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Case Report

Cardiac tamponade secondary to leptospirosis. A rare association: A case report



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ABSTRACT

Herein is described the case of a 39-year-old female agronomist who was admitted to hospital after a syncopal episode. She had had fever, abdominal pain, nausea, and vomiting for the previous month. The patient showed signs of hypoperfusion, so a trans-thoracic echocardiography was done, demonstrating the presence of a cardiac tamponade. An emergency pericardiocentesis was performed, draining 500 ml of hematic content. Thoracic-abdominal computed tomography showed bilateral pleural effusion and also peritoneal effusion. Laboratory tests were compatible with an inflammatory situation with neutrophilic leukocytosis, alteration of hepatic function, and a plateau elevation of high-sensitivity troponin T. Colchicine was initiated but the evolution of the patient was torpid, making necessary the performance of a pericardial window due to an abrupt increase of pericardial effusion and echocardiographic signs of impending cardiac tamponade. Two chest tubes were inserted due to an increasing bilateral pleural effusion. Serology was positive for *Leptospira* spp. so doxycycline was initiated. She reported that she had inspected a rice-field the previous month. The patient presented a good response to the treatment, being discharged from hospital completely asymptomatic, with no pericardial effusion and practically resolved pleural effusions. She was evaluated again one month later, with no trace of effusions or symptoms.

<Learning objective: Cardiac tamponade secondary to leptospirosis has never been described before. Leptospirosis is a global zoonosis that usually does not affect the heart or its associated structures. Myocarditis and arrhythmias are the most frequently associated cardiac manifestations. Presence of fever, nausea, abdominal pain, jaundice, or conjunctival suffusion in a patient in contact with an environment possibly contaminated by *Leptospira* should make this infection be considered as the cause of the clinical picture.>

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Introduction

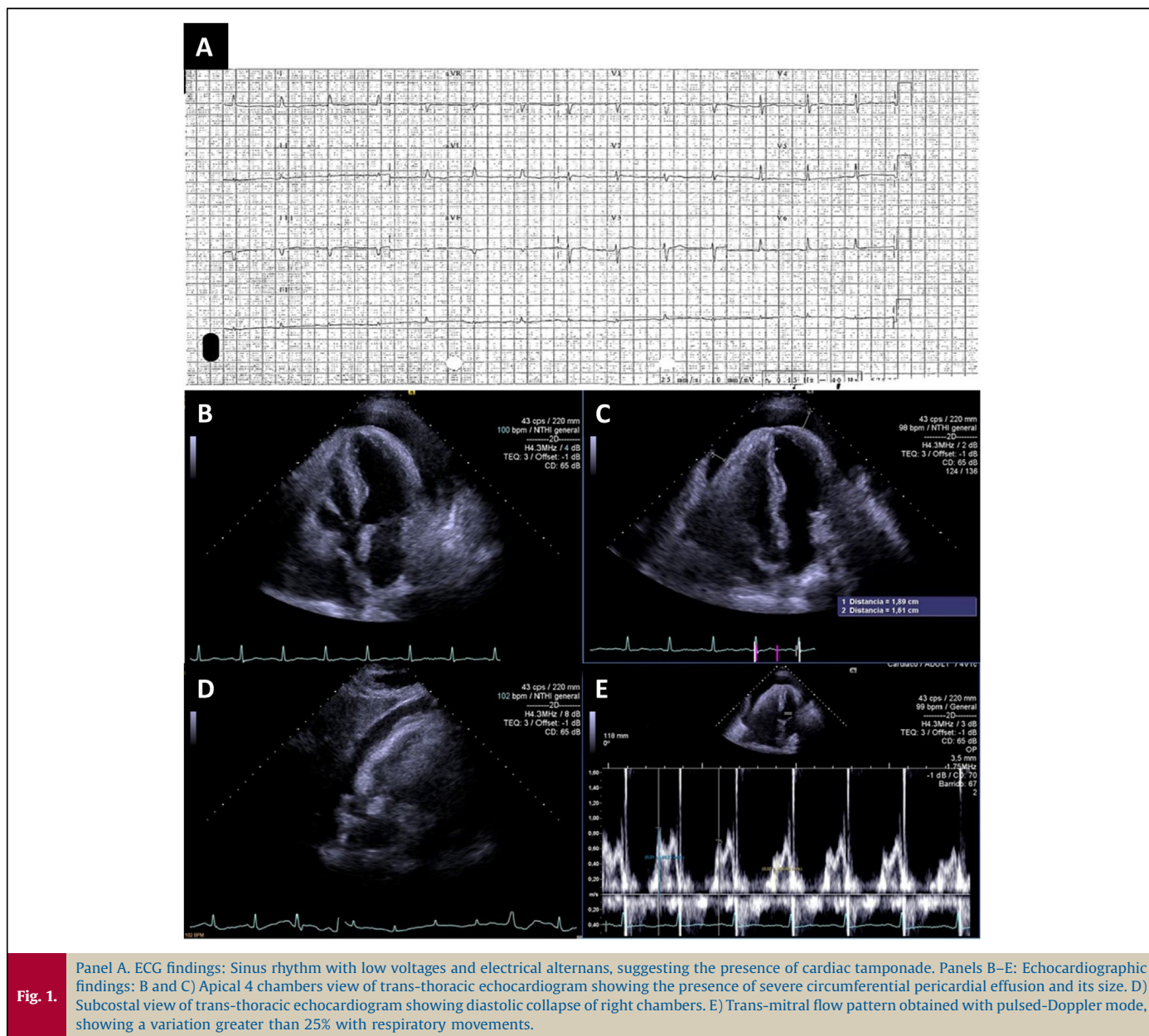
Leptospira is a genus of spirochete bacteria that usually infect people who are in contact with the urine or corporal fluids of infected animals or people who drink or are in contact with water or ground infected by that urine or corporal fluids. Symptoms of leptospirosis can appear from 2 days to 4 weeks after the

