Blunt chest trauma in the elderly: an expert practice review

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Received 25 September 2019
Revised 19 November 2019
Accepted 22 November 2019
Published Online First 12 December 2019

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To cite: Birse F, Williams H, Shipway D, *et al*. *Emerg Med J* 2020;**37**:73–78.

ABSTRACT

Trauma in the elderly (>65 years) is an increasingly common presentation to the ED. A fall from standing height is the most common mechanism after which such patients present, and rib fracture is the most common non-spinal fracture. Thoracic injury in patients aged over 65 is associated with significant morbidity and mortality. There are currently no universally applied guidelines for assessment, investigation and management of such patients. In this expert practice review, we discuss the evidence base and options for clinical management in this vulnerable patient group.

INTRODUCTION

UK Trauma data collected by Trauma Audit and Research Network (TARN) reflect the growing incidence of trauma in the elderly (>65 years) and sheds light on the common mechanisms and injuries. Between 1990 and 2013, there was an increase in mean age of those recorded in the database from 36.1 (SD 22.2) to 53.8 (SD 25.2) years. Accompanying the upward trend in mean age has been a shift in the most commonly recorded mechanism of injury from road traffic accident to low energy fall from less than 2 m.[1] Chest wall injuries are a common consequence of trauma in the elderly. The TARN 2017 report on major trauma in older people found that after head injury, the chest was the next most commonly injured anatomical region in those over 60 years of age.[2] Due to lower bone density and decreased chest wall elasticity, more significant injuries occur with low energy mechanisms in the elderly.

Complications of chest trauma are common in the elderly: 16.2% of patients aged over 65 and 28.6% of those aged over 85, who have suffered isolated blunt chest trauma, develop a complication such as pneumonia or respiratory failure.[3] Injuries such as minor pulmonary contusions may be of little consequence in the young with good cardiorespiratory reserve, but data from retrospective review of 956 blunt trauma patients aged 65 or older admitted to a US level I trauma centre between 2007 and 2015 shows that their presence in the elderly trauma patient is associated with a doubling in risk of mortality (6.2% vs 14.0%, p=0.0003 with OR 1.9, 95% CI 1.03 to 3.4, p=0.04) and a significantly longer hospital stay (6 vs 9 days, p<0.001).[4] Serious complications of rib fractures, such as haemothorax or pneumothorax, are more common in those aged over 65 (OR 4.08, 95% CI 1.64 to 10.19).[5] Elderly trauma patients with rib fractures have a more than twofold greater risk of mortality compared with those without (7.6% vs 20.1%, p=0.001).[6] The risk of death from rib fractures is two to five times greater in those aged 65 or older compared with those under 65.[7–9] Data from the US National Trauma Data Bank show that at any age, the number of ribs fractured correlates with a significantly increased risk of pneumonia and/or death. This is as high as 11.4% mortality in those with six rib fractures and 34.4% mortality in those with eight (p<0.02 for mortality increase with each increase in the number of fractured ribs).[10]

Despite the prevalence and significance of chest wall injury in the elderly, there is currently no universally applied investigation strategy, risk or severity score, or management guideline in use in the UK or USA. Consequently, there is significant variation in practice across EDs in how such patients are assessed, investigated, where they are admitted to in the hospital and how they are managed in terms of analgesic provision. Via discussion of a clinical case, this expert practice review will discuss the importance of blunt chest wall trauma in the elderly and consider evidence-based strategies for assessment and management.

CLINICAL SCENARIO

An 82-year-old man presents to the ED after a fall from standing height sustained while collecting his weekly shopping. He has significant pain across the left side of his chest, particularly on deep inspiration, and feels short of breath. He is known to have chronic obstructive pulmonary disease (COPD), but has a reasonable exercise tolerance normally. He has no history of recent exertional chest pain, and symptoms associated with his long-term respiratory condition have been stable for some time. He takes apixaban and bisoprolol for chronic atrial fibrillation. He has a pain score of 7/10. Clinical examination reveals an RR of 20, oxygen saturations of 90% in air and a very tender lateral chest wall. He is haemodynamically normal. You suspect a fractured rib clinically.

