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Physician's blind spot: Central retinal artery occlusion complicating streptococcus pyogenes infective endocarditis

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Abstract

Streptococcus pyogenes is a rare cause of infective endocarditis. The clinical features can be indistinct, making the diagnosis difficult. Embolic complications can be seen in nearly 50% of the patients and can sometimes be the first indication of the presence of infective endocarditis. We describe a case of streptococcus pyogenes endocarditis in an elderly patient with no previous history of valvular heart disease. It was only after the patient developed acute visual loss due to retinal artery occlusion that the diagnosis became apparent.

Keywords: *endocarditis; embolism; retinal artery; stroke; septic; thromboembolism*

Introduction

Streptococcus pyogenes (S. pyogenes), also known as group A beta haemolytic *Streptococcus*, is a relatively rare cause of infective endocarditis (IE), accounting for less than 3% of cases [1]. The clinical features can be vague, making the diagnosis difficult. We present a case of *S. Pyogenes* IE in an elderly patient who initially presented with cellulitis and *S. pyogenes* bacteraemia. The diagnosis was only suspected after the patient developed embolic complications of IE.

Case report

A 90-year-old woman initially presented to the hospital for an elective excision of a left fifth digit squamous cell carcinoma. She became acutely unwell with vomiting and lethargy en route to the hospital. She described a three-week history of diarrhoea prior to this. She was febrile at 37.7°C but with an otherwise normal examination and routine blood tests on arrival. She recovered from her symptoms quickly and was discharged home to the care of her family, with her original procedure postponed to a later date.

A blood cultures report became available twenty-four hours later, which grew gram-positive cocci in the aerobic and anaerobic bottles. The patient was asked to present to the Emergency Department. On presentation, she reported having deteriorated overnight with subjective fevers, rigours, whole-body myalgias, and a headache with neck pain but no photophobia. The remainder of her systems review was unremarkable. Her significant past medical history included hypertension, hyperlipidaemia, ischemic heart disease with previous myocardial infarct and cardiac bypass surgery, gastroesophageal reflux disease, and a right-sided partial mastectomy complicated by chronic right upper limb lymphoedema. However, she was a usually well and independent elderly lady living home alone in the community, with only weekly services for cleaning. She was a non-smoker and rare alcohol drinker with no recent travel history. Her regular medications included atorvastatin, pantoprazole, aspirin, metoprolol, and perindopril. On examination, she appeared rather pale, diaphoretic, with a high fever (39°C). Her Glasgow Coma Scale score was 15. However, she was mildly confused, which was abnormal for her. Her left lower limb had multiple skin breaks with surrounding erythema, warmth, and tenderness. She demonstrated no focal neurology or clear signs of meningism. She was hemodynamically stable with a 152/88 mmHg blood pressure and mild sinus tachycardia (102 beats per minute).

Initial investigations revealed mild anaemia with haemoglobin 111 g/L. Total white cell and neutrophil counts were normal. Renal function and liver function testing were within the normal range. C-reactive protein (CRP) was significantly elevated at 428 mg/L. Urine microscopy and culture, chest X-ray, CT scan of the brain, and CT scan of the abdomen and pelvis with contrast were not significant. She was empirically treated with intravenous ceftriaxone and benzylpenicillin in the emergency department. She also received a single dose of vancomycin.

The next day her left lower limb oedema and pain worsened, and signs of cellulitis became more apparent. She remained febrile. The blood culture report confirmed the growth of *S. pyogenes*, which was sensitive to penicillin, ceftriaxone, and clindamycin. A diagnosis of *S. pyogenes* bacteraemia secondary to cellulitis was made. Ceftriaxone was ceased, benzylpenicillin was continued, and clindamycin was added to the treatment regimen. Because of increasing left leg pain possibility of necrotizing fasciitis was considered and excluded after a CT scan of the left lower limb and surgical consultation, which concluded that the patient only had uncomplicated cellulitis of the left lower limb.

Over the next three days, the patient showed significant clinical improvement. Her fever settled down, and CRP improved from 428 to 93 mg/L. On day five of her treatment, intravenous benzylpenicillin and clindamycin were ceased, and the patient was transitioned to oral flucloxacillin. However, the patient developed sudden onset painless visual loss from the right eye the next day. On examination, her right pupil was fixed and non-responsive to direct illumination, with a complete visual field deficit on the right and intact visual fields in the left eye. She had no other neurological symptoms. Her CRP had also risen from 93 to 176 mg/L.

