

# Infective Endocarditis of Aortic Valve Complicated by Periannular Abscesses assessed by 4-dimensional Echocardiography

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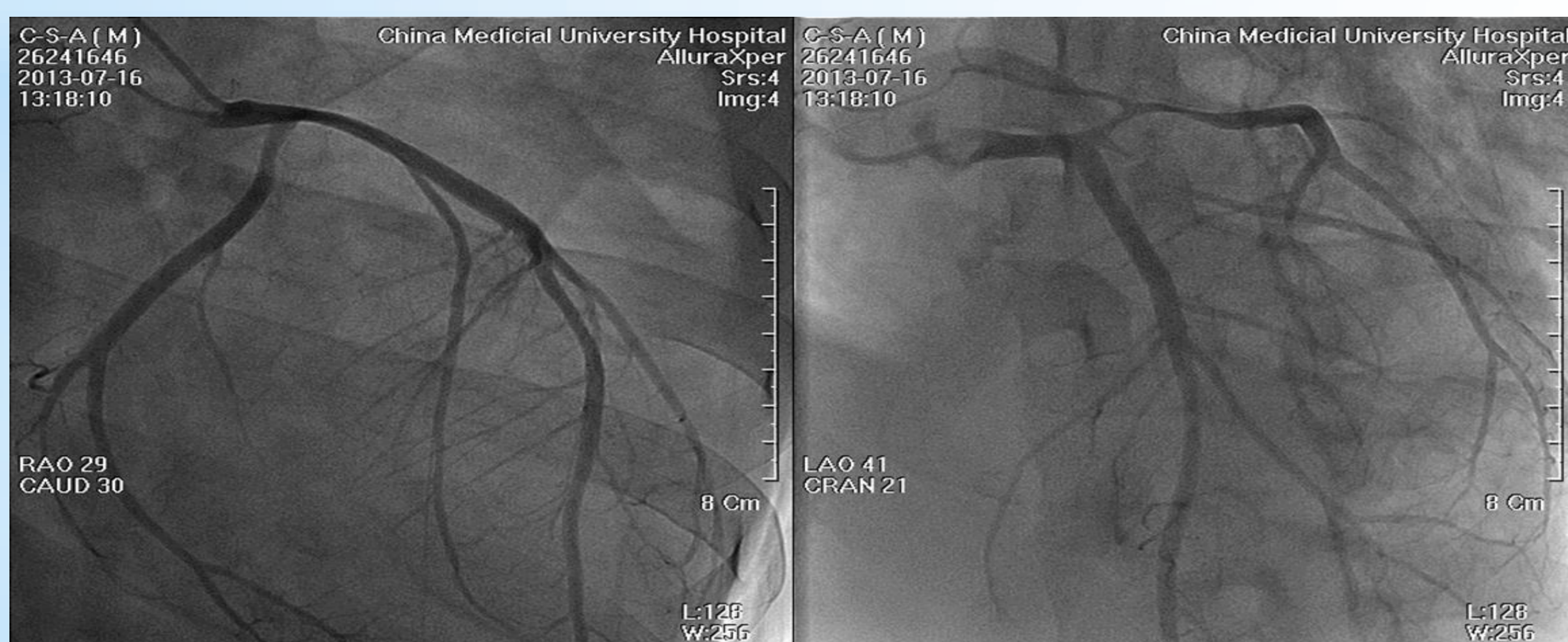
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## Background

