



***Streptococcus gordonii*: A Rare Cause of Infective Endocarditis with High Embolic Potential Revealed by Febrile Ischemic Stroke**

Charfo M ^{a*}, Afendi L ^a, Belmalyani R ^a, Errami A ^a, Haboub M ^a and Drighil A ^a

^a Department of Cardiology, Ibn Rochd University Hospital Center, Casablanca, Morocco.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CA/2024/v13i1388

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/111151>

Case Study

Received: 05/11/2023
Accepted: 11/01/2024
Published: 15/01/2024

ABSTRACT

Infective endocarditis is a relatively rare disease which, despite today's advances in diagnosis and treatment, is still associated with a high morbidity and mortality rate. Staphylococci and streptococci head the list of causative organisms. Few cases of *Streptococcus gordonii* endocarditis have been reported in the literature.

We report the case of a 34-year-old man with no previous history of *S. gordonii* IE, responsible for multiple systemic embolisms in addition to valvular lesions.

Keywords: Embolism; endocarditis; *Streptococcus gordonii*; stroke.

*Corresponding author: E-mail: dr.charfomahamadou@gmail.com, mdcharfo1@gmail.com;

1. INTRODUCTION

Infective endocarditis (IE) is an uncommon disease, grafted with high morbidity and mortality, with a risk of heart failure and systemic embolism. Ischemic stroke is the initial presentation of IE in 20% of cases, as reported by Byrne et al. Along with staphylococci, streptococci are the main germs responsible for IE. They comprise six main subgroups: *S. mutans*, *S. mitis*, *S. anginosus*, *S. salivarius*, *S. bovis* group and *S. sanguinis*. *S. gordonii* belongs to the *S. sanguinis* group and rarely causes IE.

We report the case of a 34-year-old man with no pathological history who presented with infective endocarditis caused by *Streptococcus gordonii*, revealed by a febrile ischemic stroke and complicated by partial occlusion of the right anterior tibial artery.

2. CASE PRESENTATION

34-year-old man with no medical history hospitalized for febrile focal neurological deficit. The story began three months ago with the onset of progressively worsening dyspnea in a context of fever and deterioration in general condition. The evolution was marked by the occurrence of left hemiparesis with an ischemic stroke on the brain scan a week ago (fig.1). On examination the patient is hemodynamically stable with blood pressure at 105/54mmHg, heart rate at 112bpm,

fever at 38.7, protodiastolic murmur 4/6 at the aortic focus. Pulse felt, ample and symmetrical, no signs of heart failure. Moreover, there is a bad oral condition probably the infectious gateway. The ECG, notes sinus tachycardia with negative apico-lateral T waves.

Transthoracic echocardiography found left ventricular dilatation (LVED = 70 mm) with a good left ventricular ejection fraction (LVEF) at 55%. The mitral valve is the seat of an eccentric average regurgitation directed towards the interatrial septum by perforation of the AMV, presence of vegetation on the auricular slope measuring 4X7mm (fig. 2-3). The aortic valve is the seat of several vegetations, the largest of which measures 20x7 mm attached to the right coronary cusp responsible for severe ALo (VR = 132ml, SOR = 120 mm², ETD = 62cm/s) without stenosis (fig. 4-6). the PAPS per PI flow is estimated at 39mmHg. The thoraco-abdominal scanner notes a homogeneous hepato-splenomegaly without detectable infarction.

Biologically, there is an inflammatory syndrome with microcytic anemia at 9g/dl, CRP at 78mg/l, VS at 50mm, leukocytes at 7570/mm³; positive rheumatoid factor and the Low complement factors C3 and C4. The other biological tests including renal function, electrolytes, liver, thyroid, hemostasis, and viral serology (HBV, HCV and HIV) negative. Three blood cultures taken on admission are positive for multisensitive *Streptococcus gordonii*.

