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Abstract

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Case report - Aortic and aneurysmal

**Mycoplasma hominis** mediastinitis after acute aortic dissection repair

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Abstract

We report a case of ascending aortic graft infection by an atypical bacteria, *Mycoplasma hominis*, with mediastinitis, a dreaded complication after cardiac surgery. A 55-year-old patient underwent ascending aorta replacement for acute type A dissection. He developed sternal instability and purulent discharge, requiring sternal wire removal and debridement. Cultures were initially sterile, but showed *M. hominis* infection after a significant delay and in specific culture media. The patient was treated with doxycycline and moxifloxamine. Cultures became negative and the sternum was closed on the 28th postoperative day after the first debridement. Recovery was favorable, with no signs of infection. Antibiotics were continued for one year. The patient is still asymptomatic 16 months after antibiotic interruption. Atypical organisms should be considered in the differential diagnosis of acute mediastinitis of unknown etiology after routine microbiological investigations.

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Keywords: Aortic dissection; Aortic operation; *Mycoplasma hominis* mediastinitis

1. Introduction

Deep sternal wound infection is a dreaded complication after cardiac surgery, due to significant morbidity and mortality despite prompt and aggressive surgical intervention and administration of adequate antimicrobial agents. Graft infection after thoracic aortic surgery occurs in 0.9–1.9% of patients [1] and implies a mortality of 25–75% [2]. Surgical approaches leave some forms of graft material vulnerable to recurrent infection: the original graft, remnants that cannot reasonably be removed or an entirely new graft implanted in the old site. Additional strategies are used to prevent recurrence, such as omental flaps, local antibiotic irrigation, homografts and life-long suppressive antibiotic therapy. Previously uncommon pathogens are increasingly being identified in surgical infections. These microorganisms may be difficult to culture in usual media, or can be resistant to conventional empiric antimicrobial agents, resulting in delayed initiation of appropriate therapy. *Mycoplasma hominis* is a rare cause of mediastinitis [3], deep sternal wound infection [4], and an agent of blood culture-negative endocarditis [5]. We report an ascending aortic graft infection by this fastidious microorganism, to our knowledge not previously reported in the literature.

2. Case report

A 55-year-old immunocompetent white male with a medical history of hypertension and right collarbone fracture, underwent emergent ascending aorta surgical replacement for acute type A aortic dissection. Femoro-femoral cardiopulmonary bypass was instituted. The dissected ascending aorta was resected and replaced by a 28-mm Dacron graft (Intervascular®, Datascpe Corp., Montvale, NJ, USA). The postoperative course was initially favorable. However, the sternum became unstable on the 16th postoperative day (POD), with a clean surgical wound and no discharge, and required reoperation with steel wire sternal closure for seemingly sterile sternal dehiscence.

On POD 22, the patient showed increased inflammatory parameters (C-reactive protein 319 mg/l, leucocytes 13.2 g/l). Empirical antibiotic treatment was started with imipenem and vancomycin, but the patient developed febrile episodes despite antibiotic therapy. Computed chest tomography (CT) on POD 23 showed moderate pericardial effusion and bilateral pleural effusion. Percutaneous drainage of the pleural effusion did not identify any bacteria on Gram staining and a culture was negative after three days. However, this specimen, later proved positive for *M. hominis* after five days of culture (POD 32). Sternal instability relapsed on POD 27, with the development of a purulent discharge from the surgical wound. The patient underwent sternal wire removal, debridement and vacuum-assisted closure therapy on POD 28. Imipenem was stopped and...
tazobactam was introduced empirically. Cultures of the pericardial discharge, sternum and aortic graft were positive for \textit{M. hominis} on POD 44, after 16 days of culture. PCR on one blood sample (from three) showed five copies/ml of \textit{M. hominis}. Piperacillin and tazobactam were discontinued, in favor of doxycycline and moxifloxacin. Transesophageal echocardiography did not identify any signs of aortic valve or graft endocarditis. Under continued vacuum-assisted closure therapy, cultures became negative and the sternum was successfully closed using steel wires on the 28th POD after sternal debridement. Recovery was favorable, with no signs of local or systemic infection.

However, cultures and PCR from specimens taken during closure were again positive for \textit{M. hominis}. Chest CT and transesophageal echocardiography did not show evidence of peri- or endograft infection. The logistic EuroSCORE for a reoperation to remove all infected graft and tissues with a homograft gave a predicted mortality >25%. Given the favorable course under antibiotic treatment, it was decided to continue conservative management. The patient was discharged 67 days after the index operation in a stable condition, without any local or systemic signs of infection. Antibiotics were continued for four months. Chest CT at that time did not show any perigraft infection and transesophageal echocardiography did not show any evidence of aortic valve or graft endocarditis. Doxycycline was stopped and moxifloxacin was continued for a total of one year from the index operation. The patient remained asymptomatic at 12 months, with a clean sternal wound, and no evidence of infection on blood examination. Blood polymerase chain reaction for \textit{M. hominis} was negative. CT again did not show any perigraft infection and transesophageal echocardiography did not reveal any evidence of endocarditis. Moxifloxacin was stopped and the patient has remained asymptomatic for 16 months. He remains under close clinical surveillance for any signs of recurrence of infection.

3. Discussion

\textit{Mycoplasma hominis} is a commensal bacteria of the urogenital tract. It is usually responsible for infections in the genitourinary tract and of gynecological surgical wounds. \textit{Mycoplasma hominis} mediastinitis has been reported, mainly after coronary artery bypass grafting and heart and/or lung transplantation, and rarely after aortic valve replacement and ventricular septal defect closure [4, 6].

The diagnosis of \textit{M. hominis} infection is difficult. This microorganism is characterized by its minute size and lack of a cell wall, which means that it cannot be Gram stained and is naturally resistant to beta-lactam antibiotics that interfere with peptidoglycan biosynthesis. \textit{Mycoplasma hominis} is a fastidious slow-growing organism, which may not be readily identified by using routine culture protocols and whose growth might further be inhibited by sodium polyanethol sulfonate used in some culture media. This represents a major impediment to its identification using standard culture media, and explains the delay in correct diagnosis and treatment in our patient.

Tetracyclines in association with clindamycin or moxifloxacin are the antibiotics of choice for treating \textit{M. hominis} postsurgical wound infection. Our patient responded rapidly to antibiotics effective on \textit{M. hominis}, allowing sternal closure without resorting to an omental flap given the excellent clinical response to antibiotics, followed with rapid wound healing. Reoperation was considered too risky in a stable, asymptomatic patient, and suppressive long-term antibiotics successfully treated the suspected graft infection. The ideal duration of antibiotic treatment is unknown, although most surgeons would err on the side of caution and recommend life-long treatment, as it is virtually impossible to eliminate all bacteria which have infected prosthetic material, short of removing the material. Long-term antibiotic treatment also carries its risks, including resistance selection, prompting the discontinuation of antibiotics after 12 months of effective treatment. The patient remains at risk for a future reactivation of the infection, and thus remains under close clinical surveillance.

In conclusion, \textit{M. hominis} should be considered in the differential diagnosis of acute purulent mediastinitis of unknown etiology after routine microbiological investigations (Gram/culture) along other fastidious pathogens, such as \textit{M. tuberculosis}, which cannot be identified in standard cultures.

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References

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