

## Potentially Reversible Causes of Dementia

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International Journal of Collaborative Research on Internal Medicine & Public Health  
Vol. 2 No. 8 (August 2010)  
Pages 258-265

ISSN 1840-4529

<http://www.iomcworld.com/ijcrimph/>

### **Paper review summary:**

Paper submission: April 29, 2010

Revised paper submission: August 10, 2010

Paper acceptance: August 27, 2010

Paper publication: August 30, 2010

### **International Journal of Collaborative Research on Internal Medicine & Public Health**

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## Potentially Reversible Causes of Dementia

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### Abstract

**Introduction:** Dementia is tragic mind-wrecking disease, defined as a multifaceted decline in cognitive function severe enough to interfere with activities of daily life. Three individual cases are presented that presented with loss of memory and altered behaviour. Even though potentially reversible dementia accounts for a relatively small portion of the total cases of dementia, the three cases presented here demonstrate that accurate and timely diagnosis may greatly improve the condition of the patients, or even restore their normal intellectual function.

**Case presentation:** Patients 69 year old Malay male and 79 year old Chinese male were brought in to our hospital by their families with history of memory impairment and altered behaviour. The former was diagnosed as left frontoparietal meningioma with possible haemorrhage causing mass effect. The latter was diagnosed as subdural hematoma with midline shift. The former underwent craniotomy and excision of meningioma, and aspiration of an adjacent hemorrhagic cyst. The latter underwent burr-hole craniotomy with closed-system drainage. Following surgery both patients improved with Mini-Mental State Examination levels (MMSE) of 28/30 and 30/30 respectively and in their follow-up were doing well. Third patient, a 50-year-old Chinese lady, had symptoms of forgetfulness and altered behaviour for the past two years, was treated for depression and improved markedly with no more psychotic symptoms.

**Conclusion:** Chronic subdural hematomas, meningiomas and depression are among the known reversible causes of dementia. Presenting symptoms can be subtle and clinical acumen dictates that all patients should be thoroughly investigated to rule out such possibilities.

**Keywords:** Reversible dementias, Chronic subdural hematoma, Meningioma, Depression

## **Introduction**

Dementia is a growing medical, social and public health problem, which is becoming a global priority due to increasing number of new cases. Epidemiologists estimate that every 7 seconds, there is a new patient diagnosed with dementia across the globe<sup>(1)</sup> Dementia shortens life expectancy; with estimates of median survival of 5 to 9.3 years.<sup>(2)</sup> According to AD Foundation Malaysia 2010<sup>(3)</sup> there are currently about 50,000 people with the disease, but majority are under diagnosed as it is viewed as a natural part of aging. Senility is an outdated term which used to mean cognitive impairment due to aging and was assumed to be normal. With aging there are mild changes in memory and learning abilities, which are benign and are neither progressive nor affect activities of daily living [ADL]. Majority of older persons remain active and productive until a very old age.<sup>(4)</sup> Dementia syndromes on the other hand are disabling and should never be viewed as an aging process.<sup>(5)</sup> Even though reversible dementia cases are rare, the clinicians ought to be mindful as they can be treated effectively.

## **Case Presentation**

### ***Case 1:***

A 69-year-old Malay male was referred for worsening headache and altered behaviour in March 2008. His past medical history was unremarkable except subdural hematoma in January 2003 which was drained in Hospital Tengku Ampuan Afzan [HTAA] with full recovery. He described the current headache as throbbing in nature with no nausea, vomiting or blurring of vision. During examination he was alert and cooperative but talked irrelevantly. He could not answer questions, recognise family members or recall past events. There was no relevant history of fever or trauma and denied regular medications.

Vital signs on presentation were normal. General and neurological examinations were normal. The MMSE<sup>(6)</sup> revealed a low score of 12/30.

Basic investigations were within normal limits. CT imaging of the brain is depicted in (Fig. 1 and 2).



Plain CT brain in axial view shows marked white matter oedema in the left frontoparietal region with an associated mass (arrows). It measures 4.3x2.0x5.6cm, causing compression on the ipsilateral ventricles and midline shift to the right. There are few intralesional calcifications seen (arrowhead). There are left skull defects due to previous left frontoparietal craniotomy. The adjacent skull shows no evidence of hyperostosis or erosion.

Fig. 1



Post-contrast CT brain in axial view shows avidly enhancing mass in the left frontoparietal region (arrows).

