ACUTE CEREBROVASCULAR INCIDENT CAUSED BY SEPTIC EMBOLI: A CASE REPORT

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SUMMARY – Septic embolism is a rare disorder associated with infective endocarditis, urinary tract infections, bone infections, femoral thrombophlebitis and sinusitis. We present a 53-year-old patient with multiple systemic embolism and cerebral infarction resulting from aortal thrombus after surgical treatment of the right fibular malleolar fracture with osteosynthetic material placement. After the surgery, the patient became antisocial, with decreased appetite and substantial weight loss. Computerized tomography scan showed several small hypodense zones in the supratentorial and periventricular region of the brain as well as bilateral pleural effusion, large infarcts of the spleen and right kidney, smaller infarcts of the lower pole of the right kidney, discontinuity of the wall of the thoraco-abdominal aorta and a thrombus present in the distal part of abdominal aorta. The findings primarily indicated septic emboli. The right ankle x-ray showed still present postoperative fracture gap of the right fibular malleolus with reduced bone mineralization but no signs of bone destruction. Control MSCT of the abdomen showed a large spleen abscess of 10x6 cm in size. Due to edema of the right ankle, ultrasonography was performed to reveal a thick content in the joint. The patient was transferred to University Department of Surgery, where splenectomy with evacuation of the perisplenic abscess together with extraction of the osteosynthetic material of the right fibular malleolus was performed. If not promptly diagnosed, septic emboli can cause devastating neurologic damage. In our patient, early diagnosis and intensive physical therapy facilitated almost complete regression of his neurologic deficit.

Key words: *Endocarditis, bacterial – complications; Intracranial embolism – complications; Brain ischemia – complications; Sepsis*

Introduction

Septic embolism is a rare disorder associated with bone infections, infective endocarditis, sinusitis, orbital cellulitis, femoral thrombophlebitis, urinary tract infections, central venous catheter infections, prosthetic cardiac valve infections and pacemaker infections. Some of the causative organisms include *Staphylococcus aureus*, *Klebsiella pneumoniae viridans* and streptococcal species. Predisposing factors for septic emboli include diabetes mellitus, immunosuppression and intravenous drug use[1]. Septic embolism can be difficult to diagnose and can present with a variety of features. These include fever, night sweats, fatigability, malaise, and weight loss. It can embolize any tissue, particularly the lungs, kidneys, spleen and central nervous system (CNS), resulting in pneumonia or empyema, abdominal pain, hematuria, splenomegaly, stroke, brain abscess and subarachnoid hemorrhage[2]. If multiple septic emboli are accompanied

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with sepsis, the mortality rate varies between 30% and 50%. The outcome of the patient depends on previous illnesses, age, duration of septic state and accompanying complications. Despite all new treatment methods including a wide range of antibiotics and supportive therapy, 50% of patients develop septic shock with a 50%-90% mortality rate[3].

Case Report

A 53-year-old male was admitted to the hospital for sudden weakness of the left extremities with facial asymmetry. Four days prior to admission, he had general weakness, diarrhea and vomiting. In September 2008, the patient underwent surgical treatment of the right fibular malleolar fracture with osteosynthetic material placement. In November 2008, he was hospitalized because of postoperative wound infection, when cloxacillin was prescribed due to isolation of *Staphyloccocus aureus*. The patient became antisocial, with decreased appetite and intentional weight loss (6 kg in month and a half).

At admission, the patient's blood pressure was 140/100 mm Hg and he was febrile (38 °C). Relevant findings on physical and neurologic examination included abdominal distension, hiccups, dysarthria, central lesion of the left facial nerve, mild left hemiparesis, positive Babinski sign on the left, and postoperative scar wound in the region of lateral malleolus of the right ankle.

Computerized tomography (CT) scan of the brain was performed immediately, according to the guidelines for stroke management[4]. It showed minimal asymmetry of insular cortex in supratentorial region with a small hypodense zone on the right side, highly suspect of new ischemic changes. The right periventricular region and the region of the right basal ganglia showed several point-like hypodensity zones, possibly acute lacunar changes.

In order to assess cerebral arteries, we performed Doppler of the carotid and vertebral arteries and transcranial Doppler that revealed only a small flat hypoechogenic plaque at the origin of the right ICA, which caused no significant stenosis of the vessel. The hemodynamics was satisfactory[5].

Relevant laboratory findings showed elevated white blood cells (19.5x10^9/L). C-reactive protein (CRP) and creatinine were also elevated (90.6 mg/L and 313 μmol/L, respectively).

Chest radiography performed in horizontal position showed no infiltration changes, no signs of pneumonia or heart congestion, and no pleural infiltration. The right ankle x-ray showed postoperative state of fibular malleolus with a fracture gap and reduced bone mineralization, but no signs of bone destruction.

Spinal tap was obtained. Macroscopically, it looked slightly dim and slightly hemorrhagic. The cell count was 20/3 cells/μL, red blood cells 1365 cells/μL and elevated proteins (0.74 g/L). Magnetic resonance imaging (MRI) of the brain showed acute ischemic lesion in the left temporo-occipital area of the posterior cerebral artery (PCA) and large ischemic changes in the region supplied by the right medial cerebral artery (MCA), with signs of hemorrhagic transformation in the frontal and temporal area.

