



Case report

Brucella prosthetic valve endocarditis with septic and cardiogenic shock

Amal Hamieh^{a,*}, Mohamad Hamieh^{b,1}^a Department of Internal Medicine, Division of Infectious Diseases, Al-Rassoul Al Aazam University Hospital, Lebanon^b Cardiology Department, Beirut Cardiac Institute, Lebanon

ARTICLE INFO

Article history:

Received 31 May 2020

Received in revised form 17 June 2020

Accepted 17 June 2020

Keywords:

Brucella

Prosthetic aortic valve endocarditis

Heart failure

Septic shock

Surgery

Mortality

ABSTRACT

A young man with aortic prosthetic valve replacement, presented with prolonged fever and diagnosed with brucella endocarditis based on positive transthoracic echo findings with high titer positive brucellacapt serology. He was started on medical treatment with doxycycline and rifampin to which gentamicin and ceftriaxone were added and he was planned for surgical intervention. Unfortunately, the patient developed cardiogenic with septic shock before performing surgery and died within 24 h soon after admission.

© 2020 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Case presentation

We report a case of young man diagnosed with brucella prosthetic aortic valve endocarditis. A 37-year-old patient admitted initially in another medical center for history of fever of 3 months' duration with night sweats and generalized fatigue. Patient reported raw milk intake. A diagnosis of brucellosis was made based on serology and he was started on doxycycline with rifampin. But no major improvement was noted after 2 weeks of treatment. The family transferred the patient to our hospital for continuity of care. Patient had persistent fever, and shortness of breath even at rest. He was found to be tachypneic, saturating 88 % on room air, tachycardic, and hypotensive. There was no urinary output. His past surgical history included an aortic valve replacement with mechanical valve implantation 20 years ago. An urgent transthoracic echo showed a total mechanical aortic prosthesis dehiscence with 4/4 para-valvular regurgitation, abscess in the aortic valve, with low ejection fraction (34 %) and moderate to severe pulmonary hypertension (Figs. 1 and 2). BNP was 2202 pg/mL, troponin was 0.8 ng/mL. He was diagnosed with aortic prosthetic valve endocarditis. Six sets of Blood cultures as well Multiplex blood PCR were taken to increase the yield of getting positive result. Brucellacapt titer was ordered. Patient was

admitted to the CCU department and started on empiric treatment with Ceftriaxone 2 g IV OD, Gentamicin 1 mg /KG IV q 8 h, Doxycycline 100 mg PO q 12 h and Rifampin 300 mg 3 tablets PO daily pending all studies results. Diuretics and vasopressors were added to his medical regimen. Cardiothoracic surgeon was informed. The condition of the patient rapidly deteriorated within 24 h of admission. Patient was intubated, there was no response to high dose vasopressors. Lactate level reached 87.7 mg/dl. Procalcitonin value was 0.95 ng/mL. His laboratory test showed severe liver failure and renal failure that required hemodialysis. An aortic valve replacement was not performed that day due to the difficulty of maintaining a stable blood pressure. The patient died within 48 h of admission. Later on, Brucellacapt test showed a positive result test at 1/2560 I/mL. Multiplex blood PCR tests and cultures results turn out to be negative. The final adopted diagnosis was a septic and cardiogenic shock due to a prosthetic endocarditis by *Brucella* sp.

Discussion

Brucellosis is a zoonotic infection acquired after consuming unpasteurized milk or cheese [1]. It is common in the middle east region with 10 of thousands of new cases happening annually [2] In Lebanon, *Brucella* has an incidence of 3.5 and 9 cases per 100,000 inhabitants with highest percentage in Bekaa [3] where the patient lived. *Brucella* endocarditis is a rare disease (2%–5 %) [1] affecting native, congenital, or prosthetic valve and associated with high mortality in 80 % of cases [1–4]. *Brucella* endocarditis on prosthetic

* Corresponding author.

E-mail address: amal_hamieh@hotmail.com (A. Hamieh).¹ Both authors contributed equally.



Fig. 1. Echo cardio showing abscess on aortic valve.



