CASE REPORT

Septic Emboli to the Skin Following Angioplasty

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Abstract

Invasive vascular procedures have good efficacy and safety profiles and are now widely used for the diagnosis and treatment of many cardiovascular disorders. However, they do have potential complications that can occasionally be life-threatening. We present a new case of infectious pseudoaneurysm following percutaneous transluminal coronary angioplasty and complicated by septic emboli to the skin. It is a rare condition characterized by persistent bacteremia, sepsis of unknown origin, and regional septic emboli. Histopathology of the skin lesions typically reveals gram-positive coccobacilli and septic vasculitis. The condition carries a significant morbidity and mortality, making early diagnosis essential. Both cholesterol and septic emboli should be considered in the differential diagnosis of skin lesions after invasive vascular procedures.

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PALABRAS CLAVE
Pseudoaneurisma; Angioplastia coronaria transluminal percutánea; Staphylococcus aureus; Púrpura

Embolismos sépticos cutáneos tras angioplastia

Resumen

Los procedimientos vasculares invasivos son en el momento actual ampliamente utilizados para el diagnóstico y tratamiento de muchas patologías del sistema cardiovascular, con un buen perfil de seguridad y eficacia, aunque entrañan potenciales complicaciones que ocasionalmente pueden comprometer la vida del paciente. Presentamos un nuevo caso de pseudoaneurisma infeccioso postangioplastia complicado con embolismos sépticos cutáneos. Se trata de una entidad infrecuente caracterizada por bacteriemia persistente, sepsis sin foco aparente y embolismos sépticos regionales. El análisis histopatológico de las lesiones cutáneas habitualmente permite evidenciar la presencia de cocobacilos Gram positivos y de vasculitis séptica. Es una entidad con una importante morbimortalidad, por lo que el diagnóstico precoz resulta esencial. Por ello, ante lesiones cutáneas tras procedimientos vasculares invasivos deben considerarse en el diagnóstico diferencial no solo los embolismos de colesterol, sino también los embolismos sépticos.

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Introduction

Angioplasty is a safe and effective invasive vascular technique that is widely used in revascularization procedures. However, complications do occur, including infectious complications, which are relatively rare and develop in less than 1% of these procedures. The most common infectious complications are postangioplasty bacteremia and local infections at the puncture site; postangioplasty endocarditis and septic endarteritis are very rare. We present a case of septic emboli to the skin secondary to an infectious postangioplasty pseudoaneurysm. This is a rare condition, but it has a characteristic clinical presentation and histopathology.

Case Description

The patient was a 70-year-old man with a history of diabetes mellitus on treatment with insulin, systemic hypertension, ischemic heart disease, and renal and bladder cancer treated surgically in 2005, with no evidence of local recurrence or metastases. Three days after undergoing revascularization of the anterior descending artery by angioplasty with insertion of a drug-eluting stent, performed via the right femoral artery, he was admitted to our hospital for a deterioration of his chronic renal failure and pain in the right lower limb associated with acute functional impotence. In a previous admission 6 days earlier he had undergone revascularization of the right coronary artery, with access via the same artery.

He presented fever of 39°C and hypotension (blood pressure, 90/60 mm Hg) since the previous admission. Physical examination revealed an increase in diameter of the right lower limb associated with loss of muscle strength; there was a nonpulsatile mass in the right inguinal region compatible with a postangioplasty hematoma. Round and oval plaques of approximately 1 to 3 cm in diameter were observed exclusively in that limb. The plaques were erythematous and edematous, with a purpuric center and poorly defined borders; they were most numerous on the distal part of the limb and tended to be present in groups (Figure 1). There were no other significant findings.

