Case report

Rare case of infective endocarditis due to Gemella morbillorum in patient with bicuspid aortic valve

Abstract

Infective endocarditis caused by Gemella morbillorum is one of the rare causative microorganisms of endocarditis and only a few cases have been reported in the literature so far. We describe a case of Gemellamorbillorum endocarditis in a 37-year-old moroccan man who had a congenitally bicuspid aortic valve. He presented to our institution with a 1.5-month history of fever, and the onset of a motor deficit in the right hemibody one day prior to consultation. A transthoracic echocardiogram showed two large, echogenic and mobile vegetations (30×8 mm) with perforation of the left cusp and fistulized abscess of the anterior mitral leaflet measuring approximately 16x20mm. Blood cultures of the patient grew pan-sensitive Gemellamorbillorum. The patient fulfilled the Duke's criteria for infective endocarditis. The patient was successfully treated with antibiotics and aortic and mitral valves replacement.

Keywords: Infective endocarditis, Bicuspid aortic valve, Gemella Morbillurum, Embolism

Introduction

Gemella morbillorum is one of the rare causative microorganisms of endocarditis with few cases reported in the English literature. Despite the improvements in the treatment methods, the morbidity and mortality rates are still high.

We report here a rare case of G. morbillorum endocarditis from Morocco in a young man who had a bicuspid aortic valve.

Case presentation:

A 37-year-old male presented to our hospital with a 40-day history of fever, associated with chills, and the onset of a motor deficit in the right hemibody one day prior to consultation. All of this was evolving in a context of moderate deterioration in general condition.

The patient had been treated for rheumatoid arthritis since childhood, for which he received extencillin until the age of 25. He had no history of smoking, alcohol consumption, illicit drug use or recent dental procedures.

Upon admission, a physical examination revealed the patient to be in moderately altered condition. Vital signs were as follows: body temperature of 39°C, pulse rate was 109 beats/min, and blood pressure was 100/50 mmHg. He did not report any chest pain or cough.

The cardiovascular examination showed a diastolic murmur at the aortic focus (4/6) and a systolic murmur at the mitral focus (4/6), no jugular venous distension or pitting edema. He had aphasia and right hemiplegia (Motricity 1/5), the oral examination showed multiple caries with no dental abscess. There were no mucocutaneous lesions, petechiae, Osler nodes, Janeway lesions or subungual hemorrhages, and no Roth spots were noted in the eye examination

A complete blood count revealed leukocytosis (14,010/mm^3) including 73% neutrophils, anemia (Hb 10,6g/dl), platelet count of 243000/mm^3 and elevated C-reactive protein (73,4 mg/l), erythrocyte sedimentation rate of 55mm/h. Hepatic and renal functions were within the normal range.Urinary analysis was normal. Hepatic, syphilitic and HIV serologies were negative.

An electrocardiogram revealed a sinus tachycardia.

A brain CT scan on admission showed a subacute left deep sylvian ischemic stroke. Transthoracic echocardiography showed a left atrial dilation, and an ejection fraction of 60%. The aortic valve was bicuspid (fig 1), on which a large vegetation of 30×8 mm in diameter was observed associated with perforation of the left cusp, severe aortic regurgitation and moderate aortic stenosis (fig 2). There was a fistulized abscess of the anterior mitral leaflet measuring approximately 16x20mm causing perforation and severe mitral regurgitation without stenosis (fig 3). estimated pulmonary artery pressure at rest was 60 mmHg. Similar findings were also demonstrated in transesophageal echocardiography (TEE).

