Infective Endocarditis Caused by *Finegoldia magna* Following Aortic Dissection Repair: A Case Report and Data Evaluation

AB 1 Khetam Hussein

ACDEF 2 Ziv Savin

ABDE 2 Liran Shani

E 2 Yaakov Dickstein

BEF 3 Yuval Geffen

ABDEF 1,2 Ayelet Raz-Pasteur

Corresponding Author: Ayelet Raz, e-mail: a_raz@rambam.health.gov.il

Conflict of interest: None declared

**Patient:** Male, 45

**Final Diagnosis:** Endocarditis

**Symptoms:** —

**Medication:** —

**Clinical Procedure:** Antibiotic treatment and aortic repair

**Specialty:** Surgery

**Objective:** Unusual clinical course

**Background:** *Finegoldia magna* (*F. magna*) is a rare pathogen causing infective endocarditis (IE). Only 7 cases are documented in the literature.

**Case Report:** We report a case of infective endocarditis in a 45-year-old male due to *F. magna* 2 months after a Bentall procedure. He presented with fever, dyspnea, and chest pain. Aerobic and anaerobic blood samples were drawn before empirical antibiotic treatment was initiated. A transesophageal echocardiogram (TEE) demonstrated several findings involving the prosthetic valve, including a vegetation. The patient underwent a second aortic repair procedure. Tissue cultures obtained from 2 sources in the infected area during the operation were positive for *F. magna*. The antibiotic regimen was changed in accordance with susceptibility testing to piperacillin/tazobactam. Two weeks after the operation, the patient was released with a recommendation for antibiotic treatment for 8 weeks.

**Conclusions:** We report this case because *F. magna* in a rare pathogen causing endocarditis. This was a case of prosthetic valve *F. magna* IE in which the definitive diagnosis was based on tissue cultures following sterile blood cultures. Data evaluation of all *F. magna* IE reported cases illustrated that tissue cultures were the predominant microbiologic diagnostic tool used.

**MeSH Keywords:** Endocarditis • Heart Valve Prosthesis • Peptostreptococcus

**Full-text PDF:** http://www.amjcaserep.com/abstract/index/idArt/892057
Background

*Finegoldia magna* (formerly *Peptostreptococcus magnus*) is part of the normal human mucocutaneous flora and is one of the most common gram-positive anaerobic cocci isolated from clinical specimens [1]. Peptostreptococcus species have been described as pathogens of upper respiratory infections, ear, sinus and mastoid infections, osteomyelitis, and soft tissue abscesses and ulcers [1–3]. In addition, these species have been reported to cause nosocomial infections, including lung and soft tissue abscesses, sinusitis, and bone infections [4].

Over the last 3 decades, anaerobic bacteria have been identified as the causative agent in up to 16% of published infective endocarditis cases [5]. Specifically, there have been 21 published reports of IE caused by Peptostreptococcus spp. [6]. *F. magna* was identified as the agent in only 7 cases, mostly by tissue culture taken during surgical procedure following sterile blood cultures [7–11].

Case Report

A 45-year-old man was admitted to the department of internal medicine for evaluation in March of 2012 following complaints of fever, dyspnea, and chest pain. Two months prior to his admission, the patient had undergone resection and replacement of the ascending aorta due to a dissecting aneurysm. The procedure included a composite aortic graft incorporated with a 25-mm aortic mechanical valve. The patient was discharged 8 days after the operation in good general condition. On readmission the patient reported 2 days of chest pain and dyspnea. He had a documented fever of 39°C at home with a single episode of night sweats.

Vital signs on admission included an oral temperature of 37°C, blood pressure 95/60, respiratory rate 30 breaths per minute and blood oxygen saturation level of 96% while breathing room air. Physical examination demonstrated no remarkable findings. Laboratory tests revealed a slight leukocytosis of 12,400 cells/µl (normal range 4,500–10,000 cells/µl), hemoglobin level of 11.8 g/dL (13.5–16.5 g/dL), cardiac t-Troponin peak value of 0.12 ng/mL (<0.02 ng/mL), and elevated erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels of 65 mm/hr (20–25 mm/hr) and 196.33 mg/L (<6 mg/L), respectively. The patient was receiving warfarin therapy and the international normalized ratio (INR) was in the therapeutic range (2.69). Chest X-ray showed no pathologic findings. ECG demonstrated incomplete right bundle branch block and inverted T waves in leads V2-3, unchanged from previous tracings. Aerobic and anaerobic blood cultures were drawn before empirical antibiotic treatment was initiated with vancomycin, rifampin, and gentamicin.

