UNSTEADINESS AND CLUMSINESS — COULD THERE BE SOMETHING MORE THAN A MINOR STROKE? A CASE STUDY TO REMEMBER.

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ABSTRACT

Unsteadiness and falls in the elderly are a common complaint in primary care and their incidence is expected to increase as the population ages. These patients are physiologically less able to withstand traumatic forces than their younger counterparts and are thus more prone to morbidity and mortality.Aside from intrinsic and extrinsic risk factors, there may be more sinister pathologies underlying these events.

We report a case of an elderly gentleman who presented with unsteadiness, clumsiness and recurrent falls. The patient's son brought to our attention subtle suspicious findings which eventually led to further evaluation. The patient was found to have had bilateral acute on chronic subdural haemorrhages with associated mass effect, underwent emergent decompression surgery and showed marked functional recovery.

We review the incidence and outcomes of recurrent falls in the elderly, as well as the incidence, risk factors and varied presentations of subdural haemorrhage in the primary care setting. The case also reminds clinicians of the tendency to overlook and undermanage such patients with seemingly "minor" falls, and the value of family members' inputs during consultation. It highlights the need for a high index of suspicion and the necessity of lower referral thresholds for further evaluation if indicated.

Keywords: Haematoma, Subdural, Accidental Falls, Aged, Geriatrics

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PATIENT'S REVELATION: WHAT HAPPENED?

First Consultation

Mr T is a 71-year-old Chinese gentleman who was brought in by his son for what seemed to be a "simple" same-level fall while showering. Although circumstances leading up to the event were not entirely clear, Mr T had fallen backwards and hit his head on the bathroom floor. There were no reported pre-syncopal symptoms and no abnormal post-fall mentation or external bleeding of note. However, on further questioning, he vaguely recalled having had another fall 2 months prior but felt well and thus did not seek medical help. He was unable to provide further details regarding the mechanism of these falls and of any injuries sustained.

Mr T's only co-morbidities were benign prostatic hyperplasia — for which he was on alpha receptor antagonist Alfuzosin — and right rotator cuff injury, which was conservatively treated. He was an otherwise well, fairly independent, community ambulant retiree living at home with his wife and son. He also led an active lifestyle playing golf and tennis frequently.

In keeping with the seemingly mild description of his fall, subsequent physical assessment was also unremarkable — in particular, there were no neurological deficits or fractures found. Mr T was reassured, given gait and fall prevention advice, and told to return if further abnormalities developed.

Second Consultation (at Home)

The following day, Mr T's son called to report that his father "did not seem quite right". He was wearing slippers in an odd manner, was knocking into objects, had difficulties using chopsticks and "was unsteady". In addition, Mr T had suffered another fall at home. His attending physician paid a home visit and noted only slight weakness in the right limbs — he was otherwise generally well. The judgement call was between sending Mr T to the Emergency Department on a Sunday afternoon for what appeared to be a minor stable stroke versus reviewing him and admitting him the next morning for further evaluation. Although the eventual decision was the latter, the physician was concerned and advised the son to contact him should there be further changes to Mr T's condition overnight.

Third Consultation

Mr T returned to the clinic the next day as arranged. During the consult, his son added that he had noticed subtle behavioural changes (less alert and generally quieter) during the period of recurrent falls. On examination, tone on the right side was increased, alongside reduced power, with the upper limb more severely affected than the lower limb.

It was decided that the constellation of signs and symptoms warranted further workup. The impression was possible ischaemic episodes resulting in recurrent falls and physical disabilities. Intracranial haemorrhage from the recent acute series of falls was also of concern.

Mr T was immediately referred to the nearest hospital for urgent assessment.

Diagnosis and Management

An urgent Computed Tomography (CT) of Mr T's brain was performed at the Emergency Department. It revealed bilateral acute on chronic subdural haemorrhage (SDH) with associated mass effect and subfalcine herniation of the left lateral ventricle (Figure 1).