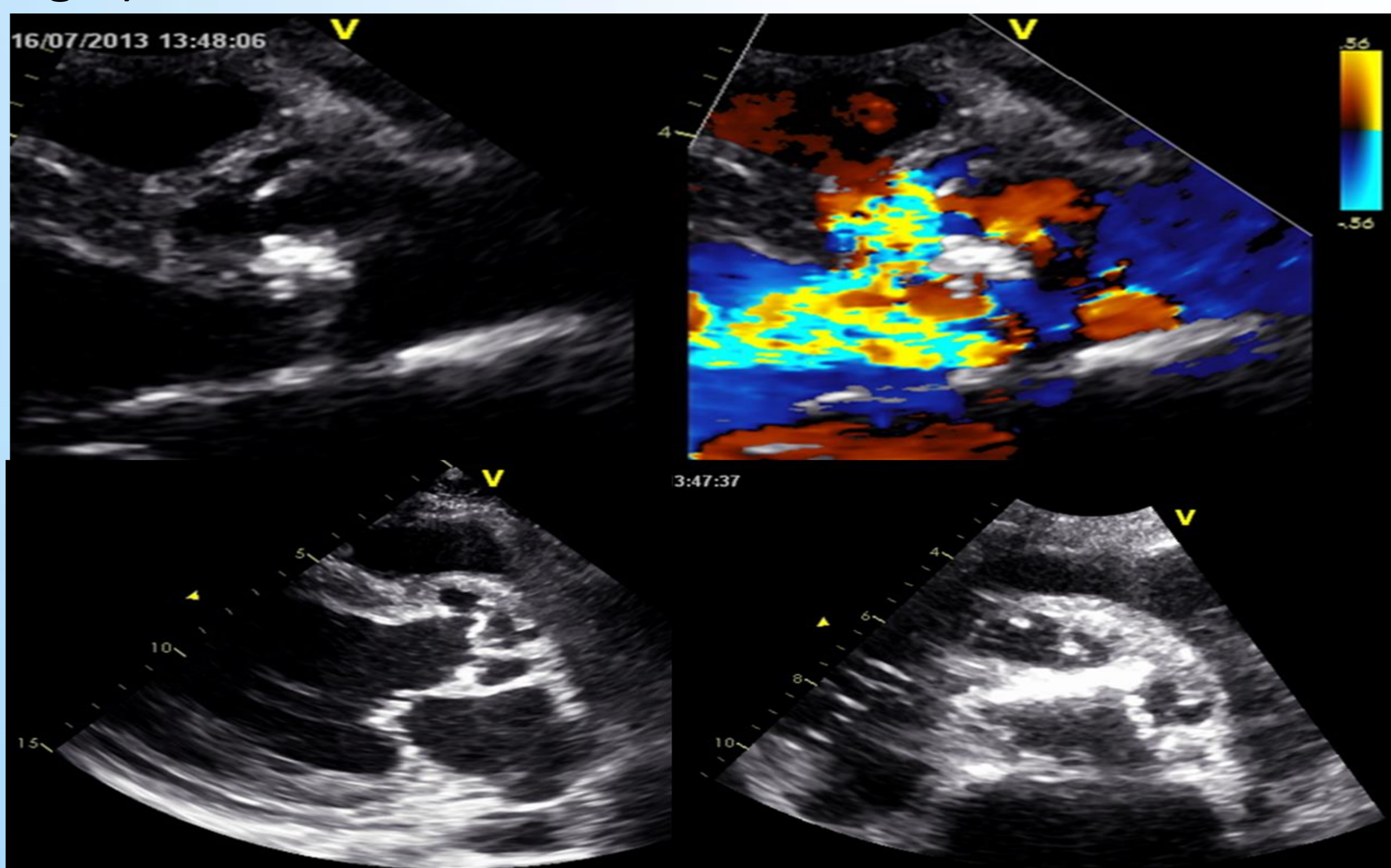
Infective endocarditis(IE) continues to cause high mortality despite of standardized therapeutic protocols. Echocardiography is essential in IE diagnosis, complications, and decision making in treatment. Transthoracic echocardiography(TTE) has 40-63% sensitivity in the detection of vegetations, while transesophageal echocardiography(TEE) has a superior sensitivity of 90-100%. In the last decade 4-dimensional (4D) echocardiography with additional views than traditional echocardiography provides incremental value in spatial insight.