Fig. 2

The patient underwent craniotomy, excision of meningioma and aspiration of a hemorrhagic cyst beneath the tumour. Post operative period was uneventful. Patient was discharged with full recovery and MMSE of 28/30. Histopathology revealed meningothelial meningioma (WHO grade 1).

### *Case 2:*

79-year-old Chinese man was admitted to HTAA with one month history of ataxic gait, and altered behaviour. He was in good health until two months back, when he had head knock against a wall to avoid a car with a minor abrasion. The local general practitioner reassured him after a brief examination and gave antiseptic cream for local application.

A month later family noticed progressive weakness on his ® side of body until he

became ataxic and could not walk without support. Subsequently he became confused, unable to recognise his surroundings or talk in full. One week before admission he was incontinent of urine as well. There was no history of fever, headache, nausea or vomiting. He was a social smoker but had no history of alcohol, drug abuse or any mental illness. He was currently treated for hypertension and ischemic heart disease, and had cataract surgery 3 months previously. He had no past history of stroke or endocrine disorder.

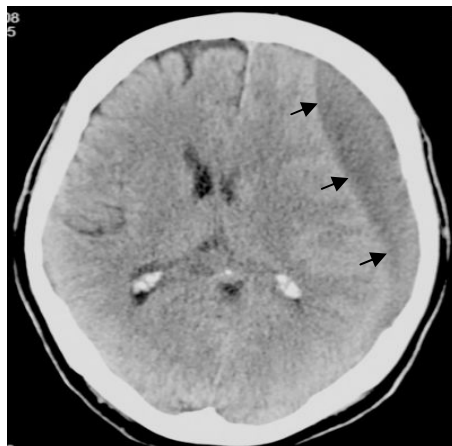
General physical examination was unremarkable. Neurological examination revealed significant deficits in mental status. He was alert and cooperative but disoriented to place and time. He failed serial 7s, simple calculations or naming common objects. His speech was dysarthric. Short term memory was moderately impaired and MMSE revealed a low score of 7/30.

Fundus examination was difficult due to cataract surgery on ® side and cataract on <sup>(L)</sup> side. There was no nystagmus. Otherwise Cranial nerves were intact.

There was 4/5 strength in the ® upper and lower extremity and full power on <sup>(L)</sup> side. His gait was unsteady and could not walk without support. No atrophy or fasciculation's were present. Deep tendon reflexes were normal and planter on ® side was equivocal. Sensory examination was normal. Examination of the heart, lungs and abdomen was normal.

Basic investigations performed were within normal limits but CT imaging of the brain revealed SDH (Fig3). Patient underwent burr-hole craniotomy (BHC) with closed-system drainage. The neurological signs completely resolved and he regained normal mental function with MMSE of 30/30. He is currently under my follow-up and is able to perform normal ADL.

Fig. 3



Plain axial CT scan of the brain shows chronic subdural hematoma (arrows) involving the left hemisphere. Note the midline shift, blunting of sulci and oedema.

### **Case 3:**

Madam LYW a previously healthy 50-year-old married Chinese lady presented with symptoms of forgetfulness and altered behaviour for the past two years. The symptoms began after a car accident involving her youngest son- an engineering graduate leading to his paraplegia. As it was a case of hit and run, compensation prospect was remote. Seeing a grim future of her son and on-going financial problems, she exhibited biological symptoms of depression. She became very forgetful, refused to eat and neglected her personal hygiene. She always asked the location of her belongings and would become irritable if her family members did not help her to find them. She also had prominent somatic symptoms such as weakness, tiredness, and occasional inability to walk. This affected her ability to work as Quality Control officer at a textile factory to the extent that she had to resign.

She had no family history of mental illness. Previously she was an introvert, preferred to keep problems within herself and only had small circle of friends. She was moderately religious. Both of her parents had passed away many years ago. She was the 4<sup>th</sup> from 9 siblings.

On admission she was restless with head nodding and shaking. She had poor eye contact and looked down and at times stared blankly at the interviewer or to the wall. The speech was relevant, coherent, but sketchy. The tone was rather low and she did not answer most of questions. She admitted of feeling hopeless but denied of having any hallucinations or suicidal thought. Short term and recent memories were affected but the long term memory was intact. Her attention and concentration were impaired as she was not able to do serial seven. Orientation to time, place and person was preserved, so were her judgment and abstraction thinking. She had good insight as she was aware that she was suffering from a mental illness and wanted to seek medical attention.

