



Sara Bird

Failure to diagnose: brain tumour

Case studies are based on actual medical negligence claims or medicolegal referrals; however certain facts have been omitted or changed by the author to ensure the anonymity of the parties involved.

This article discusses a recent coronial inquest into the death of a 5 year old girl from a brain tumour.

Keywords: child; diagnosis, differential; neoplasms; medulloblastoma; headache; vomiting



Case study

Victoria Palmer, 5 years of age, became unwell on 11 January 2008, suffering from nausea and vomiting.¹ On 18 January 2008 she was seen by her general practitioner. The GP recorded a history that Victoria had woken that morning with a headache which had become worse after an episode of vomiting. The patient's mother was concerned about the possibility of meningitis because her brother had experienced similar symptoms the previous year and was treated with intravenous antibiotics. The GP noted that Victoria was alert and well hydrated. She was afebrile. There was no rash, no lymphadenopathy and her chest was clear. The GP ordered a full blood count, electrolytes and liver function tests. He told Victoria's mother that he would call her later that day with the test results and that she should contact him if the patient's condition worsened. The urgent white cell count was reported as normal and the GP rang the patient's mother to

inform her of the test results. The GP asked her to bring Victoria back to the surgery if her headache persisted or got worse.

Between the 19 and 28 of January 2008 the patient was on holidays with her father.

On 29 January 2008, the patient's mother took Victoria back to the general practice and she was seen by another GP in the practice, because her usual GP was on annual leave. The GP recorded a history that the patient had been complaining of intermittent headaches, nausea and vomiting for the past 2 weeks. He noted that Victoria had been seen by his colleague on 18 January 2008 at which time her mother was concerned she may have meningitis. On examination, the GP noted that Victoria appeared lethargic. She was afebrile. He examined her ears, nose and throat and the only abnormal finding was some swelling of the cervical lymph nodes. There was no rash and abdominal examination was normal. The GP thought that Victoria was making a slow recovery for an episode of viral gastritis or possibly meningitis. He advised Victoria's mother that he thought no further treatment would be needed.

On the 31 January 2008, shortly after arriving at school, Victoria went to 'sick bay', complaining of a 'sore head'. Soon after arriving in sick bay, Victoria vomited and she then reported that her headache was not as bad but that she now had 'stomach pain'. On examination, the nurse noted she was afebrile, her pupils were equal and reactive and there was no evidence of neck

stiffness or photophobia. The nurse then called the patient's mother who attended the school to pick up Victoria. The mother reported that Victoria had now been sick for almost 3 weeks and she had been diagnosed as suffering from a viral infection. The nurse recommended that she take her daughter to a hospital emergency department (ED) for review.

Victoria was seen by the ED registrar later that morning. The registrar noted the unusual features of the history as being the length of time Victoria had been unwell and the severity of her headache. No history of trauma was noted. On examination, the registrar found that Victoria was lethargic and not acutely distressed. Physical examination was unremarkable. In particular, there was no evidence of neck stiffness, rash or fever. The registrar ordered a chest X-ray, a midstream urine (MSU) sample and screening blood tests, all of which were normal. He made a provisional diagnosis of a viral illness. However, in view of the atypical headaches, he also considered the possibility of intracranial pathology. He discussed Victoria's presentation with the on call paediatrician, stating that Victoria most likely had a viral illness and that her current clinical condition did not require hospital admission. The registrar asked the paediatrician to review Victoria the following day to consider if computerised tomography (CT) of the brain was required. He prescribed ondansetron for her vomiting.

On 1 February 2008 Victoria was seen by the paediatrician. The paediatrician obtained a history of vomiting for 2–3 weeks, as well as intermittent headaches, which at times were severe. Since her presentation to the ED, Victoria had had further vomiting, with little fluid or food intake. On examination, the paediatrician noted that Victoria was not distressed and, although

she was able to walk normally, she preferred to sit or lie. She had mild photophobia. There was no sign of papilloedema. Neurological examination was normal, and the remainder of her physical examination was unremarkable. There was no specific sign of dehydration, but the paediatrician estimated that Victoria was at least 5% dehydrated. The paediatrician made a provisional diagnosis of cyclical vomiting, which he noted was a relatively frequent condition considered to be a variant of migraine. He recommended hospital admission for the administration of intravenous fluids. He further noted that if Victoria was going to have a CT brain, it was preferable to do this after her dehydration had been corrected.

Victoria was admitted to hospital at about 3:30 pm on 1 February 2008. The paediatrician reviewed her in hospital at around 10:30 pm. He noted that she was restless because of headache, and there had been occasional periods of bradycardia. The paediatrician recommended that a CT brain be performed the following day.

