

Stroke related to staphylococcus endocarditis with no valves signs in transthoracic echocardiography a case report.



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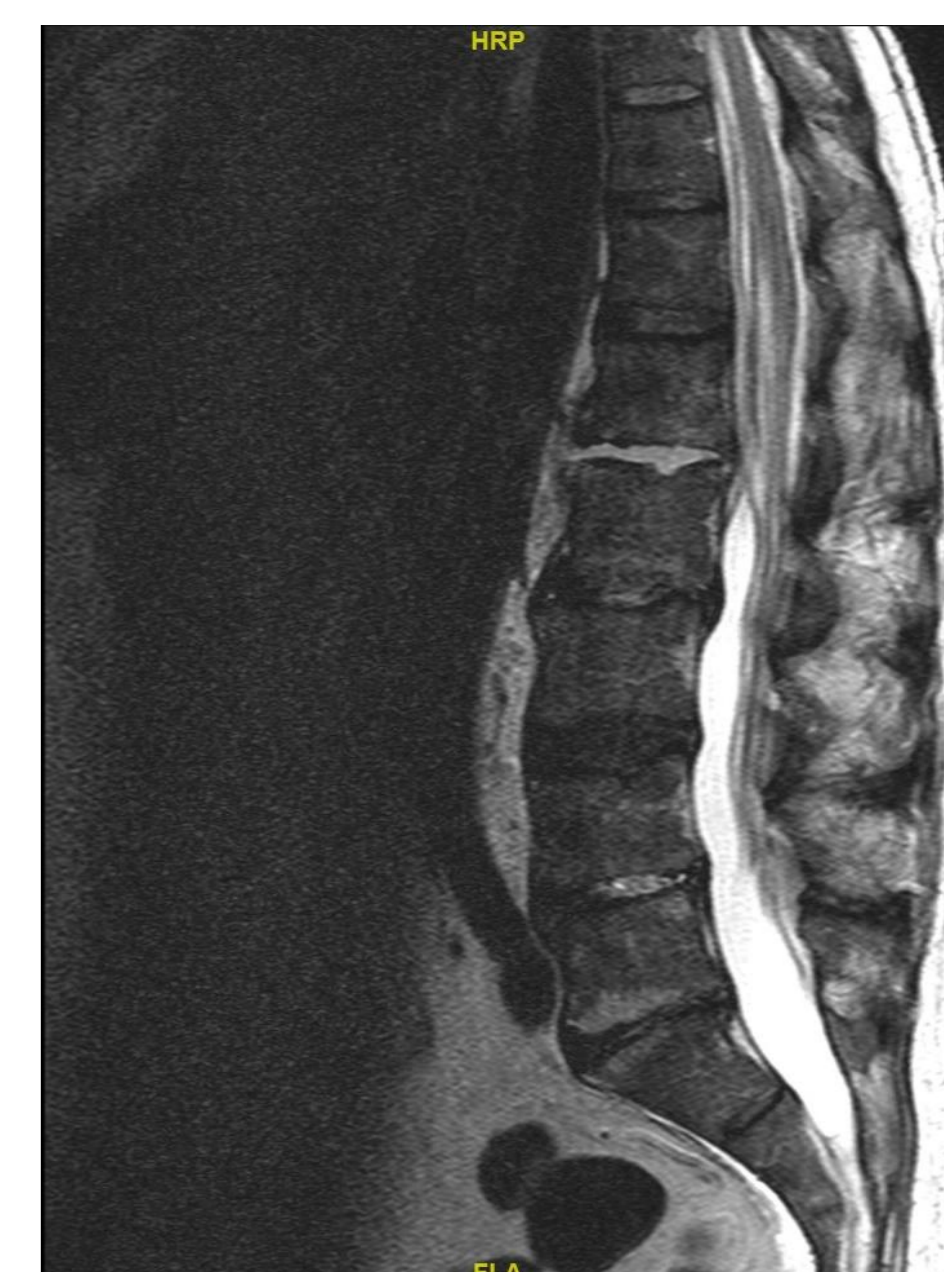
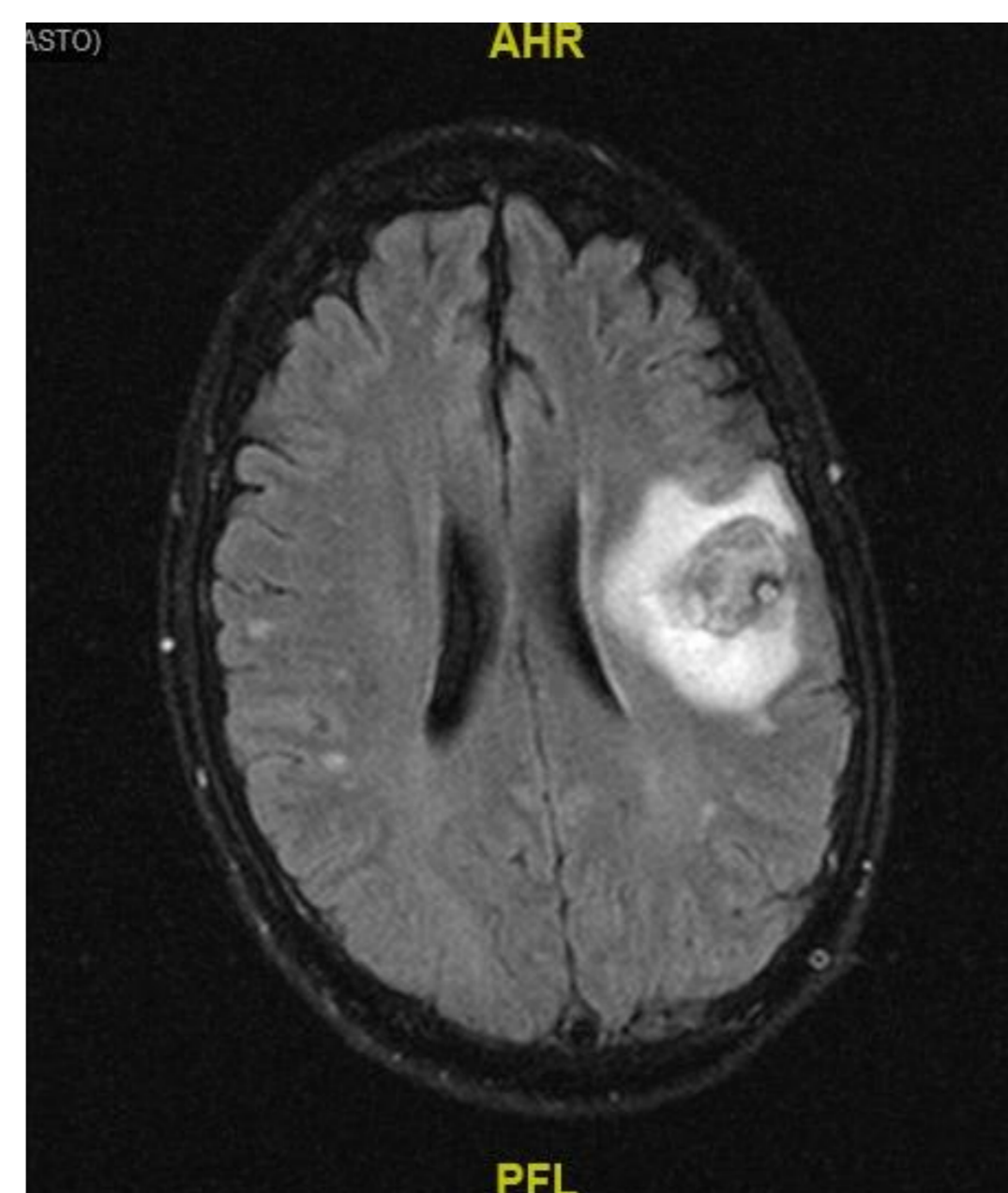
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Introduction