exposition to the bacteria. The typical clinical picture consists of fever, shivers, vomiting, diarrhea, abdominal pain, exanthema, conjunctivitis, headache, or jaundice. Cardiovascular implication in leptospirosis is infrequent and when it happens, most patients remain asymptomatic. We present the case of a cardiac tamponade secondary to leptospirosis in a young female patient who worked as an agronomist.

Case report

A 39-year-old woman with personal history of type I diabetes and repetitive urinary tract infections was admitted to hospital for

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having presented a syncopal episode just after a vomiting episode. The patient reported that two weeks previously she went to an emergency department presenting a clinical picture of fever along with asthenia, abdominal pain, nausea, and vomiting. On analysis of that admission she presented leukocytosis with neutrophilia. The urine test showed the presence of proteins and erythrocytes in urine. She was diagnosed with pyelonephritis and completed a cycle of antibiotics (ceftriaxone). Despite this, the symptoms persisted until the syncopal episode.

The physical exploration of the patient showed acrid coldness, low blood pressure (70/40 mmHg), jugular ingurgitation, low heart sounds, and mild tachycardia. She also presented an exanthema on the central region of chest and a body temperature of 39.3 °C. The electrocardiogram showed sinus rhythm at 80–90 beats per minute with low voltages of QRS complexes and electrical alternans (Fig. 1A).

A trans-thoracic echocardiography (TTE) was performed, showing the presence of a severe pericardial effusion that was causing the diastolic collapse of right ventricle with relevant

trans-valvular flow pattern variations (Fig. 1B–E). Taking this into account, the patient was diagnosed with cardiac tamponade and was transferred to the acute cardiac care unit (ACCU) where invasive arterial blood pressure monitoring was achieved, showing paradoxical pulse (systolic blood pressure fell up to 55 mmHg with inspiration), and a subxiphoid pericardiocentesis was successfully performed, obtaining a drainage of 500 cc of hematic content. Blood pressure raised up to 110/70 mmHg after this intervention and cardiac frequency remained stable around 70–80 beats per minute.

Once she was hemodynamically stable, she was submitted to a thoracic and abdominal computed tomography (Fig. 2), showing a moderate pericardial effusion, an important bilateral pleural effusion, and also peritoneal effusion.