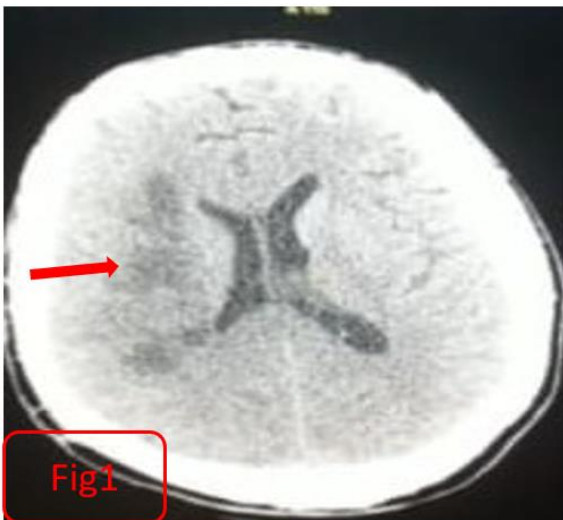


Fig. 1. Cerebral ischemia of the territory of the right middle cerebral artery of subacute appearance

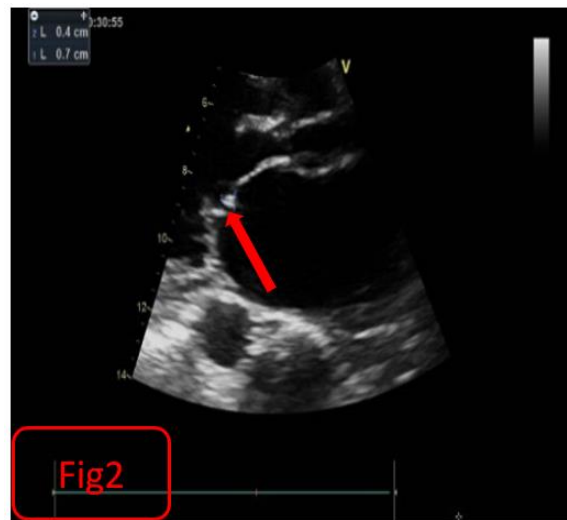


Fig. 2. Mitral vegetation

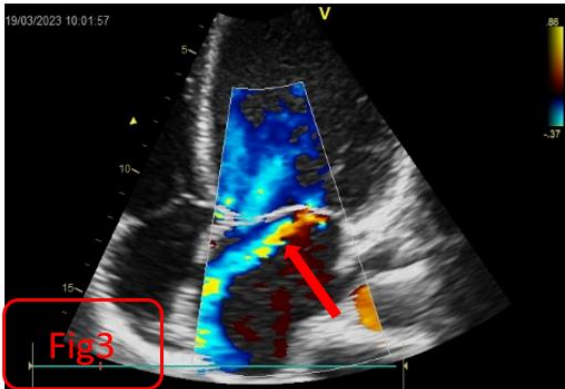


Fig. 3. Moyenne eccentric mitral regurgitation due to perforation

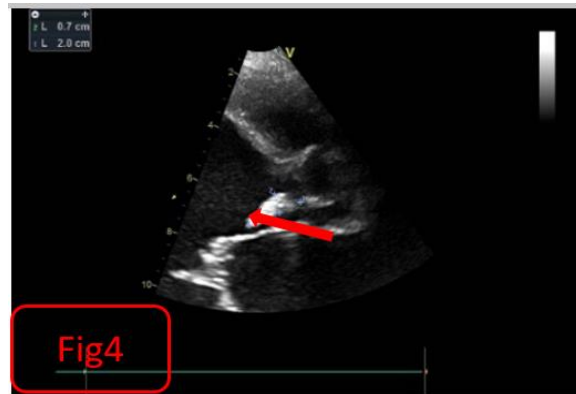


Fig. 4. Aortic vegetation

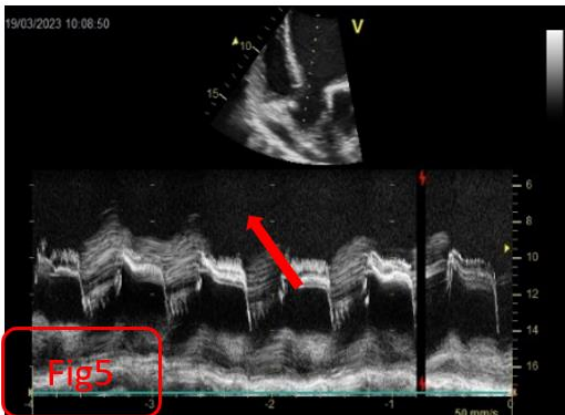


Fig. 5. Vibratory character of aortic vegetation

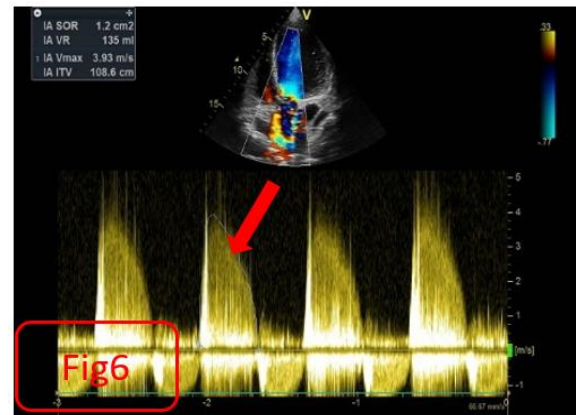


Fig. 6. Severe AR

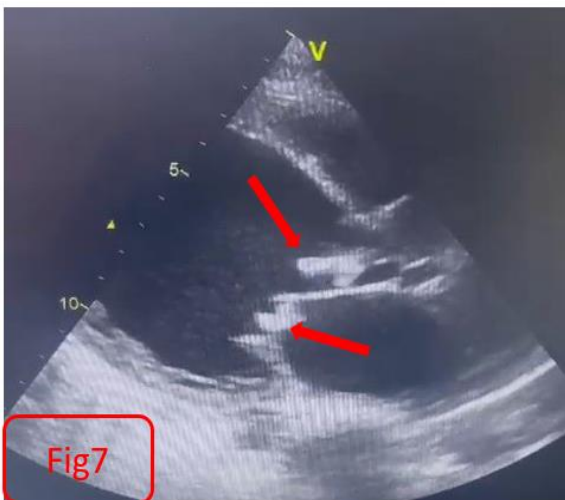


Fig. 7. Evolution showing the increase in mitro-aortic vegetations

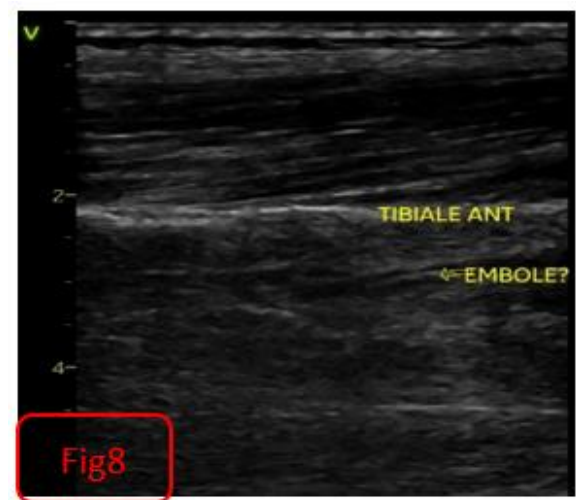


Fig. 8. Anterior tibial arterial occlusion