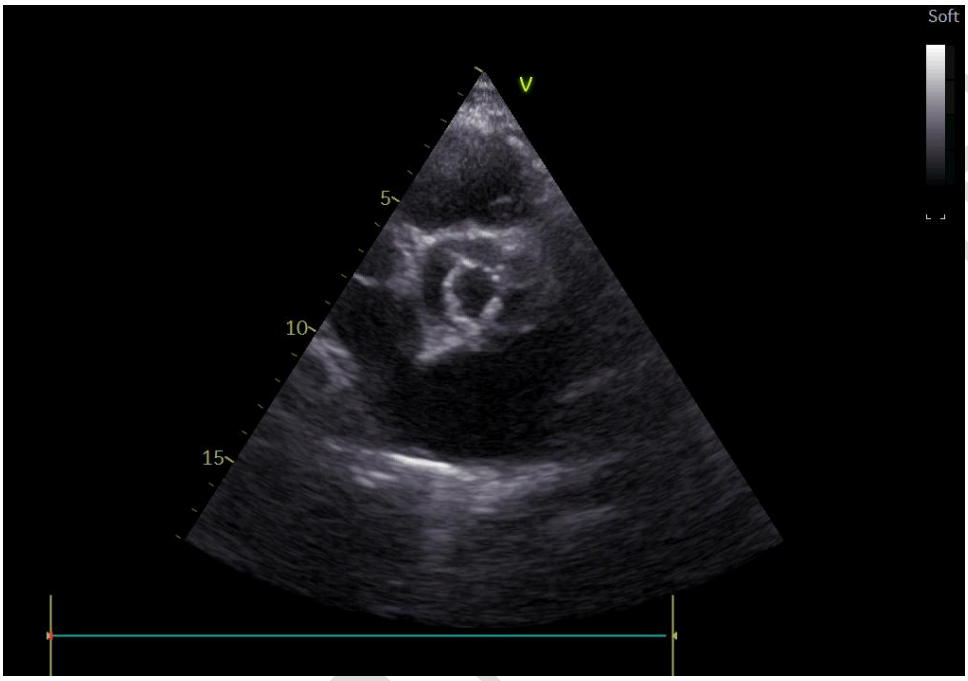

Figure 1. Transthoracic echocardiography showing the bicuspid aortic valve.

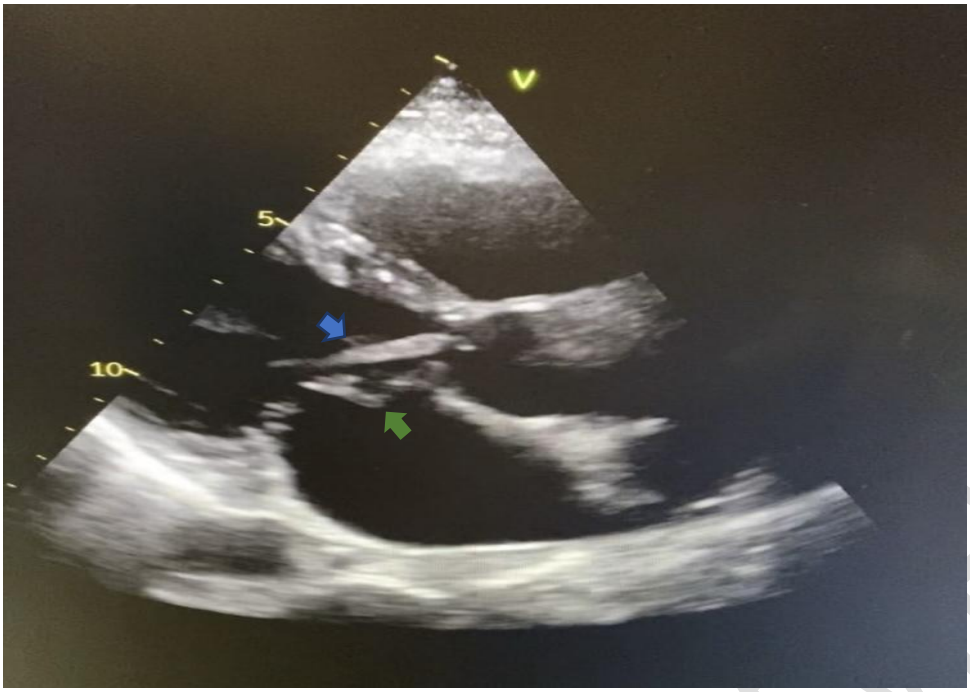

Figure 2. Transthoracic echocardiography showing the vegetation on the aortic valve (blue arrow) and abscess of the anterior mitral leaflet (green arrow)