Infective endocarditis is a disease associated with considerable morbidity and mortality. Neurological sequelae of bacterial endocarditis are most often due to septic embolization producing ischemia and/or suppuration, resulting in infarction, haemorrhage, meningoencephalitis, or abscess. Any organism capable of producing bacterial endocarditis may secondarily infect the central nervous system via haematogenous spread. Staphylococcus aureus and streptococci, which cause 90% of all cases of bacterial endocarditis, are the most common organisms associated with central nervous system complications (1-2).



Case Report

A 54 year-old male patient was admitted to Stroke Unit of Sant'Andrea Hospital of Rome with sudden onset of motor aphasia, right upper limb weakness. He presented high grade fever, preceded by 5-day history of severe back pain with no response to non-steroidal anti inflammatory drugs

Clinical History and physical examination

- The patient had no history of heart disease and did not use intravenous drugs. He did not undergo any dental or surgical treatment in the previous six months.
- Physical examination revealed scratching-induced skin lesions on legs surface, since he had a history of chronic pruritus.
- In addition, he complained of pain at the elbows that were red, swollen and warm, but neither Janeway lesions nor Osler nodes were found.

Diagnosis and treatment

Cerebral CT, performed on first day of hospitalization, did not show acute ischemic lesions. **Brain MRI**, performed on the second day of hospitalization, demonstrated multiple acute ischemic areas. **Spine MRI** showed spondylodiscitis at T7-T8 and L1-L2 level.

Transthoracic echocardiography (TTE) was negative. Blood samples were collected to obtain microbiological cultures for common bacteria. Despite no clear evidence of systemic infection, antibiotic therapy was started with the consensus of the rheumatologists and infectious disease specialists, basing the hypothesis of possible infection on clinical signs and severity of patient.

In the light of a suspected systemic infection, a **Transoesophageal echocardiogram (TOE)** was performed: ultrasound images showed mild aortic regurgitation due to two valve vegetations. Moreover, a **Total Body CT scan** showed pulmonary embolism in the inferior lobe of the left lung and multiple splenic, hepatic and renal infarctions.

