

Two cases of hemorrhagic shock due to septic arteritis secondary to urinary tract infection

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Infectious, or septic, arteritis is a rare condition attributed only to certain chronic infections, such as syphilis. The incidence of septic arteritis may be higher than supposed, however, as it may be a complication of certain other infections, such as those in the urinary tract. Septic arteritis is usually diagnosed when the patient develops a complication, such as ruptured vessels or occult bleeding, and such events often end in death. We describe 2 cases of septic shock originating in complicated urinary tract infections with early septic arteritis that led the affected vessels to rupture; hemorrhagic shock followed. The emergency physician should be alert to the possibility of these potentially serious events and be prepared to treat the condition quickly and aggressively. [Emergencias 2014;26:371-374]

Keywords: Arteritis. Pyelonephritis. Hemorrhagic shock. Septic shock.

Introduction

Infection of the walls of an artery, or infectious arteritis, has been classically described in mycotic aneurysms from endocarditis, syphilis, tuberculosis and other specific diseases. However, it is now recognized that it may be caused by hematogenous spread of any bacteria¹, and the main sources are the urinary tract and the abdominal cavity². Arteritis may complicate the clinical course of sepsis and cause acute bleeding secondary to the formation and rupture of pseudoaneurysms which in most cases go undetected until bleeding occurs³. Two cases of urinary septic shock complicated by bleeding due to rupture of two separate acute arterial aneurysms.

Clinical cases

The first case was a 61 year-old woman with a history of alcohol abuse (80 g/day), hypertension and dyslipidemia who presented at the emergency department for malaise, drowsiness and di-

orientation, accompanied by fever since a week before. On arrival the patient presented stupor, hypotension (blood pressure 72/46 mmHg), tachycardia (heart rate 112 beats per minute) and fever (38.2°C). The rest of the examination was normal. Blood tests showed C-reactive protein 30.61 mg / dl, WBC 12,600 x 10⁹ / L (87.4% neutrophils), hematocrit 42 L / L and creatinine of 1 mg / dl. Urine sediment showed 16 leukocytes per field; chest radiography and lumbar puncture were normal. Treatment was started with ceftriaxone and fluid resuscitation, followed by noradrenaline for persistent hypotension. On suspicion of urinary septic shock, the patient was moved to the intensive care area. In the next 12 hours she presented marked improvement, regaining consciousness and normal temperature and blood pressure. Blood and urine cultures identified multi-susceptible *Escherichia coli*. At 24 hours, she presented sudden decreased consciousness and electromechanical dissociation. Physical examination showed pale skin and abdominal distension. Urgent hematocrit was 13 L / L. Resuscitation and RBC transfusion were initiated. Abdominal ultra-

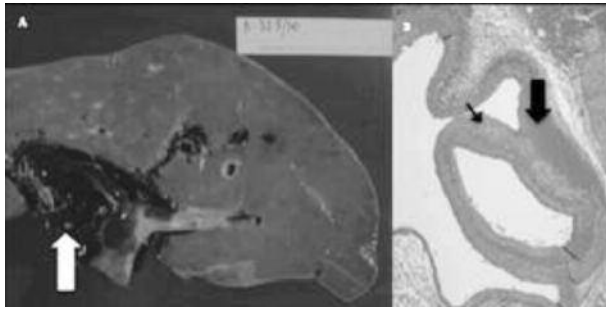


Figure 1. A. Macroscopic image of a post-mortem liver specimen from case 1 where a large hematoma is seen in the hepatic hilum (arrow). B. Microscopic image (40X hematoxylin eosin) of the hepatic artery, showing inflammation of the arterial wall (small arrow) and accumulation of extra-luminal RBCs in the area of the dissection (large arrow).

sound showed abundant intraperitoneal free fluid and a heterogeneous mass at the hepatic hilum. After 70 minutes of resuscitation, the patient died. Autopsy revealed a large hematoma secondary to hepatic hilum dissection of the hepatic artery (Figure 1A) and acute pyelonephritis. Microscopic examination showed acute inflammatory infiltrate and secondary dissection of the hepatic artery suggestive of viral arteritis (Figure 1B).