- What modality of imaging, if any, is most appropriate to investigate the severity of injury in this patient?
- Can a chest injury severity risk score contribute to clinical assessment and management?

WHAT IMAGING IS APPROPRIATE?

The use of CT has generally become more common in the investigation of the trauma patient and in many EDs is much more readily accessible than it has been previously. For seriously injured patients, a CXR can quickly identify acute pathology that may

need timely intervention such as large haemopneumothorax. The scenario described here considers an elderly patient with a low energy mechanism of injury and no immediately apparent life-threatening injury. In these patients, it can be difficult to decide which modality is most appropriate. Does the increased cost, greater time involved, risk of contrast nephropathy and greater radiation of CT offer a diagnostic benefit over the CXR? Identifying the full extent of thoracic injury in an older patient is important to inform prognosis and therefore management. An imaging strategy with sufficient specificity to pick up small numbers of rib fractures, small pneumothoraces and pulmonary contusions is needed. In the UK, the London Major Trauma Network guideline for the management of elderly trauma patients recommends CT as the investigation of choice in chest wall injury in the elderly due to the high rate of missed rib fractures on X-ray in this age group.[11] However, this approach has not yet been adopted universally due to the significant resource implications and current lack of national guidelines.

The assessing clinician must decide if the elderly blunt chest trauma patient requires imaging. The National Emergency X-Radiography Utilization Study (NEXUS) tool is a decision instrument designed to rule out significant intrathoracic injury and identify those who do not need imaging.[12] It is similar to other decision instruments in two important aspects. First, similar to the Ottawa ankle and knee rules, it was developed from data considering predominantly younger patients (mean age 46, predominant mechanism of injury motor vehicle collision). It recognises the enhanced risk profile of older trauma patients and includes an age cut-off (age >60), over which the tool cannot be used to justify forgoing imaging. Second, the decision instrument relies on clinician judgement, or *gestalt*, to inform an assessment of pretest probability. All patients over 65 would score a point on the NEXUS chest tool, but if the physician considers the pretest probability of a rib fracture to be low, the tool should not be seen to be mandating imaging.[13]

Having decided if imaging is warranted, the next decision is which modality to request. CT is more specific than X-ray for detecting fractured ribs and associated intrathoracic injuries. The NEXUS chest studies that the tool was developed from included 8661 (of the total 21382 prospectively enrolled) patients presenting to 10 American level 1 trauma centres who underwent both CXR and CT to evaluate blunt chest trauma. Two thousand seventy one of these patients were found to have fractured ribs and 1368 (66.1%) of these rib fractures were picked up on CT only. Median age of those found to have fractured ribs was 53 compared with a median age of 48 in those without ($p<0.001$).[14] A retrospective single-centre study published in January 2019 from an American level 1 trauma centre considered the use of chest CT in just the sort of patient considered in the clinical scenario presented here.[15] Three hundred and thirty patients aged 65 or older who had suffered a mechanical fall requiring thoracic imaging were included. All of the patients underwent both CXR and CT, with both being reported by a radiologist. Rib fractures were identified on CXR in 40 (12.1%) of the 330 and on CT only in 96 (29.1%). Relative sensitivity of CXR versus CT in this patient group was therefore found to be 40% (95% CI 30% to 50%) with specificity of 99% (95% CI 97% to 100%). In all eight cases where pulmonary contusion was identified on CT, this was not evident on CXR. Relative sensitivity for detection of pneumothorax was 62% (95% CI 32% to 86%) and specificity 99% (95% CI 97% to 99.8%).

