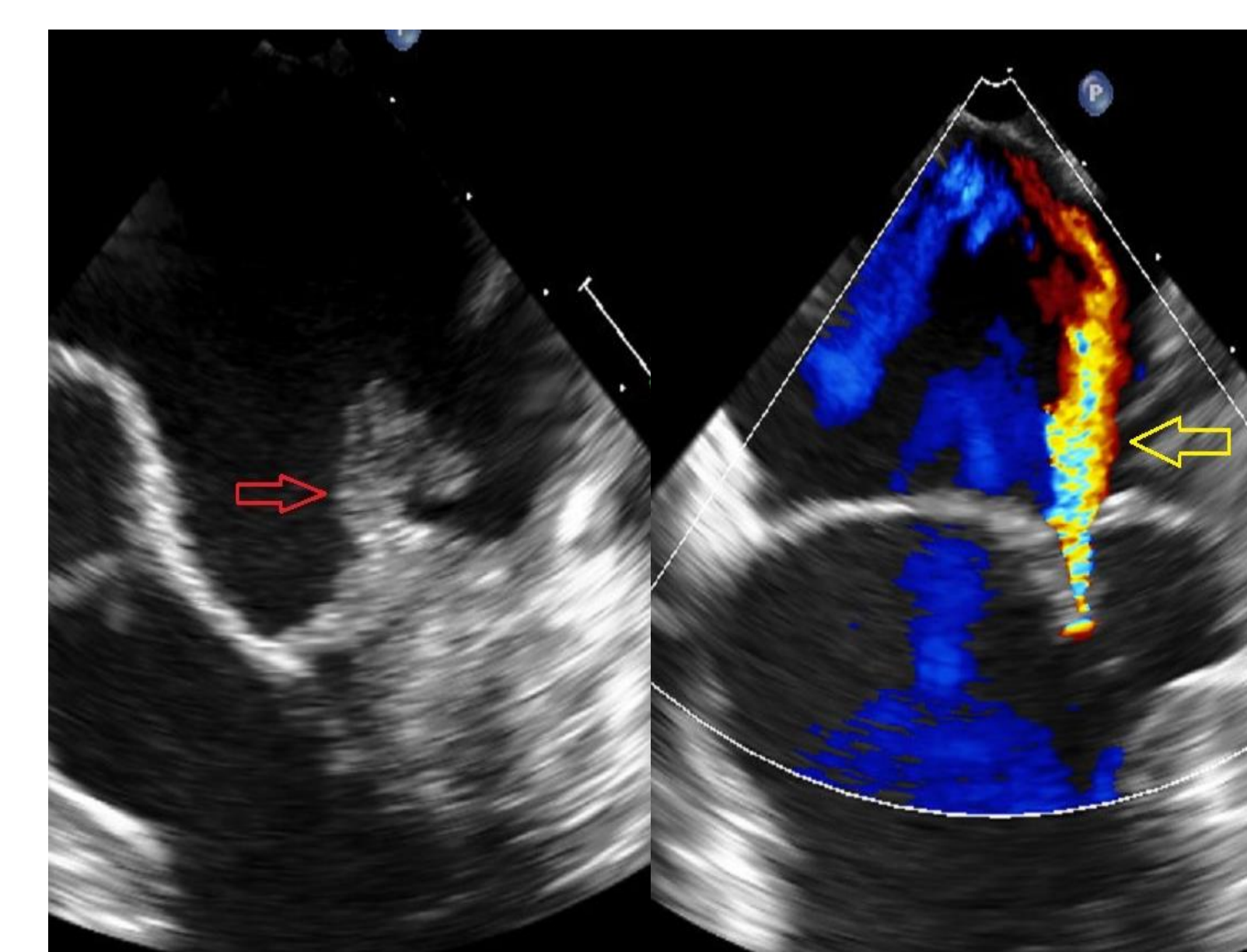


Figure 6: Patient A – Transoesophageal echocardiogram showed an irregular, frond-like shaped mass (red arrow) attached to the posterior mitral leaflet with associated lateral mitral regurgitation. The mass measured 1.5 x 1.0cm and was associated with mild-moderate mitral regurgitation (yellow arrow).

References:

1. Habib G *et al.* 2015 ESC Guidelines for the management of infective endocarditis. *European Heart Journal* 2015; 36: 3075-3123.
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