



MAGISTRATES COURT of TASMANIA

CORONIAL DIVISION



Record of Investigation into Death (Without Inquest)

*Coroners Act 1995
Coroners Rules 2006
Rule 11*

I, Rod Chandler, Coroner, having investigated the death of Stephen John French

Find that:

- (a) The identity of the deceased is Stephen John French;
- (b) Mr French was born at Burnie, Tasmania, on 4 August 1956 and was aged 57 years;
- (c) Mr French died at the Royal Hobart Hospital (RHH) in Hobart, Tasmania, on 10 August 2013;
- (d) The cause of Mr French's death was a large volume ischaemic infarct (stroke). Significant contributing factors were atherosclerotic coronary vascular disease, remote myocardial infarct and emphysema.

Background

Mr French resided with his wife, Julia Kramer, at 117 Main Road in Penguin. They had been married since 28 December 2012. Mr French had three children from a previous marriage. He was a carpenter by trade. He was employed by the Parks and Wildlife Service constructing walking tracks in the Dial Range area behind Penguin. His past medical history included a transient ischaemic event (transient stroke) with full recovery in 2002, and a myocardial infarction due to near complete blockage of the right coronary artery. This was managed with placement of a stent in 2009 to maintain patency of the vessel although Mr French was left with a degree of heart damage. He was a long term cigarette smoker.

Circumstances Surrounding the Death

During late May 2013 Mr French had been suffering headaches. On 28 May he complained to his wife of a headache and blurred vision. His wife took him to the North West Regional Hospital (NWRH) where he was attended in the Emergency Department (ED). The history

recorded at that time noted that Mr French had experienced a headache the day before that had improved by the next morning, but that it redeveloped later that day whilst using a lawn mower. At this time he also realised he was having difficulty walking in a straight line and also became aware of a visual field disturbance. His clinical observations were unremarkable. A non-contrast CT scan of his head reported: “*no acute intracranial pathology*”. The following day Mr French was reviewed by an ophthalmologist who found an inferior bilateral hemifield visual defect consistent with damage to the occipital lobes. An MRI was advised.

On 30 May Mr French was transferred to the Launceston General Hospital (LGH) and an MRI was carried out later that day. The scan reported multiple ischaemic infarcts in the cerebelli, occipital and parietal lobes bilaterally. There were no haemorrhages. An MRI angiogram was reported as showing a hypoplastic right vertebral artery. There was no arterial stenosis and no aneurysm seen about the Circle of Willis.

The decision was taken to transfer Mr French to the acute stroke unit (ASU) at the RHH. Beforehand, Dr H Castley, a stroke physician at the ASU, requested that a CT angiogram of the brain be undertaken at the LGH to exclude vertebral artery dissection. This was done by Radiologist Dr Anil Gupta, who reported the scan showing the hypoplastic right vertebral artery and no definite evidence of dissection. There was no thrombus seen, the blood flow was good and the Circle of Willis (anterior cerebral circulation) was normal. Mr French was then transferred by air ambulance to the RHH arriving in the early hours of 31 May. He was then admitted to the ASU with a posterior cerebral circulation stroke being noted as a possible diagnosis.

In the early hours of 1 June Mr French's bedside monitor recorded an arrhythmia suggesting an episode of ventricular tachycardia. It was decided to transfer him to the cardiology ward. Mr French was then investigated for a source of the vertebral artery emboli but no source was found. However, because of abnormalities on echocardiography Mr French was commenced on clexane and warfarin. He was also prescribed the anti-platelet agent clopidogrel which was to be maintained until the warfarin became therapeutic. At this point both the cardiology team and the neurology team were satisfied that Mr French could be discharged home. Arrangements were made for him to have a cardiology review at the NWRH in 4 to 6 weeks.

Following discharge Ms Kramer reports that her husband continued to have a constant headache of varying intensity. Pain relieving medication was obtained from his general practitioner.