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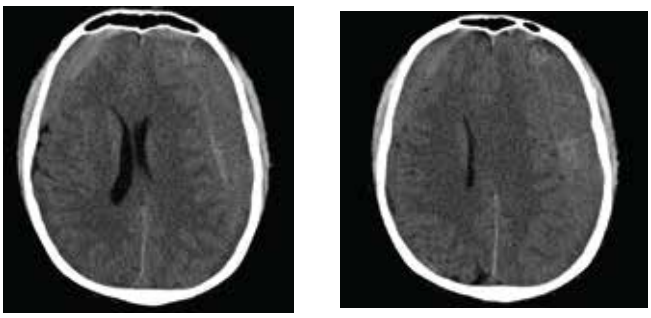

Figure 1. CT brain images showing the patient's bilateral acute on chronic subdural haemorrhage and associated mass effect. The hematoma on the left was greater in depth (2.3cm) than the right (1.5cm), corresponding to the clinical findings of increased tone and decreased power of the right side of the body.

Mr T underwent bilateral burr-hole decompression that afternoon. He was monitored post-operatively in the High Dependency Unit and a repeat CT brain 2 days later showed reductions in the SDH and mass effect (Figure 2).

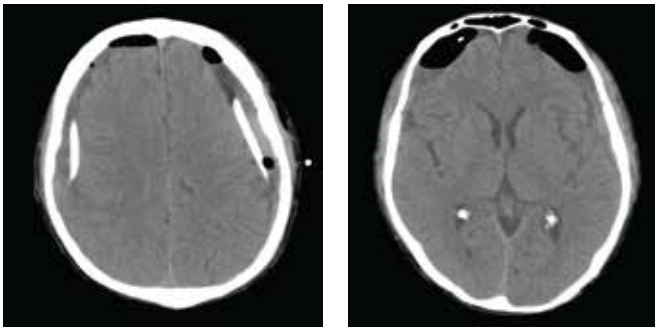

Figure 2. CT brain images showing the patient post bilateral burr-hole decompression. It shows marked reduction in the subdural haemorrhage and resolution of previous mass effect.

After a period of rehabilitation, Mr T's care was returned to his family physician. His son mentioned that his condition and behaviour had since improved markedly, and that he was back to being fully independent at home.

GAINING INSIGHT: WHAT ARE THE ISSUES?

This case brings to mind several issues:
(i) Are falls with minor head injuries in elderly patients overlooked in the primary care setting, resulting in delays in referrals to hospitals?
(ii) Is there sufficient awareness of SDH and its varied presentations in the primary care setting (including recurrent falls)?
(iii) Do primary care physicians neglect the valuable inputs of family members, especially for elderly patients?

STUDY THE MANAGEMENT: HOW DO WE APPLY IN OUR CLINIC PRACTICE? ISSUES?

Recurrent Falls in the Elderly
Recurrent falls are a common complaint in primary care and its incidence is expected to increase as the population ages.1 The American Family Physician defines "recurrent falls" as more than 2 falls in a 6-month period, and recommends that such patients be evaluated for treatable causes.[2] For Mr T, this may have been due to poor balance, possibly aggravated by postural hypotension (from Alfuzosin). Other elderly suffer from coexisting musculoskeletal, cardiac, and respiratory problems. Furthermore, extrinsic factors such as carpets and uneven floors add to these risks.

Incidence of Recurrent Falls
It is estimated that on average about one in three patients aged 65 years and above in the United States fall at least once a year.[3] The incidence of falls among elderly Chinese in Hong Kong in a year was found to be 19.3 percent — of these, 4.75 percent had recurrent falls.[4] A 1997 study among Singaporeans showed similar results, with 17.2 percent of elderly having fallen before, of which one-third suffered from recurrent falls.[5] Unfortunately, there has not been more recent local data published since to account for demographic changes. In light of the rapidly ageing population in Singapore, this is an important area requiring further research.

Outcomes of Falls in the Elderly
The aged are physiologically less able to withstand traumatic forces as compared to their younger counterparts and are more prone to morbidity and mortality.[6] In the United States, 20 to 30 percent of people who fall suffer moderate to severe injuries, with increased risk of early death from reductions in mobility and independence.[3] Similar trends have been seen locally. In 2013, 58 percent of all Tier 1 and 2 injuries (i.e., serious to unsurvivable) due to unintentional falls, as reported to the Singapore National Trauma Registry, were in persons above the age of 65.[7] Indeed, falls in the elderly should not be treated lightly. In the primary care setting, this should span both primary (e.g., fall risk assessment) to secondary prevention (e.g., early referral to tertiary care).