Secondary analysis of data collected during the NEXUS study shows that injuries identified by CT, but not plain X-ray, are significant. One third of patients with an injury detected on CT (pulmonary contusion, rib fracture, haemothoraces and pneumothoraces), which was not visible on CXR, required some form of intervention; 13.9% required major intervention such as chest drain insertion or mechanical ventilation; 23.6% required more minor intervention such as hospital admission or a period of observation.[16]

Ultrasound is less costly to perform than CT and does not expose patients to radiation, but requires the availability of a trained sonographer or ED physician with point-of-care ultrasound skills. Although ultrasound may offer a useful alternative to CT scanning with a greater sensitivity than CXR for detecting rib fractures and associated complications, there is not enough evidence of sufficient quality to support this currently. Systematic review of the use of ultrasound to detect fractured ribs was published in the *Emergency Medicine Journal* in April 2019 and found 13 studies considering its use. Significant heterogeneity was found between studies with particular differences in the reference standard, time period between injury and scan, and ultrasound operator. This precluded meta-analysis.[17]

We therefore recommend adopting a low threshold for CT imaging when pretest probability of a significant thoracic injury is considered high in patients aged over 65 years. Although the identification of a single fractured rib or small pulmonary contusion may not affect the management of a young, otherwise well patient, these injuries can be significant in older patients with reduced physiological reserve. Chest radiographs do not identify all injuries in elderly patients that are identified by CT imaging. Immediate imaging via portable X-ray may be clinically necessary, but in circumstances where it is not, there seems to be a sensible argument for CT as first-line imaging.

CAN A RISK OR SEVERITY SCORE HELP GUIDE HIS MANAGEMENT?

In emergency medicine, there are numerous risk scores used to guide imaging decisions,[18] diagnostic decision making[19] or therapeutic decision making.[20] The multiplicity of tools and the disease-specific nature of how they are developed present a challenge to ED physicians.[21] Some risk scores have become almost universally embedded in clinical practice. Despite this, blunt thoracic injury imaging and management have not historically been guided by risk scores, perhaps due to the heterogeneity of the injured population and the varying nature of associated lung injury. However, several scores and scales have been developed to assess thoracic trauma.[22] These have previously focused on identifying the anatomical nature of thoracic injury.[23–25] Measures of thoracic trauma have also been described for use in the assessment of major and polytrauma patients.[26 27]

A simple rib fracture scoring system has been suggested, which includes number of ribs fractured and age: rib fracture score = (breaks × sides)+age factor (50–60: 1; 61–70: 2; 71–80: 3; >80: 4). The score was designed to grade severity of injury and predict likely outcome and level of care required.[28] Subsequent validation study of this score did not demonstrate strong statistical validity as a predictive model of hospital and intensive care unit (ICU) length of stay, but authors suggested it might still be useful as a prompt to consider severity of injury.[29]

The association between advancing age, pre-existing respiratory disease and mortality in chest wall injury is well described.[7] A risk score that informs the management of the elderly patient with chest wall injury should contain a measure of preinjury morbidity or frailty and include age as a key determinant of the scoring outcome. Battle *et al*[30] have suggested such a score based on retrospective analysis of 274 blunt chest wall trauma

Table 1 The STUMBL tool. Adapted from Battle *et al*[31]

	Score	
Age	1 point for each decade: 10–19 scores 1, 20–29 scores 2 etc	
Number of rib fractures	3 points per rib fracture	
Anticoagulated	No	0
	Yes	4
Chronic lung disease	No	0
	Yes	5
Oxygen saturation levels	100%–95%	0
	90%–94%	2
	85%–89%	4
	80%–84%	6
	75%–79%	8
	70%–74%	10
Risk score	**Probability of complications**	
0–10	13%	
11–15	29%	
16–20	52%	
21–25	70%	
26–30	80%	
31+	88%	

patients presenting to a cardiothoracics centre in Wales, with a subsequent multicentre prospective study to assess the model and derived integer score, in terms of accuracy and predictive capabilities (see table 1). The STUdy of the Management of BLunt chest wall trauma (STUMBL) prognostic model was shown to have a sensitivity of 80%, specificity of 96%, positive predictive value of 93%; negative predictive value was 86% for complications following blunt chest wall trauma. An integer score of 11 or more was suggested as the cut-off point for significant risk of developing complications and therefore requiring hospital admission. An integer score of 26 was selected as the cut-off point, at which the patient was at sufficiently high risk to warrant intensive care admission. Although the score has been externally validated in a multicentre study, the clinical and cost-effectiveness of this score are yet to be proved by an appropriate randomised controlled impact trial.[31] There are currently no superior alternative scores published, and if the STUMBL tool is appropriately validated, it could become a very useful component of the assessment of all patients suffering chest wall trauma, including the elderly.