Mr French re-presented to the ED at the NWRH on 3 August 2013. It was recorded that he had been suffering from a “*background*” headache ever since his stroke in May but that it had worsened over the previous two days. The headache was sited predominately behind his right eye, was dull in nature and constant. There was some associated visual disturbance. All of his clinical observations were within normal limits. A CT scan of the brain revealed further ischaemic changes. He was discharged the next day with Endone to manage his headache.

Mr French continued to suffer with headaches over the following days which were only partly relieved by the Endone. His condition worsened on 6 August. His headaches became more severe, he felt nauseous and vomited. His wife drove him back to the NWRH arriving shortly after midnight. It was recorded in the ED that he was complaining of a severe headache, impaired vision, vomiting, slurred speech and left sided weakness. On examination the visual field defects were unchanged. There were signs of left hemiplegia with left facial drop. Cerebellar signs were present on the left side. A CT scan suggested bilateral posterior cerebral artery infarcts and maybe some minor haemorrhagic change within the right parietal lobe infarct.

The NWRH records at this point disclose some uncertainty around Mr French’s warfarin therapy. The resident medical officer was Dr Michelle Musca. Her note in the records indicate that she discussed Mr French with a Neurosurgical Registrar at the RHH whom, it seems, advised that Mr French was “*not a neurosurgical problem*” and recommended that his warfarin be reversed. Dr Musca’s notes then record that she then discussed Mr French with a Medical Registrar at the NWRH who was prepared to admit Mr French to the medical ward and who expressed the view that it was not necessary for the warfarin to be reversed. The notes then record a discussion with Dr Brady Tassicker, an ED consultant at NWRH, who advised that the warfarin be reversed. There was then a discussion with the on-call haematology consultant at the LGH who advised upon the reversal and this was then implemented.

A repeat non-contrast CT scan was carried out at 10.30am on 7 August. It revealed a thrombosis of the dominant left vertebral artery and the presence of thrombus in the basilar artery. These findings were confirmed by a CT angiogram of the brain. Over the course of

the day Mr French's condition deteriorated. He became febrile after vomiting. His gag reflex was absent and he required oral suctioning to maintain his airway. The decision was taken to transfer Mr French to the RHH for admission to the ASU.

The transfer was carried out by air ambulance. Between Wynyard and Launceston there was deterioration in Mr French's condition. At the Launceston airport's treatment room Mr French was reviewed by the retrieval doctor and it was determined that sedation and intubation were necessary. The flight then continued to Hobart.

Mr French was admitted to the Intensive Care Unit. An urgent CT scan of the brain undertaken in the early morning of 8 August showed extensive brain injury. Medical staff discussed the CT results with Ms Kramer. The decision was taken to withdraw active treatment. Mr French was then kept clinically stable to enable his family to gather in Hobart. He died at 3.50pm on 10 August 2013.

Post-Mortem Examination

This was undertaken by Forensic Pathologist, Dr Donald Ritchey. In his opinion the cause of Mr French's death was a large volume ischaemic infarct (stroke). Significant contributing factors were atherosclerotic coronary vascular disease, remote myocardial infarct and emphysema.

Investigation

The coronial investigation has included the following:

1. Consideration of two affidavits provided by Ms Kramer.
2. A review of Mr French's hospital records at the NWRH, LGH, and RHH conducted by research nurse, Ms L K Newman.
3. Consideration of reports obtained from:
 - Dr Mahwash Ikhlaq, Medical Registrar for Professor Robert Fassett at the NWRH.
 - Dr Alan Rouse of the NWRH.
 - Radiologist, Dr Anil Gupta.
 - Report of Radiologist, Dr Luke Matar.

- Mr Dominic Morgan as Chief Executive Officer of Ambulance Tasmania.
 - Dr Michelle Musca of NWRH.
 - Dr Brady Tassicker of NWRH.
 - Radiologist, Dr John Earwaker.
 - Professor, Dr Jens Froelich of the RHH.
4. Consideration of the notes of a telephone conversation on 17 February 2014 between Professor Fassett and Ms Newman.
 5. Consideration of a report provided by Dr A J Bell as medical advisor to the Coroner upon his medical review of the circumstances related to Mr French's death.
 6. Meetings attended by myself, Dr Bell, Ms Newman, Dr Ritchey and State Forensic Pathologist, Dr Christopher Lawrence, to monitor and review the coronial investigation.