A TEE demonstrated a large mass surrounding the ascending aorta with multiple cavitations and dehiscence of the intervalvalular fibrosa, with a vegetation extending to the left ventricle outflow tract and involving the prosthetic valve (Figure 1). These finding were consistent with a large infected hematoma and/or abscess.

The patient underwent a second aortic repair procedure and the proximal aortic graft was replaced with a new composite mechanical valve and prosthetic aortic graft. Surgical findings included a large peri-valvular abscess extending around the detached proximal aortic graft and extensive tissue damage involving the coronary graft insertions. While 5 sets of aerobic and anaerobic blood cultures taken prior to the surgery were negative, tissue cultures obtained from 2 sources in the infected area during the operation were positive for *F. magna*. Anaerobic cultures were performed on Centers for Disease Control (CDC) anaerobe 5% sheep blood agar plates (Hy Laboratories, Rehovot, Israel) incubated for 5 days in an anaerobic jar. Isolate identification was performed on the Vitek-2 system (bioMérieux, Marcy l’Etoile, France) with the anaerobic and coryneform bacteria (ANC) card. Susceptibility to antibacterial agents was performed using E-test (AB Biodisk, Solna, Sweden) in accordance with the manufacturers’ instructions. Results were interpreted according to breakpoints defined by the Clinical and Laboratory Standard Institute (CLSI) [12]. The patient recovered slowly from the operation and the antibiotic regimen was modified in accordance with susceptibility testing to piperacillin/tazobactam administered through a peripherally inserted central catheter (PICC).

TEE performed 10 days after the surgery revealed normal morphology and function of the prosthetic valve and proper graft integrity. A single peak of white blood cells (20,000 cells/µl) was observed shortly after the surgery and resolved the following day. Two weeks after the operation the patient was released with a plan for continued ambulatory treatment with piperacillin/tazobactam for a total of 8 weeks.

Four weeks after the surgery the patient visited the surgical post-op clinic following an oral temperature of 38.2°C. Blood workup revealed mild leukopenia. TEE demonstrated no pathological findings. After ruling out other possible causes, a diagnosis of drug-related fever was made and piperacillin/tazobactam was replaced with meropenem. The patient completed the 8-week course of antibiotic therapy, with normalization of leukocyte levels and without recurrence or complications up to a year afterwards.

Discussion

As part of the Peptostreptococcus spp., *F. magna* rarely cause IE and was first documented as a causative agent in 1985,
presenting as an infection of a native mitral valve [7]. Since then, only 6 additional cases of IE due to *F. magna* have been published, all in patients with prosthetic valves [8–11], a major risk factor for IE [13]. In our case, we present the 8th reported case of *F. magna* as an early post-operative IE.

Table 1 summarizes data regarding previous *F. magna* IE cases. The mean age of patients (including the individual presented above) is 53, with a male-to-female ratio of 3:1. Except for 1 patient, all cases followed valve-replacement surgery and 6 out of 7 of these were an early complication. The median delay between the surgical procedure and the onset of *F. magna* IE was 2 months. All cases involved the mitral or aortic valves, with an aortic-to-mitral ratio of 5:3. The most frequent echocardiogram findings were vegetations on the prosthetic valves and paravalvular leak. Surgery was required in all the cases involving artificial valves, including ours, and 6 of 7 patients that underwent surgery were diagnosed with *F. magna* endocarditis only through tissue culture results and not by blood cultures. The statistical data analysis is shown in Table 2.