Fig. 2. Severe paravalvular regurgitation.

valve is described in the literature [1], with an incidence of 8.3 % among all *Brucella* endocarditis cases [5]. In Saudi Arabia, *Brucella* is an etiology in 10 % of cases of prosthetic endocarditis [1]. There are no reported cases from Lebanon.

Although *Brucella* endocarditis affects both mitral and aortic valves, mitral valve endocarditis due to brucellosis tends to happen in pre-damaged valve whereas aortic endocarditis is seen especially in pre-healthy valves [4]. Our patient had aortic involvement on a prosthetic valve. *Brucella* endocarditis leads to destructive lesions on the valve [6] and it represents the majority of death related to *brucella* infection [6]. Main clinical symptoms include prolonged fever and shortness of breath [4]. Night sweats and fatigue can be seen [1]. *Brucella* endocarditis with cardiogenic shock is not well described in literature. Kandasamy et al. reported one case of severe left ventricular dysfunction with severe aortic regurgitation and hemodynamic instability, in which patient survived after surgical and medical therapy [7]. *Brucella* endocarditis presenting with unusual case of septic shock after 50 years of quiescence was described by Haran et al. in her case report [8]. In the setting of low ejection fraction and dehiscence of the aortic prosthetic valve in addition to hypotension, high lactate level and high procalcitonin make us think about both entities: cardiogenic and septic shock

The diagnosis of *brucella* endocarditis rely on positive blood culture in the setting of favorable cardiac imaging findings [9] but some depends on indirect measures such as Serology SAT (a value $>1/160$ in nonendemic area, and $1/320$ in endemic regions [9]. Positive blood culture for *Brucella melitensis* was seen in Raju's series of *brucella* endocarditis [4]. According to their series,

brucella abortus and *brucella melitensis* are the most frequent involved species in *brucella* endocarditis [4]. We could not know the species of *brucella* involving our patient's valve, since he was on anti-*brucella* therapy for 2 weeks prior to presentation which led to negative blood culture [4]. But his serology was very high ($1/2560$) in the setting of positive severe aortic valvular regurgitation and dehiscence valve, making acute *brucella* endocarditis more likely. In addition, the low blood culture incidence is justified because of the intracellular location of *brucella* with the fastidious nature of this organism as well the previous use of antibiotics [10]. Vegetations are present on echocardiography [4]. Complications of *brucella* endocarditis includes: cusp perforation, rupture chorda tendina, and detached leaflet [1], myocardial abscesses, disseminated intravascular coagulation, embolic phenomena (eg mycotic aneurysms transient ischemic attacks, organ infarctions) and Congestive heart failure with the latter being responsible for the majority of death in patient with *brucella* endocarditis [1,4] like what happened with our patient. Ring abscess with valve detachment occurs most of the time with prosthetic valve infection. This infection can extend to surrounding myocardium and can cause AV block [11].

Due to rarity of *brucella* endocarditis incidence, treatment depends on case series and not on specified guidelines. This includes antimicrobial combined to surgical intervention [1,4] especially if severe aortic regurgitation from damaged valve cause congestive heart failure [1]. *Brucella* endocarditis tend to have tissue ulceration causing severe valve injury with large vegetation making medical therapy alone insufficient [9]. Antibiotics should be bactericidal and have intracellular level [12], The 5 patients of the Raju's series were treated with triple antibiotic therapy (gentamicin, doxycycline and rifampin) (4). Other combination regimens include ceftriaxone with streptomycin and rifampin [13]. Duration of therapy is variable. In the series of Alsoub et al., patient received treatment from 10 to 20 weeks [6].

Conclusion

Even if *Coxiella Burnetii* and *Bartonella* represent the most common cause of fastidious germ related Blood culture negative endocarditis (BNCE) [14], *brucella* should be considered in the differential diagnosis of this entity, especially in a young patient with prosthetic valve and living in endemic area such as middle east where the prevalence of *brucella* in dairy product is 29 % [15]; because earlier diagnosis and treatment lead to decreasing morbidity and mortality related to this infection.

