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Case report

Haemophilus influenzae serotype f endocarditis and septic arthritis

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A B S T R A C T

Haemophilus influenzae represents gram-negative coccobacilli which can cause endocarditis, meningitis, septicemia, pneumonia, septic arthritis. *H.influenzae* exists as encapsulated and unencapsulated (non-typeable) strains. Non-typeable *H.influenzae* are emerging pathogens especially in elderly population. We report a case of a 73 year old woman with bacteremia, endocarditis and septic arthritis due to *H.influenzae* serotype f. This case emphasizes the clinical features and the key elements of diagnosis and management of infections caused by non-typeable strains of *H.influenzae*.

1 Introduction

Haemophilus influenzae represents small nonmotile, non-spore forming, gram-negative coccobacilli that is strictly a human pathogen [1]. *H.influenzae* exists as encapsulated and unencapsulated (non-typeable) strains. The encapsulated strains carry a unique polysaccharide capsule, and they are correspondingly divided into six serotypes, namely a–f [2]. The spectrum of disease caused by this organism includes endocarditis, meningitis, septicemia, pneumonia, epiglottitis, septic arthritis, osteomyelitis, cellulitis, peritonitis, and pleuritis [3]. Endocarditis caused by *Haemophilus, Actinobacillus, Cardiobacterium, Eikenella, and Kingella* (HACEK) species is a rare event, accounting for less than 2% of cases [4]. Bacterial endocarditis due to *H.influenzae* involves diagnostic and therapeutic challenges of considerable interest [5]. Treatment of choice for *H.influenzae* endocarditis is intravenous ceftriaxone for a period of at least 4 weeks [4]. We describe a case of endocarditis and septic arthritis due to *H.influenza* serotype f.

2 Case presentation

A 73-year-old woman with past medical history of type 2 diabetes mellitus and osteoarthritis with bilateral knee replacement presented with right ankle and bilateral knee pain for two days. Patient had undergone a dental procedure one month prior to admission. Patient was febrile to 101.7 °F (38.7 °C) and was started on broad spectrum antimicrobials with intravenous vancomycin and meropenem for broad spectrum coverage. Laboratory findings were significant for normal white blood cell count 8400/uL with 21% bands, creatinine 1.8 mg/dL, erythrocyte sedimentation rate 76 mm/hr, and CRP 302 mg/L.

Imaging of knees revealed small knee joint effusions bilaterally. Patient underwent bilateral knee arthrocentesis and synovial fluid was sent for cell count, culture and gram stain. Fluid analysis showed cell count of 175,000 with 90% neutrophils and no crystals. Fluid culture grew *Haemophilus influenzae* (beta-lactamase negative) sensitive to ampicillin/sulbactam, amoxicillin/clavulanate, cefaclor, ceftriaxone, cefuroxime, levofloxacin, and trimethoprim-sulfamethoxazole. One set of blood cultures grew the same organism which was found to be serogroup f by slide agglutination serotyping. The isolate was sensitive to ampicillin/sulbactam, amoxicillin/clavulanate, cefaclor, ceftriaxone, cefuroxime, levofloxacin, and trimethoprim-sulfamethoxazole. Antibacterial regimen was deescalated to intravenous ceftriaxone 2 gr every 12 h. Transthoracic echocardiogram and transesophageal echocardiogram were negative for vegetations.

Despite negative surveillance blood cultures, patient's clinical condition continued to deteriorate, with acute thromboembolic cerebrovascular accident, and new onset congestive heart failure complicated by acute respiratory failure requiring intubation. A repeat transesophageal echocardiogram was performed 9 days after the first one, which revealed vegetation at posterior leaflet of mitral valve measuring 1.45 × 0.5 cm (Figs. 1 and 2). The intraoperative cultures were negative. Patient underwent mitral valve replacement and received treatment with iv ceftriaxone for eight weeks in total followed by chronic suppression with sulfamethoxazole/trimethoprim for life for prevention of recurrence and reactivation of the infection, given the presence of infected prosthetic knee joints bilaterally, which were not removed surgically as patient was deemed a high risk surgical candidate.