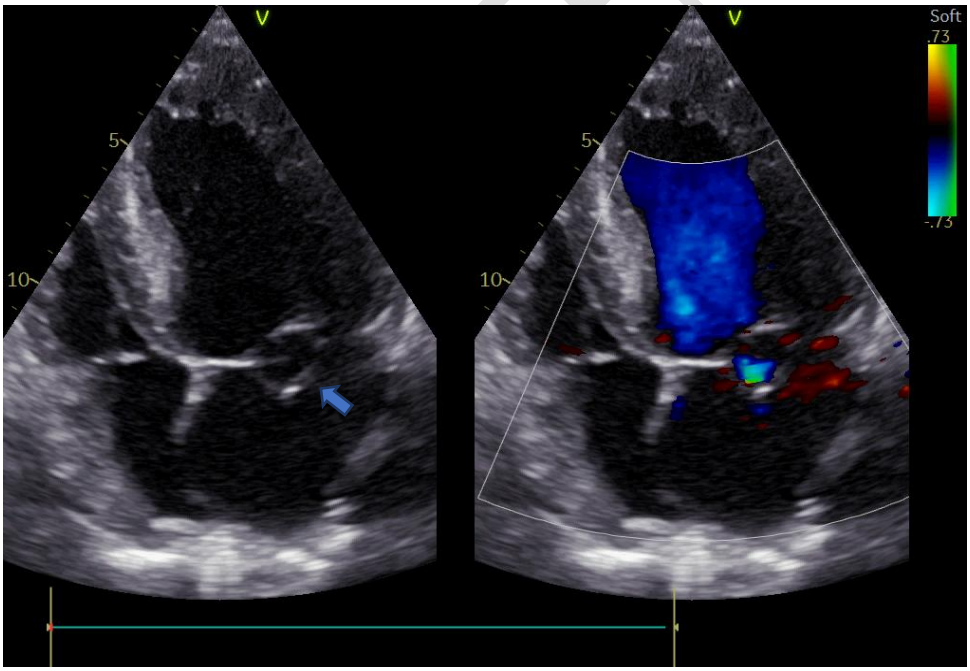

Figure 3. Transthoracic echocardiography showing fistulized abscess of the anterior mitral leaflet

In thoraco-abdomino-pelvic CT scan revealed a normal spleen size, regular contours, with the presence of two subcapsular, triangular, peripherally based, non-enhanced splenic areas, the larger measuring 25x12 mm, suggestive of splenic infarcts (fig4)

