CASE REPORT

Infective endocarditis secondary to a hemodialysis catheter revealed by subarachnoid hemorrhage: Case report

Endocardite infectieuse secondaire à un cathéter d'hémodialyse révélée par une hémorragie sous-arachnoïdienne: Rapport de cas

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Abstract

Introduction: Endocarditis associated with medical care is a rare and serious entity. The risk of occurrence is increased in hemodialysis patients due to the immunosuppression and the multiplicity of vascular accesses of different kinds. The mode of revelation can be variable given the diversity of symptoms it causes. Herein, we describe the case of endocarditis associated with medical care in a patient with renal failure who presents with neurological symptoms.

Observation: A 38-year-old patient with a history of kidney disease in the hemodialysis stage presented to the emergency room with altered neurological status in the context of fever. The patient's condition requires airway control, sedation, and vasopressor medication. Brain imaging revealed Fisher 4 subarachnoid hemorrhage with brain turgor. Transthoracic and transesophageal cardiac ultrasound exploration revealed infective mitro-aortic endocarditis with trigonal abscess fistulized in the left ventricle and destruction of the aortic valve with massive regurgitation. The additional imaging in a second step did not highlight any images of mycotic aneurysm. The indication for early surgery was not approved given the hemodynamic instability and the poor intracerebral hemodynamics demonstrated by transcranial doppler ultrasound. The initial outcome under antibiotic treatment and renal replacement was favorable. But the subsequent course was fatal due to septic shock with multiple organ failure.

Conclusion: The diagnosis of infective endocarditis should always be considered in hemodialysis patients presenting in a septic state with signs of systemic involvement. It is a source of mortality in these debilitated patients.

Key words: Case report, Catheter related infection, Endocarditis, Renal insufficiency, Subarachnoid hemorrhage, Transesophageal echocardiography,

Résumé

Introduction: L'endocardite associée aux soins médicaux est une entité rare et grave. Le risque est augmenté chez les patients hémodialysés en raison de l'immunodépression et de la multiplicité des accès vasculaires. Le mode de révélation peut être variable compte tenu de la diversité des symptômes qu'elle entraîne. Nous rapportons le cas d'une endocardite associée aux soins chez un patient insuffisant rénal présentant des symptômes neurologiques.

Observation: Un patient de 38 ans ayant des antécédents d'insuffisance rénale au stade d'hémodialyse s'est présenté aux urgences avec un état neurologique altéré dans un contexte de fièvre. L'état du patient a nécessité le recours à la ventilation mécanique et l'administration de vasopresseurs. L'imagerie cérébrale a révélé une hémorragie sous-arachnoïdienne de type Fisher 4 avec une turgescence cérébrale. L'exploration échographique cardiaque transthoracique et transœsophagienne a révélé une endocardite mitro-aortique infectieuse avec abcès trigonal fistulisé dans le ventricule gauche et une destruction de la valve aortique par un magma de végétations avec régurgitation massive. L'imagerie complémentaire n'a objectivé aucune image d'anévrisme mycotique. L'indication d'une intervention chirurgicale précoce n'a pas été approuvée vu de l'instabilité hémodynamique et la mauvaise hémodynamique intracérébrale démontrée par l'échographie doppler transcrânienne. L'évolution initiale sous traitement antibiotique et épuration extra-rénale a été favorable. Mais l'évolution ultérieure a été fatale en raison d'un choc septique avec défaillance multi-viscérale.

Conclusion: Le diagnostic d'endocardite infectieuse doit toujours être envisagé chez les patients hémodialysés présentant un état septique avec des signes d'atteinte systémique. C'est une source de mortalité chez ces patients affaiblis.

Mots clés: Echocardiographie transoesophagienne, Endocardite, Hémorragie sous-arachnoïdienne, Infection liée au cathéter, Insuffisance rénale, Rapport de cas

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Introduction

Endocarditis associated with medical care is a rare entity, especially in the intensive care unit (1). The risk of occurrence is increased in hemodialysis patients due to the immunosuppression and the multiplicity of vascular accesses of different kinds (2). Vascular fistulas are less likely to cause infections than temporary catheters (3). Endocarditis is responsible for high morbidity and mortality in patients with compromised or predisposed immunity (4). The mode of revelation can be variable given the diversity of symptoms it causes (1). Neurological complications are common in endocarditis (5). However, they are uncommon as a mode of revelation (2). The management is complex, especially in severe intensive care patients with co-morbidities (1). The therapeutic decision is multidisciplinary involving: anesthesiologist, cardiologist, infectious disease specialist, radiologist and cardiac surgeon (6). Herein, we describe the case of endocarditis associated with medical care in a patient with renal failure who presents with neurological symptoms. The diagnosis of infective endocarditis should always be considered in hemodialysis patients presenting in a septic state with signs of systemic involvement. To improve the chances of survival, management must be immediate and appropriate between the various actors within the multidisciplinary team regarding the hemodynamic support, the effective antibiotic therapy and the timing of surgery.