The second case was a 55 year-old man with a history of type 2 diabetes mellitus and alcoholism (60 g/day) who presented to the emergency department with fever since 10 days before without other accompanying symptoms. On arrival, blood pressure was 90/42 mmHg in, and the rest of the examination was normal. Chest x-ray showed no significant alterations. Lab tests showed glucose level of 474 mg / dL, C-reactive protein 17.56 mg / dL, leukocytes $20,600 \times 10^9 / L$ (91% neutrophils), creatinine 1.5 mg / dL and hematocrit of 26 L / L; urine sediment with pyuria and abdominal ultrasound showed minimal left peri-renal fluid. Treatment with ceftriaxone and fluid resuscitation was prescribed and norepinephrine treatment was initiated for persistent hypotension. On suspicion of urinary septic shock, he was moved to the intensive care area. Blood and urine cultures isolated multi-susceptible *Klebsiella pneumoniae*. For persistent fever and requiring high doses of noradrenaline at 72 hours, ceftriaxone was changed to meropenem; abdominal tomography revealed a prostatic abscess, a left renal abscess and multiple pulmonary nodules, all less than 20 mm. For the study of anemia, fibrogastroscopy showed mild portal hypertension gastropathy without signs of bleeding. Clinical condition then improved and the patient was transferred to conventional hospitalization on day 6. Within 48 hours he suffered massive rectal bleeding and hypotension. Abdominal angiography revealed a hemo-

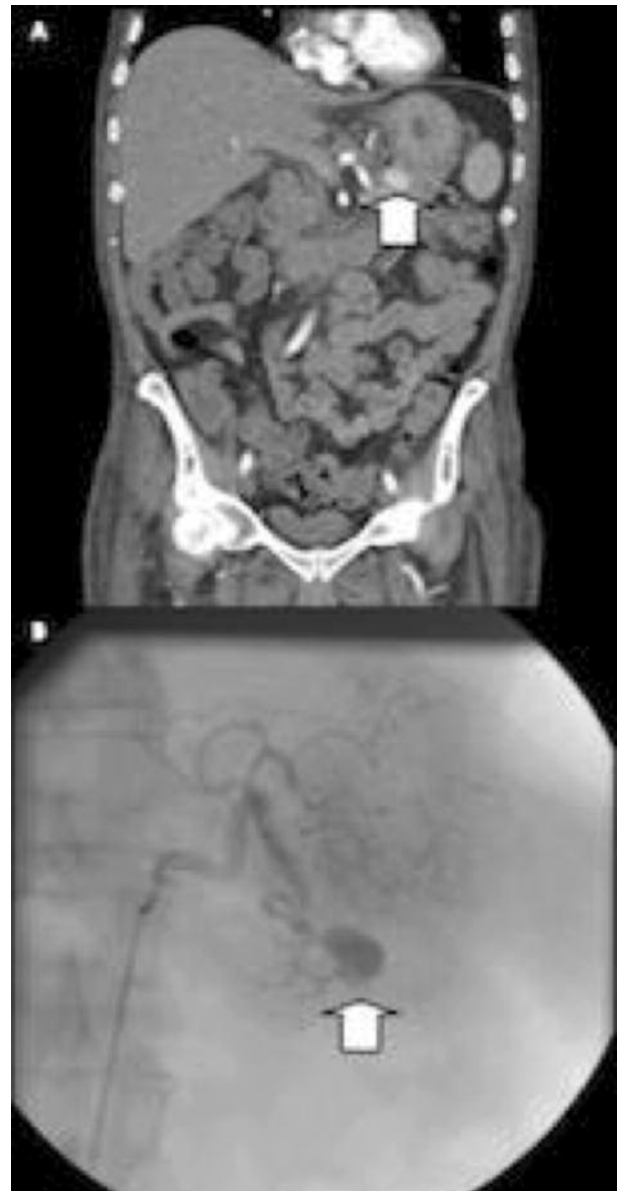


Figure 2. A. Abdominal CT image from Case 2. A pseudoaneurysm of the left gastric artery (arrow) is shown. B. Arteriography of the superior mesenteric artery showing the pseudoaneurysm (arrow).

peritoneum and a pseudoaneurysm measuring 17 x 15 mm in the left gastric artery (Figure 2A), which was not present in the previous scan. Guided by arteriography, embolization (Figure 2B) was performed and no further bleeding episodes were recorded. The patient completed four weeks of antibiotic therapy and was discharged without further complications.

