Florence, a 60-year-old lady, presented to her general practitioner (GP) complaining of a sudden onset of a severe headache, neck stiffness and back pain.

A few days prior to her presentation, Florence had been redecorating her living room, which included rearranging her furniture. She recalled her attempts at moving a particularly heavy coffee table, with the explosive headache developing abruptly soon afterwards. Her symptoms had been persistent since then. The GP concluded that she had suffered a neck sprain secondary to heavy lifting. No differential diagnosis was considered. She was prescribed analgesia and advised to consult the GP again if her symptoms persisted.

In the following days Florence’s response to the pain medication was minimal and her symptoms did not subside. After a second visit to the GP she was referred to the Emergency Department (ED), where she received a cervical spine X-ray. Results from this were normal and Florence was discharged with stronger analgesics, with a recommendation to follow up with her GP.

The next day a family member found Florence vomiting and displaying signs of confusion. Upon presenting to the GP a third time she was again referred to the hospital. On admission to the ED a computed tomography (CT) scan was arranged. The scan revealed bleeding in the subarachnoid space. A diagnosis of subarachnoid haemorrhage (SAH) was made and she was quickly taken to theatre where she underwent a decompressive craniectomy.

Following the procedure Florence was reviewed by neurological services. She was found to display some neurological deficits suggestive of a brain injury. Her difficulties are mainly in relation to mobility and vision. Ongoing assistance and rehabilitation are planned.

A treatment injury claim was lodged for a delay in diagnosis of SAH. The claim was accepted on the basis of external clinical advice, which considered that the features presented at the initial visits to the GP and ED had warranted further investigation or specialist referral. It was also noted that an earlier diagnosis may have resulted in a better neurological outcome.

**Expert commentary**

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For every 1000 patients on their list, the average GP can expect to see a case of SAH only once in every 14 years. 1 Even so, the diagnosis is not hard if it presents in classical fashion as a severe headache of sudden onset, associated with nausea, neck pain and collapse. However, at least 30% of cases of SAH are misdiagnosed at first presentation. 2

As in this case study, the patient may present with relatively unremarkable symptoms that mimic more minor causes of illness. The sudden onset of a headache is still the most reliable clinical indicator of SAH, 3, 8 but some patients may not report this spontaneously. They may focus more on the severity of the headache, which is commonly described as the worst ever experienced. Clinicians also need to be aware that New Zealand’s accident compensation scheme can provide an incentive for patients to identify accidents to which to attribute health problems.

Delayed presentation to medical attention, as in this case, should not be a deterrent. No matter what the subsequent course has been, careful attention should be given to the mode of first onset of headache in all patients presenting to GPs with headaches. This is the key to recognising SAH.

Patients who do not give spontaneously a clear account of the mode of onset of their headaches must be questioned thoroughly to determine this accurately, e.g. “How long did it take from the peak of your headache to present to the GP?”. Those who answer immediately or seconds should be managed as SAH until proven otherwise and referred immediately to hospital. Nine out of every 10 patients presenting with sudden, severe headaches will be found to have benign causes, 4 but SAH can only be ruled out by CT scan and, if this is not possible, then other imaging studies are needed.

**Key points**

- Classical symptoms of subarachnoid haemorrhage (SAH) include:
  - severe headache of sudden onset
  - nausea
  - neck pain
  - recent collapse
- Often patients present with unremarkable symptoms suggestive of more minor ailments (30% of cases of SAH are misdiagnosed at first presentation).
- In New Zealand there is the additional risk of misdiagnosis as there are incentives to link symptoms to accidental causes.
- Careful attention should be given to the mode of first onset of headache in all patients presenting to GPs with headaches. This is the key to recognising SAH.
- The suddenness of onset of headache is still the most reliable clinical indicator of SAH, but some patients may not report sudden onset. They may focus more on the severity of the headaches.
- Those who answer “instant” or “seconds” should be managed as SAH and referred immediately to neurological services for management.
- SAH can be ruled out by CT scan when performed within 12 hours of acute headache onset.
- Risk factors for SAH include:
  - 24% more common in women than in men
  - smoking, hypertension and excess alcohol each roughly double the risk
  - 10% of patients have a family history of SAH.
Management of SAH

1. Patients with diagnosed SAH must be referred immediately to neurosurgical services for management.

References/Websites


About this case study

Sharing information to enhance patient safety

This case study is based on information amalgamated from a number of claims. The name given to the patient is therefore not a real one.

The case studies are produced by ACC’s Treatment Injury Centre, to provide health professionals with:

• an overview of the factors leading to treatment injury
• expert commentary on how similar injuries might be avoided in the future.

The case studies are not intended as a guide to treatment injury cover.

Send your feedback to: TI.info@acc.co.nz

How ACC can help your patients following treatment injury

Many patients may not require assistance following their treatment injury. However, for those who need help and have an accepted ACC claim, a range of assistance is available, depending on the specific nature of the injury and the person’s circumstances. Help may include things like:

• contributions towards treatment costs
• weekly compensation for lost income (if there’s an inability to work because of the injury)
• help at home, with things like housekeeping and childcare.

No help can be given until a claim is accepted, so it’s important to lodge a claim for a treatment injury as soon as possible after the incident, with relevant clinical information attached. This will ensure ACC is able to investigate, make a decision and, if covered, help your patient with their recovery.

Not diagnostic, lumbar puncture (LP). All have to be investigated if avoidable damage from bleeding is to be minimised. Patients with more minor symptoms are likely to be the ones who do best, as they are likely to have experienced less bleeding.1 But if due to a sentinel bleed, some 15% of patients will have a further bleed within the first day and 40% of first-day survivors will have another bleed within a month.2 This makes a high index of suspicion essential.

As in this case, the severity may vary greatly and not necessarily be associated with the other symptoms.3,4 In about a third of patients with SAH, headache may be the only presenting symptom.3,4,5 SAH may mimic other conditions such as headache of cerebral origin, migraine, thunderclap headache, reversible vasospastic syndrome headache and ischaemic stroke.3,5,9

There are several recognised risk factors for SAH: it is 24% more common in women than in men,6,7 and smoking, hypertension and excess alcohol each roughly double the risk.6,8 Prior warnings with symptoms of a sentinel bleed may occur, but these are underreported by patients and easily missed.7 There is a slight genetically determined risk, with 10% of patients having a family history of SAH.8 Two large observational studies of familial aneurysms suggest that screening patients with two or more first-degree relatives with aneurysmal SAH may be cost effective in preventing SAH and improving quality of life.9,10

A non-contrast CT scan followed by LP has been shown to have 100% sensitivity and 100% specificity for a diagnosis of aneurysmal SAH.14 CT scanning alone (non-contrast CT followed by CT angiography) is close to 100% sensitive when performed within 12 hours of acute headache onset, and some centres may offer patients the choice of avoiding LP if they present rapidly to hospital.15

Current professional standards/guidelines

Prevention of SAH

1. Treatment of hypertension, smoking cessation and avoidance of alcohol misuse are recommended to reduce the risk of SAH.

2. A consideration of non-invasive aneurysm screening is recommended for patients who have two or more first-degree relatives with aneurysmal SAH. Screening is not generally recommended for those with only one affected family member.

Diagnosis of SAH

1. SAH is a medical emergency that is frequently misdiagnosed. A high level of suspicion for SAH should exist in patients with acute onset of severe headaches.

2. An acute diagnostic workup should include a non-contrast head CT. LP is generally required to rule out SAH when CT is negative, but a non-contrast CT followed by CT angiography may be considered an appropriate alternative diagnostic strategy without LP when performed early after acute headache onset.