Blood tests showed acute anemia (hemoglobin, 9 g/dL; reference range, 13-17.3 g/dL), an elevation of the plasma creatinine (4.24 mg/dL; basal level, 2.3 mg/dL; reference range, 0.60-1.30 mg/dL), neutrophilia of 90% (reference range, 41%-74%) without leukocytosis, and elevated C-reactive protein (150 mg/L; reference range, 0-5.00 mg/L). Urgent and delayed cerebral computed tomography (CT), arterial Doppler ultrasound of the right lower limb, and CT scan of the abdomen and pelvis were normal. Retinal examination revealed no signs of cholesterol emboli. Histopathology of the skin lesions showed a normal epidermis and multifocal, dense neutrophilic inflammatory infiltrates in the mid and deep dermis with extravasated red blood cells (Figure 2). The vessels presented a prominent endothelium, intraluminal thrombi, and intraluminal, intraparietal, and interstitial neutrophils. Gram stain revealed the presence of scattered gram-positive coccobacilli in pairs and clusters in the areas corresponding to the dense neutrophilic inflammatory infiltrates (Figure 3). Methicillin-sensitive Staphylococcus aureus (MSSA) was isolated from the blood and skin cultures; all other cultures were negative.

Transesophageal echocardiography was requested on the basis of a diagnosis of septic vasculitis due to MSSA. This showed no vegetations or signs suggestive of infective endocarditis. Arteriography revealed the presence of a pseudoaneurysm of the right deep femoral artery (Figure 4).

With a definitive diagnosis of sepsis secondary to an infectious postangioplasty pseudoaneurysm of the right deep femoral artery complicated by local septic emboli to the skin, the patient was administered a course of treatment with intravenous cloxacillin 1 g/4 h for the first 2 weeks followed by 1 g/6 h by mouth for 4 weeks, and the
infectious pseudoaneurysm was surgically repaired. This achieved complete resolution of the condition.

Discussion

In 1985, Krupski et al. published the first case of infectious postangioplasty pseudoaneurysm. Previously reported cases of infective endarteritis complicated by local septic emboli were related to the use of arterial catheters for monitoring vital signs in critically ill patients. Septic endarteritis is an infection of the wall of an artery. Its natural clinical course leads to destruction of the wall and dilatation of the artery, with the subsequent formation of an infectious aneurysm or pseudoaneurysm that may even rupture. As cited by other authors, Frazee and Flaherty established criteria to differentiate between local infection and postangioplasty septic endarteritis. According to those authors, postangioplasty septic endarteritis is defined by clinical evidence of local infection at the puncture site and one or more of the following observations: persistently positive blood cultures in the absence of infective endocarditis, evidence of local septic emboli, and presence of a pseudoaneurysm with pus observed on surgical examination.

In the pre-antibiotic era, the most common cause of septic endarteritis and of an infectious aneurysm or pseudoaneurysm was infective endocarditis, due either to persistent bacteremia with bacterial seeding of the previously damaged arterial wall or to septic microemboli entering the vasa vasorum. Nowadays, the most common cause is blood vessel injury due to the increasing use of invasive diagnostic and therapeutic vascular procedures and to the parenteral administration of recreational drugs. S. aureus is the microorganism most frequently implicated in septic endarteritis and in postangioplasty mycotic pseudoaneurysm.

The risk factors for developing postangioplasty septic endarteritis are advanced arteriosclerosis, a past history of blood vessel injury, and congenital or acquired immunodeficiency. There are also risk factors related to the angioplasty technique, such as difficulty of arterial access, the duration of the procedure, and leaving the arterial sheath in place for 24 to 72 hours after angioplasty; it has been observed that thrombus forms on the surface of 100% of these sheaths within 24 hours. Furthermore, a second coronary revascularization procedure with access via the same artery between 3 and 7 days after an initial procedure also predisposes to septic endarteritis, and the formation of a post-revascularization hematoma at the site of arterial puncture favors bacterial proliferation due to a disturbance of local immunity. In our patient, a second angioplasty was performed via the right femoral artery, used in an initial revascularization procedure less than a
and livedo reticularis. Palpable purpura, petechiae, pustules, digital cyanosis, to regional cutaneous septic emboli from an infectious recommendation.

Radiological evidence of septic emboli to other organs, such as the central nervous system, spleen, or kidneys. In our case, the contralateral limb is unsuitable for technical reasons, antibiotic prophylaxis should be considered, whom the contralateral limb used for the intervention, not only cutaneous cholesterol but also septic emboli secondary to an infectious aneurysm or pseudoaneurysm as a complication of postangioplasty septic endarteritis.

Conflict of Interest

The authors declare that they have no conflict of interest.

References