Subdural Haemorrhage
Subdural haemorrhage is a potentially reversible condition through timely surgical decompression, although rapid spontaneous resolutions have also been reported in a small number of cases.[8] There are three main forms of SDH, namely, acute, subacute and chronic, depending on their speed of onset.[9] Chronic SDH may present as recurrent falls, while an acute SDH is usually a consequence of a sudden head injury. To complicate matters, patients may also present as our case did — as acute events admixed against a background of chronic changes.

The challenge for primary care physicians is often in its timely identification from history and clinical examination in the absence of advanced diagnostic modalities. On one hand, such patients may present acutely with obvious neurological deficits, prompting urgent referral for further evaluation at a tertiary establishment. On the other, cases may present over a

more protracted course with non-specific symptoms resulting in missed or delayed diagnoses. It is important that physicians recognise that this group of patients also warrant prompt referral.

Incidence of Subdural Haemorrhage

This spectrum of presentation makes determining the actual incidence of SDH difficult, with estimates varying across studies and populations. For example, a retrospective cross-sectional study in North Wales placed the incidence of chronic SDH in patients above 65 years of age at 8.2 per 100,000 persons per year,[10] while a more recent Japanese study found the incidence closer to 20.6 per 100,000 persons per year.[11] The latter also noted increasing incidences from previous reports, in part contributed by a greying population. Although the corresponding local rate has yet to be accurately determined, one could postulate approaching Japan's situation over time.

Risk Factors for Subdural Haemorrhage

Known risk factors for the development of SDH include aging, falls, head injury, use of anticoagulant or antiplatelet drugs, bleeding diatheses, alcohol use, epilepsy, low intracranial pressure and haemodialysis.[12] These conditions result in cerebral atrophy with an increased predilection for the tearing of bridging veins draining into dural sinuses.[13,14] As a result, trivial trauma or even a whiplash type of injury in the absence of direct physical impact may result in a subdural bleed.[15]

A population-based study in Taiwan rightly highlighted the importance in identifying such risk factors especially since the clinical signs of SDH are subtle and easily missed. Researchers found that old age (≥ 75 years old), male gender and coexisting hydrocephalus were significant predictive factors of chronic SDH, and should prompt closer follow up.[12] Similarly, the National Institute for Health and Care Excellence (NICE) in the United Kingdom advocates in their head injury pathway for persons presenting at community health services (including general practitioners) a list of history, physical examination and risk factors that warrant escalation of care.[16]

In this case, Mr T's single risk factor was his advanced age, which in and of itself is often all too quickly disregarded when considering other seemingly "riskier" factors. To address this, several groups have advocated for age to be included in the criterion for triage of trauma patients.[17,18]

Clinical Features of Subdural Haemorrhage

The clinical presentation of patients with SDH may appear similar to other differentials such as alcohol intoxication, delirium, psychiatric disorders and transient ischaemic attacks.[19-26] Table 1 presents a selection of published signs and symptoms of patients with SDH, including proportions contextual to the population sampled. Although not exhaustive and of limited generalisability, it provides a flavour of the wide range of possible presentations. As expected, recurrent falls (as in the case of Mr T), altered mental state and focal neurological deficits are the most common symptoms, likely as a result of raised intracranial pressure and meningeal irritation of large haematomas. Ironically, cerebral atrophy — the denominator for many risk factors — allows greater accommodation for space-occupying lesions. This poses challenges in early diagnosis and prompt treatment of elderly patients as their signs/symptoms become subtler and thus harder to pick up.

However, there are also numerous case reports on novel or atypical presentations of SDH such as intermittent paraparesis, transient aphasia or unilateral sensory-motor abnormalities.[27-41] Therefore, it is still worthwhile to keep the diagnosis at the back of one's mind and/or send patients for further evaluation especially if there is substantial doubt about the provisional diagnoses, if there are multiple disconcordant clinical presentations, or in the presence of other risk factors.