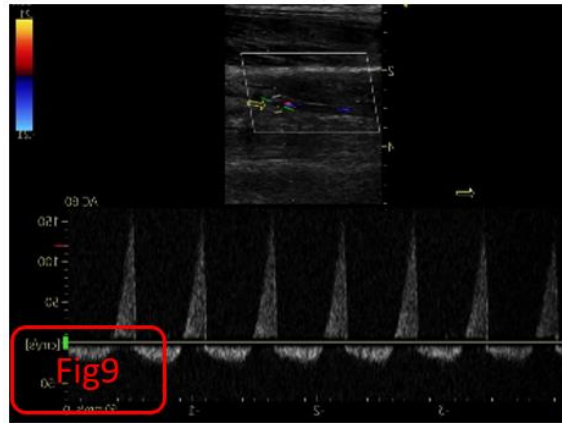


Fig. 9. Velocity of anterior

Thus, in front of the vegetations on echocardiography, the positivity of blood cultures, fever, immunological and vascular signs, the diagnosis of endocarditis complicated by severe ALo, middle mitral insufficiency and ischemic stroke is retained, and the patient put on dual antibiotic therapy based on ceftriaxone and gentamycin. The evolution is characterized by the increase in the size of the mitro-aortic vegetations (fig. 7) and the embolism with anterior tibial arterial occlusion (fig. 8-9). And this despite the apyrexia and the reduction of the inflammatory syndrome, posing the indication of a double mitro-aortic surgical replacement in emergency to control the infection.

