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## **Moraxella lacunata – a rare cause of infective endocarditis**

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All authors wrote, reviewed and revised the article and approved the final version of the manuscript. Dr Kutleša and Dr Lepur were primarily responsible for data collection and writing the manuscript.

## **ABSTRACT**

We describe the first case of *Moraxella lacunata* definite native valve endocarditis in a patient with previously normal mitral valves. The disease was complicated with embolizations of the brain and spleen. After the six weeks of antimicrobial treatment valvular replacement was performed. The clinical course and diagnostic findings suggest that *Moraxella lacunata* possess high aggressiveness leading to progressive valvular destruction and embolizations.

## INTRODUCTION

*Moraxella lacunata* is a Gram-negative coccobacillus that is normally found in the oral cavity, upper respiratory tract and conjunctiva. It usually causes otitis, sinusitis, conjunctivitis and pharyngitis in children [1]. Invasive infections, although scarce, were also reported and included sepsis, meningitis and arthritis [2,3]. Infective endocarditis (IE) due to *Moraxella lacunata* is extremely rare and all patients described so far had prior valve abnormality [4]. *Moraxella lacunata* is usually well susceptible to  $\beta$ -lactam antibiotics. However, resistant strains were also reported [5]. We present a case of definite native valve *Moraxella lacunata* endocarditis complicated with systemic and cerebral emboli.

## CASE REPORT

A 60-year-old white female was admitted to the Zagreb Infectious Disease University Hospital in July 2006 because of severe sepsis. She had been sick for five days with fever, shivers and vomiting. One day prior to admission to the hospital she became confused and developed urinary incontinence.

At admission she was febrile, hypotensive (blood pressure was 85/50 mmHg), dehydrated and appeared severely ill. Glasgow Coma Score was 14. Her oral cavity was in poor condition, with residual dentition affected by dental caries. Chest examination revealed crackles over the right lung. No heart murmurs were heard. Her liver was soft, enlarged and palpable for 4 cm below the right costal margin. Rash, Janeway lesions or skin and conjunctival hemorrhages were not observed.

Before admission the patient received only symptomatic therapy. She had not been taking any medication before this disease and was not acutely ill in the recent months. Her medical history revealed arterial hypertension and an umbilical hernia surgery that she underwent two years ago.

Erythrocyte sedimentation rate was 36 mm/h. C-reactive protein was 148.8 mg/L. Leukocytosis of  $23,4 \times 10^9/L$  with mature neutrophilia was present. The red blood cell count was  $2,99 \times 10^{12}/L$ , hemoglobin 87 g/L, hematocrit 0,246 and platelets count  $190 \times 10^9/L$ . The blood levels of sodium and potassium were decreased (128 mmol/L and 3,5 mmol/L, respectively).

Total protein level was 48 g/L (albumin 23 g/L, globulin 25 g/L). Blood levels of glucose, lactate, urea nitrogen, creatinine, total bilirubin, aminotransferases, lactate-dehydrogenase, gamma-glutamyl transferase and alkaline phosphatase were all normal. Prothrombin and partial-thromboplastin times were normal. Urinalysis revealed no abnormalities.

Chest radiography showed enlarged heart with clear lung fields. Electrocardiogram was normal. Abdominal ultrasound examination performed on the day of admission revealed mild hepatosplenomegaly.

Initial antimicrobial treatment with co-amoxiclav and gentamicin was started along with high volume fluid replacement. The patient's condition significantly improved in the next two days. She became fully oriented and normotensive with normal urine output.

Six days upon admission a holosystolic heart murmur was detected over the apex. Both transthoracic (TTE) and transesophageal (TEE) echocardiography showed a large and mobile vegetation on the posterior mitral leaflet. A severe mitral valve regurgitation was also present. Other abnormalities of the mitral valve were not detected. Surprisingly, the high-intensity transient signals (HITS) were not detected within both middle cerebral arteries during one-hour transcranial Doppler ultrasound (TCD) recording.