## Case Description

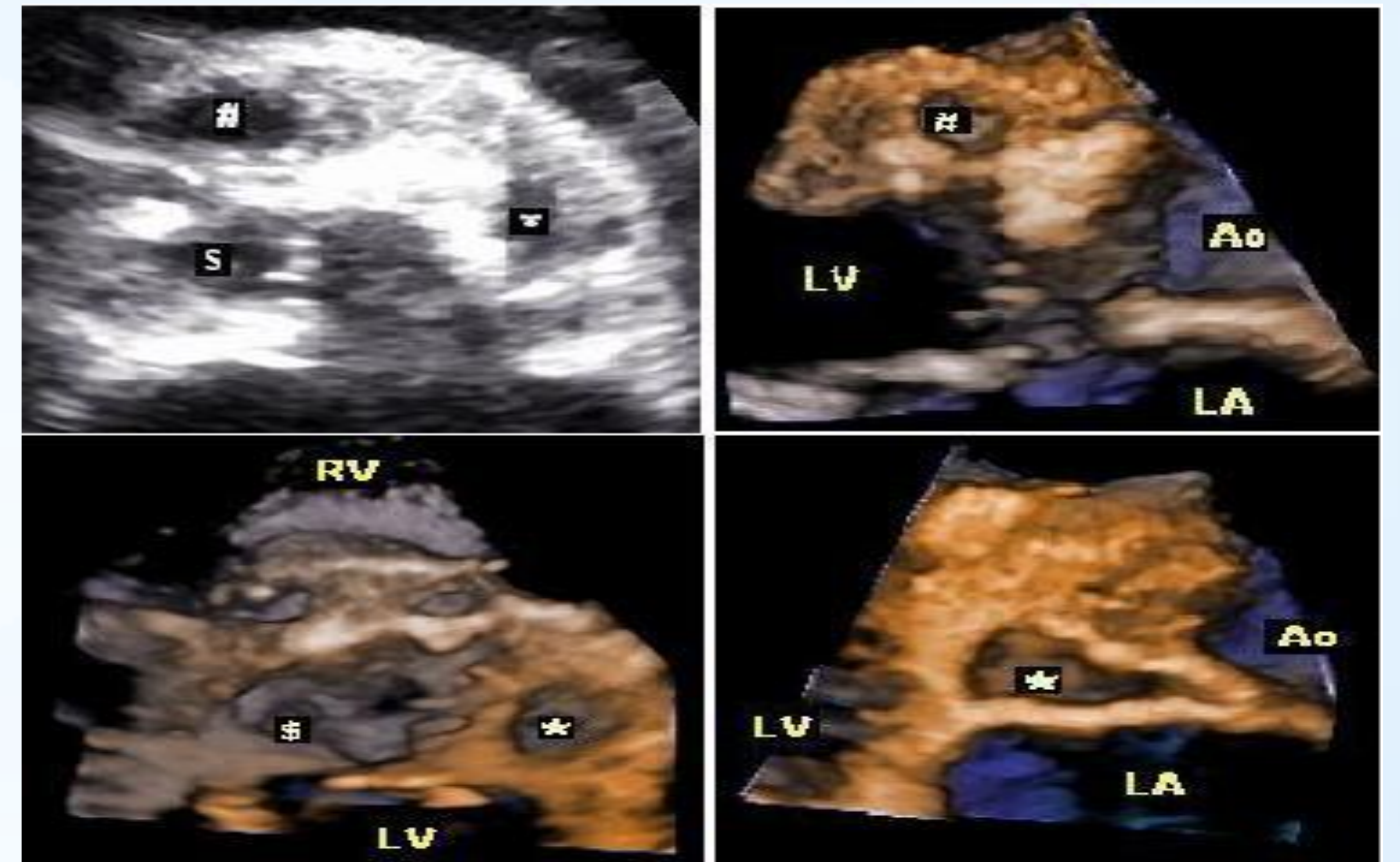
A 36-year-old man, heroin abuser, was referred to our hospital for chest pain and dyspnea. He had been admitted to another hospital for antibiotic treatment of *Pseudomonas aeruginosa* related IE. Physical examination was notable for crackles in both lung and a III/VI to and fro murmur heard best at the left sternal border. There was also lower limbs edema. His electrocardiogram showed sinus rhythm, left axis deviation, QS pattern in V1-4, and new precordial ST elevation. Emergency coronary angiogram showed patent coronary arteries except left circumflex artery had 75% stenosis due to external compression (Fig 1).



