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Case report

# Brucella endocarditis of the aortic valve

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**Abstract**

Brucella endocarditis was diagnosed in two patients with acute renal failure. Both patients had major aortic insufficiency, congestive cardiac failure and clinical and laboratory signs of an active infection, although adequate antibacterial therapy had already been introduced. Replacement of the aortic valve, together with the aortic root in one of the cases, were carried out as emergency procedures, followed by antibacterial treatment with rifampicin, doxycycline and co-trimoxazole. Both patients left the hospital cured and are well 2.5 and 2 years after the surgery, respectively. © 1998 Elsevier Science B.V.

*Keywords:* Brucella endocarditis; Valve replacement; Aortic valve endocarditis

## 1. Introduction

Despite eradication programs, it is believed that about 500 000 new cases of brucellosis are diagnosed every year and many others are either not diagnosed or declared [1,2]. Hence, it is still an important cause of morbidity, especially in countries of the Mediterranean basin and of the Middle East [3,4]. The three most frequent agents of human brucellosis are *Brucella melitensis*, *B. abortus*, *B. suis* and less frequently *B. canis* [2,5].

Brucella endocarditis is a rare complication but is the main cause of death by brucellosis [6,7]. The global incidence is probably less than 1% [1], but an incidence of up to 10.9% was described from Saudi Arabia [8]. It is more frequent in men than in women and the aortic valve is usually affected, frequently resulting in congestive cardiac failure, which is the main final episode. It is rarely cured by medical therapy alone, although some cases have been described [9]. Hence, it is almost always necessary to proceed to surgery for replacement of the valve, followed by antibiotic treatment for long periods of time [10].

In this report, two cases of Brucella endocarditis recently treated in this department are described.

## 2. Case 1

A 56-year-old male, a sheep herder, was admitted in March 1985 with arthralgias and myalgias, headaches, sweating and fever. This diagnosis of brucellosis was made and he was discharged medicated with doxycycline (100 mg bid) and rifampicin (900 mg id). He was readmitted 3 days later for persistence of the previous complaints, now accompanied by weight loss, weakness and tiredness. Significant aortic regurgitation was confirmed by echocardiography. There was dilatation of the left ventricle which, however, maintained good systolic function. The patient was kept on antibiotics and initiated antifailure therapy but was later readmitted with refractory congestive cardiac failure and acute renal failure. The examination now showed a diastolic aortic murmur, divergent arterial pressure, collapsing pulses, exanthema and oedema of the lower limbs and of the eyelids.

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During the first admission the patient had a positive Rose Bengal reaction, Wright 1/1280, indirect immunofluorescence 1/640 and negative blood cultures. In the last admission, pre-surgery, there was mild anaemia (Hb 10.5 g/dl), thrombocytopenia (platelets 94.000/mm$^3$), C-reactive protein (CRP) 5.5 mg/dl, ESR 30 mm/h, BUN 50 mg/dl and creatinine 3.5 mg/dl. The blood culture was now positive for *Brucella melitensis*. Colour Doppler-echocardiography revealed a very enlarged left ventricle (Dd 88 mm, Ds 60 mm) with good contractility, a moderately enlarged left atrium and an aortic valve with nodular thickening compatible with vegetations, with good opening and major regurgitation. A renal biopsy showed acute tubular necrosis.

During surgery, the aortic valve, which was found to be bicuspid, had many vegetations and the right coronary cusp was almost completed destroyed. There was a small annular abscess. The aortic valve and aortic root were replaced using a modified Benthal technique with an aortic homograft.

There were no complications in the post-operative period and the patient was discharged 43 days after surgery. In the first few months after surgery he had high *Brucella* serum titers and for this reason the antibiotics were continued (doxycycline, rifampicin and co-trimoxazole) for 9 months. After 2.5 years of follow-up, the patient had no signs or symptoms of cardiovascular disease.

## 3. Case 2

A 27-year-old male—a building worker—was admitted in poor physical condition, to a district hospital in September 1995, with hyperthermia of 2 weeks evolution, macroscopic haematuria, general ill feeling and weakness and oedema of the lower limbs and of the face. A year earlier, he and his father, an owner of a sheep herd which was looked after by both, had been diagnosed as having brucellosis. At that time he was medicated with rifampicin and doxycycline, which he had been taking irregularly for 1 year.

The haemoglobin was 8.4 g/dl, leukocytes 10 500/mm$^3$, creatinine 2.05 mg/dl, BUN 77 mg/dl, negative CRP and positive Waaler-Rose reaction and rheumatoid factor test. The patient was medicated with furosemide, isossorbide dinitrate and ciprofloxacin which resulted in a progressive improvement of the cardiac failure, but with persistence of high temperatures, worsening renal function and anaemia (Hb 6.9 g/dl). For these reasons he was transferred to this hospital for further studies, including a renal biopsy. On arrival he had a systo-diastolic aortic murmur. The creatinine was 5.0 mg/dl, CRP 7.7 mg/dl, positive Rose Bengal test, indirect immunofluorescence 1/320 and ESR 30 mm/h. The renal biopsy was compatible with post-infective glomerulonephritis.

Colour Doppler-echocardiography showed a moderately dilated left ventricle (Dd 72 mm and Ds 48 mm) with good contractility and an aortic valve, probably bicuspid, with marked thickening of the cusps, corresponding to endocarditis. There was major aortic valve regurgitation and a mild pericardial effusion. *Brucella* was identified in the blood cultures but the species could not be identified. The patient initiated specific antibiotic therapy with rifampicin (900 mg id) and doxycycline (200 mg id) and co-trimoxazole was added 1 week later. The fever subsided after 10 days of antibiotic therapy but the persistence of severe congestive cardiac failure, despite adequate therapy, motivated surgical intervention.

