International Journal on Science and Technology (IJSAT)
E-ISSN: 2229-7677 ● Website: www.ijsat.org ● Email: editor@ijsat.org

Masked Endocarditis: The Radiologist's Role in Uncovering Critical Complications

Y. Sekkat[1], M. Yatim[2]

[1,2]Radiology division, Hospital center, Auxerre 89000, France

Abstract

Infective endocarditis (IE) is a serious condition that can lead to severe complications such as embolic events, abscess formation, and mycotic aneurysms. While echocardiography is essential for evaluating valvular involvement, the role of radiological imaging is crucial in detecting systemic complications. This case report presents a 69-year-old patient initially suspected of ischemic heart disease, who was later diagnosed with infective endocarditis complicated by septic emboli and mycotic aneurysms. Advanced imaging techniques, including MRI, were pivotal in identifying these complications, significantly influencing the treatment approach. As radiologists, we play a key role in detecting these life-threatening manifestations, guiding clinical management, and improving patient outcomes through early intervention.

Keywords: infective endocarditis, mycotic aneurysms; septic embolism, systemic complications

1. Introduction

Infective endocarditis (IE) is a serious condition with high morbidity, often complicated by embolic events, abscess formation, and vascular complications. While echocardiography is key for diagnosing valvular involvement, radiological imaging plays a crucial role in detecting systemic complications. CT and MRI are essential for identifying embolic infarctions, mycotic aneurysms, and metastatic infections. This case highlights the importance of multimodal imaging in diagnosing and managing IE-related complications, emphasizing the radiologist's role in guiding treatment decisions.

2. Case presentation:

A 69-year-old man referred by his primary care physician for a comprehensive cardiac assessment. His medical history includes hypertension and diabetes mellitus, with no significant clinical abnormalities. Laboratory tests were unremarkable, with the exception of a positive blood culture. Electrocardiography (ECG) revealed left ventricular hypertrophy with an anterior hemiblock, without any repolarization disturbances. A PET scan was ordered for a comprehensive evaluation due to the clinical discordance presented by the patient.

The PET scan revealed a suspicious but inconclusive area of increased radiotracer uptake at the junction between the aortic bulb and the mitral annulus Additionally, there was a concerning focal hyperfixation suggestive of an abscess at the posterior joints of L4 to S1 on the right side. No other significant areas of

increased uptake were noted in the other regions explored. This raised suspicion of a potential infectious process, prompting further diagnostic evaluation [figure 1].

To further assess the cardiac uptake, a transthoracic echocardiogram was initially performed, but it provided no significant findings. Subsequently, a transoesophageal echocardiogram was conducted for more detailed exploration, revealing a highly suspicious, oscillating mass on the non-coronary cusp of the aortic valve.
To further evaluate the spinal hyperfixation, an MRI was performed to confirm potential infectious involvement at this site. The imaging demonstrated a right-sided epidural spinal abscess at the L5-S1 level, located within the foraminal space. Additionally, there were reactive inflammatory changes in the ipsilateral paraspinal muscles, with no evidence of intracanal medullary extension [figure 2].

During hospitalization, the patient developed headaches accompanied by visual disturbances. A cerebral MRI was performed for further investigation.
This latter imaging study revealed a nodular contrast enhancement within the left thalamus, with hemorrhagic foci identified on susceptibility-weighted imaging sequences. Surrounding this lesion was a region of hyperintensity on FLAIR sequences, collectively forming a characteristic "target" sign. The findings are suggestive of a mycotic aneurysm [figure 3].

The patient was managed by the cardiology team, and an appropriate antibiotic regimen targeting the identified pathogen was initiated. The patient demonstrated favourable clinical progress, and surgical intervention was not required.

3. **Discussion:**

Infective endocarditis (IE) is a serious, life-threatening condition that often leads to systemic complications. The complications associated with IE can be diverse, ranging from embolic events and septic abscesses to mycotic aneurysms and organ infarctions. These complications significantly contribute to the morbidity and mortality in IE patients, making their early detection crucial for appropriate management. While echocardiography remains the primary diagnostic modality for detecting valvular involvement and vegetations, radiological imaging is critical in identifying systemic embolization and other extracardiac complications that may be present in IE cases [1, 2].