3. DISCUSSION

"IE is characterized by ulcerative and vegetative lesions related to grafting on the endocardium, valvular (IE on native valve), much more rarely parietal, or on an intracardiac prosthesis (IE on prosthesis) or on an intracardiac electronic device (ICED), of a microorganism, most often bacterial" [1-2]. It is a relatively rare disease worldwide whose estimated annual incidence of 3-10 cases per 100,000 peoples has not decreased in recent years [2-4]. A serious disease with a short-term mortality rate of 10-30%, IE occurs in 50% in a subject free of heart disease [2,3,4,5].

The main microorganisms involved are Gram-positive cocci, dominated at 80% by the staphylococci and streptococci groups [2,6]. *Streptococcus gordonii* (SG) is a gram-positive alpha hemolytic coccus belonging to the *streptococcal sanguinis* group [7,8]. It is involved in the alkalization of the oral cavity, the production of protective biofilm and is rarely

responsible for IE [4,7]. The mechanism of *S. gordonii* IE is often secondary to a procedure, trauma or during tooth brushing, resulting in bacteremia and therefore risk of IE [4,8,9]. Our young patient has not had recent dental procedures but has a poor dental condition [8]. In a study including 6506 cases of streptococcal bacteremia, Sandra C et al. found that SG bacteremia, although rare 1.46%, was at high risk of IE, essentially native valves [6]. Dadon et al. reports in a single-center experiment, only 15 cases of IE in *S. gordonii* in 20 years [7].

The clinical presentation in our patient shows in addition to valve damage, a high embolic potential with the revelation of IE by cerebral ischemia complicated by neurological deficit. The patient presented during his hospitalization, an embolism with anterior tibial arterial occlusion. And this is consistent with what is reported in the literature, so cases of neurological complications, spondylodiscitis, splenic, renal, and mesenteric infarction, or multisite embolization have been reported [8,9-11]. Only one case of thrombosis polplity is reported in the literature like our young patient [10]. The severity and significant embolic potential of *S. gordonii* IE may be related to the ability to evade and resist bactericidal agents that degrade bacteria in phagolysosomes possessed by the *S. gordonii* DL1 subtype [12]. The diagnosis is retained in our patient as in the literature on clinical elements, echocardiography, and blood cultures [3].

The size of vegetation in our patient is very important, respectively 20 x7mm and 4x7mm at the aortic and mitral level. The size of the vegetation is according to the ESC recommendations of the management of infective endocarditis, one of the criteria for early

surgery. It has been shown that vegetations larger than 15 mm have a higher risk of embolic complications [13]. Our patient has multiple emboli of the brain and lower limbs, which is comparable to the literature [8,10].

In our case the transplant was done on native valve, cases of grafting on prosthetic valves or on mitralclip have been reported. [6,14].

S. gordonii is sensitive to penicillin, ceftriaxone, and gentamycin with a high risk of needing surgery [6,10,15]. In our case he had benefited from a combination of ceftriaxone and gentamycin for 2 weeks and then ceftriaxone alone for a total duration of 6 weeks of treatment. To this is added a double surgical valve replacement, performed after the second week of antibiotic therapy and the operating suites were simple [16-17].

