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Acute-on-chronic subdural haematoma: a rare complication after spinal anaesthesia

慢性轉重型硬膜下血腫：脊神經麻醉後出現的罕有複雜病例

An 88-year-old woman with an undiagnosed chronic subdural haematoma underwent emergency repair of a femoral hernia under spinal anaesthesia. The patient complained of headache postoperatively, and a subsequent computed tomography brain scan showed an acute-on-chronic subdural haematoma, with midline shift and impending coning. The patient recovered completely after surgical decompression. The difficulty in diagnosing chronic subdural haematoma in the elderly patient with no history of trauma is discussed, along with the differential diagnosis of headache following spinal anaesthetic in this age-group.

一位88歲的女性病者，在未被診斷出患有慢性硬膜下血腫的情況下，接受脊神經麻醉以進行一項修補股疝的緊急手術。病人在術後表示頭痛；經電腦斷層照相術進行腦掃描，發現一個慢性重型的硬膜下血腫，其中線正移動，並迫近錐形疝。病人在減壓手術後完全康復。本文亦探討了診斷本身沒有創傷病歷的年老病者患上慢性硬膜下血腫所出現的困難，並討論對這年齡組別的病者，在接受脊神經麻醉後出現頭痛進行的鑒別診斷。

Introduction

Acute subdural haematoma is a rare but well-recognised serious complication after accidental or deliberate dural puncture.[1-8] It can lead to mortality or neurological deficits if neglected.[3,5] Headache and deterioration in the conscious state usually prompt the attending doctor to perform further investigations to determine the cause. The presentation of chronic subdural haematoma is more subtle, however. We report a patient with an undiagnosed chronic subdural haematoma, who developed acute-on-chronic subdural haematoma after spinal anaesthesia.

Case report

An 88-year-old woman presented with an irreducible right femoral hernia, and was scheduled for an emergency repair. She was alert on admission, and was able to provide a medical history. The patient had suffered a myocardial infarction 13 years previously, and current medical conditions included atrial fibrillation adequately controlled with digoxin, as well as chronic obstructive airways disease, requiring home oxygen. She was not receiving anticoagulants, or using non-steroidal anti-inflammatory drugs (NSAIDs), or Chinese herbal medicines. There was no history of head injury prior to admission. Her effort tolerance was restricted to walking on level ground only. She had a productive cough, with white sputum. Clinical examination revealed poor general condition, with expiratory rhonchi on auscultation of the chest. Heart sounds and the neurological assessment were unremarkable. Laboratory results, including coagulation profile, were normal. The chest X-ray was also unremarkable. In view of the patient's poor health, spinal anaesthesia was the preferred anaesthetic technique for the surgical procedure. This was explained to the patient and informed consent was given. The patient was positioned in the right lateral position. The anaesthetic procedure

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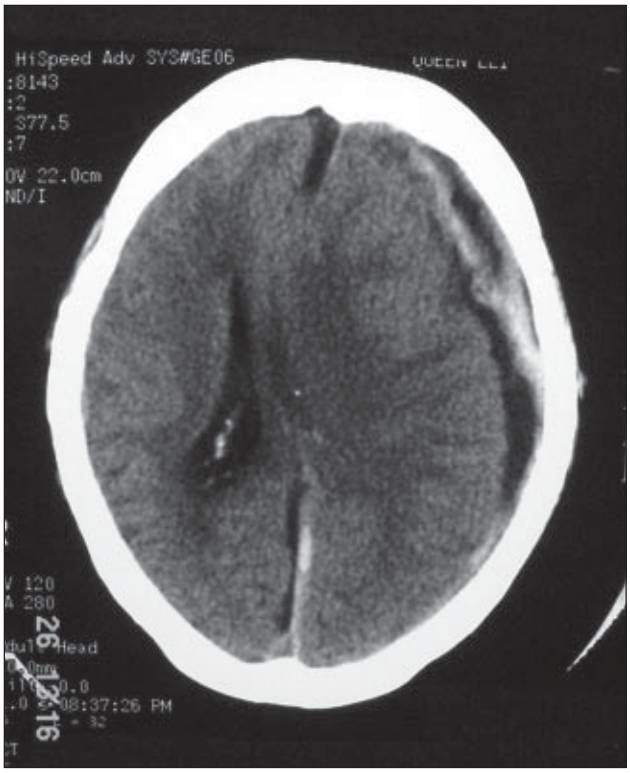