This case underscores the importance of multimodal imaging in diagnosing and managing the systemic complications of infective endocarditis. Although the initial clinical presentation suggested ischemic heart disease, radiological workup revealed far more concerning findings. The PET scan showed a suspicious hyperfixation, but it was the transesophageal echocardiogram (TEE) that confirmed the presence of aortic valve vegetation, a key finding in IE. This highlights the superior sensitivity of TEE for detecting valvular vegetations, especially in complex or atypical cases [3].
In addition to the cardiac findings, the radiological investigation revealed significant systemic complications, including a right-sided epidural abscess and the characteristic "target" appearance on cerebral MRI, which is suggestive of a mycotic aneurysm. These findings are consistent with septic

embolization, a common and severe complication of IE, where infected emboli travel from the heart to distant organs, often resulting in life-threatening consequences.

Mycotic aneurysms are associated with a high risk of rupture and hemorrhage and require prompt identification and management. In this case, the early recognition of these complications allowed for the timely initiation of appropriate antibiotic therapy and avoided the need for surgical intervention [4, 5].

Moreover, septic emboli can lead to infarctions in organs such as the kidneys and lungs. The use of advanced imaging modalities, such as CT and MRI, was critical in identifying these embolic events and their sequelae, providing crucial information that helped guide the clinical management. These imaging techniques not only confirmed the presence of these complications but also helped differentiate them from other possible conditions, such as malignancies or non-infectious inflammatory diseases, which may present with similar radiological features [6].

The role of the radiologist in the management of IE and its complications cannot be overstated. While echocardiography remains essential for evaluating valvular involvement, it is often the radiologist who identifies and characterizes systemic complications through cross-sectional imaging. CT and MRI are invaluable tools in the detection of embolic phenomena, mycotic aneurysms, abscesses, and other sequelae that can result from IE. The radiologist's expertise is instrumental in detecting these potentially life-threatening manifestations and guiding clinical management, ultimately improving patient outcomes [7].

This case highlights the need for a high level of suspicion when assessing patients with potential infective endocarditis, especially when they present with atypical or non-specific symptoms. The radiological workup provided vital information that complemented the clinical and echocardiographic findings, enabling timely intervention and preventing further complications. By identifying systemic embolization and other complications early, radiologists play a critical role in improving the prognosis of IE patients and optimizing treatment strategies.

4. Conclusion:

Infective endocarditis is a complex condition with a wide range of potential complications, many of which can have serious consequences if not promptly diagnosed and treated. The role of the radiologist in identifying these complications cannot be overstated. Advanced imaging techniques, including CT, MRI, and echocardiography, are critical in detecting systemic embolic events, abscesses, mycotic aneurysms, and other complications that significantly affect patient management and prognosis.

This case underscores the importance of a multimodal imaging approach in the diagnosis and management of IE-related complications, highlighting the radiologist's essential role in guiding clinical decisions and improving patient outcomes

5. Figures and Tables

Figure 1: (a, b) axial views showing focal hypermetabolic area at the junction between the aortic bulb and the mitral annulus. (c) sagittal views highlighting a focal area of at the posterior joints of L4 to S1.

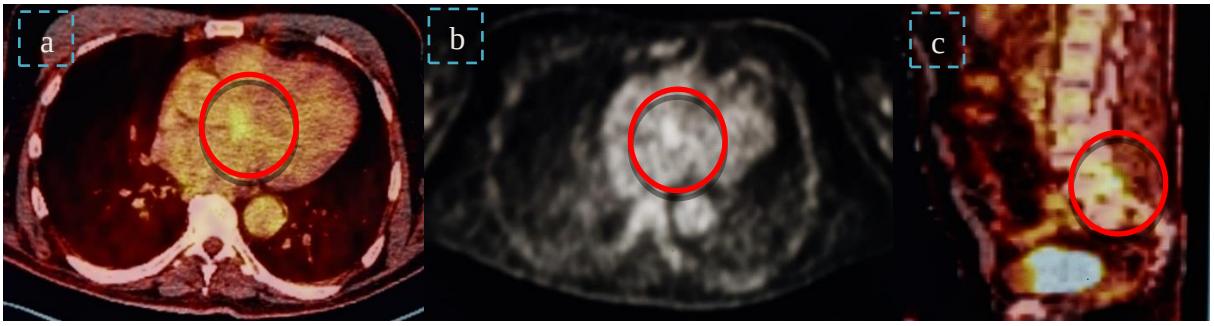


Figure 2: Axial view of a post-gadolinium T1-weighted sequence demonstrating a ring-enhancing right foraminal spinal abscess, associated with epidural and adjacent soft tissue contrast enhancement.

