

Not everything that clicks is bad: A commonly missed physical exam finding of mechanical valve thrombosis

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1. INTRODUCTION

- Mechanical valve thrombosis is a life-threatening condition that warrants immediate intervention.
- Prompt diagnosis and management is paramount.
- Here we highlight a physical exam finding that provides a clue in making the diagnosis.

2. CASE DESCRIPTION

- A 56-year-old male with history of mitral stenosis with a St Jude mechanical valve replacement a year prior, atrial fibrillation on warfarin presented with a seven day history of productive cough, dyspnea, pedal edema and light-headedness.
- Vital signs were stable.
- Initial physical exam showed expiratory wheezing, an irregularly irregular rhythm with a murmur and pedal edema.
- CXR revealed pulmonary edema.
- He was admitted for heart failure exacerbation with possible superimposed bacterial pneumonia.
- IV diuresis and antibiotics were started.
- A day later, he went into cardiogenic shock.
- Dobutamine was added and he was transferred to a tertiary centre.
- Physical exam there revealed an irregularly irregular rhythm, **absence of expected mechanical valve click** and pedal edema.

3. RADIOLOGY

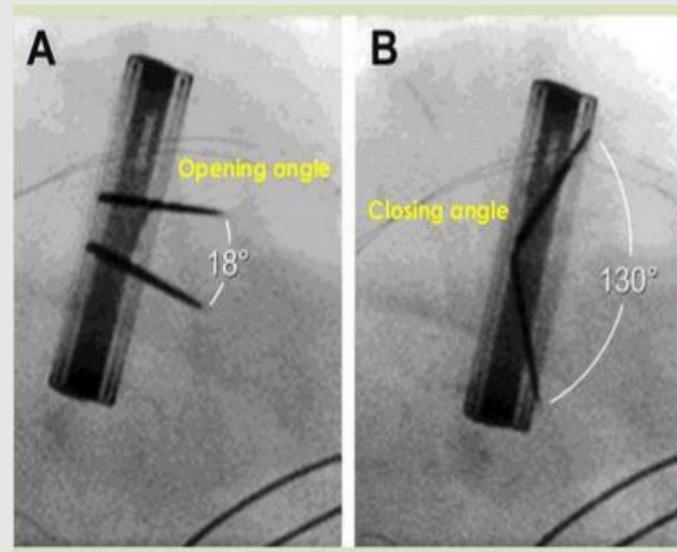


Figure 1

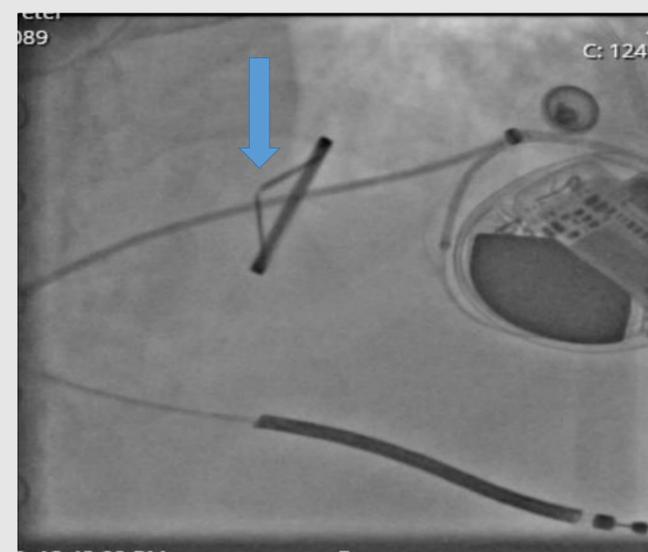


Figure 2

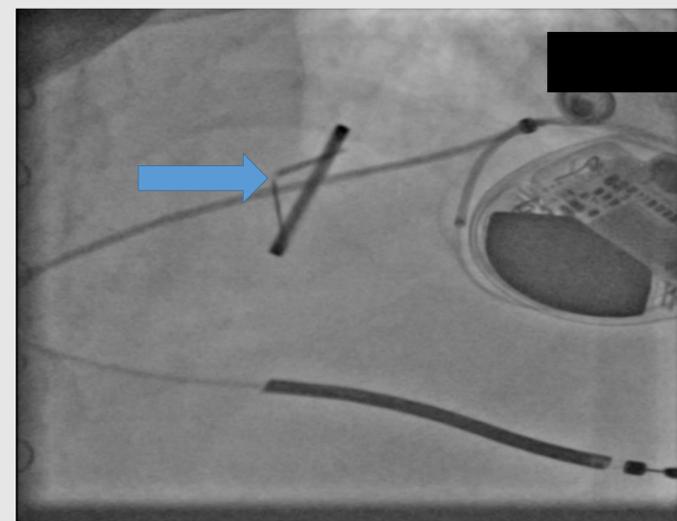


Figure 3

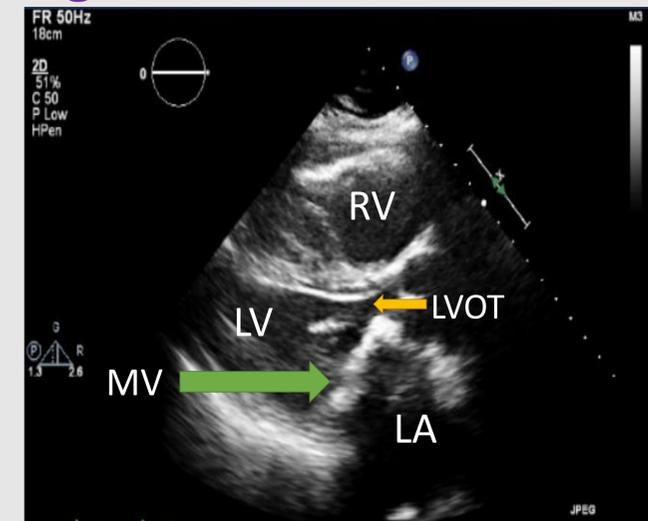


Figure 4

Figure 1: Normal Opening and closing of a bi-leaflet prosthetic valve

Figure 2 & 3: Blue arrows pointing towards valves fixed in the closed position

Figure 4 : Long axis view echocardiogram showing mitral valve stenosis