Author contribution

Amal Hamieh:

She worked on discussion part, references, reviewing over all the manuscript, and then submitting the manuscript

Mohamad Hamieh:

He worked on writing the case details of the patient as well providing pictures and reviewing over all the manuscript

Informed consent

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

Funding

Authors state that there are no sources of funding for our manuscript

Declaration of Competing Interest

The authors declare that there is no conflict of interests associated with this work or any financial support for it that may have influenced its outcome.

References

- [1] Al Dahouk S, Schneider T, Jansen A, et al. Brucella endocarditis in prosthetic valves. *Can J Cardiol* 2006;971–4, doi:[http://dx.doi.org/10.1016/s0828-282x\(06\)70316-6](http://dx.doi.org/10.1016/s0828-282x(06)70316-6).
- [2] Pappas G, Memish ZA. Brucellosis in the middle east: a persistent medical, socioeconomic and political issue. *J Chemother* 2007;243–8, doi:<http://dx.doi.org/10.1179/joc.2007.19.3.243>.
- [3] Al-Shaar L, Chaaya M, Ghosn N, et al. Brucellosis outbreak in Chouf district of Lebanon in 2009: a case–control study. *East Mediterr Health J* 2014;250–6.
- [4] Tammi R, Solanki R, Patnaik AN, et al. Brucella endocarditis – a series of five case reports. *Indian Heart J* 2013;72–7, doi:<http://dx.doi.org/10.1016/j.ihj.2012.12.017>.
- [5] Mehanic S, Mulabdic V, Baljic R, et al. Brucella endocarditis in prosthetic valves. *Mater Sociomed* 2012;24(suppl):11–2, doi:<http://dx.doi.org/10.5455/msm.2012.24.s11-s12>.
- [6] Alsoub H. Brucella infective endocarditis: a report of four successfully treated patients. *CMI* 2001;382–5, doi:<http://dx.doi.org/10.1046/j.1198-743x.2001.00267.x>.
- [7] Kandasamy A, Ramalingam S, Reddy B, et al. Anesthetic and hemodynamic management of a rare case of Brucella multivalvular endocarditis in cardiogenic shock undergoing emergency aortic valve replacement and mitral valve repair. *Annals of cardiac anesthesia* 2013;286–8, doi:<http://dx.doi.org/10.4103/0971-9784.119182>.
- [8] Haran M, Agarwal A, Kupfer Y, et al. Brucellosis presenting as septic shock. *BMJ journal* 2011, doi:<http://dx.doi.org/10.1136/bcr.12.2010.3586>.
- [9] Fonseca J, Pereiro T, Santos D, et al. Successful management of prosthetic valve Brucella endocarditis with antibiotherapy alone. *Eur J Case Rep Intern Med* 2018, doi:http://dx.doi.org/10.12890/2018_000808.
- [10] Roodpeyma S. Brucella endocarditis. *Arch Pediatric Infect Dis* 2014;2(2):227–30, doi:<http://dx.doi.org/10.5812/pedinfect.14249>.
- [11] Fernández-Guerrer M, Martinell J, Aguado J, et al. Prosthetic valve endocarditis caused by Brucella melitensis. *Arch Intern Med* 1987;1141–3, doi:<http://dx.doi.org/10.1001/archinte.1987.00370060137022>.
- [12] Sasmazel A, Baysal A, Fedakar A, et al. Treatment of Brucella endocarditis: 15 years of clinical and surgical experience. *Ann Thorac Surg* 2010;1432–6, doi:<http://dx.doi.org/10.1016/j.athoracsur.2010.01.048>.
- [13] Koruk S, Erdem H, Koruk I, et al. Management of brucella endocarditis: results of the Gulhane study. *Int J Antimicrob Agents* 2012;145–50, doi:<http://dx.doi.org/10.1016/j.ijantimicag.2012.04.009>.
- [14] Liesman R, Pritt B, Maleszewski J, et al. Laboratory diagnosis of infective endocarditis. *J Clin Microbiol* 2017, doi:<http://dx.doi.org/10.1128/JCM.00635-1>.
- [15] -Abed A, Baltork F, Alizadeh A, et al. The prevalence of Brucella spp. in dairy products in the Middle East region: a systematic review and meta-analysis. *Acta Trop* 2020, doi:<http://dx.doi.org/10.1016/j.actatropica.2019.105241>.