

# Bacterial Endocarditis following Lithotripsy: an Unusual Complication Caused by a Non-Invasive Procedure

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Infective endocarditis (IE) is a rare and potentially severe disease characterized by high morbidity and mortality (16–45%) [1]. In 1885, during his Goulstonian lecture at the Royal College of Physicians in London, Sir William Osler distinguished between “simple” and “malignant” forms of endocarditis. He defined “simple” as subacute bacterial endocarditis (SBE) generally presenting with subtle onset, whereas “malignant” forms were those characterized by acute onset and a fulminant course.

Any invasive interventional procedure may be responsible for transient bacteremia, the latter being considered a major risk factor for development of iatrogenic IE. With regard to urological procedures, evidence of acute IE following this category of surgical interventions is extremely scarce, thus antimicrobial prophylaxis is recommended only in individuals at high risk for IE. We describe a case of SBE following lithotripsy, which is regarded as a non-invasive procedure not mandating antibiotic prophylaxis.

## PATIENT DESCRIPTION

A 30 year old male patient was admitted to our hospital due to general weakness, decreased appetite, and 20 kg weight loss over the previous 6 months. In addition,

he complained of an intermittent nocturnal fever without diaphoresis. The patient denied any respiratory or abdominal symptoms, recent travel to other countries, as well as use of illicit drugs or unprotected sexual relations.

Three months prior to his admission he underwent lithotripsy due to nephrolithiasis and 1 month later he was diagnosed with a urinary tract infection (UTI) for which antibiotic treatment was prescribed.

At the present admission his temperature was 37.1°C, blood pressure 100/60 mmHg and pulse rate 90 beats/min. On physical examination the lungs were clear and a systolic murmur was heard over the left sternal border; bilateral enlarged lymph nodes were palpable in his neck, and splenomegaly was also present. No skin pigmentations, lesions, or edema of lower limbs were present.

Laboratory examinations showed a hemoglobin concentration of 7.9 g/dl, mean corpuscular volume 71 fl, mild thrombocytopenia (platelets 118,000/mm<sup>3</sup>) and increased inflammatory markers (erythrocyte sedimentation rate 80 mm/hr, C-reactive protein 71 mg/dl). Creatinine, urea, electrolytes and liver function tests were entirely normal. Urinalysis demonstrated positive nitrate testing as well as the appearance of white blood cells. Polymerase chain reaction for Epstein-Barr virus and cytomegalovirus excluded recent infection.

A computed tomography of the chest and abdomen showed a pericardial effusion and splenomegaly (spleen length 21 cm) with many hypodense lesions indicating possible infarctions. No lymph node enlargement was observed. All four sets of blood cultures as well as urine culture were

positive for the growth of *Enterococcus faecalis* (beta-lactamase negative). An echocardiogram showed severe flail of multiple scallops and ruptured chordae tendineae of the mitral valve, and a possible rupture of the head of the inferomedial papillary muscle. Mobile vegetations were also visualized on a leaflet of the mitral valve.

Intravenous antibiotic treatment with ampicillin and gentamicin was initiated and the patient was transferred to the thoracic surgery department for mechanical mitral valve replacement. The patient continued on antibiotic therapy for 6 weeks and uneventfully recovered.

## COMMENT

Extracorporeal shock wave lithotripsy (ESWL) is the most common technique used to treat nephrolithiasis. During ESWL the applied forces may damage the small renal vessels, eventually causing microhemorrhages as well as passage of bacteria, which may lead to urinary infection, infection of the urinary stones, and bacteremia. Bacteriuria is detected in up to 23.5% of patients who undergo ESWL, while clinical urinary infection is more frequently observed in patients with multiple or complex struvite stones. Obviously, the risk of infection is higher if there is evidence of urinary tract infection or obstruction; thus, urinalysis and urine culture are routinely performed before the procedure [1].

IE following lithotripsy has been described rarely in the literature. In 1996 Zimhony et al. [2] reported a 61 year old man who developed *Enterococcus faecalis* endocarditis following ESWL; there was no

evidence of vegetations but a thrombus was seen in the left auricle. Similar to our case, their patient also developed a splenic infarction. Furthermore, urine culture in their case grew *Streptococcus* and *Staphylococcus*, 1000 colony-forming units (CFU)/ml. No antibiotic treatment was given prior to or following the ESWL procedure in that case.

Fever and urosepsis following ESWL have been reported since 1985, when Wickham and team [3] described the first series of 50 patients treated with ESWL, many of whom developed fever despite antibiotic prophylaxis following the procedure. In 1986 Matlow and Goldberg [4] reviewed the data of 80 patients treated with ESWL, focusing on the risk for bacteremia in a population of patients with no history of UTI, whose urine cultures were sterile and who did not receive prophylactic antibiotic before the procedure. Within the first 24 hours after lithotripsy 4% of this group became febrile. Although many authors stressed the need for antibiotic prophylaxis following genitourinary procedures during the last 25 years, in 2008 the National Institute for Clinical

Excellence (NICE) and the American Heart Association (AHA) guidelines for prevention of IE have recommended cessation of routine prophylactic therapy for most patients undergoing urological procedures. Indeed, this was accepted due to the evidence of scarce reports of secondary IE following such procedures. Similarly, the 2009 new version of the European Society of Cardiology (ESC) guidelines on prevention, diagnosis and treatment of IE reduced the number of indications for prophylactic therapy and recommends it only for patients with the highest risk for endocarditis, such as those with prosthetic valves, patients with previous IE history, and patients with a complex congenital heart disease [5].

In conclusion, despite the absence of known risk factors for IE in our patient and despite the rarity of this kind of complications, IE following ESWL may occur. Therefore, a thorough clinical evaluation should be performed before the procedure in order to consider the benefits of possible prophylactic antimicrobial therapy. This is especially important in patients with an existing urinary tract infection.

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