Case study

Streptococcus Gordonnii: a rare cause of infective endocarditis with high embolic potential revealed by febrile ischemic stroke.

Abstract

Infective endocarditis is a relatively rare disease which, despite advances in the field of diagnosis and therapeutics today, remains grafted with a significant morbidity mortality. Among the incriminated germs, we find at the top of the list staphylococcus and streptococcus. Few cases of Streptococcus gordonii endocarditis have been reported in the literature.

We report the case of a 34-year-old youth with no history, who presents with an AE to S. gordonii responsible for multiple systemic emboli in addition to valve lesions.

Keys words*: Embolism, Endocarditis, Gordonii, Infective, Regurgitation, Streptococcus,Stroke, Vegetation.*

Introduction

Infective endocarditis (IE) is an uncommon disease, grafted with a heavy morbidity and mortality with the risk of heart failure and systemic embolisms. Ischemic stroke is the initial presentation of IE in 20% of cases as reported by Byrne et al. Streptococcus is with staphylococcus one of the main germs responsible for EI, it includes six major subgroups: S. mutans, S. mitis, S. anginosus, S. salivarius, group S. bovis and S. sanguinis. S. gordonii belongs to the S. sanguinis group and rarely causes an IE.

It is for this purpose that we report the case of a 34-year-old youth with no pathological history who presented with an infective endocarditis caused by streptococcusgordoniirevealed by afebrile cerebral ischemic attack and complicated partial occlusion of the rightanterior tibial artery.

Case presentation:

34-year-old man with no medical history hospitalized for febrile focal neurological deficit. The story goes back three months 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(figure1). 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 (figure 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 AIo (VR = 132ml, SOR = 120 mm2, ETD = 62cm/s) without stenosis (figure 4-6). the PAPS per PI flow is estimated at 39mmHg. The thoraco-abdominal scanner notes a homogeneous hepato-splenomegaly without detectable infarction.