Fig. Computed tomography brain scan showing acute-on-chronic subdural haematoma, with a heterogeneous density of blood clots, midline shift, and obliteration of the ventricle

was completed with ease in a single attempt, and there was free flow of clear cerebrospinal fluid (CSF). An intrathecal injection of 1.6 mL 0.5% plain bupivacaine was given at the lumbar 2/3 level using a 25G Quincke needle. This resulted in a block up to the level of the T-9 dermatome, and surgery proceeded uneventfully.

When the patient was allowed to increase mobility on postoperative day 2, she complained of headache and vomiting. There was no associated hearing loss or visual abnormality. The symptoms were attributed to the spinal anaesthetic and she was referred to the Department of Anaesthesiology for review. Detailed questioning did not elicit a postural basis for the headache and the anaesthetist was of the view that the headache was not typical of postdural puncture headache. Paracetamol was prescribed, with good relief of symptoms. On day 3 postsurgery, the patient became drowsy and confused. An urgent computed tomography (CT) brain scan showed signs of brain atrophy, with an acute-on-chronic left subdural haematoma, midline shift, and impending coning (Fig). An emergency craniotomy for evacuation of clots found a 2.5-cm thick haematoma, consistent with the diagnosis of acute-on-chronic subdural haematoma.

Direct questioning of the patient and relatives after neurosurgery did not reveal any suggestion of head injury or of a change in patient behaviour, mental status, or memory prior to admission. The patient made a complete recovery and was discharged home.

Discussion

This case report highlights two clinical problems—the difficulty in diagnosing chronic subdural haematoma in the elderly during preoperative assessment, and the difficulty of diagnosing headache after spinal anaesthesia.

Chronic subdural haematoma usually occurs after head injury, and is more frequent in the elderly as ensuing cerebral atrophy results in reduced tissue volume and hence greater movement of the brain within the cranium.[9] Cortical bridging veins found in the potential subdural space are thin-walled, and this relative weakness leads to tearing when subjected to shearing force, resulting in blood collecting in the subdural space.[10] Foelholm and Waltimo[11] reported the incidence of chronic subdural haematoma in the 70- to 79-year age-group as 7.35 per 100 000 population per year. Asghar et al[12] have reported a slightly higher rate of 8.2 per 100 000 population in those older than 65 years in a North Wales (UK) study.

The time interval between trauma and clinical manifestation increases with age, as brain atrophy in the elderly allows the haematoma to accumulate before symptoms become obvious. The onset of chronic subdural haematoma in the elderly may thus be insidious, and usually presents as changes in cognition rather than as signs of an increase in intracranial pressure. Symptoms and signs may not be pathognomonic, and include inattention, reduced concentration, headache, impaired memory, and confusion. Behavioural changes, such as sleep disturbances, lethargy, emotional outbursts, poor personal hygiene, and a manic-depressive state may occur. The elderly patient may be misdiagnosed as having dementia or other psychiatric illnesses as a result. Focal or lateralising signs, if present, may be observed in the form of speech impairment (dysarthria) or language difficulties (aphasic symptoms, such as anomia), and motor deficits that may be confused with a cerebrovascular accident or transient ischaemic attack.