Discussion

Viral arteritis is an under-diagnosed entity cau-

sed by inflammation of the vascular wall in proximity to an adjacent focus of infection or, more commonly, at a distance, in the context of systemic dissemination of infection^{1,4}. Although endocarditis has traditionally been considered the main cause, the predominant scenario is currently bacteremia from different sources^{1,5}. The most frequently isolated agents are staphylococci, streptococci, *E. coli* and *Salmonella spp*^{3,6}. Infectious agents of classic series of infectious aneurysms such as *Treponema pallidum*, *Mycobacterium tuberculosis* and mycotic aneurysms have been relegated to the background. The abdominal aorta and the femoral artery are most commonly affected, but any artery may be affected⁵. Arterial damage occurs predominantly in preexisting atheromatous or aneurysmal type lesions and evolves towards the formation of aneurysms and pseudoaneurysms² which represent life-threatening complications due to their capacity for rapid expansion and susceptibility to rupture. Isolation of *S. aureus* and *Salmonella spp*, advanced age and the absence of surgical treatment are considered poor prognostic factors³. Diagnosis is based on angiographic detection of vascular changes in the course of an infection, usually incidentally⁷. In some cases, such as those presented here, the diagnosis is reached after a complication of a hemorrhagic event. Treatment consists of exclusion of aneurysms by surgery, endovascular embolization procedures or prosthesis placement. Prolonged antimicrobial treatment is recommended⁸.

Of the cases presented, it is noteworthy that, to date, there have only been anecdotal reports of arteritis and aneurysm secondary to pyelonephritis⁹⁻¹¹, and gram-negative bacilli were the main pathogens involved. The absence of germs in the histopathological examination of the first case does not exclude an infectious origin, since such organisms are not frequently isolated in experimental animal studies either¹, nor in large series of infected aortic aneurysms¹².

Also, the fact that the patient was receiving effective antibiotic therapy helps to explain the absence of germs in the affected tissues. The absence of preexisting aneurysms or hepatic artery lesions or other pathologic vascular territory during the study points to the existence of recent arterial damage and, therefore, possibly related to the acute process. In our second case, we consi-

der that the gastric artery pseudoaneurysm could have been the consequence of infection which was not present on CT scan six days earlier. Although visceral pseudoaneurysms have been linked to acute pancreatitis, abdominal surgery or trauma, they can also occur in the context of infection⁸. Finally, although a case of pseudoaneurysm of the left gastric artery has been previously described, this is, to our knowledge, the first of probably infectious origin¹³.

In conclusion, infectious arteritis is a potentially fatal condition that can appear rapidly in the course of urinary sepsis. It can affect any territory during the course of infection and requires a high level of suspicion to be diagnosed and treated. In the event that signs of bleeding appear during the course of urinary sepsis, or unexplained anemia or acute shock not suggestive of acute septic shock, either early or deferred, the possibility of infectious arteritis should be quickly excluded and, if present, should be subject to emergency therapeutic measures to prevent complications.

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Descripción de dos casos de shock hemorrágico por arteritis infecciosa secundaria a sepsis urinaria

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La arteritis infecciosa es una entidad considerada rara y atribuida únicamente a determinados agentes con infección crónica como la lúes. Sin embargo, su incidencia puede ser más elevada de lo esperado, ya que puede complicar cuadros sépticos como los de origen urinario. Mayoritariamente se diagnostican cuando se complican, habitualmente en forma de ruptura y hemorragia oculta, a menudo mortal. Se describen dos casos de *shock* séptico urinario complicados con una arteritis infecciosa precoz que condicionó la ruptura de los vasos afectados y un *shock* hemorrágico posterior. El *urgenciólogo* debe estar alerta frente a esta posibilidad, dada su potencial gravedad y la necesidad de un tratamiento agresivo precoz. [Emergencias 2014;26:371-374]

Palabras clave: Arteritis. Pielonefritis. *Shock* hemorrágico. *Shock* séptico.