RV: Right Ventricle; LV: Left Ventricle; MV: thickened mechanical mitral valve; LVOT: Left Ventricular Outflow Tract; LA: Left Atrium

References

- Meyer, Theo E MD P. Auscultation Of Heart Sounds. <https://www.uptodate.com/contents/auscultation-of-heart-sounds#H48>. Published 2019. Accessed September 29, 2020.
- Kupari M, Harjula A, Mattila S. Auscultatory characteristics of normally functioning Lillehei-Kaster, Björk-Shiley, and St Jude heart valve prostheses. *Br Heart J*. 1986. doi:10.1136/hrt.55.4.364.

4. CASE DESCRIPTION

- TTE showed severe mitral stenosis and leaflet thickening as in **Figure 4**.
- Mitral valve mean gradient was 28mmHg.
- Fluoroscopy demonstrated valve leaflets stuck in the closed position as in **Figure 2 and 3**.
- Emergent surgical mitral valve replacement was performed.
- A large clot immersing the entire prosthesis was observed.
- After bio-prosthetic valve replacement, he made an uneventful recovery there on.

5. DISCUSSION

- On physical exam, mechanical prosthetic valves produce loud 'clicky' sounds.
- A decreased intensity of the closing sound or the absence of a 'clicking' sound should raise suspicion for valve malfunction.
- Relative intensity of the opening and closing sounds vary depending on the type and design of the prosthetic valve.
- Regardless of valve type, closing sound is loudest.
- TEE, fluoroscopy and/or gated CT can be useful for assessing mechanical valve motion.

6. CONCLUSION

- Absence of a loud closing click** is a diagnostic clue to valve malfunction.
- Applying this simple tip will hasten diagnosis and reduce risk of potentially devastating effects of unrecognized prosthetic valve thrombosis.