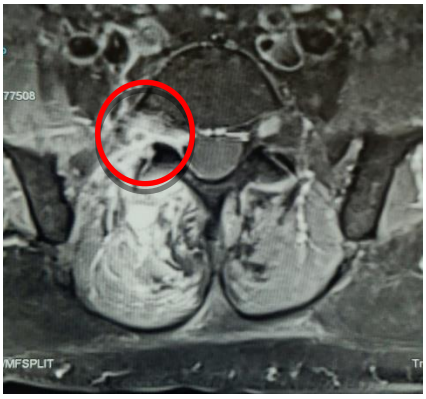
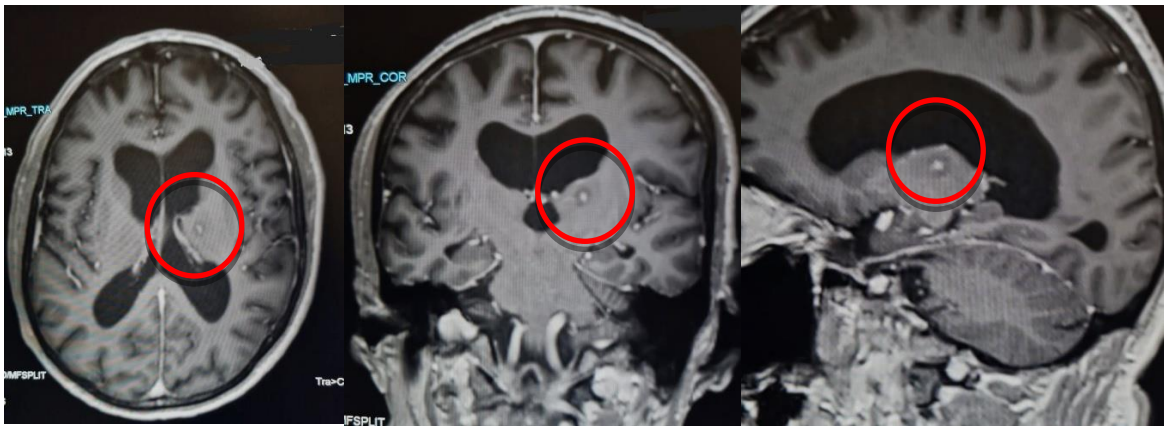


Figure 3: Axial, coronal and sagittal views of enhanced MRI images showing a nodular contrast-enhancing lesion in the left thalamus creating a "target" sign, characteristic of a mycotic aneurysm.



6. Conflict of Interest

The authors declare that they have no conflicts of interest.

7. Acknowledgement

None.

References

1. Baddour LM, Wilson WR, Bayer AS, et al. Infective endocarditis: diagnosis, antimicrobial therapy, and management of complications. Circulation. 2005;111(23):e394-e434. doi:10.1161/CIRCULATIONAHA.105.165564.
2. Mylonakis E, Calderwood SB. Infective endocarditis in adults: epidemiology, microbiology, and risk factors. Clinical Infectious Diseases. 2001;32(6):934-941. doi:10.1086/319757.
3. Cahill TJ, Prendergast BD. Infective endocarditis. Lancet. 2016;387(10021):882-893. doi:10.1016/S0140-6736(15)00067-7.
4. Habib G, Lancellotti P, Antunes MJ, et al. 2015 ESC Guidelines for the management of infective endocarditis. European Heart Journal. 2015;36(44):3075-3128. doi:10.1093/eurheartj/ehv319.
5. Falup-Pecurariu C, Popa F, Bârsan L. Systemic complications of infective endocarditis. Romanian Journal of Internal Medicine. 2007;45(3):239-247.
6. Mylonakis E, Hohmann SF, Calderwood SB. Systemic infections in infective endocarditis. Infectious Disease Clinics of North America. 2004;18(2):301-313. doi:10.1016/j.idc.2004.03.004.
7. Lamas CC, Lopes RF, Lemos FR, et al. Radiological evaluation in infective endocarditis: a review of imaging techniques. Cardiovascular Imaging. 2007;30(6):1264-1272. doi:10.1016/j.cjca.2007.07.011.