4. CONCLUSION

Endocarditis due to *S. gordonii* is rare but very serious with a sometimes-significant multisite embolic potential as in our patient who embolized in the brain and lower limbs. Occurs mainly on native valves, diagnosis must be early, and management often combines surgery with antibiotic treatment. In our case, endocarditis was revealed by cerebral ischemia, management consisted of dual antibiotic therapy combined with early valve surgery.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Cahill TJ, Prendergast BD. Infective endocarditis. *Lancet*. 2016 Feb 27; 387(10021):882-93. DOI: 10.1016/S0140-6736(15)00067-7
2. Delahaye F, Delahaye C. Endocardite infectieuse. *EMC – Cardiologie* 2023 ;37 . n°1 > Février . Available: [http://dx.doi.org/10.1016/S1166-4568\(22\)45425-8](http://dx.doi.org/10.1016/S1166-4568(22)45425-8)
3. Cimmino G, Bottino R, Formisano T, Orlandi M, Molinari D, Sperlongano S, et al. Current views on infective endocarditis: Changing epidemiology, improving diagnostic tools and centering the patient for up-to-date management. *Life*. 2023 Feb;13(2):377.
4. Mosailova N, Truong J, Dietrich T, Ashurst J. *Streptococcus gordonii*: A Rare cause of infective endocarditis. *Case Reports in Infectious Diseases*. 2019 Jun 12;2019:1–2.
5. Humphrey TJ, Marchwiany D, Salimy MS, Nelson SB, Bedair HS, Melnic CM. Outcomes of concurrent endocarditis and periprosthetic joint infection: A retrospective case series of 16 patients. *Cureus*. 2022 Apr 14;14(4):e24139. DOI: 10.7759/cureus.24139 PMID: 35573522; PMCID: PMC9106541.
6. Chamat-Hedemand S, Dahl A, Østergaard L, Arpi M, Fosbøl E, Boel J, et al. Prevalence of infective endocarditis in streptococcal bloodstream infections is dependent on streptococcal species. *Circulation*. 2020 Aug 25;142(8):720–30.
7. Dadon Z, Cohen A, Szterenlicht YM, Assous MV, Barzilay Y, Raveh-Brawer D, et al. Spondylodiskitis and endocarditis due to *Streptococcus gordonii*. *Ann Clin Microbiol Antimicrob*. 2017 Oct 4;16:68.
8. Chang CY, Gan YL, Radhakrishnan AP, Ong ELC. Acute abdomen revealed *Streptococcus gordonii* infective endocarditis with systemic embolism. *Oxford Medical Case Reports*. 2022 Jan 1;2022(1):omab145.
9. Rajevac H, Taweeseed P, Khan Z, Bachan M. 1097: A rare case of *Streptococcus gordonii* causing empyema. *Critical Care Medicine*. 2020 Jan;48(1):528.
10. Hussin SA, Iberahim NA, Mokthar Z, Othman MK, Keat TJ, Nah NMZ, et al. The success story of complicated *Streptococcus gordonii* infective endocarditis management: A case report. *International Journal of Cardiology*. 2022 Dec;369:45.
11. Wang Y, Xu R, Li M, Duan C, Wang L, Duan W. *Streptococcus gordonii* infectious endocarditis presenting as a

- neurocysticercosis mimic — A rare manifestation. *Journal of Infection and Public Health*. 2021 Jan 1;14(1):39–41.
12. Urano-Tashiro Y, Saiki K, Yamanaka Y, Ishikawa Y, Takahashi Y. *Streptococcus gordonii* DL1 evades polymorphonuclear leukocyte-mediated killing via resistance to lysozyme. *PLOS ONE*. 2021 Dec 20; 16(12):e0261568.
 13. Habib G, Lancellotti P, Antunes MJ, Bongioni MG, Casalta JP, Del Zotti F, et al. 2015 esc guidelines for the management of infective endocarditis: The task force for the management of infective endocarditis of the european society of cardiology (esc) endorsed by: European association for cardio-thoracic surgery (EACTS), the european association of nuclear medicine (EANM). *Eur Heart J*. 2015 Nov 21;36(44):3075–128.
 14. Hristakos N, Aleman R, Morreale C, Rifai L. Subacute *Streptococcus gordonii* infective endocarditis following mitralclip placement with prosthetic sparing. *Journal of the American College of Cardiology*. 2021 May 11;77(18_Supplement_1):2843–2843.
 15. Le Bayon A, Lebourg O, Blard JM, Pagès M. Hémorragie cérébrale par rupture d'anévrisme mycotique. Deux observations. *La Revue De Médecine Interne*. 2002 May 1;23(5):469–73.
 16. Byrne JG, Rezai K, Sanchez JA, Bernstein RA, Okum E, Leacche M, et al. Surgical management of endocarditis: The society of thoracic surgeons clinical practice guideline. *The Annals of Thoracic Surgery*. 2011 Jun 1;91(6):2012–9.
 17. Sebastian SA, Co EL, Mehendale M, Sudan S, Manchanda K, Khan S. Challenges and updates in the diagnosis and treatment of infective endocarditis. *Current Problems in Cardiology*. 2022 Sep 1;47(9):101267.

© 2024 Charfo et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/111151>