CASE REPORT

Mycotic Aneurysm of the Carotid Artery Due to *Salmonella enteritidis* Associated with Multiple Brain Abscesses

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Introduction

Mycotic aneurysms of the extracranial carotid are very uncommon, with 29 cases reported, only three secondary to salmonella infection. We report a case of mycotic aneurysm of the right common carotid artery due to an infection by salmonella associated with ipsilateral brain abscesses of probable embolic origin.

Case Report

A 59-year-old male was admitted with swelling of the right side of the neck. He had a 2 month history of pyrexia. His past medical history included: hypertension, diabetes mellitus, hyperlipaemia, cholelithiasis and a probable embolic stroke 1 month before admission. Physical examination revealed a 3 cm soft mass on the right side of the neck without palpable regional lymphadenopathy. Neurological examination was normal. The CT-scan showed a lateral cervical mass associated with the right carotid vessels compatible with an abscess. The cerebral scan revealed some enhancing rings in the temporal and frontal cortical areas of the right hemisphere, which were reported as multiple brain abscesses (Fig. 1).

After admission, he developed enterocolitis with stool cultures positive to *Salmonella enteritidis*. Blood cultures were negative. Intravenous treatment was begun with cefotaxime and metronidazole; the gastrointestinal symptoms disappeared and the cervical mass decreased. The patient was discharged back to the referring hospital.

Three months later, the patient was readmitted because of a head injury (right temporal contusion) produced by syncope. No neurological findings were apparent. The cerebral CT-scan showed a subarachnoid haemorrhage and confirmed the complete disappearance of brain abscesses. Duplex scan of the carotid vessels showed a saccular aneurysm of the right carotid bifurcation with an intra-aneurysmatic

Fig. 1. Contrast computerised tomography scans showing enhancing rings in the right brain hemisphere.
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Fig. 2. Right carotid angiogram demonstrating an aneurysm of the carotid bifurcation.

thrombus. Angiography confirmed the diagnosis (Fig. 2).

The day prior to surgery, the patient developed fever recurrent with stool cultures positive for salmonella. He was treated with high dose intravenous cefotaxime and metronidazole 24 h before surgery. The operation was performed through an incision along the anterior border of the sternocleidomastoid muscle. The aneurysm of the carotid bifurcation was identified and the vessels clamped after systemic heparinisation. The aneurysm sac was opened and a carotid shunt inserted. Excision of the aneurysm was performed and the carotid artery reconstructed with a saphenous vein graft. The external carotid was sacrificed. The wound was closed in layers, without drainage. Intraoperative cultures were negative for *Salmonella enteritidis*. High doses of antibiotics were administered for 6 months postoperatively.

The patient’s medical history which included cholelithiasis confirmed by ultrasound and stool cultures positive for salmonella suggested the diagnosis of a chronic salmonella carrier. Two months later elective cholecystectomy was performed. Culture of the bile was positive for *Salmonella enteritidis*. Pathology revealed an adenocarcinoma of the gallbladder. At 6 months follow-up, the patient remains asymptomatic with no recurrence of gastrointestinal symptoms. He continues under oncology surveillance for his adenocarcinoma. Duplex scanning of the graft shows smooth flow through the saphenous vein bypass.

**Discussion**

Atherosclerosis is the major factor in the pathogenesis of microbial arteritis. The aorta is the most frequent site of atherosclerosis and therefore most commonly affected by this kind of arterial pathology.1 Intimal injury favours bacterial inoculation, infection and development of the infectious aneurysms.

The incidence of primary mycotic aneurysms due to microbial arteritis has decreased with the use of antibiotics as most of these aneurysms were caused by syphilis or tuberculosis. The microorganisms now most commonly involved are *Staphylococcus aureus* and salmonella.2 Arterial infection due to salmonella is unusual, but it is one of most frequent causes of mycotic aneurysms. Metastatic infections can occur in any part of the body, causing multiple mycotic aneurysms and organ abscesses.3 The most common species are *Salmonella choleraesuis* and multiple serotypes of *Salmonella enteritidis*.

Mycotic aneurysms of the extracranial carotid artery are rare with only three cases due to salmonella reported in the medical literature.4,5 They usually appear as an enlarging pulsatile lateral cervical mass in a septicemic patient. The natural course of a mycotic aneurysm is rapid enlargement with rupture or septic embolisation. The probable association described here between mycotic aneurysm of the right common carotid artery and multiple brain abscesses in the ipsilateral hemisphere was based on the radiological location of the brain abscesses in the areas perfused by the right internal carotid artery. Metastatic abscesses account for about 30% of all brain abscesses. The mechanism of metastasis is presumed to be septic emboli, although this can rarely be proven in clinical studies.6

Review of the literature related to the management of mycotic carotid artery aneurysms shows that ligation is associated with a 25% mortality, compared to a 7% mortality when the artery is reconstructed with autogenous tissue. The treatment of choice should be resection of the infected aneurysmal sac and reconstruction of the carotid artery with autogenous vein bypass, preferably with saphenous vein.11,12 Administration of a broad spectrum intravenous antibiotic should be maintained for 24–48 h preoperatively and continued for up to 6 weeks11,14 after surgery, or for life under specific conditions.

**References**


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