Staphylococcus aureus was isolated from blood samples 7 days after sample collection.

Widal-Wright serodiagnosis and **tuberculin skin test** were negative; **HIV test** was negative and no other causes of immunodeficiency were detected.

Major criteria	
1. Blood cultures positive for IE	<ul style="list-style-type: none"> a. Typical microorganisms consistent with IE from 2 separate blood cultures: <ul style="list-style-type: none"> • Viridans streptococci, Streptococcus gallolyticus (Streptococcus bovis), HACEK group, Staphylococcus aureus; or • Community-acquired enterococci, in the absence of a primary focus; or b. Microorganisms consistent with IE from persistently positive blood cultures: <ul style="list-style-type: none"> • ≥2 positive blood cultures of blood samples drawn >12 h apart; or • All of 3 or a majority of ≥4 separate cultures of blood (with first and last samples drawn ≥1 h apart); or • Single positive blood culture for Coxiella burnetii or phase 1 IgG antibody titre >1:800
2. Imaging positive for IE	<ul style="list-style-type: none"> a. Echocardiogram positive for IE: <ul style="list-style-type: none"> • Vegetation; • Abscess, pseudoaneurysm, intracardiac fistula; • Valvular perforation or aneurysm; • New partial dehiscence of prosthetic valve. b. Abnormal activity around the site of prosthetic valve implantation detected by ¹⁸F-FDG PET/CT (only if the prosthesis was implanted for >3 months) or radiolabelled leukocyte SPECT/CT. c. Definite paravalvular lesions by cardiac CT.
Minor criteria	
1. Predisposition such as predisposing heart condition, or injection drug use.	
2. Fever defined as temperature >38°C.	
3. Vascular phenomena (including those detected by imaging only): major arterial emboli, septic pulmonary infarcts, infectious (mycotic) aneurysm, intracranial haemorrhage, conjunctival haemorrhages, and Janeway's lesions.	
4. Immunological phenomena: glomerulonephritis, Osler's nodes, Roth's spots, and rheumatoid factor.	
5. Microbiological evidence: positive blood cultures but does not meet a major criterion as noted above or serological evidence of acute infection with organism consistent with IE.	

CT = computed tomography; FDG = fluoro-deoxyglucose; HACEK = Haemophilus parainfluenzae, H. aphrophilus, H. paraphrophilus, H. influenzae, Actinobacillus actinomycetemcomitans, Cardiobacterium hominis, Eikenella corrodens, Kingella kingae, and K. denitrificans; IE = infective endocarditis; Ig = immunoglobulin; PET = positron emission tomography; SPECT = single photon emission computerized tomography. Adapted from Li et al.¹⁷

Modified from 2015 ESC Guidelines for the management of infective endocarditis.

Recommendations	Class ^a	Level ^b
A. Diagnosis		
TTE is recommended as the first-line imaging modality in suspected IE.	I	B
TOE is recommended in all patients with clinical suspicion of IE and a negative or non-diagnostic TTE.	I	B
TOE is recommended in patients with clinical suspicion of IE, when a prosthetic heart valve or an intracardiac device is present.	I	B
Repeat TTE and /or TOE within 5–7 days is recommended in case of initially negative examination when clinical suspicion of IE remains high.	I	C
Echocardiography should be considered in Staphylococcus aureus bacteraemia.	IIa	B
TOE should be considered in patients with suspected IE, even in cases with positive TTE, except in isolated right-sided native valve IE with good quality TTE examination and unequivocal echocardiographic findings.	IIa	C

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Conclusions

- Endocarditis must always be suspected in patients with fever and multiple embolic lesions; antibiotic treatment must be started as soon as possible.
- A negative pattern of TTE doesn't exclude the infection, the use of transoesophageal echocardiography seems to represent the gold standard for diagnosis. A multidisciplinary team approach should be preferred in decision-making process in complex clinical cases.

1. Murdoch DR, Corey GR, Hoen B, Miró JM, Fowler VG Jr, Bayer AS, Karchmer AW, Olaison L, Pappas PA, Moreillon P, Chambers ST, Chu VH, Falcó V, Holland DJ, Jones P, Klein JL, Raymond NJ, Read KM, Tripodi MF, Utili R, Wang A, Woods CW, Cabell CH; International Collaboration on Endocarditis-Prospective Cohort Study (ICE-PCS) Investigators. Clinical presentation, etiology, and outcome of infective endocarditis in the 21st century: the International Collaboration on Endocarditis-Prospective Cohort Study. Arch. Intern. Med. 169:463-473.
 2. Fowler VG Jr1, Miro JM, Hoen B, Cabell CH, Abrutyn E, Rubinstein E, Corey GR, Spelman D, Bradley SF, Barsic B, Pappas PA, Anstrom KJ, Wray D, Fortes CQ, Anguera I, Athan E, Jones P, van der Meer JT, Elliott TS, Levine DP, Bayer AS; ICE Investigators. Staphylococcus aureus endocarditis: a consequence of medical progress. Jama. 2005;293(24):3012-21.