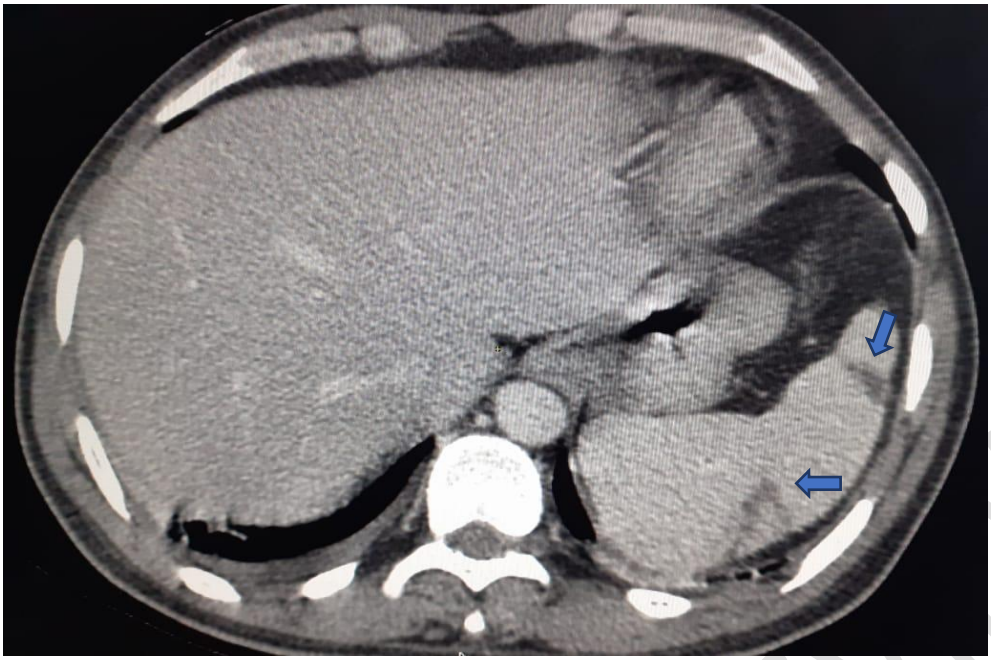

Figure 4. thoraco-abdomino-pelvic CT showing splenic infarcts

Three sets of blood culture were obtained from the patient who was hospitalized to investigate the cause of fever. Intravenous ceftriaxone 1×2 g/day and gentamicin 3mg/kg/day IVwas started empirically after blood cultures are taken. Two blood cultures were positive after 38 hours in culture, and direct examination showed Gram-positive cocci. The bacterium identified after subculture was G.morbillorum, and the antibiogram revealed resistance to penicellin G and tetracycline (table 1). The initial antibiotic regimen was maintained.

BACTERIOLOGIE – VIROLOGIE – HYGIENE

Type de prelevement	Hémoculture anaerobie
Nature du prélevement	Ponction veineuse
Gram	Cocci à Gram positif
Culture	Positive
Nombre de bactéries isolees	1
1ere Identification	*Gemella morbillorum*
Identification	*Gemella morbillorum*

Antibiotique	Resultats	Antibiotique	Resultats
Oxacilline		Erythromycine	Sensible
Peni G	Resistant	Vancomycine	Sensible
Ampicilline		Teicoplanine	
Cotrimoxazole		Rifampicine	Sensible
Gentamicine		Clindamycine	Sensible
Ciprofloxacine		Chloramphenicol	
Lévofloxacine		Tetracycline	**Resistant**
Ceftriaxone	Sensible		

Table 1.Antibiogram of G.morbillorum in our case

Our patient fulfilled modified Duke's criteria for IE diagnosis according to the American Heart Association (AHA) guidelines and ESC guidelines. More precisely,one major and four minor criteria were present in our case, including a large vegetation of the left aortic cusp, positive blood cultures, fever, bicuspid aortic valve, and evidence of septic emboli,consistent with the diagnosis of IE.

On the 15th day of the treatment, transthoracic echocardiographycontrol showed no regression of vegetation size. Apyrexia was obtained after 7 days of antibiotic therapy with a decrease in CRP and in WBC/PNN. The dental carieshas been treated as a likely cause of bacteremia and IE.A cardiovascular surgeon was consulted and the patient was transferred to the cardiovascular surgery department of the CHU Ibn Rochd in Casablanca, Morocco. The patient underwent mitral valve and aortic valve replacement with 2 mechanical prostheses. His postoperative course was uneventfuland the patient has remained symptom-free during follow-up.