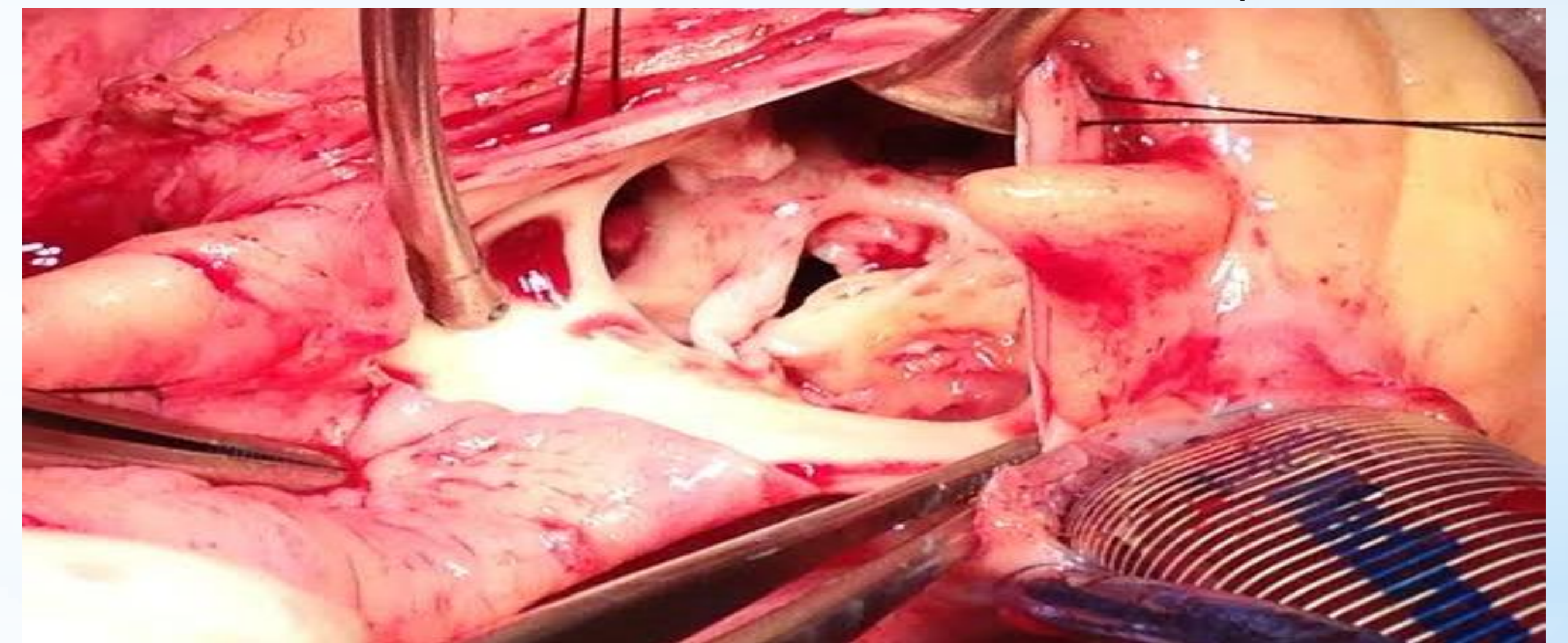
2D TTE showed calcified aortic valve with multiple fuzzy and mobile masses and severe aortic regurgitation (Fig 2).



4D TTE (Fig 3 \*) revealed 3 peri-annular abscesses, one of them was located between the left aortic cusp and LA which corresponded to exertional compression of LCX on angiography.



He underwent excision of aortic valve (Fig 4), repair of sinus valsalva fistula and mechanical valve placement.



He recovered well after operation until the 18<sup>th</sup> postoperative day when he suffered from acute chest pain, dyspnea, and then collapse. TTE after resuscitation showed akinetic left ventricle, aortic mechanical valve with perivalvular leakage causing moderate AR, and a space located between aortic mechanical valve and LA appendage. 4D TEE confirmed the perivalvular leakage at the right sinus valsalva, an open space next to left sinus valsalva communicating with both aortic and LV sides, and a small fistula between the pulmonary trunk and aortic root.(Fig 5).



He finally expired due to profound hemodynamic instability and ventricular arrhythmia.

## Conclusions

4D echocardiography allows for the incremental optimal identification of valve apparatus morphology, pathology and spatial relationship to surrounding structure. This superiority highlighted its value in IE patients and guided risk stratification, medical and surgical management.