

A Rare Case of Multiple Septic Embolism Related to Urosepsis

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Abstract: Septic embolism due to urosepsis, especially with multiple septic emboli in organs other than lungs, is quite rare. A 47-year-old woman was referred to our intensive care unit due to uncontrolled fever, hypoxic acute respiratory failure and circulatory disorders. Urosepsis, pneumonia, acute coronary syndrome, circulatory disorders, nephrolithiasis, aortic aneurysm and acute renal failure on chronic renal failure were diagnosed. On the clinical course, multiple brain abscesses appeared. It was suggested that all clinical conditions developing after urological intervention were due to septic embolus related to urosepsis. In the presence of uncontrolled fever and sepsis following urological intervention, multiple septic emboli and abscesses should be considered. This case, which had interesting clinical features, was reported alongside related literature.

Keywords: Urosepsis, Septic embolus, Abscess.

INTRODUCTION

Septic embolism is an important clinico-pathologic entity that affects critically ill patients. It is comprises of both early and late life-threatening complications. We report a rare case of septic embolism, related to urosepsis following urologic intervention.

CASE HISTORY

A 47-year-old woman, who followed up with her diagnosis of nephrolithiasis, aortic aneurysm (with stent) and chronic renal failure (CRF), was subjected to right-ureteroscopy (URS) and double-J stent at the Public Hospital Urology Clinic, where she had been admitted for side pain due to urinary calculi. After 24 hours, a series of conditions, including fever, chill, respiratory difficulties and circulatory disorder (at each of four distal extremities) appeared. With a preoperative serum creatinine level of 1,65 mg/dl (0,6 – 1,2), leukocyte levels on urinalysis of 7/hpf, leukocyte esterase +++ and many bacteria, the patient showed decreased urination and also acute renal failure. When the patient was delivered to our unit, she had the following features: blood pressure 140/70 mmHg, pulse rate 118/min, body temperature 38°C, respiratory rate 22/min, poor general medical condition, state of unconsciousness, Glasgow coma scale score 3 and intubated, diffuse rales on pulmonary auscultation, inability to measure peripheral pulses at each of the four distal extremities and gangrenous changes starting from elbows and ankles (Figure 1). The results from the laboratory examinations included, as follows: Glucose:

64 mg/dl (75–115), AST: 454 U/L (5-40), ALT: 311 U/L (5-40), ALP: 141 U/L(30-120), GGT: 58 U/L (0-55), Creatine kinase: 1540 U/L (24-195), CK-MB: 80,81 U/L (0-25), total bilirubin: 0,8 mg/dl (0,00-1,10), direct bilirubin: 0,6 mg/dl (0-0,35), urea: 167 mg/dl (10-50), creatinine: 5,3 mg/dl (0,6-1,2), sodium: 139 mEq/L (135-145), potassium: 6,1 mEq/L (3,5-5,5), troponin: 8,38 ng/ml (0,02-0,06), CRP: >220 ng/L (0-5), procalcitonin: 199,5 ng/ml (0-0,1), leukocyte count: 20,130/mm³ (neutrophil 96%), hemoglobin: 8,9 g/dl (11,1-17,1), platelet count: 30.000/mm³.

She was admitted to the intensive care unit of internal diseases with a diagnosis of urosepsis, pneumonia, acute coronary syndrome, circulatory disorders, nephrolithiasis, aortic aneurysm and acute renal failure on chronic renal failure. None of the cultures obtained presented any growth. However, *Escherichia coli* was reported to grow in urinary culture that was obtained from the first medical center. Despite multi-antibiotic therapy, fever was unable to be kept under control after 72 hours, with a manifestation of septic shock. Antifungal drugs were added into the therapy. An expansion from the thoracic aortic aneurysm and the presence of the stent applied to the aorta, as well as common infiltrations in both lungs, were observed at chest radiography (Figure 2A). On the following day, progression at bilateral reticulonodular lesions was observed in the control x-ray (Figure 2B). In the examination of arterial Doppler ultrasonography, no blood stream was observed at the bilateral upper extremities, at lower extremity ankles and at right distal

posterior and bilateral distal peroneal arteries. It was evaluated as “septic emboli,” and amputation was recommended by cardiovascular surgery, but it was not accepted by the patient’s relatives. Therefore, a medical therapy was arranged. In the course of antibiotic therapy, thorax and brain CT were performed due to progressive lesions in lungs and failure to reduce fever. Common infiltration areas, bilateral excess pleural effusion, obliteration at the posterior segment of the right lung upper lobe and related atelectasia and thoracic aortal aneurysm, as well as the presence of the stent applied, were observed (Figure 3) at both lungs. In the examination of brain CT, a few similar lesions were observed, the largest of which sized 0,5 cm at the right

lobe, along with a 2 cm subcortical-located hyper dense lesion, surrounded by a large vasogenic edema at the right posterior parietal lobe and pansinusitis findings (Figure 4). If necessary, hemodialysis was performed during follow-up, as well as transfusion of the erythrocyte and platelet. The patient died on the 28th day following hospitalization without any medical response to such treatments. According to the last examination, the results were as follows: hemoglobin 7,1 gr/dl, leukocyte count 23180/mm³, CRP: 156 ng/L, Procalcitonin >200 ng/ml, urea: 171 mg/dl, Crea: 3,6 mg/dl, AST: 46 U/L, ALT: 15 U/L, INR: 1,04 PTT: 36,8 sec (21-36) PT: 13,1 s (10-14).