The recommendation for intensive care admission and consideration of invasive treatments such as intubation and mechanical ventilation need careful consideration on a case-by-case basis in the age group considered here. Data from a cluster randomised clinical trial in French hospitals published in 2017 show that when elderly patients are systematically admitted to intensive care (irrespective of age and comorbidity status) there is no significant reduction in mortality, functional status or quality of life at 6 months compared with usual practice, despite a higher rate of ICU admission (RR 1.68, 95% CI 1.54 to 1.82).[32] Frailty is not synonymous with advancing age, but the frailty syndrome is more common in the elderly. Systematic review and meta-analysis of 12 observational cohort studies considering frailty in the intensive care setting showed an association between frailty and in-hospital mortality.[33] A specific measure of frailty may help inform the assessing ED physician and receiving team as to whether intensive care admission is appropriate. There is growing recognition of the importance of frailty screening for elderly patients at presentation to the ED, but a lack of data investigating the correlation between frailty scores and chest trauma outcomes.

The man presenting in the clinical scenario described here will, on the STUMBL tool, score 8 for age, 4 for anticoagulation, 5 for his COPD and 2 for oxygen saturations on presentation. This gives him a score of 19 and 52% probability of developing complications without any fractured ribs found on imaging. If he is found to have three or more rib fractures, he will have a score of at least 28 and ICU admission would be recommended.

The risk score developed by Battle *et al* reflects the importance of age in prognosis and the risk of complications of rib fractures in the elderly. What remains as yet unanswered is how to consistently address this risk from an ED perspective.

CLINICAL SCENARIO

A CT chest is organised for the presenting man after persuading the radiologist. This reveals fractures to the fifth and sixth ribs on the left hand side. This gives him a score of 19 against the prognostic model given above. The CT also reveals a small pneumothorax, <1 cm at the apex, and evidence of a small pulmonary contusion. He has only had partial relief from simple analgesia and a small dose of opioid. He is still struggling to take a deep breath and cough due to pain, but his saturations remain 90% without increasing oxygen requirement. An inpatient bed is arranged.

- What options exist to achieve adequate pain relief?
- Should any intervention be made to manage the small pneumothorax?
- Which specialties should be involved in his care?

HOW SHOULD ADEQUATE PAIN RELIEF BE ACHIEVED?

Achieving effective analgesia in patients with fractured ribs is essential in order to reduce complication rates, but it is often challenging. It is important to remember that older patients are least able to tolerate respiratory complications by virtue of the physiological changes of ageing. Analgesia must be started promptly in the ED to enable deep breathing, adequate coughing and early mobilisation, in order to reduce the risk of chest-specific complications such as atelectasis, pneumonia and respiratory failure. Treatment options range from simple analgesics to more complex interventions such as regional anaesthesia. Elderly patients often receive inadequate analgesia due to fear of causing side effects, such as sedation and respiratory depression.

Ageing is associated with a number of physiological changes that affect the pharmacokinetics and pharmacodynamics of drugs. Reduced hepatic and renal blood flow can affect metabolism and clearance. Tissue receptor expression is reduced rendering elderly patients more susceptible to the effects of opioids. These changes should be carefully considered when selecting appropriate analgesia. Patient comorbidities may also affect drug response and the potential for adverse side effects should be evaluated. Elderly patients are particularly susceptible to delirium, which can be contributed to by both uncontrolled pain and high doses of opioids. Opioid-sparing analgesia strategies may be effective in the elderly with fractured ribs and help reduce the risk of delirium.[34] Therefore, a combination of analgesics and techniques to reduce the adverse effects of drugs such as opioids is much more desirable for these patients.