On analytics she presented a mild normocytic-normochromic anemia and mild leukocytosis with neutrophilia. Platelets were in normal range. Coagulation and renal function were preserved. Hepatic enzymes were slightly elevated (aspartate aminotransferase 66 IU/l; alanine aminotransferase 110 IU/l; gamma glutamyl

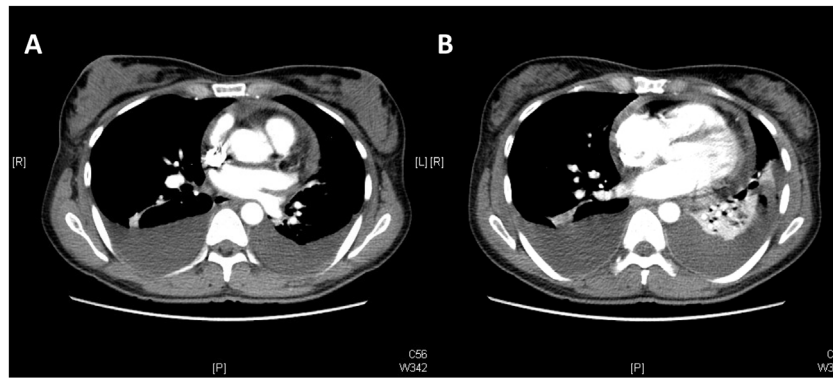


Fig. 2. (A and B). Radiologic findings: chest computed tomography showing moderate pericardial and bilateral pleural effusion.

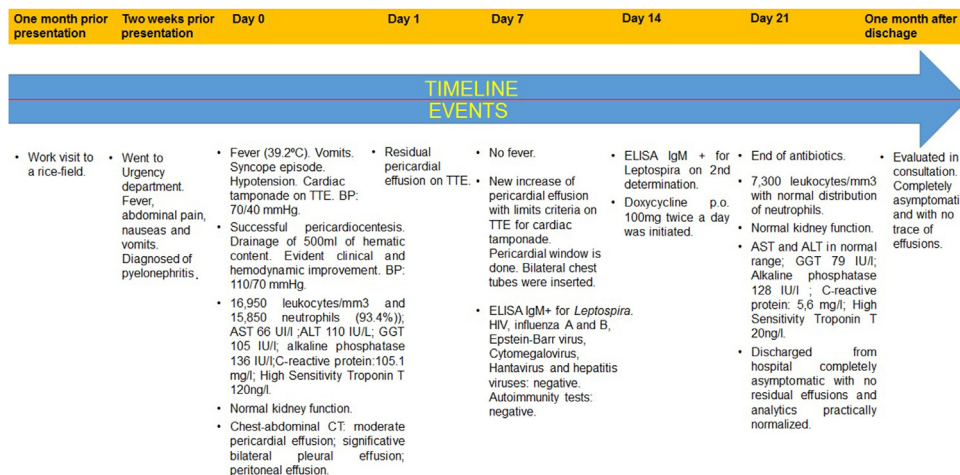


Fig. 3. Arrow timeline that resumes the most relevant clinical, analytical and procedural events of the case.

transferase 105 IU/l; alkaline phosphatase 136 IU/l). Bilirubin values were in range of normality. C-reactive protein was also elevated (105.1 mg/l; normal values are under 5 mg/ml). High-sensitivity troponin T was stable around 120 ng/l.

The 24-h urine determination showed the presence of mild proteinuria.

On the next day, a new TTE was performed, showing the presence of some residual pericardial effusion.

Taking into account that the patient apparently suffered from a systemic inflammatory process, colchicine was initiated with apparently good response to it over the following days, with progressive reduction of the residual pericardial effusion on control echocardiograms.

She had no more pericardial effusion so the drainage was retired and the patient was discharged from ACCU and transferred to the cardiology ward. Pleural effusion was monitored with repeated chest radiographs, showing a progressive increase in the volume of the effusion.

One week later, a control TTE showed an abrupt expansion of residual pericardial effusion with signs of impending cardiac tamponade, so the patient was submitted to a pericardial window. Taking advantage of her transfer to the theater, two chest tubes were inserted (one on each side), draining hematic content.

That day the first results for serology were available, being remarkable for the presence of positive enzyme-linked immunosorbent assay (ELISA) immunoglobulin (Ig) M antibodies

to *Leptospira* spp. (1.41) (<0.9 is considered as negative; 0.9–1.1 is considered as doubtful and a new sample should be sent; >1.1 is considered as positive). No other significant positive results were obtained. ELISA test for *Leptospira* spp. was repeated, obtaining a new positive result seven days later (IgM + (1.55)). No blood or urine samples were taken for culture due to the evolutionary time of the disease, because these tests are not worth it when more than 10 days have passed from the onset of the disease and because *Leptospira* grows slowly, so antibodies from serology are available much earlier. There was no availability for performing a microscopic agglutination test (MAT) or polymerase chain reaction (PCR) at the time of the hospitalization [1]. Serology for human immunodeficiency virus, influenza A and B, Epstein-Barr virus, cytomegalovirus, hantavirus, and hepatitis viruses were negative. Autoimmunity tests were also negative.

