CASE STUDIES

A Multifactorial Assessment: falls in the older population within the emergency department

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Introduction

Falling in the elderly is associated with an increase in morbidity, mortality, reduced functioning and premature admission to nursing homes[1, 2]. The factors responsible for falling can often be corrected depending on the age of the patient, any underlying medical conditions, and the presence of any hazards within their home environment. As age increases, both the incidence of falls and the severity of the related injuries worsen and it is suggested that in geriatric populations, the mechanism of injury is often not proportional to the severity of resulting complications[3]. The elderly also often fail to report an episode of a fall to their doctor[4]. This results in any prophylactic intervention for falls taking place after injury, where disability may already have resulted. The patient is often brought to a clinic by another family member or an eye witness to the fall.

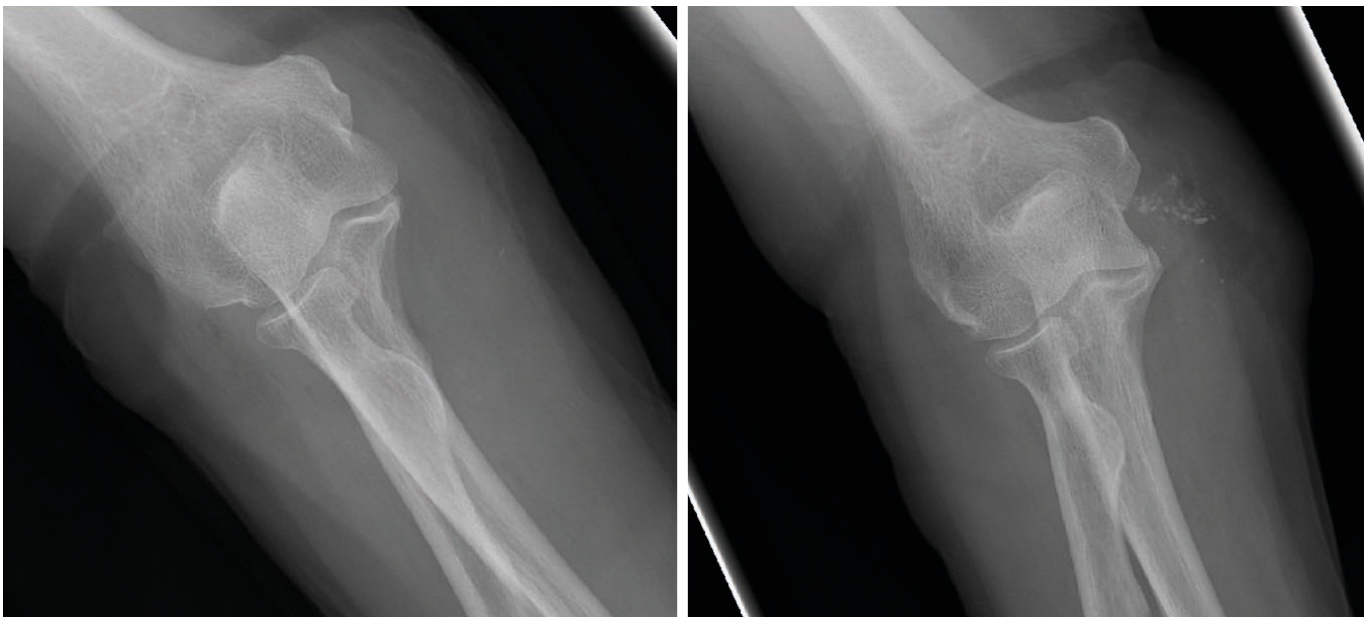

figure 1 The patient's soft tissue injury over the olecranon of the posterior right upper limb

Presentation of case

An 82 year old Caucasian woman presented to the Emergency Department (ED) for the treatment of a soft tissue injury over the olecranon on the posterior part of her right upper limb. This wound was sustained following a fall on the street. The injury was a deep flap wound measuring 5 cm by 5 cm with the tip of the flap positioned distally, with a degree of

muscular exposure.