General physical and systemic examination was normal. Diagnosis of Major depressive disorder was made and she was admitted to psychiatric ward. Selective serotonin reuptake inhibitors, antipsychotics and cognitive behavior therapy were started but her condition deteriorated. At that point electroconvulsive therapy was considered but the relatives refused consent. Later Serotonergic Noradrenalin Reuptake Inhibitor and Risperidone were commenced and she improved remarkably. She was discharged to outpatient follow-up, had good compliance of her medicines with no complains of side effect. Her mood had improved, no more psychotic symptoms such as weird behavior and passivity phenomena and had started ambulating in the house. Further psycho education and family counselling were given during her follow up.

### **Discussion**

Dementia is defined as a multifaceted decline in cognitive function severe enough to

interfere with ADL. Impairment of memory is generally regarded as a necessary aspect, but decline in one or more other cognitive domains must also be demonstrated.<sup>(4, 7)</sup> The disease affects not only the patients themselves, but also the lives of family members and close friends.<sup>(8)</sup>

The prevalence of potentially reversible dementias has previously been reported by several authors, and the results have varied widely among studies. Unfortunately these cases account for less than 20 percent of patients with dementia.<sup>(9)</sup> In 1988, Clarfield published an informative review of 32 studies comprising almost 3000 patients.<sup>(10)</sup> On average, potential reversibility was found in 13% of patients. Only one-third of the studies provided follow-up information. Partial reversal was seen in 8% and full reversal in 3% of patients. Another review in 1995 showed the prevalence of 0–23% for partial and 0–10% for full reversal.<sup>(11)</sup> Even though such cases are rare, it is important to know the most frequent causes. In the above reviews depression and drug intoxication were the most frequent reversible causes of dementia (together about 50%), with a fair chance of total reversal.<sup>(10, 11)</sup> Unlike younger individuals, elderly depressed patients may present with cognitive impairment. Depression may also coexist with dementia and worsen the problem. Therefore all patients must be screened for depression initially. The case three was treated for depression and was doing well. Metabolic disorders are also relatively frequent (thyroid disorders, vitamin B12 deficiency, and others) but with a smaller chance of full recovery. Alcohol must also be considered although damage might be irreversible. Another major cause is normal pressure hydrocephalus [NPH]; slow ventricular enlargement without cortical atrophy due to poor cerebrospinal fluid [CSF] absorption, with normal opening pressures on lumbar puncture. It occurs in middle-aged and older persons and is associated with dementia. It is important to recognise, as it is potentially reversible by the placement of a ventriculo peritoneal shunt. Imaging demonstrates enlargement of the cerebral ventricles which can be difficult to distinguish from the atrophy associated with AD or Vascular dementia. Reviews show about 30% of patients shunted show significant improvement. SDH and benign cerebral tumour such as meningioma are less frequent causes – if they present as dementia. Chronic SDHs, which usually occur in older individuals with a peak incidence in the 6th and 7th decades of life, are defined as hematomas of more than 21 days duration. The most common presenting symptoms are headache, altered mental status, hemiparesis, gait disturbance, and aphasia.<sup>(12)</sup> The history of head injury sometimes trivial may be forgotten. Memory impairment in AD develops over several months to years, whereas in chronic SDHs, changes develop over several weeks as in our patient. Some patients with chronic SDH will show focal neurologic signs whereas patients with AD will not. Symptoms of NPH are similar to those of chronic SDHs with the exception of urinary incontinence. Differentiation from chronic SDH based on clinical examination alone can be difficult. The patient in case two presented with signs and symptoms that were actually consistent with the classic triad of NPH. This case underscores the importance of neuroimaging in making the correct diagnosis. Urinary incontinence is an unlikely finding in chronic SDH. CT brain revealed SDH with midline shift. The patient had altered mental status with focal neurologic signs providing clear indications for surgical intervention. Patient underwent BHC with closed-system drainage with complete recovery. Brain tumours especially frontal tumours can mimic

dementia and can occasionally be treated. Patients often have a similar presentation to chronic SDH. The patient in case 1 presented with worsening headache, forgetfulness and altered behavior. He underwent surgery with full recovery.

## **Conclusion**

Medical professionals must recognise "potentially reversible" cases of dementia. The general public also must be aware of this fact, so that treatable cases even if few are not neglected. Clinical evaluation is the mainstay of diagnosis, but ancillary tests are indispensable to detect potentially reversible causes.

**Competing interests:** The authors declare that they have no competing interests.

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