During surgery, the aortic valve was found to be bicuspid and both cusps were destroyed by multiple vegetations, but there were no abscesses. A mechanical prosthesis (Carbomedics 23R) was used for replacement of the aortic valve. The culture of the aortic valve tissue was positive for *Brucella*. The patient had an uneventful post-operative period and before discharge, 24 days after surgery, the Hb was 10.1 g/dl and the creatinine 1.3 mg/dl. After 2 years the patient was well, living an unlimited active life. The patient was kept under antibiotic therapy with doxycycline and rifampicin, because of high serum *Brucella* titers, for 21 months.

## 4. Discussion

Brucella endocarditis is a rare but serious complication of brucellosis. It is the main cause of mortality of this infection, accounting for 80% of its deaths [11]. Despite adequate medical therapy, Brucella endocarditis generally requires urgent or emergency cardiac surgery, usually because of the inability to control the infectious process with progression to a medically uncontrollable congestive cardiac failure. However, in a recent report Cohen et al. [9] described one case and found another 12 in the literature, which were cured by antibiotic therapy alone. But in the majority of cases surgery is indicated by failure of adequate conservative therapy for a reasonable period of time in the presence of an haemodynamically significant valve lesion. The authors also found only 49 reported cases of cure with combined medical and surgical therapy, demonstrating both the rarity and the serious nature of the complications.

The aortic valve is preferentially involved and both root abscesses and aneurysms occur in up to 45% of the cases [11]. The two cases described herein are typical examples of this entity. Both patients were male, had involvement of the aortic valve and had to be subjected to urgent aortic valve replacement for control of the infectious process and of cardiac failure. It is worth stressing that both patients had been treated with ap-

propriate antibiotic therapy for several months (albeit not properly conducted in case 2) which did not prevent the negative evolution and, eventually, the need for surgery, probably because the antibiotics do not easily reach the inner layers of the vegetations.

The diagnosis of Brucella endocarditis was not difficult in either case, in view of the context of active brucellosis and because of the echocardiographic pictures which clearly showed the valve vegetations. The strong clinical suspicion was confirmed by the laboratory results, namely by the high serum titers and the positive cultures for *Brucella*. Blood cultures are usually negative in uncomplicated chronic brucellosis and for this reason the identification of this bacteria in the blood cultures indicates a good probability of endocarditis.

The literature shows considerable variation in the duration of the antibiotic therapy after surgery, varying from 2 weeks to more than 1 year. However, there is some consensus about the need to prolong the treatment for at least 3 months post-surgery. In our two patients, antibiotic therapy was maintained to the normalisation of the serum titers, but this may not be necessary. Also, the antibiotic schemes have varied from single to triple therapy, but most authors believe that single antibiotic therapy must be avoided because the development of resistance has been frequently demonstrated in this situation. Generally, rifampicin and/or co-trimoxazole must be added to the classic doxycycline in dosages usually higher than those recommended for other infections [1,5]. Other antibiotics, such as tetracycline, streptomycin and gentamycin, have been used by other authors [8].

## 5. Conclusion

Brucella endocarditis is a very serious and potentially lethal complication of brucellosis. Antibiotic therapy usually fails to control the disease and only surgery with replacement of the aortic valve and/or the aortic root, as was done in the two patients, can cure it.

## References

[1] Jacobs F, Abramowicz D, Vereerstraeten P, Le Clerc JL, Zech F, Thys JP. Brucella endocarditis: the role of combined medical and surgical treatment. Rev Infect Dis 1990;12:740–4.
[2] Havas L. Problems and new developments in the treatment of acute and chronic brucellosis in man. Acta Trop 1980;37:281–6.
[3] Lezaun R, Teruel J, Maitre MJ, Artaza M. Brucella endocarditis on double valvular prosthesis. Postgrad Med J 1980;56:119–21.
[4] Valliattu J, Shuhaiber H, Kiwan Y, George A, Chugh T. Brucella endocarditis—report of one case and review of the literature. J Cardiovasc Surg (Torino) 1989;30:782–5.
[5] Jeroudi MO, Halim MA, Harder EJ, Al-Sibai MB, Ziady G, Mercer EN. Brucella endocarditis. Br Heart J 1987;58:279–83.
[6] Cleveland JC, Suchor RJ, Dangue J. Destructive aortic valve endocarditis from *Brucella abortus*: survival with emergency aortic valve replacement. Thorax 1970;33:616–8.
[7] Peery TM, Evans JH. Chronic valvular heart disease following non-fatal Brucellosis. Ann Intern Med 1958;49:568–79.
[8] Al-Kasab S, Al-Fagih MR, Al-Yousef S, et al. Brucella infective endocarditis—successful combined medical and surgical therapy. J Thorac Cardiovasc Surg 1988;95:862–7.
[9] Cohen N, Golik A, Alon I, et al. Conservative treatment for Brucella endocarditis. Clin Cardiol 1997;20:291–4.
[10] Quiroga J, Miralles A, Farinolla T, et al. Surgical treatment of Brucella endocarditis. Cardiovasc Surg 1996;4:227–30.
[11] Peery TM, Belter LF. Brucellosis and heart disease. Fatal Brucellosis: a review of the literature and report of new cases. Am J Pathol 1960;36:673–97.