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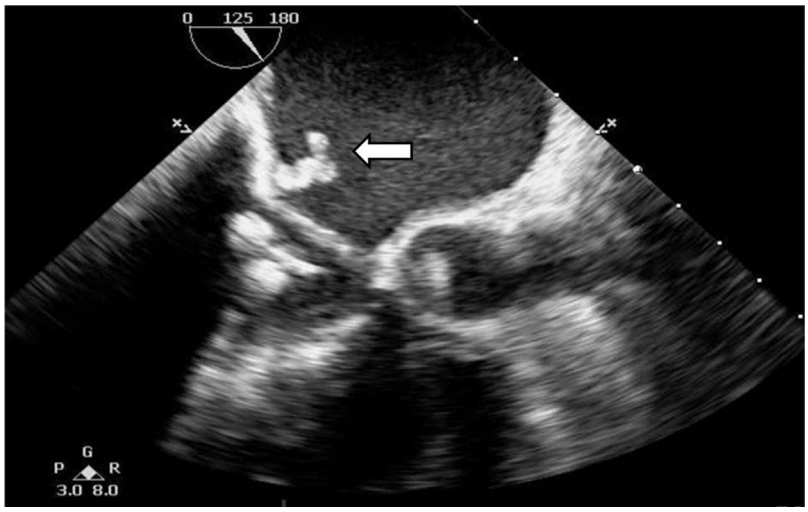

Fig. 1. Mitral valve vegetation on repeat transesophageal echocardiogram – Mid esophageal view.

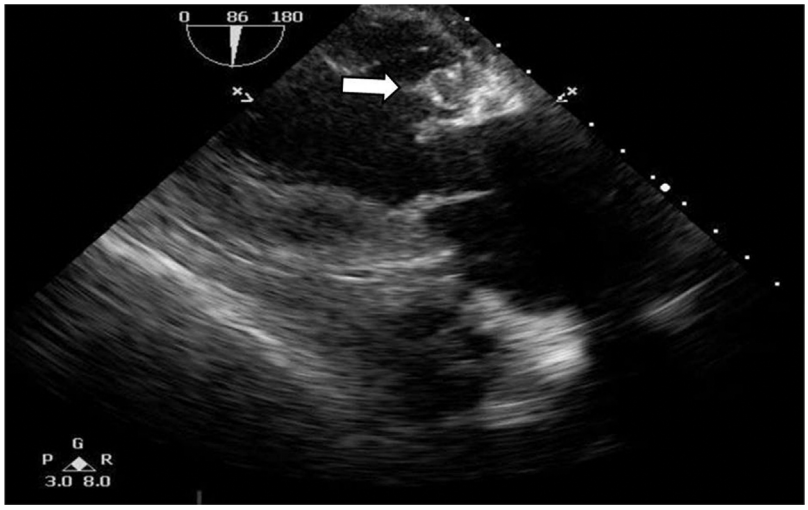

Fig. 2. Mitral valve vegetation on repeat transesophageal echocardiogram – Deep gastric view.

3 Discussion

Haemophilus species are gram-negative coccobacilli. *H. influenzae* isolates with a polysaccharide capsule are categorized as types a–f [1]. Treatment of *H. influenzae* endocarditis is intravenous ceftriaxone for a period of at least 4 weeks [4]. Bacterial endocarditis due to *H.influenzae* as single clinical entity or in combination with septic arthritis is caused typically due to hematogenous spread. Non-typeable *H.influenzae*, particularly serotype f, are emerging important bacterial pathogens with an increasing prevalence in elderly patients > 60 years of age [6]. Additionally, patients with underlying pulmonary disease are at risk and the microorganisms often produce b-lactamase [7]. None-ncapsulated strains cause disease by local mucosal invasion and have been responsible for otitis media, and sinusitis [8]. The infections caused by nontypeable strains tend to recur, despite appropriate antimicrobial therapy and periods of asymptomatic, culture–negative clinical evaluations [8,9]. Widespread use of the *H. influenzae* type b conjugate vaccines resulted in an expected decline of associated infections and it has been implicated that the vaccine caused a decrease in the carriage of serotype b, resulting in increasing colonization by nontypeable *H. influenzae* and serotypes other than serotype b [1].

In our patient, we assume that the source of entry for the pathogen was the oropharynx. This case highlights all of the characteristics of endocarditis due to *H. influenzae*: a large vegetation, progression of the disease despite appropriate antimicrobial treatment and the need for surgical intervention and valve replacement [10].

Conflicts of interest

None

Consent

Written informed consent was obtained from the patient's next-of-kin for publication of this case report and accompanying images.

Acknowledgement

None

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