Case report

This case is about a 38-year-old patient with a history of end-stage renal failure at the hemodialysis stage for 18 years. The etiology of his renal failure was undetermined according to his attending physician. He had several operations for the establishment of arteriovenous fistulas. For the past 11 months, hemodialysis has been done via a single-channel catheter tunneled into the anterior wall of the chest and its distal part reached the level of the superior vena cava.

One week before his admission, he had holo-cranial headaches associated with vomiting resistant to symptomatic treatment. On the day of his admission he presented with a sudden altered consciousness, so he was referred by the doctor at a district hospital in the governorate of Bizerte to the emergency room of the national institute of neurology. The examination showed a photophobic patient with stiffness of the neck, a Glasgow coma scale (GCS) equal to 8/15 and pupils in reflective intermediate position. In addition, were noted tachycardia at 145 bpm, polypnoea at 40 cycles per minute and fever of 40°C. All were associated to the presence of petechial lesions on the chest and both feet. Emergency brain computed tomography revealed a Fisher 4 subarachnoid hemorrhage predominantly in bi-frontal, in the sylvian valleys and in the base cisterns. Were noted a diffuse cerebral edema associated with multiple hypodensities in bi-frontal, right temporo-insular, right parietal and right occipital.

Considering the rapid neurological deterioration (GCS decreased to 6/15), the patient was intubated, ventilated, sedated and transferred to a resuscitation environment. He was put on noradrenaline because of the circulatory failure. Transcranial doppler examination demonstrated intracranial hypertension with collapsed diastolic velocities (Figure 1).

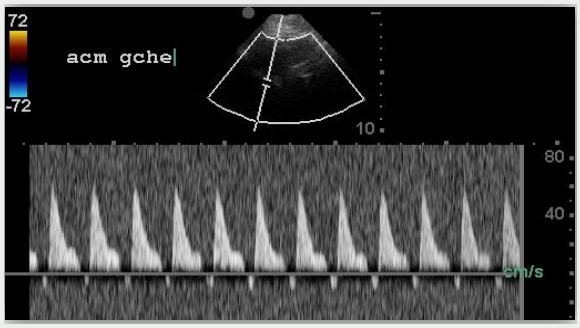

Figure 1. Findings of the transcranial Doppler: Peak systolic and collapsed diastole

This justified the strengthening of sedation and osmotherapy. An emergency hemodialysis session was performed due to the threatening hyperkalaemia of 7.9 mmol/L [3.5-5.5]. The old catheter was removed and referred for bacteriology. The biological and bacteriological assessments concluded in a biological inflammatory syndrome (C-reactive protein = 384 mg/l [< 6], Procalcitonin = 153 ng/ml [<0.15], White blood cells = 16300 E/mm3 [4000-10000]). Hemodynamic exploration by transthoracic ultrasound was difficult due to the patient's poor echogenicity. Only the subcostal window showed a collapsed inferior vena cava at 9 mm, a circumferential pericardial effusion of low abundance and one of the images was suggestive of abscesses at the level of the aortic valve. This was completed by a transoesophageal ultrasound which showed the existence of significant vegetations on the 3 aortic sigmoids with valvular destruction resulting in massive aortic regurgitation. There was also a 2.5 cm trigonal abscess fistulized in the left ventricle with a magma of vegetations on the anterior mitral valve with a thickness of 2 cm. The posterior mitral valve is less affected with a large pedicled vegetation of 1.5 cm on the atrial side associated with minimal mitral regurgitation. It should be noted that the left ventricle had normal kinetics and the absence of involvement of the tricuspid valve. The report was validated by a senior cardiologist (Figures 2 and 3).