During hospital admission, the patient developed rigid abdomen with preserved peristalsis, enlarged liver and spleen, urinary retention and dark loose stool. Body temperature was elevated (39.2 °C). Ultrasonography of the abdomen was immediately performed to reveal hepatosplenomegaly with hyperechogenic liver and perisplenic space with a minimal amount of liquid content; kidneys showed no signs of hydronephrosis. Abdominal CT showed bilateral pleural effusion, large infarcts of the spleen and right kidney, smaller infarcts of the lower pole of the right kidney, discontinuity of the wall of the thoraco-abdominal aorta and a thrombus present in the distal part of the abdominal aorta, just above the bifurcation. In addition, there was mesenterial edema, including edema of several fascia in the abdomen and pelvis. The finding primarily indicated septic embolism, supported by multiple infarct localizations and changes in the thoracic and abdominal aorta. Echocardiography showed hypertensive heart disease with normal parameters of systolic function of the left ventricle and diastolic dysfunction in terms of incomplete relaxation. Cardinal cusps showed no clear signs of vegetation and no regurgitation of the valves. No discontinuity of the interatrial and interventricular septum was verified.

The patient was then transferred to Intensive Care Unit, University Department of Medicine, where repeat heart ultrasonography showed no vegetations on the heart valves. Blood culture isolated coagulase-negative staphylococcus.

After 14 days of medication (cloxacillin, penicillin, netylmicin), the patient was physically and psycho-

logically better with partial improvement of inflammation parameters. However, the patient remained subfebrile and the inflammation parameters began to rise again. Control CT of the abdomen showed a large spleen abscess sized 10x6 cm. Due to continuous edema of the right ankle, ultrasonography was also preformed to show a thick content in the joint. The traumatologist recommended extraction of the osteosynthetic material.

The patient was transferred to University Department of Surgery, where splenectomy with evacuation of the perisplenic abscess and extraction of the osteosynthetic material of the right fibular malleolus were performed. The early postoperative period was complicated with high fever, which was put under control with imipenem. On postoperative day 60, the patient was readmitted to University Department of Medicine. Control ultrasonography and CT scan of the abdomen were normal.

After several weeks of hospitalization and the course of disease described above, control of the inflammatory process and gradual stabilization of the patient's general condition were achieved; however, chronic renal insufficiency persisted. Intensive physical therapy facilitated almost complete regression of the patient's neurologic deficit.

Discussion

We presented a patient with stroke symptoms as the first signs of septic embolism. Cerebral stroke is the leading cause of disability in industrialized countries. It affects 400 of 100,000 inhabitants *per* year, leaves 40% of stroke patients with moderate functional impairment and up to 30% with severe disability[6,7]. However, septic cardioembolism is a rare cause of stroke.

Septic embolism is a rare condition that is associated with bone infections and infective endocarditis. Mattar *et al.* describe a case of periodontal disease that led to the diagnosis of septic emboli[8]. Miyaki *et al.* describe a case of septic embolism induced by urinary tract infection[9]. Lemierre's syndrome has also been described in the literature, consisting of pulmonary septic emboli from an internal jugular vein thrombus after anaerobic head and neck infection[10].

Septic embolism can be difficult to diagnose and can present a variety of features[2,6]. The diagnosis can be suspected by antecedents and symptoms, but imaging tests together with cultures isolating microorganism play a key role in the diagnosis of septic embolism[1]. The approximate time between the onset of symptoms and the time of diagnosis is roughly 18 days[11]. Early treatment with intravenous antibiotics should be administered because of the high mortality, and surgical treatment may sometimes be necessary.

If not promptly diagnosed, septic embolism can cause devastating neurologic damage. In our patient, timely diagnosis and intensive physical therapy facilitated almost complete regression of his neurologic deficit; however, chronic renal insufficiency persisted.

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Sažetak

AKUTNI CEREBROVASKULARNI ISPAD UZROKOVAN SEPTIČNOM EMBOLIJOM: PRIKAZ SLUČAJA

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Septična embolija je rijedak poremećaj uzrokovan infektivnim endokarditisom, infekcijom mokraćnih putova, infekcijama skeleta, femoralnim tromboflebitisom te sinusitisom. Prikazujemo slučaj 53-godišnjeg bolesnika s višestrukom sistemskom embolijom i cerebralnim infarktom uzrokovanim aortnim trombom nakon osteosinteze prijeloma malleola desne fibule. Nakon operacijskog zahvata bolesnik se povlači u sebe, smanjenog je apetita i značajno gubi na težini. CT mozga je pokazao nekoliko hipodenznih zona u supratentorijalnoj i periventrikularnoj regiji, dok je CT abdomena pokazao pleuralni izljev obostrano, veće infarkte slezene i desnog bubrega, manji infarkt donjega pola desnog bubrega, nepravilnosti u području stijenke torakoabdominalne aorte, te tromb u distalnom dijelu abdominalne aorte. Nalaz je prvenstveno odgovarao septičnim embolusima. Rtg desnoga gležnja pokazao je još vidljivu poslijeoperacijsku frakturnu pukotinu desnoga fibularnog malleola uza smanjenu koštanu mineralizaciju bez znakova destrukcije kosti. Kontrolni CT abdomena pokazao je apsces slezene veličine 10x6 cm. S obzirom na otok desnoga skočnog zgloba učinjen je UZV koji je pokazao gust sadržaj u zglobu te se bolesnik premješta u Kliniku za kirurgiju gdje je obavljena splenektomija uz evakuaciju perispleničnog apscesa te uklanjanje osteosintetskog materijala desnoga fibularnog malleola. Ako se ne dijagnosticira pravodobno, septična embolija može uzrokovati značajan neurološki deficit. Zahvaljujući ranoj dijagnozi bolesti i intenzivnoj fizikalnoj terapiji kod našega bolesnika došlo je do gotovo potpunog povlačenja neurološkog deficita.

Ključne riječi: *Endokarditis, bakterijski – komplikacije; Intrakranijska embolija – komplikacije; Moždana ishemija – komplikacije; Sepsa*