An urgent ophthalmology consultation was sought, which suggested the central retinal artery occlusion (CRAO) with possible differential diagnosis of giant cell arteritis (GCA) or thromboembolic event. An MRI scan of the brain was performed, which demonstrated two non-enhancing areas (2.2, 3 mm) of restricted diffusion adjacent

to the anterior horn of the right lateral ventricle and in the left temporal lobe, consistent with acute infarcts (Figures 1 and 2). These were in two separate vascular territories implying a cardiac or great vessel source. No intracranial vascular stenosis or aneurysm was seen, and the intracranial venous sinuses were intact. No enhancing mass lesion or leptomeningeal enhancement was noticed. A subsequent CT cerebral and carotid angiogram did not show vascular lesions in the carotid and vertebral arteries. A transthoracic echocardiogram was performed, which showed a small mobile echo density on the posterior leaflet of the mitral valve consistent with vegetation, with near-normal valve function (mild mitral regurgitation with mean gradient 3 mmHg).

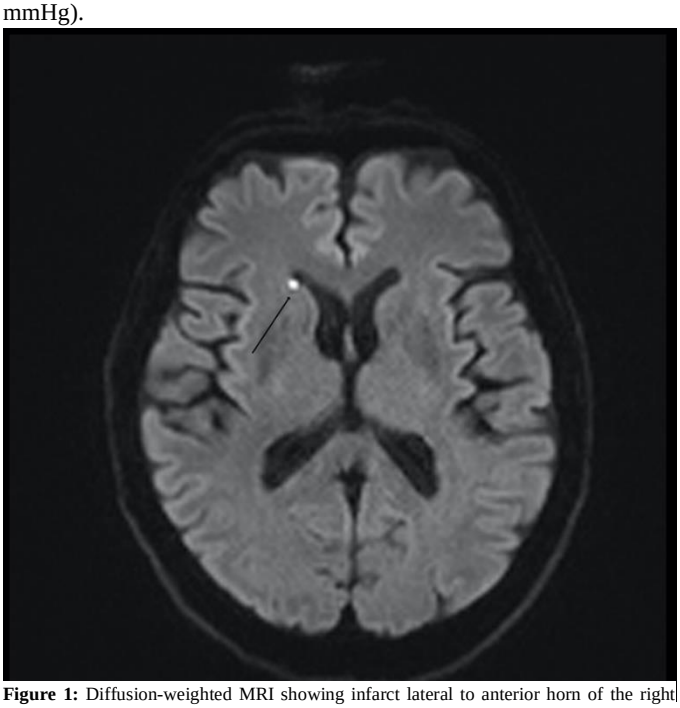

Figure 1: Diffusion-weighted MRI showing infarct lateral to anterior horn of the right lateral ventricle

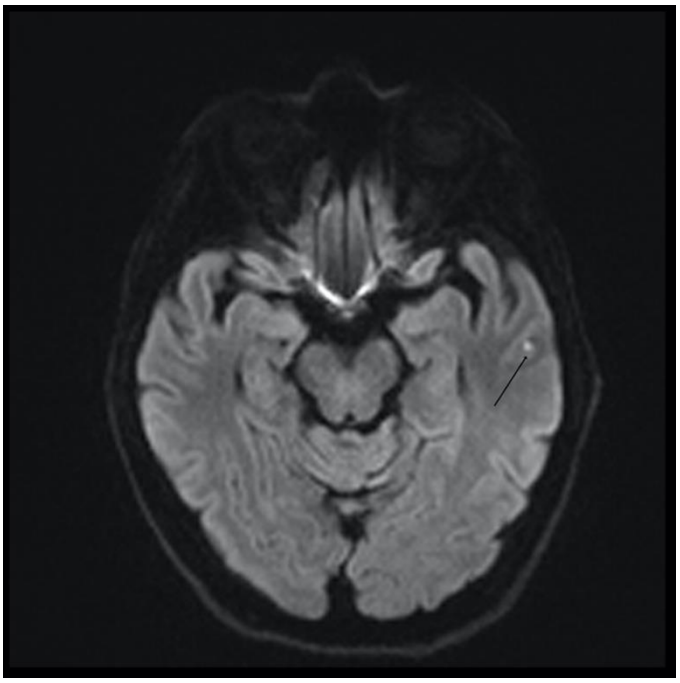

Figure 2: Diffusion-weighted MRI showing left temporal infarct

A final diagnosis of *S. pyogenes* IE complicated by septic emboli to the brain and the right retinal artery was then made. The patient was put back on intravenous benzylpenicillin. Once stable, she was discharged from the hospital with a plan for a total of six weeks of intravenous antibiotics to be given by the "hospital in the home" team. Over the following weeks, she gradually improved. CRP normalized, and subsequent blood cultures became negative. Intravenous antibiotics were stopped after completion of the prescribed course. Unfortunately, she represented systemically unwell with hypotension, fevers, and delirium a month after finishing her antibiotic course. In discussion with the patient and her family, the decision was made not to treat actively and transition to palliative management and comfort care. She passed away peacefully at home, surrounded by loved ones.