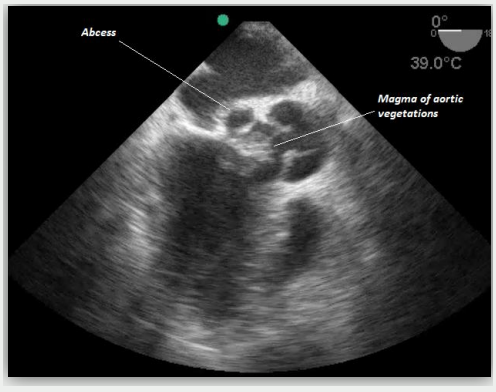

Figure 2. Abcess and magma of aortic vegetations

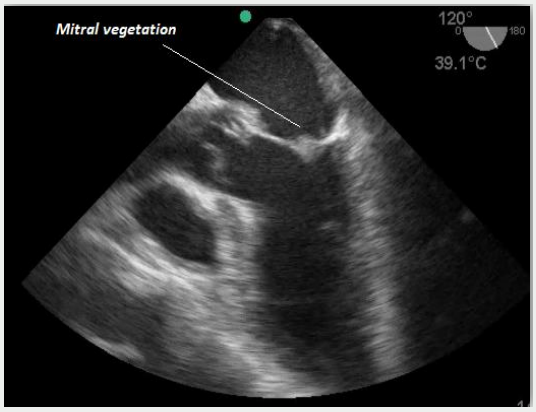

Figure 3. Mitral vegetation

The patient was therefore put on antibiotic therapy based on vancomycin, gentamycin, fluconazole and piperacillin / tazobactam. Teicoplanin was then associated either on the second day of hospitalization after a positive result of the culture of catheter with a coagulase negative staphylococcus. The other bacteriological samples were negative. The initial evolution was marked by improvement in hemodynamic parameters with decreased doses of vasopressors and improvement in tachycardia. Improved transcranial doppler data were noted: diastolic velocities at 35-40 cm/s [35-55] with a pulsatility index at 1.2-1.6 [0.8-1.2] and mild velocities at 60-90 cm/s [55-80]. An improvement in biological parameters was noted, especially a decrease in white blood cells, C-reactive protein and procalcitonin, and a lasting apyrexia. The control by brain computed tomography did not reveal images of mycotic aneurysms. However, the early surgical indication was not accepted by the cardiac surgery team due to hemodynamic instability, intracranial hemorrhage and poor neurological prognosis. Subsequently, the patient presented with a worsening of his hemodynamic status with shock and signs of peripheral hypoperfusion associated with ischemic lesions in the two lower limbs. Theses lesions were related to multiple occlusions of the legs left common and superficial femoral arteries and right anterior tibial and popliteal arteries. The outcome was unfavorable with death due to shock complicated by multiple organ failure on the 10th day of hospitalization.

Discussion

This was an uncommon clinical situation in which the revelation of infective endocarditis was a subarachnoid haemorrhage. The important points to be drawn from this clinical situation were to evoke the diagnosis of infective endocarditis in vulnerable patients who present in a septic state with signs of multisystem involvement. And, to focus on the importance of transoesophageal echocardiography in the intensive care setting as a diagnostic tool, especially if transthoracic examination is inconclusive. Management is multidisciplinary, and the therapeutic decision takes into account the patient's general condition, vital signs and neurological prognosis.

Infectious endocarditis is one of the rare entities of healthcare associated infections that can occur especially in the intensive care unit (1). It is a provider of morbidity and mortality, mainly in patients with compromised immunity including patients with renal impairment on hemodialysis (4) (7). It can appear in different clinical presentations given the embolic and systemic nature of the lesions.

A similar case of endocarditis secondary to a tunneled dialysis catheter was published by Mariana Sousa et al. (8), the germ identified was of the candida albicans type. The outcome was favorable after antifungal treatment and surgery (8). Endocarditis in this context are usually endocarditis of the right heart (9). However, the involvement of the mitral valve and the aortic valve as in our case could be related to a bacterial transplant secondary to sepsis starting from a catheter related infection.

In our case, the only positive bacteriological sample was the culture of the removed catheter. It showed a coagulase negative staphylococcus. This germ is pathogenic especially in the population of immunocompromised patients (10).

Neurological complications during endocarditis are common and consist of ischemia, intracranial hemorrhage, meningeal reaction, brain abscess and mycotic aneurysms (11). Cases of intracranial hemorrhages associated with endocarditis have been reported with different radiological aspects, different bacteriological profiles and different prognoses (12) (13). Several mechanisms are responsible for intracranial hemorrhage in the context of endocarditis: ischemia with hemorrhagic transformation, ruptured mycotic aneurysm, septic embolization or septic and pyogenic arteritis (14) (15). Septic arteritis has been described as a mechanism of bleeding in staphylococcal endocarditis (14) (15). This may be the case with our patient given the absence of a mycotic aneurysm image and the presence of staphylococcus in the bacteriological culture.

Some cases of non-traumatic subarachnoid hemorrhage have been described as the initial manifestation of infective endocarditis (16) (17) (18). It has been indicative of endocarditis in a few published cases including the article of Talal Asif et al. (16). There were not images of mycotic aneurysms demonstrated as in our case (16).

The timing of surgery for complicated endocarditis with intracerebral hemorrhage remains a delicate decision. Waiting a month can lead to irreversible complications of higher functions. Early surgery could cause the worsening of the hemorrhage. An article published by Venn RA et al.(6), has provided a clear algorithm for the management and early timing of surgery for intracranial hemorrhage based on radiological evidence and multidisciplinary discussion between different disciplines (6). In our case, emergency surgery was rejected due to the significant neurological lesions of hemorrhagic nature and the hemodynamic instability.

Our patient gathered several items of poor prognosis, which were highlighted by the international literature in an article published by Mirabel M et al.(19), we cite the delay in diagnosis and consultation, the initial septic shock and the immunosuppression (19).

Conclusion

The diagnosis of infective endocarditis should always be considered in hemodialysis patients presenting in a septic state with signs of systemic involvement. It is a source of mortality in these debilitated patients. To improve the chances of survival, management must be immediate and appropriate between the various actors within the multidisciplinary team regarding the hemodynamic support, the effective antibiotic therapy and the timing of surgery.

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