Systemic analgesia

A multimodal approach should be adopted and should include regular simple analgesia such as paracetamol, which is well tolerated in the elderly. Non-steroidal anti-inflammatory drugs have useful analgesic properties but should be used with caution due to their adverse side effects. Long-term use in the elderly should be avoided, though acute use may be justified with appropriate precautions (eg, proton-pump inhibitor cover). Rapid onset weak opioids (eg, codeine) are a reasonable choice for moderate rib fracture pain but may be inadequate where pain is severe and limiting deep breathing or mobilisation. We do not use transdermal weak opiates (eg, buprenorphine) for acute rib pain due to slow onset-offset limiting their efficacy in this setting. The pain from rib fractures can be difficult to manage, and patients often require the addition of a strong opioid for breakthrough pain or on a regular basis. Lower doses should be used when opioid therapy is initiated in elderly patients due to their increased sensitivity, and doses should be titrated carefully. However, it is important to be mindful that there is a window of opportunity to prevent catastrophic sequelae of rib fractures, which include pneumonia, sepsis, respiratory failure and delirium. Elderly patients should therefore not be denied strong opioids, but should be carefully monitored for side effects and toxicity including sedation and delirium.

Regional anaesthesia

Epidural may well offer significant benefit in terms of pain relief, particularly for patients with multiple or bilateral rib fractures. Inserting an epidural in these patients requires the absence of contraindications, availability of an anaesthetist and the ability to admit to a ward that is capable of safely managing neuroaxial anaesthesia. These resources are not ubiquitous and can limit access to these techniques. Aside from analgesic benefit, the evidence is not so positive for the use of epidurals in rib fractures, particularly in the elderly. Retrospective studies have found that epidurals do not reduce hospital, ICU length of stay or pulmonary complications in a range of ages.[35] Older patients may actually be admitted for longer and suffer more pulmonary complications when an epidural is used in this context.[9 36] Epidural anaesthesia can result in significant orthostatic hypotension in elderly patients and limit early mobilisation. Thoracic epidural analgesia is associated with complications and side effects, and it seems these are more likely in the type of patient we consider in the clinical scenario given here—those with less severe injury and with cardiovascular or respiratory comorbidity.[37] They will also often not be suitable in this group due to contraindications such as anticoagulation or cognitive impairment limiting compliance.

Other options for regional anaesthesia include paravertebral block, serratus plane block and intercostal block.[38] Paravertebral block catheters can remain in place for 7 days and are reported to provide similarly effective analgesia to epidural, but with fewer associated complications and contraindications.[37 39] See table 2 for a comparison of regional blocks and epidural anaesthesia. Evidence for the effect of regional blocks on length of stay and the frequency of complications in rib fractures in the elderly is limited. A retrospective cohort study published in 2018 considering patients 65 or older with three or more rib fractures investigated the risk of delirium in those treated with systemic opioids versus those treated with regional anaesthesia.[34] Of the 144 patients included, 19% received regional anaesthesia in the form of epidural or paravertebral local anaesthetic infusion visa catheter. The study considered only those severely injured enough to be admitted to an ICU setting and measure of delirium was made using the CAM-ICU assessment. The risk of delirium was found to decrease by 24% per day per patient with the use of regional anaesthesia (incident rate ratio 0.76, 95% CI 0.61 to 0.96).

Table 2 Comparison of regional block and epidural anaesthesia. Adapted from Wardhan[37]

Advantages of regional block over thoracic epidural anaesthesia		
	Epidural	**Regional**
Cognitive status	Not recommended in confused, potentially non-compliant, or sedated patients.	Can be used in sedated and ventilated patients. More practical in confused patients.
Venous thromboembolism prophylaxis	Not recommended	Can be used
Technical difficulty	Difficult in those with reduced mobility	Less complex
Complication risk	Higher	Low
Systemic effects	Potentially profound due to sympathectomy	Limited

It seems highly likely that regional anaesthesia will become more commonplace in the management of rib fracture pain as expertise becomes more widespread. This may well become routine, based on an on-admission assessment of severity of injury and frailty or in those cases in which traditional analgesic strategies have failed. Availability to a service to provide and subsequently manage single-shot blocks and infusion catheters will differ greatly hospital to hospital. The patient considered here, as with increasing numbers of those over 65 presenting to the ED, is taking a direct oral anticoagulant (DOAC): this represents a contraindication to epidural anaesthesia and other regional blocks.