Discussion

S. pyogenes is a common pathogen accounting for various infections such as cellulitis, pharyngitis, impetigo, and scarlet fever in humans. It can lead to bacteraemia, necrotizing fasciitis, and *streptococcal* toxic shock syndrome in its more severe form. Immune-mediated complications such as post-streptococcal glomerulonephritis, acute rheumatic fever, and rheumatic heart disease have also been described [2].

Although bloodstream infections with *S. pyogenes* are common, IE is a relatively rare complication [1]. The usual risk factors for *streptococcal* IE include native valvular disease, prosthetic heart valves, cardiac devices, and male sex [1]. However, *S. pyogenes* IE has also been reported in patients with previously normal heart valves [3]. It has also been reported to be more common in intravenous drug users and children with preceding varicella infection [4]. Embolic complications have been described in nearly half of the cases, with brain and skin the most common organs affected [3].

CRAO is a rare but devastating embolic complication of IE [5-7]. CRAO is caused by a sudden blockage of the central retinal artery, most commonly due to an embolism. This results in retinal hypoperfusion and eventually irreversible retinal damage and permanent vision loss. CRAO typically presents with sudden onset, painless monocular vision loss that occurs rapidly over seconds. This under-recognized complication can be diagnosed by fundoscopic exam [8].

Our patient did not have usual risk factors for IE, which made the diagnosis difficult. Moreover, embolic complications developed despite being on the adequate antibiotic cover for *S. pyogenes* bacteraemia and cellulitis. IE's embolic complications can be seen in up to 45% of cases [9]. Typically, left-sided IE leads to systemic emboli, while right-sided lesions lead to pulmonary emboli. Systemic emboli can also occur in patients with right-sided IE and a right to left shunt such as patent foramen ovale. Septic emboli can sometimes also occur while on antibiotic treatment but are rare after ten days of antibiotic treatment [10].

Conclusion

This case emphasizes the need to consider IE in patients with *S. pyogenes* bacteraemia, even in patients without pre-existing risk factors for IE. The diagnosis can be difficult at initial presentation and can potentially lead to serious complications. A high index of suspicion is needed for timely diagnosis and management.

References

1. Chamat-Hedemand S, Dahl A, Østergaard L, Arpi M, Fosbøl E, et al. Prevalence of Infective Endocarditis in Streptococcal Bloodstream Infections Is Dependent on Streptococcal Species. *Circulation.* 2020; 142: 720-730.
2. Walker MJ, Barnett TC, McArthur JD, Cole JN, Gillen CM, et al. Disease manifestations and pathogenic mechanisms of group A streptococcus. *Clin Microbiol Rev.* 2014; 27: 264-301.
3. Sarda C, Magrini G, Pelenghi S, Turco A, Seminari E. Mitral Valve Infective Endocarditis due to Streptococcus pyogenes: A Case Report. *Cureus.* 2019; 11: e4461.
4. Branch J, Suganami Y, Kitagawa I, Stein GH, Tanaka E. A rare case of group A streptococcal endocarditis with absence of valvular vegetation. *Intern Med.* 2010; 49: 1657-1661.

5. Serras-Pereria R, Hipolito-Fernandes D, Azevedo L, Vieria L. Central retinal artery occlusion from Streptococcus gallolyticus endocarditis. *BMP Case Reports.* 2020; 13: e235763.
6. Piqueras Flores J, Esquinas Blanco G, Pinilla Rivas M, Montero MA, Marina Breysse M, et al. Central retinal artery occlusion and infective endocarditis: rigor does matter. *Arch Soc Esp Oftalmol.* 2015; 90: 546-548.
7. Ziakas NG, Kotsidis S, Ziakas A. Central retinal artery occlusion due to infective endocarditis. *Int Ophthalmol.* 2014; 32: 315-319.
8. Mehta N, Marco RD, Goldhardt R, Modi Y. Central Retinal Artery Occlusion: Acute Management and Treatment. *Curr Ophthalmol Rep.* 2017; 5: 149-159.
9. De Castro S, Magni G, Beni S, Cartoni D, Fiorelli M, et al. Role of transthoracic and transesophageal echocardiography in predicting embolic events in patients with active infective endocarditis involving native cardiac valves. *Am J Cardiol.* 1997; 80: 1030-1034.
10. Snygg-Martin U, Gustafsson L, Rosengren L, Alsiö A, Ackerholm P, et al. Cerebrovascular complications in patients with left-sided infective endocarditis are common: a prospective study using magnetic resonance imaging and neurochemical brain damage markers. *Clin Infect Dis.* 2008; 47: 23-30.

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