Post-operative Mediastinitis due to *Finegoldia magna* with Negative Blood Cultures.

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Abstract

We report the case of a *Finegoldia magna* (formerly known as *Peptostreptococcus magnus*) mediastinitis following coronary artery bypass in a 50-year-old patient. Even if staphylococci remain the main causative organism of postoperative mediastinitis, the responsibility of anaerobic bacteria must be evoked in case of fever and sternal drainage with negative blood cultures.

Case report

A 50-year-old man was admitted to the cardiothoracic surgery department to undergo a coronary bypass surgery. His past medical history was remarkable for high blood pressure, dyslipidemia and myocardial infarction two years earlier, treated by percutaneous angioplasty of the right coronary artery. He also had undergone two surgical interventions on both maxillary sinuses in the past twenty years for recurrent sinusitis. Because of persisting chest pain episodes one year after the myocardial infarction, a cardiac catheterization was performed and disclosed double-vessel coronary atherosclerosis. The patient underwent a double internal mammary-coronary artery bypass on October 15th 2008. The prophylactic antibiotherapy protocol included intranasal application of mupirocin before and 4 days after the intervention and intravenous cefamandole during surgery. Neither intra-operative, nor immediate postoperative complications were noted. Three days after surgery, the patient was febrile at 38.9°C, in association with dehiscence and instability of the sternum, moderate pain and local erythema. There was no sign of necrosis of the skin. His leukocyte count was 12,000/mm³. Three blood samples, respiratory and urine samples were drawn, and all aero- and anaerobic cultures were negative after 24H (*BacT/Alert* with *FAN* medium containing charcoal, Biomérieux, Lyon, France). Purulent wound discharge appeared the day after, for which Gram stain and cultures were also negative after 24H. Because of persistent fever and abundant exudates draining from the median sternotomy incision, a deep sternal puncture was performed. Cultures of the mediastinal fluid were all negative except for a single enriched liquid media which...
grew a *Streptococcus oralis*. The patient was placed under intravenous antibiotherapy by amoxicillin, vancomycin and gentamicin on October 21st and underwent extensive sternal and mediastinal debridement with placement of eight mediastinal drainage tubes on the same day. Blood cultures, all performed before administration of antibiotics, remained negative. However, all intraoperative cultures of mediastinal material grew within 48 hours a *Peptostreptococcus* spp. 16S RNA gene amplification and sequencing was realized as described before (11), and led to the identification of *Finegoldia magna* (formerly *Peptostreptococcus magnus*). The strain was susceptible to metronidazole and amoxicillin and resistant to clindamycin and erythromycin. Vancomycin and gentamicin were discontinued and metronidazole added to the amoxicillin. Apyrexia was obtained two days after surgery and the patient completed a 6-week course of amoxicillin and metronidazole. On last visit 90 days after first surgery, the patient was afebrile with satisfactory sternotomy closure.

*Finegoldia magna* is a Gram-positive anaerobic cocci, part of the normal flora of the human mucocutaneous surfaces. It is frequently isolated in infections of soft tissues and the peritoneal cavity, and few cases of endocarditis and pericarditis have also been reported (2, 9, 12, 17). Post-sternotomy mediastinitis due to *F. magna* is far more uncommon. To our knowledge, only 5 cases formally due to *F. magna* have been reported by now (Table, 4-8, 15).

As illustrated in table, anaerobic mediastinitis following cardiothoracic surgery are often polymicrobial (Table). However, in our case the association with *Streptococcus oralis* was not considered significant since the *S. oralis* strain had been cultured in only one single specimen in enriched medium and not recovered in intraoperative cultures. Since anaerobes are often isolated in deep wound infections, it is surprising that anaerobic mediastinitis have been reported infrequently. Considering the increased isolation of anaerobic bacteria observed elsewhere (10), one can hypothesize that it is due to technical difficulties, highlighting the need for routine use of anaerobic
blood culture bottles in cardiac surgery centers and enhancing the usefulness of mediastinal punctures.

The source of infection in our patient could not be established with certainty. A past history of recurrent sinusitis was noted but he had undergone two successful surgical procedures of the sinus several years before with no recent recurrence. He also had no particular condition (i.e. malnutrition, immunosuppression, malignant or hematologic disease) which have been previously described as risk factors of anaerobic infection (10).

