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Case reports

Antiphospholipid antibodies and ischemic neuropathy following cardiac surgery

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Abstract

Sciatic nerve palsy is an uncommon complication of cardiac surgery and is thought to be induced by a combination of reduced femoral artery blood flow, small vessel vascular disease or prolonged hypoxia. We here describe a new case which is the first described with transient elevation of antiphospholipid antibodies. Although transient elevation of lupus coagulation inhibitor is known to occur frequently in patients treated in an intensive care unit, there are very few data about the possible role of antiphospholipid antibodies in the generation of ischemic neuropathies. We can not prove that the ischemic neuropathy in our case has been favored by the presence of lupus coagulation inhibitor and antiphospholipid antibodies as the occurrence of the symptoms seemed to precede the transient elevation of lupus coagulation inhibitor. This case suggests that antiphospholipid antibodies and lupus coagulation inhibitor should be included in the work up of patients who present nerve damage after cardiac surgery but further studies are needed to ascertain this association.

Key words : Ischemic neuropathy ; cardiac surgery ; antiphospholipid ; lupus coagulation inhibitor.

Introduction

Ischemic neuropathies are uncommon complications of cardiac surgery. They are likely due to a combination of reduced femoral artery blood flow and either small vessel disease or prolonged hypoxia (McManis 1994). Various immunological disturbances can occur after major surgery and particularly after cardiac surgery with cardiopulmonary bypass. It induces pro- and anti-inflammatory immune responses which involve both cellular and humoral immunity (Rothenburger *et al.* 2003 ; Levy and Tanaka 2003). Among these, the postpericardiotomy syndrome with appearance of anti-heart antibodies and circulating immune complexes is one of the most common (Engle *et al.* 1978 ; De Scheerder *et al.* 1984). The postoperative oedema and effusion syndrome (Tarnok *et al.* 2001), the systemic inflammatory response syndrome (Payen *et al.* 2000) and the heparin-induced thrombocytopenia syndrome (DeBois *et al.* 2003) are some other immunological complications that can be seen after cardiac surgery.

Transient elevations of lupus coagulation inhibitor (LCI) have been described in patients treated in an intensive care unit (ICU) but these patients do usually not present thrombotic or embolic events (Wenzel *et al.* 2002). Moreover, antiphospholipid antibodies have been observed in case of neoplasm, hemopathies and infectious diseases such as HIV, rubeola, EBV, parvovirus, viral hepatitis, *Mycoplasma pneumoniae*, *Chlamydia psittaci*, Lyme's disease, syphilis, *Salmonella sp.*, *Klebsiella sp.*, Q fever, endocarditis, malaria, *Trichomonas sp.*, tuberculosis or lepra (Catteau *et al.* 1995). In these cases, the infectious agents are thought to induce a transient elevation of antiphospholipid antibodies (Dalekos *et al.* 2001). The underlying mechanism is supposed to be a molecular mimicry between the infectious agent and the β-2-glycoprotein-I which is thought to be the preferential target antigen for antiphospholipid antibodies (Catteau *et al.* 1995 ; Dalekos *et al.* 2001).

We describe a new case of ischemic neuropathy after cardiac surgery. To our knowledge, this is the first one associated with a transient elevation of antiphospholipid antibodies (APA) likely consecutive to an ICU hospitalization.

Case report

A 43-year-old man was admitted in our rehabilitation department for weakness of the right leg. One month before, seven coronary bypasses were performed for unstable angina. An intra-aortic balloon pump was set up during 48 hours for hypotension. Thereafter, the patient stayed in the ICU for 11days. Ten days after the surgery, he started to complain of pain in the right foot. At this time, activated partial thromboplastin time (APTT) was normal. Twenty-two days after the operation, he presented a subacute paresis of the right lower limb. On admission in our department (31 days after cardiac surgery), clinical examination was normal except for the absence of right femoral pulse. Neurological examination disclosed a right flaccid

paresis of thigh abduction (4/5), knee flexion and extension (4/5), foot flexion, extension and abduction (2/5). Knee reflexes were normal but right ankle reflex was weak (1/4) (Hallett 1993). There was no pyramidal tract involvement. There was also a right foot hypoesthesia in all modalities. Electromyography showed a reduced recruitment of motor unit action potentials with maximal contraction in right tibialis anterior and abductor hallucis muscles, reduced recruitment in tibialis posterior, extensor digitorum brevis and extensor hallucis, and signs of denervation in the short portion of right biceps femoris and in the gluteus medius muscles. The amplitude of the right extensor digitorum brevis (0.23 mV) and abductor hallucis (2.6 mV) compound muscle action potentials was reduced as well as the amplitude of the sural sensory nerve action potential (0.96 µV). Electrophysiology of the left lower limb was normal. Lumbar CT-Scan and MRI were normal except for L5-S1 apophyseal osteoarthritis. Laboratory findings performed at admission showed a moderate hypercholesterolemia (total cholesterol : 206 mg/100 ml, HDL cholesterol : 25 mg/100 ml), prolongation of APTT (45 seconds ; normal range 20-35 seconds). Further investigations disclosed the presence of LCI and APA. The APA level rose to a maximum of 84U (normal range 0-12) seven weeks after the surgery. AntiNeutrophil Cytoplasmic Antibodies, AntiNuclear Antibodies, anti-GM1 gangliosides antibodies, paraprotein, cryoglobulin, Ebstein-Barr virus, Cytomegalovirus, HIV, HBV, syphilis, Campylobacter, Borrelia, and parasitic serologies were all negatives. A treatment with acetylsalicylic acid, 160 mg/day and intensive physiotherapy were performed. Paresis and sensory deficits progressively improved. Four months after the surgery, only a slight paresis (4/5) of foot extension and toes hypoesthesia remained. Meantime, LCI became undetectable and the level of APA decreased to 28U.

Discussion

Sciatic nerve ischemic neuropathy is a very rare complication of cardiac surgery (McManis 1994). In our patient, denervation signs of gluteal muscle points to sciatic nerve involvement inside the pelvis (Victor M. and Ropper A. H. 2001) which makes the hypothesis of sciatic nerve compression irrelevant. He was a heavy smoker, had atherosclerosis and required an intra-aortic balloon pump for hypotension. Despite the subacute (15 days) course of the disease, the absence of right femoral pulse argues for this diagnosis (McManis 1994).

To our knowledge, this is the first described patient presenting all risk factors described by McManis (McManis 1994) and high levels of APA which represents a major thrombotic risk factor. Neuropathies likely induced by APA are reported (Meyer *et al.* 1987). Molecular mechanisms of thrombosis due to APA are still discussed but histopathological examination in case of APA syndrome shows thrombotic microangiopathy, ischemia secondary to upstream arterial thromboses or emboli, and peripheral embolization from venous, arterial, or intracardiac sources (Levine *et al.* 2002). Transient elevations of LCI occur frequently in patients treated in an ICU but are usually asymptomatic (Wenzel *et al.* 2002). Other causes of transient elevation of APA were ruled out in our case by clinical and paraclinical investigations.

We can not prove that the ischemic neuropathy in our case has been favored by the presence of LCI and APA as the occurrence of the symptoms seemed to precede the transient elevation of LCI. Further studies are needed to establish the exact relationship and to evaluate the accurate timing between transient elevations of APA and LCI and the incidence of ischemic neuropathies following cardiac surgery. However, we suggest that antiphospholipid antibodies and lupus coagulation inhibitor should be included in the work up of patients who present nerve damage after cardiac surgery.

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