

# Call-Fleming Syndrome: An Extraordinary Complication of Tonsillectomy

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## ABSTRACT

A 36 years old woman underwent tonsillectomy for recurrent tonsillitis. At about one week in the postoperative period, she developed sudden onset severe ("thunderclap"), recurrent headaches and focal neurological signs including visual disturbances, ataxia and myoclonic jerks. Serial imaging with MRI, MRA and CT angiography revealed reversible white matter focal edema and segmental cerebral vasoconstriction. A diagnosis of Call-Fleming syndrome was made based on her symptoms and imaging findings, and she was started on nimodipine. She made a slow recovery but still has slight unilateral foot drop even 12 months since the initial event. This is the first case of Call-Fleming syndrome occurring following an ENT procedure.

**Key words:** *Call-Fleming syndrome. Tonsillectomy. Complications. CT angiography. MRI. Nimodipine. Reversible ischaemic. Headache.*

## INTRODUCTION

First described in 1988, Call-Fleming syndrome is characterized by the sudden onset of severe ("thunderclap") headaches and focal neurological deficits occurring most commonly in women aged 20-50 years.<sup>1</sup> Predictable cerebral arteriographic findings have been described including diffuse, multisegmental vasospasm involving both the anterior and posterior cerebral circulation, with delayed ischaemic insults often occurring in either an arterial border zone or in the parieto-occipital distribution.<sup>1-3</sup> No definitive mechanism has been found to explain its onset, but the pattern has been described in wide variety of conditions such as migraine, postcarotid endarterectomy, during puerperium, Guillian-Barré syndrome, following sexual intercourse, unruptured intracranial aneurysm and after exertion. Similar features have been noted following the administration of certain medicines (seretonegic, sympathomimetics such as sumatriptan, paroxetine and venlafaxine; ergonovine and bromocriptine; and illicit drugs such as ecstasy and cocaine).<sup>1-6</sup>

This patient is the first reported case of this reversible angiopathy occurring after a tonsillectomy.

## CASE REPORT

A 36 years old woman presented to the ENT out-patient department complaining of recurrent debilitating attacks

of tonsillitis over a period of 4-5 years. Examination revealed moderately sized tonsils and her past medical history was unremarkable. She was booked for an elective tonsillectomy, which was performed using bipolar diathermy dissection. She was discharged home a day after operation.

She returned on the 7th day complaining of severe headaches that appeared to be triggered by jaw movements and swallowing, sudden in onset, starting in the neck and occiput, and radiating to the forehead region. On examination, she was afebrile, and without any focal neurological signs, papilloedema or meningism. She was referred to a neurologist who suggested a possible indirect link between her headaches and recent surgery, especially since swallowing seemed to be triggering them. Neuropathic headache as a complication of tonsillectomy was the working diagnosis. Atypical migraine following stress of the operation was the differential diagnosis, especially since she had a family history of migraine. She was readmitted and started on intravenous fluids, antibiotics and analgesia (paracetamol, diclofenac and tramadol), and a short course of dexamethasone. Magnetic resonance imaging (MRI) scan was normal. On day 11, her symptoms began to subside with the medication, and gabapentin, diazepam and sumatriptan were later added prior to discharge.

At a follow-up appointment on day 18, the tonsillar fossae were seen to be healing well. She reported good initial relief with the use of the sumatriptan as opposed to the gabapentin, hence reinforcing the potential diagnosis of migraine. However, she was still experiencing severe headaches, with straining at stool becoming a major triggering factor. Her examination, however, failed to reveal any signs of raised intracranial

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pressure or evidence of low pressure headache caused by a spontaneous cerebrospinal fluid (CSF) leak. She was re-admitted for further evaluation. In view of her new-onset exertional headaches, a magnetic resonance angiogram (MRA) was performed, which was normal. Her gabapentin dose was increased, and propranolol and indomethacin were added to her regime. The sumatriptan was continued as needed, and her symptoms improved. She was discharged on day 21 with a view to gradually tapering off her analgesics and to reducing her prophylactic migraine medication.

She was readmitted urgently on day 26 with reported increasing confusion. This was obvious on examination, but the rest of her neurological examination remained normal. Both the gabapentin and indomethacin were stopped on the basis that they can cause confusion. She had by this time begun to taper off her analgesics, but 24 hours later, headaches had worsened. Neurological examination at this time revealed mild dyspraxia, though her confusion was less.

An emergency MRI scan was obtained which showed new demyelinating-type white matter lesions that were not present on the previous MRI. An atraumatic lumbar puncture was performed under local anaesthetic, which produced slightly turbid CSF at a raised opening pressure of 30 cm H<sub>2</sub>O. Since she was prone to developing cold sores, a tentative diagnosis of re-activated Herpes meningoencephalitis was made but ruled out when CSF analysis revealed no white cells, and normal protein and glucose levels. There was also no xanthochromia to suggest a subarachnoid haemorrhage. She was nonetheless started on intravenous methylprednisolone with acyclovir cover.

