



# Rare Case of Infective Endocarditis Due to *Gemella Morbillorum* in Patient with Bicuspid Aortic Valve

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## Authors' contributions

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

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**Case Report**

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## 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 *Gemella morbillorum* 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

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approximately 16x20mm. Blood cultures of the patient grew pan-sensitive *Gemella morbillorum*. 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 morbillorum*; embolism.

## 1. INTRODUCTION

"Infective endocarditis is a serious condition that still causes high morbidity and mortality, with an in-hospital mortality risk of around 20% despite significant advances in diagnosis, antibiotic therapy, management of complications and surgical techniques" [1-2].

"*Gemella morbillorum* is a bacterium present in the normal flora of the human oropharynx, genitourinary system and gastrointestinal tract and is one of the rare causative microorganisms of endocarditis" [3,4]. "Native valves are more frequently affected than prosthetic valves. Mitral and aortic valves are affected in almost equal numbers, sometimes even simultaneously. The tricuspid valve, on the other hand, is rarely affected" [5]. "Despite the improvements in the treatment methods, the morbidity and mortality rates are still high" [6]. "Due to its rarity, the literature on *Gemella* is limited, with most publications being case reports" [7]. This paper describes a case of *G. morbillorum* endocarditis from Morocco in a young man who had a bicuspid aortic valve.

## 2. CASE PRESENTATION

A 37-year-old male presented to our hospital with a 40-day history of fever, associated with chills, fatigue, and severe weakness of the right arm and leg, one day prior to consultation. He denied experiencing headache, dizziness, nausea, vomiting, chest pain, shortness of breath, abdominal pain, leg swelling, or urinary or bowel symptoms. 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 heart failure, renal failure or liver disease, no smoking, alcohol or illicit drug use, and no recent dental procedures. Upon admission, a physical examination revealed the patient to be febrile, with a body temperature of 39°C, his blood pressure was 100/50 mmHg, with a pulse rate was 109 beats/min. 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 (Motoricity 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.

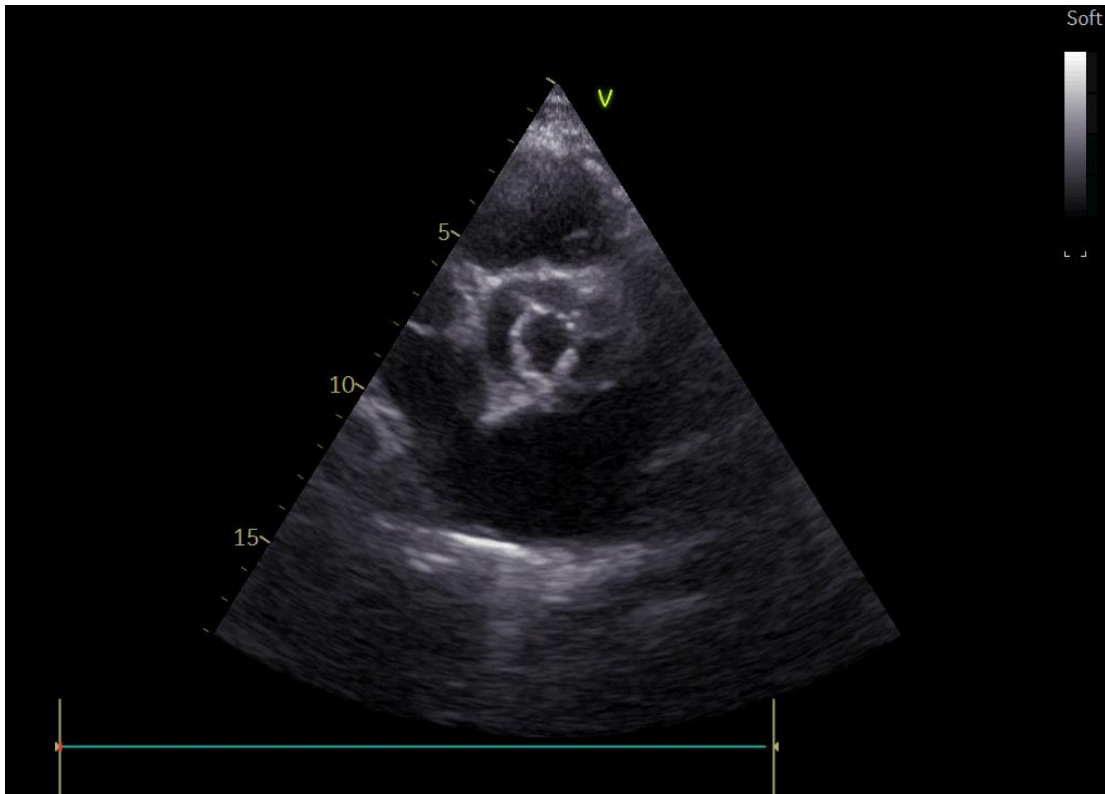
A complete blood count revealed leukocytosis (14,010/mm<sup>3</sup>) including 73% neutrophils, anemia (Hb 10.6 g/dl), platelet count of 243000/mm<sup>3</sup> and elevated C-reactive protein (73.4 mg/l), erythrocyte sedimentation rate of 55mm/h. Hepatic and renal functions were within the normal range. 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 30x8 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).