Management

On physical examination, the patient was systemically well and her vitals were normal with blood pressure values within normal range. Normal pulse rate and rhythm were recorded and there were normal heart sounds with no added sounds.

A history was taken with particular attention being given to whether she lost consciousness before or after the fall. The patient however claimed to remember tripping over loose gravel in the street and declared not to have lost consciousness. This was confirmed by an accompanying eye-witness. It was noted in the patient's history that this was the third fall in the past year. Therefore, the patient was referred to a Falls and Blackouts Unit (FABU).

She was initially sent for a radiograph of her right arm, taken in the antero-posterior and lateral views. This showed no fractures and no oedema of soft tissues, however small particles of a radio-opaque nature were present lateral to the site of injury. Adequate cleaning and irrigation of the wound was then conducted, six continuous subcuticular absorbable 4/0 sutures and thirteen interrupted non-absorbable 4/0 sutures were used. The patient was subsequently sent for a repeat radiograph of the same site, and it was noted that the former radio-opaque particles were no longer present, confirming that debris was introduced during the sustainment of the injury.

Outcome and follow-up

Given that the patient had not received Tetanus immunisation, apart from the first dose of the passive immunisation, 250IU Tetanus Immunoglobulin was administered to provide immediate protection. Amoxicillin/Clavulanic acid three times daily for five days was prescribed and an appointment was made for the sutures to be removed in ten days.

Discussion

Falls are the most common cause of accidental injury in older people and a frequent cause of accidental death in those who are over 75 years of age[3]. About 20-30% of those who endure a fall sustain a moderate or severe injury – falls are the most common cause of fractures and traumatic brain injury[3, 6], with falls due to

table 1 Intrinsic causes of falls in the elderly

Cause	Neurological	Cardiovascular	Musculoskeletal	Metabolic	Psychological
Examples	Syncope • Due to carotid hypersensitivity • Simple vasovagal syncope • Situational syncope e.g. triggered by micturition or coughing	Orthostatic hypotension	Osteoarthritis	Hypoglycemia	Anxiety
		Cardiac arrhythmias	Rheumatoid arthritis	Hypothyroidism	Munchhausen syndrome
		Stokes Adams attacks	Fragility fractures (e.g. neck of femur)		
	Cognitive impairment (e.g. dementia or delirium)		Muscle weakness (e.g. due to vitamin D deficiency)		
	Labyrinthine problems				
	Peripheral neuropathy				
	Drop attacks				
	Epilepsy				
	Reduced vision (e.g. presbyopia)				

syncope likely to result in facial bruising[5]. Presentation after a fall is the most common cause for older people to attend the ED. This results in subsequent admission to hospital for further medical or surgical care. Injury occurs more commonly in frail persons and the nature of the fall affects the risk and type of injury[7]. In the more active and younger generation, wrist fractures are most common whereas in the older population, hip fractures are most common[5].

Falls in the elderly can have a negative effect on morbidity and activities of daily living, and this impact on their activities of daily living contributes towards a loss of confidence in leaving the house[3].

A prospective study targeting sixty-five elderly patients (mean age of 78 years) in a FABU was carried out over a period of six months. Initial patient evaluations included ambulatory electrocardiography, carotid sinus massage before and after atropine and prolonged tilt-head testing[8]. The study concluded that a diagnosis was attributed to symptoms in 92% of patients. These included the following: carotid sinus syndrome (CSS; 45%), postural hypotension (32%), vasovagal syncope (11%), cardiac arrhythmia (21%), epileptic seizures (9%), cerebrovascular disease (6%) and others (12.5%)[8].