The report of Dr Bell identifies several areas of concern in Mr French's medical management. I will address each in turn.

Interpretation of the Radiography performed at the LGH on 30 May 2013.

During the investigation Dr Bell, who acknowledges that he is not a specialised radiologist, queried whether the MRI and the CT angiogram carried out at the LGH on 30 May 2013 did in fact, contrary to their reports, indicate the presence of a vertebral artery aneurysm. His query led to an opinion being sought from Professor Dr Jens Froelich, a specialist interventional neuroradiologist based at the RHH. In his report Professor Froelich says:

- Neither the MRI nor the CT demonstrates a vertebral artery aneurysm. However, they do demonstrate the classical imaging signs of a vertebral artery V4 segment dissection (which is occasionally falsely referred to as a dissecting aneurysm).
- That it is unacceptable to ascribe the detailed imaging findings to partial volume artefacts.
- *"The left sided vertebral artery dissection occurred at a very typical intracranial location, just proximal to the origin of the posterior inferior cerebellar artery (PICA) involving the V4 segment (intracranially). Unfortunately, Mr French had a congenitally aplastic right sided V3 segment and his right sided PICA perfusion was*

dependent on supply from the left vertebral artery. Even more unfortunately, Mr French did not have sufficient collateral blood flow from both internal carotid arteries, due to congenital hypoplasia of both posterior communicating arteries (PCOM-A). Subsequently, his left sided vertebral artery dissection has resulted not only in multiple embolic strokes, but finally caused occlusion of his vitally eloquent left vertebral artery with fatal infarction of his cerebellum, brain stem, posterior thalamus and occipital cerebral lobes.”

- That as a specialised interventional neuroradiologist his opinion may not be comparable with that of a general radiologist.

Dr Gupta, the Radiologist who reported upon the CT angiogram carried out on 30 May has made these points in response to Professor Froelich’s report:

- That Professor Froelich, as an interventional neuroradiologist, has “*high end expertise*” in this area and he is not a comparable peer to a radiologist.
- That the majority of the “*classical signs*” of vertebral artery dissection identified by Professor Froelich relate to the MRI which was not reported upon by him. (However, it should be noted that Dr Gupta would have been able to access the MRI at the time he reported upon the CT angiogram).
- That the changes described by Professor Froelich in relation to the CT angiogram are extremely subtle and it was reasonable for him to interpret them as representing atherosclerotic change.
- That radiologist, Dr Darren Ault, was appointed by the Australian Health Practitioner Regulation Agency to review this case. Dr Ault provided an opinion in agreement with that of Dr Gupta. He said: “*It is my opinion that it would be reasonable for an experienced general radiologist to not detect the abnormality in the left vertebral artery in the prospective reading of the CT 30. 05. 2013. It is also my opinion that if the abnormality were detected it would be more likely be ascribed to soft atherosclerotic plaque rather than focal dissection.*”

Consideration of this issue has also been aided by a report sought by myself from radiologist, Dr John Earwaker. In response to the question “*Was there evidence of vertebral artery dissection seen on the CTA and/or the MRI performed on the 30th May 2013?*” Dr Earwaker has responded: “**NO.** *The claimant has a dominant left vertebral artery which is the*

sole contributor to the posterior circulation. That vertebral artery appears to be normal and there is no evidence of dissection.”