In most of the *F. magna* IE cases, including ours, blood cultures were negative and definitive diagnosis was made only by tissue cultures obtained during the surgical procedure. Regarding other rare diseases, Solen et al. reported a case of postoperative mediastinitis due to *F. magna* with repeated negative cultures and final diagnosis based on mediastinal fluid cultures [14].

Anaerobic bacteria are overlooked or missed unless the specimen is properly collected and transported to the laboratory and then subjected to appropriate process for isolation, including the use of specialized media supplemented with growth factors. Anaerobes vary in their sensitivity to oxygen and in their nutritional requirements, but most isolates require vitamin K and hemin for growth. Proper collection media and incubation are vital to the recovery of anaerobes [15]. In general, reasons for negative blood cultures can be technical, linked to the type and the site of infection, due to the nature of the microorganism, and/or caused by prior administration of antibiotics. In our case, blood cultures were drawn before administration of antibiotics. However, we cannot exclude that the

![Figure 1. Transesophageal echocardiogram demonstrating a large mass surrounding the ascending aorta with multiple cavitations (A – short axis) and dehiscence of the intervalvular fibrosa, with a vegetation extending to the left ventricle outflow tract (LVOT) and involving the prosthetic valve (B – long axis, C – color flow showing connection between the mass lumen and the LVOT). Findings were consistent with a large infected hematoma and/or abscess.](image_url)
negative blood cultures were the result of the specific blood culture system being used in our center. Bassetti et al. reported that an *F. magna* strain causing endocarditis did not grow in BacT/Alert™ and Bactec 9240 system but did grow in the Septi-Chek BHI-S and the Isolator system [10]. Therefore, it may be suggested that IE due to *F. magna* should be considered as a culture-negative endocarditis. Culture-negative IE patients require more time for initiation of antibiotic therapy [16]. Awaiting the operation and tissue cultures delays the diagnosis of *F. magna* and the appropriate antibiotic treatment according to susceptibility test (e.g., penicillin, amoxicillin, or piperacillin). Thus, clinical suspicion of IE presenting soon after a surgical valve operation, with sterile cultures, should raise the suspicion of anaerobe IE, specifically *F. magna* IE, when initiating the appropriate empirical antibiotic therapy.

Conclusions

We present a case of early post-operative *F. magna* IE in which the patient fully recovered without any complications. This is

### Table 1. Characteristics of 8 patients with *F. magna* IE.

| Case # | Year | Age | Sex | Predisposition | Echocardiography signs | Delay since valve surgery | Diagnostic method | Antibiotic treatment | Outcome | Reference |
|--------|------|-----|-----|----------------|------------------------|---------------------------|-------------------|---------------------|---------|-----------|
| 1      | 1985 | 18  | M   | Native mitral valve | Mitral regurgitation, Vegetation | No surgery | Blood culture | Penicillin followed by Vancomycin | Death   | [7]       |
| 2      | 1992 | 77  | F   | Prosthetic aortic valve | Valve abscess, paravalvular leak | 3 months | Valve culture | Penicillin + Gentamicin | Resolution | [8]       |
| 3      | 2000 | 65  | M   | Mechanical mitral valve | Paravalvular leak, dehiscence vegetations | 23 days | Valve culture + PCR | Vancomycin + Gentamycin + Rifampin | Death   | [9]       |
| 4      | 2000 | 39  | M   | Mechanical aortic valve | Paravalvular leak, dehiscence, vegetations, aortic root abscess | 2 months | Valve culture | Penicillin + Metronidazole | Resolution | [9]       |
| 5      | 2003 | 68  | M   | Mechanical aortic valve | Paravalvular leakage | 13 days | Aortic wall culture + PCR | Penicillin | Resolution | [10]      |
| 6      | 2008 | 55  | M   | Prosthetic aortic valve | Valvular abscess, paravalvular leakage | 2 months | Valve culture + PCR | Amoxicillin/CA* | Resolution | [11]      |
| 7      | 2008 | 59  | F   | Mechanical mitral valve | Obstructive thrombus | 2 years | Valve and blood culture + PCR | Amoxicillin/CA* | Resolution | [11]      |
| 8      | 2012 | 45  | M   | Mechanical aortic valve | Cavitations and dehiscence, vegetations, paravalvular abscess | 2 months | Valve culture | Piperacillin/TA** | Resolution | Present case |

* CA – clavulanate; ** TA – tazobactam.