To identify the risk factors contributing to a fall, there is a four step process which includes; (i) Focused history taking (ii) Physical examination (iii) Functional assessment of the Activities of Daily Living (ADLs), and an (iv) Environmental Assessment including home safety[9, 10]. Focused history taking is of great importance in the management of the older patient, since this would delineate the probable cause for the fall. The aetiology of falls can be classified into intrinsic causes and extrinsic causes. Extrinsic causes of falls in the elderly would include objects in their way causing tripping (e.g. appliance wires, carpets, incontinence, unsafe footwear, confusion, poor lighting and an uneven walking surface)[11]. The identification of any underlying risk factors is also of great importance since this would contribute towards the patient's overall morbidity. A further subcategory is whether the cause was mechanical (affecting the patient's mobility) or non-mechanical (not affecting the patient's mobility). The intrinsic causes of falls are vast and apart from being attributed to lethargy, an increasing problem in the elderly (anemia, infections or hypothermia are frequent causes of increased lethargy), they can also be grouped as following in a systematic manner[11].

Medication is a common aetiological factor for falls in the elderly. Common pharmacological culprits are anti-hypertensives, sedatives, and drugs which cause parkinsonism as a side effect, such as prochlorperazine and metoclopramide[11]. There is a strong link between psychotropic medication and falls in the older population, especially with use of benzodiazepines[12]. The patient who is the subject of this case study reported having been prescribed benzodiazepines a few months previously for anxiety. These and other psychotropic medications have been associated with increased incidence of falls in the elderly[13]. Moreover, they

CLINICAL POINTS

Falls are a common cause of presentation to the Emergency Department in the elderly and can lead to loss of confidence and independence

Causes are often multifactorial in origin and there is evidence for a linear relationship between frailty and an increase frequency of falling among the elderly

The incidence of falls in the elderly contributes towards increased psychosocial morbidity, and can result in patients being fearful of leaving their home

This causes a restriction in overall mobility which may lead to increased hospitalisation resulting in negative health sequelae and increased mortality

A patient-centred management and referral to appropriate clinics for follow-up is especially essential within the older population

have been found to be independent risk factors. Positively they are a modifiable risk factor, signifying that a detailed drug history and appropriate changes to the patient's drug regimen may thus prevent further episodes[14].

An issue which is not always fully respected in geriatrics is the issue of polypharmacy. Polypharmacy is defined as four or more drugs prescribed for the patient at any given point in time[15]. Polypharmacy is often described as a risk factor for falls in the elderly, but only when one or more of the prescribed drugs was itself a falls-risk associated drug[16]. The 82-year-old patient in this study was on other medication for other conditions at the time of her fall. Review of the patient's medication is essential, and if this is found to be a contributory factor, modification of drug therapy is warranted[12].

It is important to determine whether the patient lost consciousness, before or after the fall, if at all. The patient often reports finding him or herself on the ground, or it may have been a result of the fall due to sustaining a head injury. A collateral history from an eye witness is an important contributing factor in the determination of the exact sequence of events and is always of great benefit as it may influence the management of a patient. Any preceding symptoms or signs must also be investigated – these may include clouding of vision, diplopia or vertigo.

A physical examination should then follow history-taking, where specific attention should be given to the cardiovascular and neurological status of the patient, as well as other specific investigations such as blood pressure parameters (when supine and standing upright), glucose levels and imaging modalities. It is important to rule out any other affecting chemicals (including use of sedatives or abuse of alcohol) and the possibility of any metastatic or non-metastatic manifestation of malignancy, as well as cerebellar lesions[17]. The aim of the physical examination is to support the history and identify which therapeutic group the patient belongs to.

An assessment of the living facilities and the patient's ability to perform any activities of daily living is of great importance especially when dealing with frail patients or those affected by the geriatric giants (instability, incontinence, immobility, intellectual impairment, and iatrogenic problems)[18]. Stairs might manifest as a physical barrier impeding movement and toileting for the patient. It is also important to assess the patient's support framework; whether he or she lives alone or has any live-in help, how close his or her next of kin live and how supportive they are[19].

An integration of the findings of the multifactorial assessment of the home environment must always be acknowledged by clinicians in order to make it safer for the patient. This can potentially offer home help and mobility aids. Appropriate referral to physiotherapy may be warranted, and often occupational therapy within the community is also indicated.

Conclusion

Falls as a presenting complaint often result in hospital admissions in the elderly. These patients must be assessed as to whether they will benefit from rehabilitation and inpatient care. Intervention will therefore benefit from referral to an appropriate clinic.

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