Discussion

G. morbillorumwich formerly known as Streptococcus morbillorum, a Gram-positive, facultative anaerobic, catalase-negative cocci, first described in 1917, was classified as a separate bacterial strain with its biomolecular and physiological properties in 1988 (1-2). G. Morbillorumis one of the rare causative microorganisms of endocarditis,but can cause rapiddestruction of heart valves and significant clinical deterioration (3). Predisposing factors for G. morbillorum endocarditis include poor dental hygiene, dental manipulation, gastrointestinal procedures, inflammatory bowel disease and colon malignancies, as well as valvular lesions, congenitally bicuspid valves, hypertrophic cardiomyopathy and cardiac myxoma, may also increase the risk of G. morbillorum endocarditis (4-5). The incidence rate of infective endocarditis in background population, assuming that most of patients have tricuspid aortic valves, is 10 in 100,000 patients per year according to the available data (6). Both native and prosthetic valves can be affected. Aortic valve was more frequently affected than mitral valve, bivalvular damage is possible (1-2). Bicuspid aortic valve is the most common congenital heart anomaly with an estimated incidence of up to 0.9–2% in the general population. The different flow patterns may explain additional endothelial damage, with platelet and fibrinogen deposition that facilitates haematogenic bacteria or fungi seeding (6). In our patient, poor oral health and bicuspid aortic valve were considered important predisposing factors. There were present both aortic valve vegetation and mitral valve vegetation.The treatment of G. morbillorumis either surgical replacement of the valve or medical therapy.G. Morbillorum has been shown to be susceptible to B-lactams, the combination of B-lactams and Gentamicin, or Vancomycin in penicillin allergic patients (3). Urgent surgical treatment is recommended in cases of progressive cardiac failure, large vegetations(>10mm) that could be an embolic source, emboli despite appropriate antibiotic therapy anduncontrolled infection (7). In our patient, the G. morbillorum isolated was sensitive to vancomycin, ceftriaxone, we used ceftriaxone and gentamycin for the treatment of G. morbillorum endocarditis. The severity of the lesions reported in our case required urgent surgery: vegetation >10 mm complicated with perforation in both valves and a fistulized abscess detected in transthoracic echocardiographyand TEE associated with cerebral and splenic embolism. After apyrexia was obtained mitral valve and aortic valve replacement was performed. Antibiotic therapy was continued for 4 weeks and was seen to have improved in his clinical findings.

Conclusion

Infective endocarditis is a serious and life-threating disease. It's important for clinicians to be cognizant of the fact that unusual pathogens such as G. morbillorum can be an occasional cause of infective endocarditis, especially when predisposing conditions are present in the patient. The potential requirement for urgent surgical treatment despite a good response to medical treatment should also be kept in mind.

References

1.Dogan, M. (2020). Gemella morbillorum endocarditis in a patient with a bicuspid aortic valve. *Northern Clinics of Istanbul*. https://doi.org/10.14744/nci.2020.39206

2.Massoure, P. L., Lions, C., Caumes, J. L., Spadoni, S., Gaillard, P. E., & Bougere, J. (2010). Endocardite aortique fatale due à Gemellamorbillorum chez un consommateur de khat de Djibouti. *La Revue de Médecine Interne*, *31*(8), Article e7-e9. https://doi.org/10.1016/j.revmed.2009.07.021

3.Kalapurakal, g., dang, w., chukwuma, v., siddiqui, m. Z., &kumar, s. (2023). Gemellamorbillorumendocarditis : a rare disease. *Chest*, *164*(4), a1370—a1371. Https://doi.org/10.1016/j.chest.2023.07.958

4.Zakir RM, Al-Dehneh A, Dabu L, Kapila R, Saric M. Mitral bioprosthetic valve endocarditis caused by an unusual micro- organism, Gemella morbillorum, in an intravenous drug user. J Clin Microbiol. 2004; 42: 4893-4896.

5. Al-Hujailan G, Lagac-Wiens P. Mechanical valve endo- carditis caused by Gemella morbillorum. J Med Microbiol. 2007; 56: 1689-1691.

6.Pereira, S. C., Abrantes, A. L., António, P. S., Morais, P., Sousa, C., David, C., Pinto, F. J., Almeida, A. G., & Caldeira, D. (2023). Infective endocarditis risk in patients with bicuspid aortic valve : Systematic review and meta-analysis. *IJC Heart & ; Vasculature*, *47*,101249. https://doi.org/10.1016/j.ijcha.2023.101249

7.2023 ESC Guidelines for the management of endocarditis : Developed by the task force on the management of endocarditis of the European Society of Cardiology (ESC) *Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS) and the European Association of Nuclear Medicine (EANM)*. (2023). *European HeartJournal*. https://doi.org/10.1093/eurheartj/ehad625