In a recent finding I made this observation: “.....radiology is far from an exact science and in cases such as this where a diagnosis is not plainly evident, experienced practitioners can make significantly different interpretations of the same images.....” (See findings made in March 2017 upon the death of [Neville Robert Hoskinson](#)). That comment applies here where three experienced radiologists, on differing grounds, take issue with Professor Froelich’s opinion that the radiology demonstrates the classical signs of a left sided vertebral artery dissection. Nevertheless, I am satisfied and I so find, accepting the opinion of Professor Froelich, that the imaging does evidence the presence of a vertebral artery dissection as he describes. However, I acknowledge that Professor Froelich’s specialised training and qualifications better equipped him to make this diagnosis in comparison to a general radiologist and on this basis I make no criticism of Dr Gupta for the shortcomings in his interpretation.

I now move to consider the treatment options which would have been available to Mr French had the vertebral artery dissection been detected on 30 May.

It is my understanding from advice received from Dr Bell and Professor Froelich that the diagnosis of a vertebral artery dissection is a medical emergency that mandates immediate attention. The first step to be taken would be an angiographic investigation of the dissection. What treatment option is then chosen is dependent on the findings from that investigation. Professor Froelich has described the options in these terms: *“Both treatment and prognosis are strongly affected by whether or not the dissection extends into the intracranial compartment. If the latter is true, then there is a high rate of subarachnoid haemorrhage, usually with a disastrous outcome. Treatment is also largely influenced by the location of the dissection. In dissections limited to the extra cranial vertebral artery then antiplatelet agents are the mainstay of treatment, aimed at preventing artery to artery embolization and posterior circulation infarcts. Patients with intracranial extension are not treated with anticoagulation or antiplatelet agents on account of the risk of subarachnoid haemorrhage. Provided there is adequate collateral flow (i.e. large contralateral vertebral artery, intact circle of Willis), and especially in cases of subarachnoid haemorrhage, consideration should be given to operative or endovascular trapping or coiling of the dissected artery. Depending on the arterial anatomy, the risk of resulting posterior fossa ischemia is variable.”*

It is now not possible to state what treatment option would have been employed in the RHH had it been appreciated that Mr French was suffering a vertebral artery dissection. Nor is it possible to declare the likely outcome of that treatment and whether Mr French's life could have been saved at that time. All that I can find is that the failure to diagnose the dissection at that time meant that Mr French was denied the course of treatment considered best suited to his condition and was in turn denied the chance of survival that treatment offered. In this context it must be acknowledged that each of the treatment options involved a high degree of risk and Mr French's prospects of survival have to be assessed accordingly.

A further point needs to be made. That is that it is regrettable, in hindsight, that the brain MRI and CT angiogram carried out on 30 May 2013 were not reviewed by the RHH's radiology staff when Mr French was transferred to the RHH on 31 May. Had they been then it is possible that the vertebral artery dissection would have been detected and the appropriate treatment response initiated at that time.

The Adequacy of Mr French's Treatment on 3 August 2013

When Mr French returned to the NWRH on 3 August he was admitted under the care of locum consultant, Professor Robert Fassett. He was aware that Mr French had recently been a patient at the Stroke Unit in the RHH for investigation and treatment of a stroke. Like the Stroke Unit, he was unaware of the vertebral artery dissection. He considered that the appropriate treatment, including anticoagulation, had been put in place and did not consider Mr French's presentation on this day required any alternative treatment apart from the provision of Endone for pain relief.

In his report to me Dr Bell advises that, in his opinion, Mr French's presentation at this time including complaint of ongoing/worsening headaches, coupled with the results of the CT scan done at this time suggested that Mr French had suffered further cerebral injury and that the anticoagulation therapy was not working. These circumstances suggest that anti-platelet agents may have had a role to play. However, Dr Bell acknowledges that this would have been a difficult decision as the combined effect of ischaemic stroke coupled with anticoagulation and anti-platelet agents can cause cerebral haemorrhage. Also pertinent was the fact that the RHH's Stroke Unit considered, probably correctly, that Mr French's stroke had a cardiac cause and if so, anti-platelet therapy would be ineffective. Dr Bell advises that, on balance, it is his opinion that the treatment course chosen by Professor Fassett at this time was reasonable and was perhaps the safest option. I accept this opinion

and hence make no criticism of the treatment and care provided to Mr French upon his presentation on 3 - 4 August 2013.