Non-traumatic risk factors for chronic subdural haematoma include coagulation disorders in patients receiving anticoagulant therapy, with hepatic failure, sepsis, or undergoing renal dialysis, as well as in patients using NSAIDs and Chinese herbal medications with antiplatelet activity. Chronic alcoholism is also a risk factor, probably due to cirrhosis leading to coagulopathy, or secondary to head injury. Most patients do not recall trauma, and even if present, the trauma is usually of a trivial nature.[10,13] This adds to the difficulty in diagnosis in the elderly patient.

Chronic subdural haematoma can lead to an increase in intracranial pressure, with lumbar puncture contraindicated, due to the risk of herniation of the medullary vasomotor and respiratory centres.[14] Unfortunately, it is not always possible to rule out this diagnosis because of the vague presentation and trivial nature of the trauma. Sometimes those providing care for the elderly patient at

home or in an institution may report recent changes in behaviour, or symptoms of headache, confusion, and impaired memory. A high index of suspicion is required when elderly patients require anaesthesia. Physical examination is complete only after a full neurological assessment to reveal any focal or lateralising signs, or motor deficits. A preoperative CT brain scan may also be considered in such patients.

When our patient developed headache in the postoperative period, the diagnosis of postdural puncture headache was assumed because of the history of deliberate dural puncture. Postdural puncture headache has been postulated to be due to leakage of CSF following dural puncture, resulting in the caudal displacement of brain, with traction on the pain-sensitive intracranial vessels and the tentorium. The clinical features are usually diagnostic, with the onset on the first or second day postsurgery. The headache is usually bifrontal, occipital, and may involve the neck and upper shoulders. The severity of headache can range from mild to incapacitating, and is aggravated by an upright posture, coughing, and straining. It may be associated with nausea, vomiting, loss of appetite, changes in hearing acuity, tinnitus, and depression. Diplopia and cranial nerve palsies may also be present.

Postdural puncture headache is more frequently seen in the younger patients and in women.[14] It is less common after uneventful spinal anaesthesia in an elderly patient. The presence of persistent non-postural headache in any patient after receiving spinal anaesthesia should prompt the physician to look for other causes of headache. Primary headaches, such as tension headache, and secondary headaches occurring as a result of brain tumour, intracranial bleeding, meningitis, and other non-cephalic infections, should be considered.

The patient in this study subsequently developed confusion and deterioration in conscious state, with the CT brain scan showing an acute-on-chronic subdural haematoma and imminent coning. Further delay in making a diagnosis could have led to an adverse outcome. Four of 14 cases reviewed by Newrick and Read[5] resulted in death, and one in persistent visual loss. On review, we postulated that our patient had developed a chronic subdural haematoma but was asymptomatic. It was thought the CSF leakage following spinal anaesthesia had led to intracranial hypotension, with resultant traction and then tearing of the thin-walled cortical bridging vessels, resulting in an acute-on-chronic subdural haematoma.

Acute subdural haematoma has been known to occur after an otherwise uncomplicated spinal anaesthetic,[1-8] and from overshunting in patients with normal pressure hydrocephalus.[10] At least 39 cases of acute intracranial subdural haematoma occurring after spinal anaesthesia/dural puncture have been reported in the English-language literature. The true incidence of subdural haematoma after dural puncture is not known. An analysis of the 39 reported cases of acute subdural haematoma following spinal anaesthesia showed variable presentation. The condition occurred in young patients as well as in the elderly, and after accidental dural puncture with 16G Tuohy needle,[4] or after deliberate dural puncture using a 27G Whitacre needle.[3] The onset ranged from hours to weeks. Both unilateral and bilateral subdural haematoma were reported to occur, irrespective of patient position during dural puncture.

Anaesthetists may be consulted to assess patients with postdural puncture headache. An atypical postdural puncture headache may require a neurosurgical consult, with CT scanning or magnetic resonance imaging of the brain to exclude potentially fatal causes of headache. A high level of clinical suspicion and radiological evaluation are critical factors in determining the outcome. A CT brain scan with contrast enhancement may be needed, as a plain CT scan may fail to identify subdural haematoma in the isodense phase.[8]

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