At about 6:30 am on 2 February 2008, Victoria was found by the nursing staff to be unconscious and not breathing. After initial resuscitation, an urgent CT brain was performed which revealed a large, midline posterior fossa tumour, dilated lateral ventricles, a compressed fourth ventricle and brain stem haemorrhage. A retrieval team was contacted and provided transfer of the patient by helicopter, from the regional hospital to Sydney Children's Hospital, where Victoria was admitted to the intensive care unit.

Urgent neurosurgical intervention involving a right frontal burr hole and placement of an external ventricular drain in the right lateral ventricle was undertaken. A subsequent CT brain confirmed correct positioning of the ventricular drain, with collapse of

the ventricles and progression of the cerebral swelling.

Examination on 3 February 2008 revealed that Victoria remained completely unresponsive. She fulfilled brain death criteria with absent gag, pupillary, corneal, doll's eye and cough reflexes, as well as being unresponsive to painful stimuli and having no respiratory movements when disconnected from respiratory support. At 5:05 pm on 3 February 2008, Victoria was disconnected from the ventilator and she became asystolic within a few minutes. The patient's death was reported to the coroner.

A coronial Brief of Evidence was compiled by the police. This included reports from the patient's mother and father. Reports were also obtained from both of the general practitioners who had seen Victoria, as well the emergency hospital registrar, paediatrician, and intensive care physician.

The police assisting coroner also obtained an expert report from a neurosurgeon. The neurosurgeon reviewed the medical records and the various reports. At the outset of his report, the neurosurgeon commented on the difficulty in overcoming hindsight bias in preparing his opinion. He noted that the average GP would be 'lucky to see a paediatric brain tumour in a lifetime of practice'. The neurosurgeon went on to comment 'on balance, if a young child presents with persisting headaches and vomiting then clinically the diagnosis of a possible intracranial lesion must be considered in the absence of any other obvious diagnosis'. He stated 'on balance of probability the outcome may well have been different if at least a CT head scan had been done in the 3 weeks leading up to her death'. In retrospect, 'the history was one of increasing symptoms consistent with raised intracranial pressure... it is debatable whether this investigation should have been considered on the 11 of January but it would seem to me that it should have perhaps been considered on subsequent occasions including the 18th of January, 29th of January, 31st of January and the 1st of February'. He noted that in his experience as

a paediatric neurosurgeon over a period of more than 25 years, it was not uncommon for paediatric brain tumours to be diagnosed later in the course of the disease. On balance, the neurosurgeon felt that it was 'the chronicity over a period of 3 weeks and the increasing symptoms, which on the balance of probability should have alerted people'.

The coroner handed down his findings on 1 September 2009. In his report, the coroner stated that the cause of Victoria's death was a cerebellar medulloblastoma. He concluded that: 'It is not the place of this Inquest to make a determination as to whether or not the standard of medical care provided was appropriate... The Health Care Complaints Commission is conducting such a review... Whilst I do not propose to comment on the quality of care and treatment provided to Victoria by the various medical practitioners that were consulted on her behalf, I do wish to comment on the actions of her mother, Catherine Mullen. The evidence makes it abundantly clear that Ms Mullen was a loving and caring mother. She was also very attentive to Victoria's condition. The evidence also makes it clear that Ms Mullen took all steps she could in order to assist Victoria. She is to be commended for the commitment she displayed and the care she provided to her daughter'.

Discussion and risk management strategies

Brain tumours are the commonest solid tumours in children and are now the commonest cause of cancer deaths in childhood. Their diagnosis poses difficulties and this is reflected in the symptom interval, defined as the time period between onset of symptoms and diagnosis. Multiple factors contribute to diagnostic difficulties caused by brain tumours in paediatric patients. Many of the initial symptoms and signs of brain tumours are nonspecific and mimic other more common and less serious illnesses. Indeed, nonspecific headache affects 20% of 5 year olds and 10% of school aged children suffer from migraine.² Subtle neurological deficits may be more difficult to recognise in children. Additionally, brain imaging of young children often requires anaesthesia.

A retrospective medical record review of the presenting features of brain tumours in children revealed that the commonest first presenting symptoms were headache (41%), vomiting (12%), unsteadiness (11%), visual difficulty (10%),

educational or behavioural problems (10%) and seizures (9%).² Of note, the classic diurnal pattern of headache was not reported in a large minority of the children. Neurological signs were present at diagnosis in 88% of cases: 38% had papilloedema, 49% cranial nerve abnormalities, 48% cerebellar signs, 27% long tract signs, 11% somatosensory abnormalities and 12% a reduced level of consciousness. The median symptom interval was 2.5 months (range 1 day to 120 months). A short symptom interval was significantly associated with high grade tumours and patient age of 3 years or younger.

It is hoped that this case history will raise medical practitioners' awareness of the challenges associated with the diagnosis of brain tumours in children, and minimise any delays in diagnosis in an effort to provide prompt and appropriate treatment.

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Conflict of interest: none declared.

References

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