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 (Fig. 4)



**Fig. 1. Transthoracic echocardiography showing the bicuspid aortic valve**



**Fig. 2. Transthoracic echocardiography showing the vegetation on the aortic valve (blue arrow)**

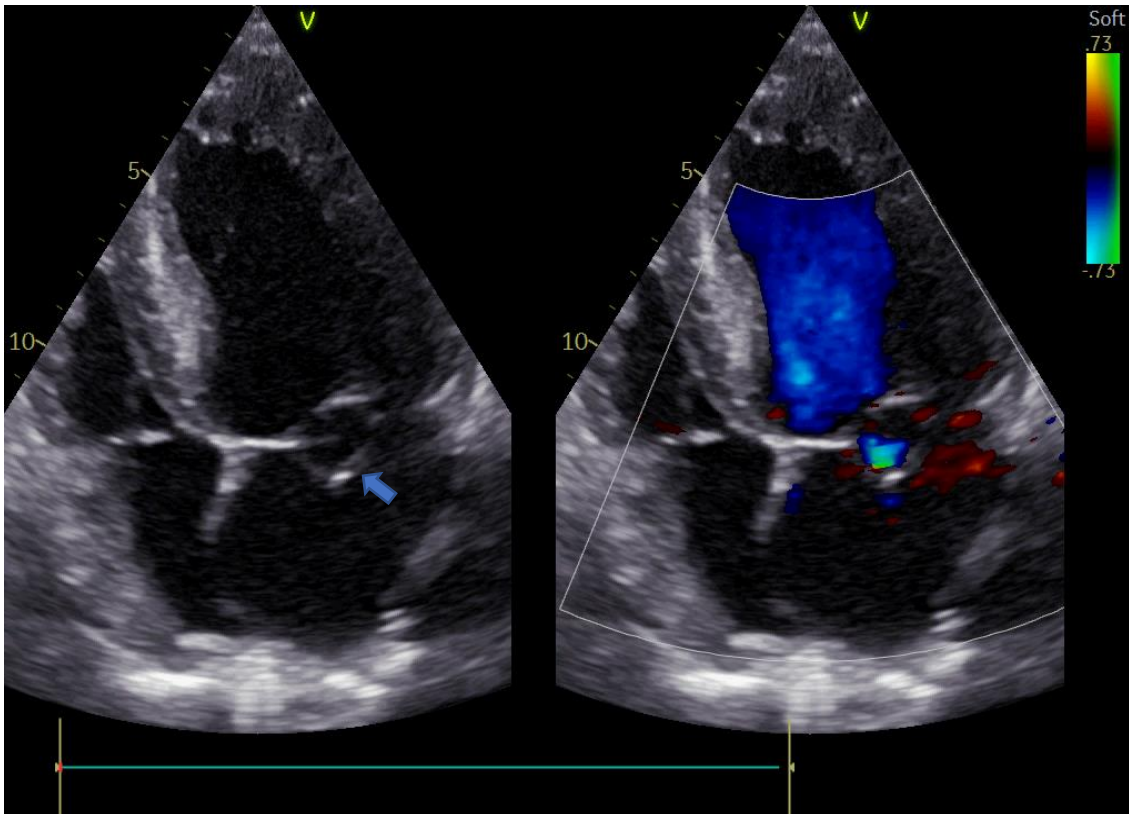


Fig. 3. Transthoracic echocardiography showing fistulized abscess of the anterior mitral leaflet