During her admission, she also developed significant higher level visual processing deficits, mild ataxia, vertigo and occasional myoclonic-type spasms. Nimodipine was started empirically for a possible a reversible cerebral vasoconstriction syndrome and CT angiogram of her cerebral vasculature was performed. It showed widespread segmental vasoconstriction compatible with reversible vasculopathy or a vasculitis (Figures 1 and 2). No aneurysms were seen.

On day 33, she was again discharged, symptomatically much improved, and with only minor sensory deficit

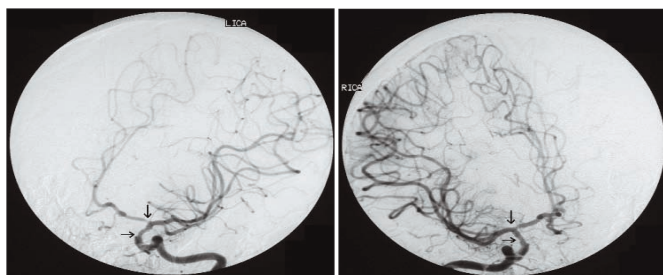
in the legs. Repeat CT angiogram prior to discharge showed no aneurysm or vasoconstriction, and a follow-up MRI scan revealed some residual ischaemic changes, predominantly in the right parietal cortex, though much improved from her earlier scan. A course of nimodipine 30 mg five times daily was prescribed for 2 weeks, during this time she was followed-up. She reported marked improvement in her symptoms, though was still getting occasional headaches, but not so severe. The dose of nimodipine was slowly tapered off over several weeks and eventually most symptoms resolved except a unilateral slight foot drop.

## DISCUSSION

Tonsillectomy is considered a minor otolaryngological operation, but many complications have been attributed to the procedure. In this patient, a tentative initial diagnosis of postoperative neuropathic pain causing headaches was made. The nerves at risk during a tonsillectomy are the glossopharyngeal nerve and the pharyngeal plexus of the vagus nerve. Simultaneous damage to these nerves has been shown to be contributory to velopharyngeal insufficiency.<sup>7</sup> Effects of damage to the glossopharyngeal nerve alone are mainly sensory, such as loss of taste in the posterior third of the tongue and of the pharyngeal reflex. Glossopharyngeal neuralgia can present as sudden onset, lancinating ipsilateral pain in the ear and neck, and has been described in patients with malignancy in the tonsillar region, and following head and neck trauma. It is also thought to be the cause of the referred otalgia often experienced in the immediate postoperative following tonsillectomy.<sup>7-9</sup> In this case, however, the nature of the headaches and the development of focal neurological signs made these diagnoses highly unlikely.

Atypical migraine as a differential diagnosis was also likely, especially since her headaches seemed to respond well to sumatriptan, and also because migraine itself has been shown to cause reversible cerebral vasoconstriction.<sup>3</sup> However, the absence of a personal history of previous migraine and the eventual response to empirical nimodipine all worked against this diagnosis. Jaw movements and straining at stool were also cited by the patient as triggering factors. This seems to negate both a migrainous variant and an ischaemic syndrome but the symptoms continued long after these apparent triggering symptoms disappeared. They were, therefore, likely to be only partially contributory, if not altogether coincidental occurrences. In addition, her ischaemic findings on repeat MRI were also resolving. These lesions may therefore represent oedematous changes as opposed to true infarction.<sup>6</sup> It is these oedematous changes that may mimic demyelinating lesions and cause difficulty in diagnosis.

The cause of Call-Fleming syndrome is currently unknown. Female sex hormones may play a role as the condition



**Figure 1:** CT angiogram of left internal carotid artery showing areas of segmental vasoconstriction (arrows).

**Figure 2:** CT angiogram of right internal carotid artery showing areas of segmental vasoconstriction (arrows).

is predominantly seen in young women. It occurs secondary to a neurogenic mechanism usually triggered by a mechanical, metabolic or biochemical insult, leading to vasospasm.<sup>2</sup> This fits with its sudden onset and self-limiting nature which likens it to the vasospasm that occurs in subarachnoid haemorrhage. The current treatment of this condition centers on calcium channel inhibitors. Nowak *et al.* demonstrated that nimodipine causes vasodilation of constricted arterial segments, making it an effective form of therapy in this syndrome.<sup>10</sup>

Call-Fleming syndrome represents a diagnostic challenge, and may be seen in the postoperative period. It is largely a diagnosis of exclusion, and commoner causes of sudden-onset headaches such as subarachnoid haemorrhage, sinus thrombosis and migraine should first be sought and ruled out. If these conditions are absent, a CTA or MRA should be performed to search for cerebral arterial vasoconstriction. If vessel narrowing is present, the mainstay of treatment is the cessation of seretoninergic/vasoactive drugs and the initiation of a calcium channel inhibitor such as nimodipine. Overall, the prognosis of Call-Fleming syndrome is excellent with complete recovery.

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