### Table 2. Statistics of *F. magna* IE cases.

| Statistical estimation – 8 cases | 
|-----------------------------| 
| Mean age | 53 years |
| M/F ratio | 3:1 |
| Aortic/Mitral ratio | 5:3 |
| Median delay between surgery and onset | 60 days |
| Mortality | 25% of cases |

### Echocardiogram findings

| Paravalvular leakage | 62.5% of cases |
| Vegetations | 50% of cases |

### Antibiotic treatment

| Penicillin | 50% of cases |
| Amoxicillin | 25% of cases |
the 8th documented case of *F. magna* IE, a rare cause of endocarditis. Our data evaluation regarding *F. magna* IE strengthens the suggestion that this agent is often presented as culture-negative IE. As in our case, diagnosis is almost always based on tissue culture obtained during the surgical procedure. Thus, one should consider *F. magna* as a possible etiology when clinical presentation of IE arises in a patient who has recently had replacement surgery and in who the blood cultures are negative. This consideration may affect the selection of empirical antibiotic agents.

References:

1. Murdoch DA: Gram-positive anaerobic cocci. Clin Microbiol Rev, 1998; 11: 81–120
2. Bourgault AM, Rosenblatt IE, Fitzgerald RH: Peptococcus magnus: a significant human pathogen. Ann Intern Med, 1980; 93: 244–48
3. Brook I: Microbiology of nosocomial sinusitis in mechanically ventilated children. Arch Otolaryngol Head Neck Surg, 1998; 124: 35–38
4. Brook I: The role of anaerobic bacteria in sinusitis. Anaerobe, 2006; 12: 5–12
5. Sapico FL, Sarma RI: Infective endocarditis due to anaerobic and microaerophilic bacteria. West J Med, 1982; 137: 18–23
6. Minces LR, Shields RK, Sheridan K et al: Peptostreptococcus infective endocarditis and bacteremia. Analysis of cases at a tertiary medical center and review of the literature. Anaerobe, 2010; 16: 327–30
7. Cofsky RD, Seligman SJ: Peptococcus magnus endocarditis. South Med J, 1985; 78: 361–62
8. Pouedras P, Donnio PY, Sire JM, Avril JL: Prosthetic valve endocarditis and paravalvular abscess caused by Peptostreptococcus magnus. Clin Infect Dis, 1992; 15: 185
9. Van der Vorm ER, Donnorp AM, Van Ketel RJ, Dankert J: Apparent culture-negative prosthetic valve endocarditis caused by Peptostreptococcus magnus. J Clin Microbiol, 2000; 38: 4640–42
10. Bassetti S, Laifer G, Goy G et al: Endocarditis caused by *Finegoldia magna* (formerly Peptostreptococcus magnus): diagnosis depends on the blood culture system used. Diagn Microbiol Infect Dis, 2003; 47: 359–60
11. Fournier PE, La MV, Casalta JP et al: *Finegoldia magna*, an early post-operative cause of infectious endocarditis: report of two cases and review of the literature. Anaerobe, 2008; 14: 310–12
12. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing: Twentieth Informational Supplement M100-S20. Wayne, PA, USA: CLSI; 2010
13. Brook I: Infective endocarditis caused by anaerobic bacteria. Arch Cardiovasc Dis, 2008; 101: 665–76
14. Solen K, Matta M, Annie BH et al: Postoperative mediastinitis due to *Finegoldia magna* with negative blood cultures. J Clin Microbiol, 2009; 47: 4186–82
15. Hallander HO, Flodstrom A, Aberg C: Collection and transport of specimens for anaerobic culture. Infection, 1980; 8: 147–50
16. Siciliano RF, Mansur AJ, Castelli JB et al: Community-acquired culture-negative endocarditis: clinical characteristics and risk factors for mortality. Int J Infect Dis, 2014; 25: 191–95