Asking the patient about possible environmental exposures, she reported that she had recently inspected a rice field because of her job.

Taking into account that the patient fulfilled several clinical criteria and a presumptive laboratory criteria for leptospirosis, she was diagnosed with suspected leptospirosis. Additionally, modified Faine's score was calculated, achieving 27 points on it, supporting the previous diagnosis [2] (see Online Table 1). Antibiotic therapy with doxycycline 100 mg p.o. twice a day was initiated according to this diagnosis. One week later the patient was completely asymptomatic, with practically no residual

effusions. The patient was discharged from hospital with antibiotic therapy completed and practically normalization of analytical alterations (see Fig. 3).

One month later the patient was evaluated again in consultation. She was totally asymptomatic and without a trace of effusions.

Discussion

Leptospirosis is a globally distributed disease with a deeper presence in tropical and subtropical countries due fundamentally to climate and hygienic conditions, although it also has a notable presence in countries with mild weather like those in southern Europe. This infection usually occurs in summer and autumn and in the rainy season. Some studies reported a mean annual incidence about 2/100,000 inhabitants in the area where this case took place [3].

As a zoonosis, leptospirosis affects nearly all mammal species. As reservoir, rodents, particularly rats, are the most important, although *Leptospira* can be hosted by other mammals as well as domestic and farm animals. These bacteria establish a symbiotic relationship with their host and can survive in the urogenital tract of these for years.

The transmission of these bacteria can occur by direct contact with urine, blood, or tissues from an infected animal or through contact with water or ground infected by that urine or corporal fluids due to the ability of these microorganisms to survive in wet environments. That is the reason why this infection usually affects veterinarians, ranchers, or rice-field workers, also in developed countries [4].

Clinical manifestations of leptospirosis range from a nearly asymptomatic form to an anicteric febrile illness or the most aggressive form of this disease, the icteric-hemorrhagic form, also known as Weil's disease, which include renal, pulmonary, and hemorrhagic manifestations and presents a mortality rate up to 20% [5]. The most common symptoms are fever, headache, myalgia, abdominal pain, jaundice, and conjunctival suffusion.

Laboratory alterations are frequent. The presence of normocytic and normochromic anemia, polymorphonuclear leukocytosis, and thrombocytopenia are common as well as the elevation of hepatic markers as bilirubin or transaminases, normally in a mild way. The presence of hematuria and albuminuria in urine analysis are also frequent. Elevations of blood creatinine and urea are usually seen too [6].

Diagnosis of leptospirosis is based on the combination of clinical and laboratory criteria.

According to the World Health Organization, the human cases of leptospirosis can be reported as [1]:

- Suspected diagnosis: cases that present a clinical description compatible with leptospirosis and have a positive presumptive laboratory diagnosis test (ELISA IgM, latex agglutination test, dipstick, lateral flow).
- Confirmed diagnosis: suspicious cases that present a positive confirmatory laboratory diagnosis test (PCR, MAT, positive cultures).

Unfortunately, confirmatory laboratory tests are not available in every hospital. The use of modified Faine's criteria for leptospirosis

have demonstrated a great sensitivity (about 90%) when clinical, epidemiological, and laboratory factors are presents, as in the case of our patient [2], and they constitute a useful tool for diagnosing leptospirosis in areas where the gold standard test is not available.

Cardiovascular involvement in leptospirosis is a rare manifestation of the disease. There are few reports around the world involving leptospirosis as a cause of myopericarditis or arrhythmias, and even less as cause of cardiac tamponade [7,8]. In fact, to the best of our knowledge, this is the first time a cardiac tamponade is reported in exclusive association with leptospirosis. However, autopsy studies had demonstrated that the presence of cardiac affection secondary to this disease is most of the time due to the development of myocarditis and with variable implication of epicardium/endocardium, coronary arteries, or even the valves, despite the patient not presenting any symptoms attributable to cardiac affection [9]. We report this case with the hope of spreading the knowledge of this probably underdiagnosed cardiac affection caused by *Leptospira*.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at <https://doi.org/10.1016/j.jccase.2020.10.020>.

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