Two blood cultures taken upon admission were positive, and *Moraxella lacunata* was identified by using the commercial **api 20 NE** identification system for non-fastidious, non-enteric Gram-negative rods (BioMerieux, France). It was well susceptible to  $\beta$ -lactam antibiotics, aminoglycosides and quinolones.

The initial antibiotic combination was changed to penicillin G-sodium ( $6 \times 4$  MU IV) with gentamicin after the diagnosis of IE was established. The optimal antimicrobial treatment was therefore started on the tenth day of disease. Gentamicin was administered for 18 days.

Pre- and postcontrast brain CT scan obtained on the 20<sup>th</sup> day of disease showed multiple low density changes in both frontal-parietal areas consistent with early cerebritis. Two of them were on the right side with diameters of 20 and 12 mm respectively, while the left-sided lesion had a diameter of 17 mm. An electroencephalogram (EEG) showed slow wave activity over the right hemisphere.

Abdominal ultrasound examination was repeated during the third week of the disease showing multiple spleen abscesses that varied in size from 25 to 35 mm.

Fundoscopy examination revealed cotton-wool exudates on the left side and bilateral retinal hemorrhages suggestive of Roth's spots.

After six weeks the antimicrobial therapy was completed. Splenic abscesses completely resolved during antibiotic treatment and the control abdominal ultrasound finding was normal. Brain CT showed encephalomalacia in previously affected areas. The patient showed no neurological deficits except temporal disorientation.

Because of severe mitral valve regurgitation (4+) and persistent vegetation on the posterior mitral leaflet, cardiac surgery was performed. Before the surgery extraction of the residual dentition was done.

The approach to the mitral valve was transeptal and the leaflets were inspected and analyzed. The vegetations were between P2 and P3 with partial rupture of the posterior leaflet. Additional calcification of the posterior annulus was present. Posterior leaflet was detached from the annulus and vegetation was excised together with adjunctive leaflet tissue. Furthermore, decalcification of the posterior annulus was performed revealing an annular abscess which was not identified preoperatively. Posterior leaflet was reconstructed by a patch of non-treated autologous pericardium and annulus was reinforced by the implantation of a 28 mm annuloplasty ring (Edwards Lifesciences, Carpentier-Edwards Physio Ring). TEE monitoring was applied throughout the surgery and upon weaning from cardio-pulmonary bypass, the mitral valve was inspected showing no residual regurgitation. The patient fully recovered and was discharged from hospital in October 2006. Six months later she was in good health .



## **DISCUSSION**

For the first time, we present a case of *Moraxella lacunata* definite native valve endocarditis with confirmed asymptomatic embolization of the brain and spleen. The patient had no known prior abnormality of the heart valves and according to the Duke criteria she had two major and two minor criteria for a definite diagnosis of IE.

*Moraxella lacunata* infective endocarditis is extremely rare with only six cases reported so far [4]. Only two of them are considered definite according to the Duke criteria. Septic embolizations in these patients were not noted. However, it is unknown if any aimed diagnostic attempt was tried.

A routine quest for septic embolization in every infective endocarditis is today mandatory, particularly in patients with high risk etiologies (*S. aureus*, *Candida albicans*, HACEK and Abiotrophia organisms) [6]. The existing embolic event significantly influences treatment choices, duration of treatment and finally the outcome of the disease. Most septic microemboli are asymptomatic and therefore neurological accidents are often (up to 47%) the first clinical manifestation of bacterial endocarditis [7,8]. It is known that appropriate antibacterial treatment significantly reduces the incidence of embolic events. The clinical course of presented patient suggest the need for repeated diagnostic procedures in a search of complications of IE.

The clinical course of the disease and diagnostic findings suggest that *Moraxella lacunata* possess high embolization potential and aggressiveness leading to valvular destruction. Early surgical treatment could be proposed for these patients in order to prevent embolic events and hasten recovery.

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