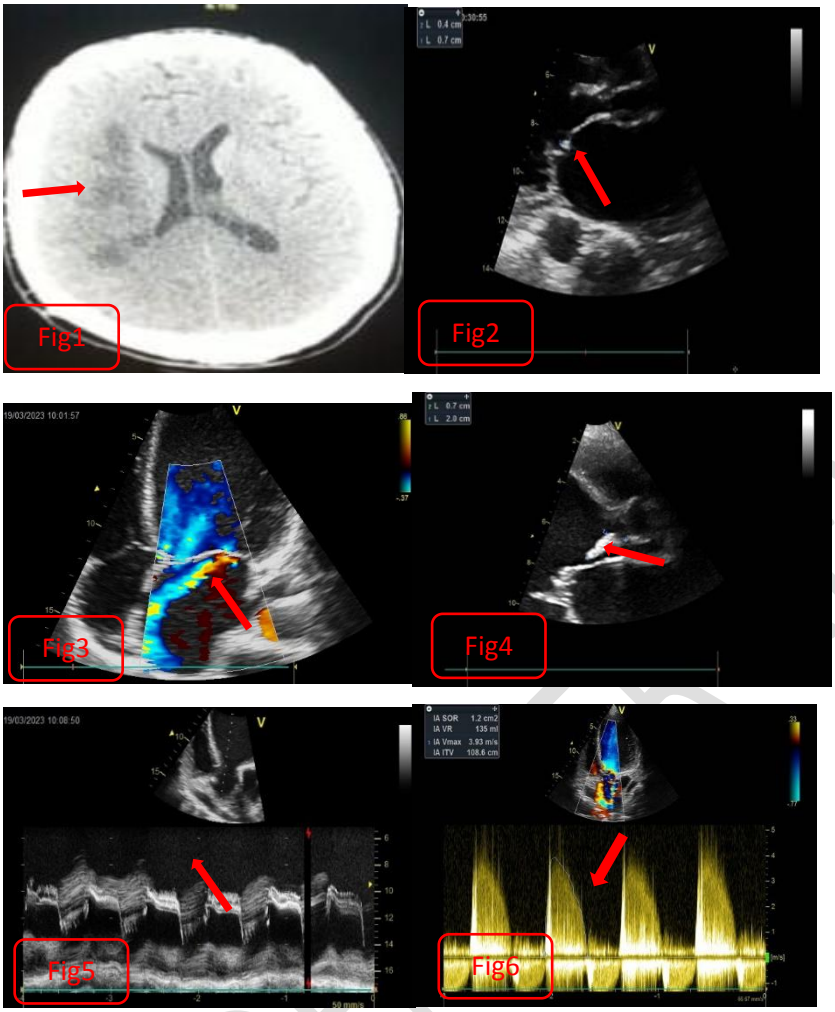


Figure 1: cerebral ischemia of the territory of the right middle cerebral artery of subacute appearanceFigure 2: mitral vegetation

Figure 3: Moyenne eccentric mitral regurgitation by perforation

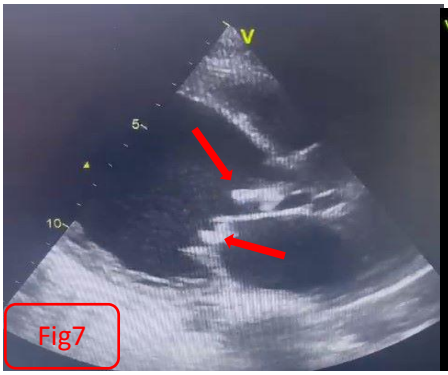
Figure 4: Aortic vegetation

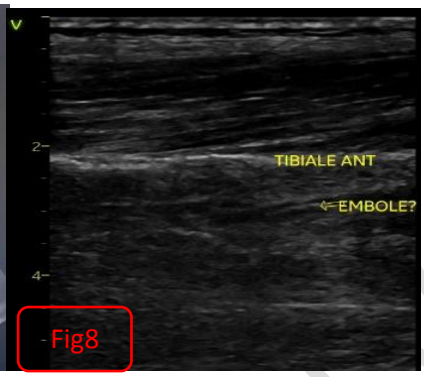
Figure 5: vibratory character of aortic vegetation

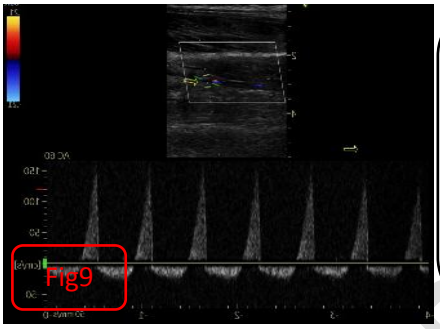
Figure 6: severe AR.

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 supplement consumption with low C3 and C4. The rest of the assessment 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.

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 AIo, 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 (figure 7) and the embolism with anterior tibial arterial occlusion (figure 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.







-Figure 7: evolution showing the increase in mitro-aortic vegetations.
-Figure 8: anterior tibial arterial occlusion

-Figure 9: Velocity of anterior

Discussion

"IE is characterized by ulcerative and vegetative lesions related to the graft 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 alkalinization of the oral cavity, the production of protective biofilm and is rarely responsible for EI (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, essentiallynativevalves.(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 EI 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 asinour 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 mitraclip 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).

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.

- Ethical approval: not applicable

- Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

References:

1. Cahill TJ, Prendergast BD. Infective endocarditis. Lancet. 2016 Feb 27;387(10021):882-93. doi: 10.1016/S0140-6736(15)00067-7. Epub 2015 Sep 1. PMID: 26341945.
2. F. Delahaye, C. Delahaye.Endocardite infectieuse.EMC – Cardiologie , Volume 37 > n◦ 1 > février 2023 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 MicrobiolAntimicrob. 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, Taweesedt 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, Bongiorni 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). EurHeart J. 2015 Nov21;36(44):3075–128.
14. Hristakos N, Aleman R, Morreale C, Rifai L. Subacute streptococcus gordonii infective endocarditis following mitraclip 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 ThoracicSurgery. 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. CurrentProblems in Cardiology. 2022 Sep 1;47(9):101267.