Fig-1: Gangrenous appearance of extremities



Fig-2: Progression of reticulonodular lesions in lungs

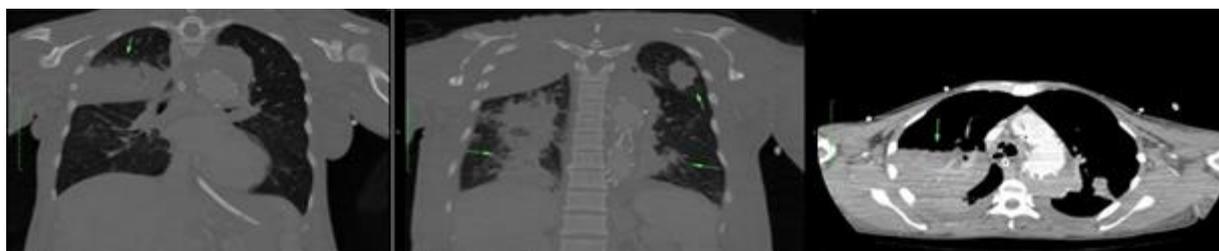


Fig-3: Common infiltration areas, bilateral pleural effusion and atelectasia



Fig-4: Hyperdense lesions surrounded by a large vasogenic edema

DISCUSSION

Septic embolism can be complicated with both early and late sequelae. Among the immediate complications is the occlusion of the vascular tree. Vascular occlusions can be common, including peripheral arterial occlusions to devastating sequelae, such as cerebral, bowel or myocardial infarction [1]. Among the late complications are mycotic aneurysms and abscesses [2, 3].

The most affected organ is the lung, resulting from the spread of emboli from the focus of infection. However, it is not a common circumstance, and the clinical findings are non-specific. Findings related to respiratory disorder such as, chest pain, cough and clinical signs caused to primer focus are observed. Nodules, common patchy infiltrations, cavity formation and pleural effusion are also observed at both lungs by imaging methods. Septic emboli at other organs are quite rare. In a collected work discussing the cases and researches published between 1978 and 2012, a number of 168 cases were reported to develop pulmonary septic emboli. In these patients, iv drug additives, iv catheter application and infective endocarditis are ranked among the top three as the infection focus. Only in six cases, renal abscess and pyelonephritis were found. A number of 48 patients presented with methicillin-resistant *Staphylococcus aureus*, 27 patients with methicillin-sensitive *Staphylococcus aureus*, 11 patients with Fusobacteria, 11 patients with *Klebsiella pneumonia*, six patients with *Candida*, and four patients with *Streptococcus viridians* when the blood cultures were examined [4].

In the presence of septic embolism, it is a rare circumstance that the source of infection is the urogenital system, itself. Urinary stasis is known to pose a risk to urinary system infections, which also most probably leads to bacterial uroepithelial invasion. It is demonstrated in some studies that certain characteristics of *E. coli* play a role in uroepithelial invasion, particularly with P-fimbriae featured in the development of bacteremia [5, 6]. Mortality has been reported to range between 5-21 % in *Escherichia coli* bacteremia [7, 8]. In the presence of bacteremia, pathogens inflict damage directly with their toxins and indirectly through inflammatory mediators, leading to local thrombosis; they form a nidus for developing abscess [9-11].

In the literature, there is some case reports related to the formation of abscess in more than one organ, resulting from septic embolism. However, the majority of these reports usually involve abscess formation mostly at 2 organs [12]. Seventy percent of brain abscesses develop as either skull trauma or emboli from a distant focus [13]. Within 24 hours after the urological intervention (placement of right ureteral double-j catheter) of our patient, with a background of chronic renal failure and ureteral calculi, a number of new conditions, including necrosis, cyanosis (associated to emboli at each of the four distal extremities), acute coronary syndrome, bilateral common infiltrations in lung and multiple abscesses in brain, were found. It sounds reasonable that this clinical manifestation may be a result from septic emboli developed after severe bacteremia. The other reason of septicemia in this patient may be stent infection. The incidence of endovascular stent infection is estimated to be between 0.6-3% [14, 15]. In our patient, aortic stent infection was not considered because of high blood rate flow in stent region, presence of the multiple brain abscess and lack of the computed tomographic findings of stent infection.

The most possible explanations seem to be the presence of preoperative urinary infection findings, the movement of purulent material in the proximal obstruction towards the renal pelvis after intervention and the effect of micro trauma on severe bacteremia. The absence of typical findings of abscess in the lungs could be due to intense antibiotic therapy. In the presence of uncontrolled fever and sepsis, following urological intervention, septic emboli and abscess should be considered because of increased risk of mortality.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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