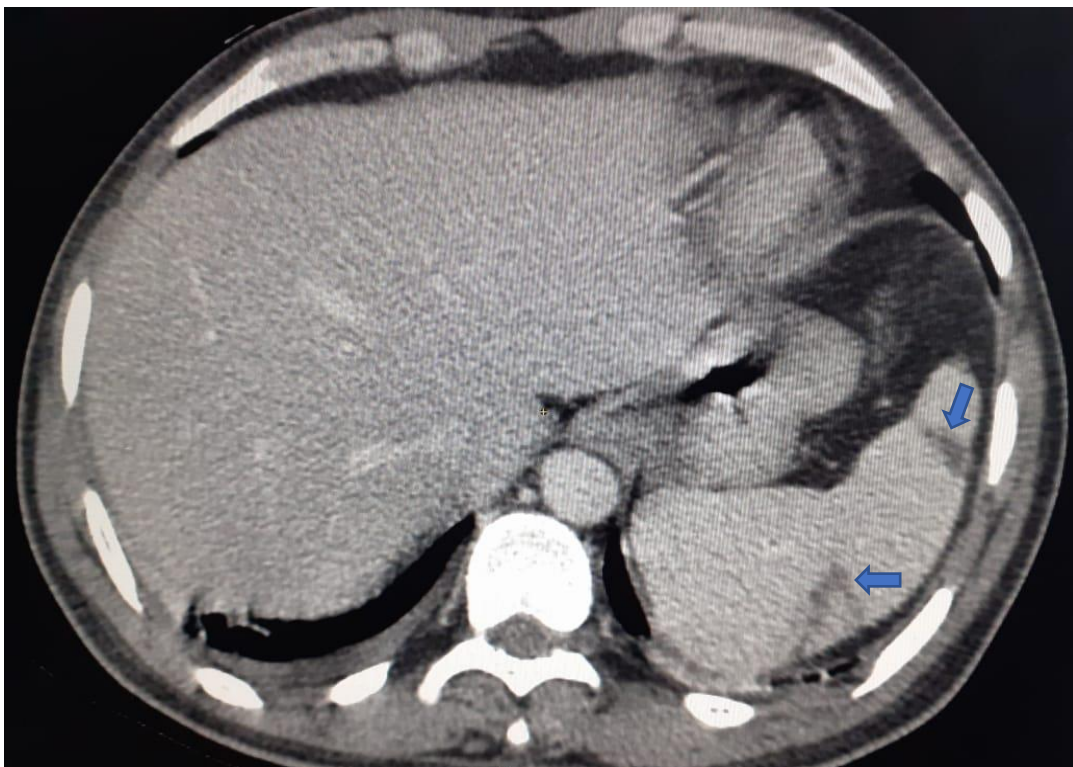


Fig. 4. thoraco-abdomino-pelvic CT showing splenic infarcts

Three sets of blood culture were obtained from the patient who was hospitalized to investigate the cause of fever. Intravenous ceftriaxone 1x2 g/day and gentamicin 3mg/kg/day IV was 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.morbilorum*, and the antibiogram revealed resistance to penicillin G and tetracycline and sensibility to vancomycin, rifampin, gentamycin and ceftriaxone. Initial antibiotic treatment was maintained on the basis of antibiogram results.

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 15<sup>th</sup> day of the treatment, transthoracic echocardiography control 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 caries has 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 uneventful and the patient has remained symptom-free during follow-up.

### 3. DISCUSSION

"*G. morbillorum* wick 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" [8-9]. "*G. Morbillorum* is one of the rare causative microorganisms of endocarditis, its incidence in the literature is rare, with less than 40 documented cases, but can cause rapid destruction of heart valves and significant clinical deterioration" [6,10]. "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" [11-12]. "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" [13]. "Both native and prosthetic valves can be affected. Aortic valve is more frequently affected than mitral valve and bivalvular damage is possible" (8-9). "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" [13]. "In our patient, poor oral health and bicuspid aortic valve were considered important predisposing factors. The treatment of *G. morbillorum* is 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" [10]. "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 and uncontrolled infection" [7-14].

Our patient's case presented a major challenge. Not only did he had two perforated valves causing severe aortic and mitral, but we also suspected that his congenital bicuspid aortic valve, in addition to his poor dental hygiene, had played a role in the onset of his condition. The aortic valve vegetations had probably spread to the mitral valve, exacerbating an already complex situation. Despite the severity of his valve problems, the patient presented none of the typical symptoms associated with valve problems. Instead, he was admitted following a stroke, adding complexity to an already complicated case. 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 associated with cerebral and splenic embolism. Antibiotic therapy was continued for 4 weeks and was seen to have improved in his clinical findings.

#### 4. CONCLUSION

Infective endocarditis is a serious and life-threatening 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.

#### CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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