Since clinical examination and imaging techniques have shown low sensibility and specificity in early diagnosis of postsurgical mediastinitis (1), blood cultures are frequently used as diagnostic test. In the retrospective analysis of 266 patients displaying post-sternotomy mediastinitis within the 60 days postsurgical period, blood culture seemed to be most accurate in patients with *S. aureus* bacteremia, (14). However, in patients with mediastinitis due to other infectious agents, 67% had negative blood cultures, like our patient. In general, reasons for negative blood cultures can be: (i) technical, (ii) linked to the type and/or site of infection, (iii) due to the nature of the microorganism, and/or (iv) caused by prior administration of antibiotics. In our case, all blood cultures had been drawn before administration of antibiotics. However, we cannot exclude that the blood culture system explains why blood cultures remained negative. Indeed, Bassetti *et al* (2, also citing 17) have reported that a *Finegoldia magna* strain causing endocarditis did not grow in the BacT/AlertT and Bactec 9240 systems, but grew in other systems, i.e. Septi-Chek BHI-S and in the Isolator system. Complicated skin and skin structure infections with anaerobes are also classically not associated with positive blood cultures (13, 16), and Gram-positive anaerobic cocci are difficult to grow.

Like illustrated in our case, the diagnosis of bacterial mediastinitis is highly plausible in a patient with fever and sternal pain, drainage or dehiscence following cardiothoracic surgery, even in the presence of negative repeated blood cultures. More invasive procedures for confirmation of diagnosis (e.g. mediastinal puncture) are very helpful (3). In the review by Brook *et al.*, the high rate
of recovery of anaerobic bacteria (23%) in case of post-surgical wound sternal infections was probably due to the systematic use of deep wound puncture (4). Mediastinal puncture contributes to earlier diagnosis and consequently reduce the length of mechanical ventilation and hospital stay, but its use is unfortunately not generalized (3).

In conclusion, anaerobic agents can be responsible for postoperative mediastinitis even if staphylococci remain the main causative organisms. This should particularly be kept in mind when facing a patient with fever and sternal drainage with negative blood cultures in the days following cardiothoracic surgery, and should encourage the use of deep sternal puncture and anaerobic culture media for all microbiologic samples. **Appropriate sampling and culturing can probably lead to increased isolation of anaerobic pathogens in this postoperative complication.**

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### References


<table>
<thead>
<tr>
<th>Year</th>
<th>Reference</th>
<th>Number of cases reported</th>
<th>Age/Gender</th>
<th>Type of surgery</th>
<th>Prophylaxis</th>
<th>Bacteriological Findings Multivisceral Flud Blood Cultures</th>
<th>Antimicrobial Therapy</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>(Cerat et al.)</td>
<td>1</td>
<td>65/Male</td>
<td>Coronary bypass</td>
<td>Cephalotin</td>
<td><em>Bacteroides fragilis</em></td>
<td><em>Bacteroides fragilis</em></td>
<td>Clindamycin Cured</td>
</tr>
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<td>(Smith et al.)</td>
<td>2</td>
<td>65/Male</td>
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<td>Cephepirin</td>
<td><em>Bacteroides brevis</em> <em>Staphylococcus epidermidis</em></td>
<td><em>Bacteroides brevis</em></td>
<td>Clindamycin Ticarcillin Gentamicin Cured</td>
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<tr>
<td>1985</td>
<td></td>
<td></td>
<td>44/Male</td>
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<td>Cephalotin</td>
<td><em>Bacteroides fragilis</em> <em>Staphylococcus epidermidis</em></td>
<td><em>Bacteroides fragilis</em></td>
<td>Clindamycin Ticarcillin Gentamicin Cured</td>
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<tr>
<td>1988</td>
<td>(Czachor et al.)</td>
<td>1</td>
<td>48/Male</td>
<td>Coronary bypass</td>
<td>Cefamandole</td>
<td><em>Bacteroides oralis</em> <em>Staphylococcus epidermidis</em> <em>α-hemolytic streptocci</em></td>
<td><em>Bacteroides fragilis</em></td>
<td>Clindamycin Vancomycin Cured</td>
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<tr>
<td>1989</td>
<td>(Brook et al.)</td>
<td>15</td>
<td>Various</td>
<td>Various</td>
<td>Various</td>
<td><em>10 Peptostreptococcus species, including 4 Finegoldia magma</em> 4 Bacteroides species 2 Propionibacterium species 2 Clostridium species</td>
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<td>2008</td>
<td>Present case</td>
<td>1</td>
<td>50/Male</td>
<td>Coronary bypass</td>
<td>Cefamandole</td>
<td><em>Finegoldia magna</em></td>
<td>Negative</td>
<td>Metronidazole Amoxicillin Cured</td>
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</tbody>
</table>

* *a specimen with anaerobic bacteria only and 9 with mixed aerobic, facultative and anaerobic bacteria, over a series of 74 patients with postthoracotomy sternal wound infection. b formerly Peptostreptococcus magnus. c only local debridement performed in this patient. |