Issues Arising from Mr French's Hospital Admission on 7 August 2013

When Mr French re-presented to the NWRH on 7 August his clinical picture made it clear that he had suffered further strokes. This was confirmed by the CT scan of the brain reported upon by Dr Matar. The critical issue confronting Dr Musca at this time was whether to reverse Mr French's anticoagulation therapy. To do so risked thrombosis of the left vertebral artery leading to severe ischaemic infarct in the posterior cerebral artery territory. Not to do so risked extension of the reported haemorrhage in an old area of infarction.

As I have noted earlier, Dr Musca made the decision to cease Mr French's warfarin upon the advice of ED consultant, Dr Tassicker. Dr Bell is critical of the process that led to this decision in several respects. Firstly, Dr Tassiker advised to reverse the anticoagulation without either viewing the CT scan or examining the patient and assessing the clinical picture. In Dr Bell's view this was unwise. Secondly, Dr Bell observes that Dr Musca had discussed Mr French's situation with the Medical Registrar who had advised against reversing the warfarin and had agreed to his admission to the medical ward. In this circumstance Dr Bell advises that normal hospital protocol means that Mr French's care became the responsibility of the Medical Registrar in collaboration with his consultant and Dr Musca should not have played any ongoing role. If the Medical Registrar required re-assurance upon his decision the course for him to take was twofold. First, he could have phoned the radiologist to obtain a better understanding of the scan and to clarify any ambiguity in the report. Second, he could have involved his consultant, Professor Fassett, in the decision. It is pertinent to note that Professor Fassett only became aware of Mr French's re-presentation when he arrived at work on the morning of 7 August and he advises that he was then "*horrified*" to learn that Mr French's anticoagulation status had been reversed and that it had occurred without him being consulted.

Findings, Comments and Recommendations

I accept Dr Ritchey's opinion upon the cause of death.

It is apparent that when Mr French first fell ill in late May 2013 that he was suffering from a serious neurological condition which was potentially life-threatening. It is apparent too that since his first hospital presentation there were serious shortcomings in his care and

management which reduced his prospects of survival. The first of these was the failure, both at the LGH and the RHH, to recognise his left vertebral artery dissection from the radiography taken on 30 May 2013. Recognition at this time presented the best opportunity to fully assess Mr French's treatment options and to implement the chosen therapy. However, as I have already noted, there was a high element of risk associated with whatever therapy was decided upon and it cannot be assumed that it would have been successful and would have provided long term relief. The other major shortcoming in Mr French's care concerns the decision made to reverse his anticoagulation when he presented at the NWRH on 7 August. Clearly this decision, with the benefit of hindsight, was an error. In all likelihood it led to the thrombus or clotting which brought about his terminal decline. In my view Mr French would have been better managed if Dr Musca had ended her involvement in Mr French's care after the Medical Registrar had agreed to his admission. In this event it is likely that the anticoagulation would not have been reversed and the thrombus or clotting would not have evolved. However, it cannot be said with any degree of confidence that this course would have produced a different outcome for Mr French. All that can be said is that if the thrombus or clotting had not evolved there would have been an opportunity to re-assess Mr French's treatment options in the context where the anticoagulation therapy put in place in June was failing as it had not prevented further ischaemic strokes. Those treatment options, with their attendant risks, would have largely been the same as presented in June had it been known at that time that Mr French had a left vertebral artery dissection.

I have decided not to hold a public inquest into this death because my investigation has sufficiently disclosed the identity of the deceased, the date, place and cause of death, relevant circumstances concerning how his death occurred and the particulars needed to register his death under the *Births, Deaths and Marriages Registration Act 1995*. I do not consider that the holding of a public inquest would illicit any significant information further to that disclosed by the investigation overseen by me. The circumstances of the death do not require me to make any further comment or to make any recommendations.

I extend my sincere condolences to Mr French's family and loved ones.

Dated 1 November 2017 at Hobart in the State of Tasmania.

Rod Chandler
Coroner