ROLE OF THE PRIMARY CARE PHYSICIAN

This case serves to remind physicians, especially those in the primary care setting, of the need to carefully consider and properly evaluate presenting complaints of elderly patients presenting with falls. Initial presentations of patients with SDH may appear docile, and one would benefit from keeping a high index of suspicion to detect subtleties indicating a more sinister pathology. Thus, although there were no "red flags" for early referral to a hospital at the initial visit in Mr T's case, perhaps a closer follow-up plan at the start would have been more ideal in view of the patient's age. To aid physicians, various organisations publish resources for fall risk assessment and management, including the National Institute for Health and Care Excellence (NICE) and the Stopping Elderly Accidents, Deaths and Injuries (STEADI) initiative of the US Centres for Disease Control and Prevention.[42]

Physicians should also keep in mind the increased mortality associated with low-impact injuries in elderly patients. A study among community dwelling elderly in Japan found that although a decrease in activities of daily living (ADL) affected the rate of falls in the elderly, it did not correlate with the extent of injury during an actual fall.[43] As such, physicians should guard against bias on the basis of seemingly good premorbid-ADL status. The threshold to refer for further evaluation should be lowered, with decisions best made through thorough history taking and physical examination. For example, had the slowly progressing behavioural changes been elicited earlier, the underlying problem may have been uncovered even before the subsequent fall.

Previous studies also show that the elderly are often not properly assessed for fall risk, with previous falls either not elicited or under-documented.[44,45]

Finally, Mr T's condition was only brought to light after the son astutely observed that the patient "did not seem quite right" and requested a medical review. This was even though the patient himself was feeling well and kept downplaying the

Sign/Symptom	Proportion	Differential Diagnosis
Common (>50%)		
Recurrent falls[25]	74%	"Accident"/Environment related, Gait/balance disorders or weakness, Dizziness/ vertigo[2]
Altered mental state[20-26]	42 – 70%	Delirium, Dementia, Psychosis
Focal or Progressive neurological deficits[22]	58-70%	Cerebral Infarct or Haemorrhage
Less Common (<20%)		
Headache[25,30]	14 – 80%	Tension, Cluster Headaches, Migraine
Seizures[25,22]	6-14%	Epilepsy
Transient neurological deficits[27-29]	1-21%	Transient Ischaemic Attack
Uncommon		
Extrapyramidal side effects[31]	23 cases	Parkinson's Disease
Individual Case reports		
Meningeal signs[32]		Meningitis
Choreathetoid movements[33]		Movement disorders
Mutism[34]		Neuroleptic Malignant Syndrome
Vertigo and nystagmus[35]		Middle ear disease (e.g. BPPV); Brainstem or cerebellar lesion
Oculomotor / Gaze palsies[36-39]		3rd Cranial Nerve Palsy, Parinaud's Syndrome
Anterior Pathway Visual Loss[39]		Optic nerve compression, occipital lobe disease, optic disc swelling
Quadriparesis[40]		Cervical spine pathology
Gerstmann's syndrome[41]		

severity of his falls and symptoms. Such behaviour is not uncommon in the elderly; previous qualitative studies show that reasons include underestimation of personal susceptibility to falling or beliefs that falls are due to bad luck or external circumstances and a consequence of ageing.[46] Recall bias is also significant in this patient group — previous studies have found that significant proportions of elderly did not recall previous confirmed falls.[44,47-49] With the increased tendency towards acceding to patient autonomy in care decisions, physicians should be astute to detect and address these nuances. In this regard, this case shows the value of reports by family members, especially in the context of elderly patients.

CONCLUSION

Elderly falls are a common cause of visits in primary care and

should be approached with due caution. This case emphasises the significant consequences of seemingly "minor" falls (including intracranial bleeds such as SDH), the need for a higher index of suspicion in the elderly, the sometimes neglected value of family members' observations and dramatic gains from timely surgical decompression of SDH.

ETHICAL CONSIDERATIONS

Verbal consent was obtained from the patient and his family for the purposes of this publication, including the use of CT imaging.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest in relation to this article.

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