Lidocaine patches

Lidocaine patches are fairly common in use at the site of fractured ribs, having been shown to be effective in other conditions with difficult-to-manage pain. Despite increasing use in the rib fracture setting, the evidence to support topical lidocaine is poor.[40] It includes one drug company-sponsored randomised control trial that enrolled 58 multiply injured patients. The trial was too small and not powered to detect a statistically significant difference in pain scores between the group receiving the lidocaine patch and the group receiving a placebo patch.[41] Other evidence for their use includes an observational study in which multiply injured patients were considered, with poorly matched controls and significant potential for bias.[42] Further work is needed, particularly in the elderly patient without other significant injuries, to determine if there is evidence for their use in the clinical scenario described here. If they prove to be effective in pain from fractured ribs, they could become a very useful tool. Transdermal patches do not require the expertise of the experienced clinician required to deliver effective regional or neuroaxial anaesthesia. Transdermal lidocaine also has less potential for serious complications and fewer contraindications, including anticoagulation.

SHOULD WE INTERVENE FOR HIS SMALL PNEUMOTHORAX?

Current Advanced Trauma and Life Support guidelines recommend that all traumatic pneumothoraces are best treated with thoracostomy and chest drain insertion.[43] They do however state that small, asymptomatic pneumothoraces may be appropriately

managed with observation and/or aspiration at the discretion of a suitably experienced doctor.

Evidence guiding the management of small traumatic pneumothoraces has previously been lacking.[44 45] The largest observational study to date of traumatic pneumothoraces using data collected via the TARN database was published in 2017.[46] Of the 3771 patients registered on the database after presentation to a UK regional trauma centre over the 4-year study period, 636 with pneumothoraces were identified and 602 included in statistical analysis; 95% of injuries were from blunt trauma. In 277 of the 602 patients, pneumothoraces were initially managed conservatively. Median age of this group was 47.1, and median size of pneumothorax 5.5 mm (22 mm in the non-conservative management group, p<0.001). Of the initially conservatively managed patients, 90% did not require intervention at any stage. Although the median age of those in whom conservative management was successful was lower than those in whom it was unsuccessful, the difference was not significant (46.7 vs 51.2, p=0.33). Mean injury severity score for both groups would have been higher than that of the patient described in the clinical scenario here (24.9 and 25) and so these patients are not a direct comparator. However, with more serious injuries, a large proportion of patients did well with conservative management, and no difference was found in hospital length of stay or mortality. Those that needed chest drain insertion following initial conservative management had a non-significant greater length of stay (11 vs 10 days, p=0.597).

Evidence to inform the management of small pneumothoraces in the elderly patient who has suffered a low energy injury is lacking. Most published data focus on victims of major trauma and multiply injured patients. In this case, our patient has been found to have only a small pneumothorax without significant respiratory compromise. Presence of a chest drain will likely add to difficulty in achieving pain relief to allow deep breathing and hinder early mobilisation. It seems reasonable to hold off intervening unless there is a deterioration.

WHERE SHOULD THIS MAN BE ADMITTED?

The appropriate admission destination of an elderly patient with a blunt chest injury may be immediately obvious, but it is not always, and anecdotally admission practices vary between centres. Critically unwell patients who are deemed suitable will be admitted to intensive care while those with a chest drain will need to be admitted to an inpatient area where this can be managed. This is most often a surgical ward. Patients with fractures in other body regions requiring intervention will typically be admitted under an orthopaedic team. It is not always so obvious where a patient such as the one discussed here should be admitted. He has a fracture that will require analgesia and rehabilitation. He also has other medical problems that may need attention and he will need a multidisciplinary assessment of why he has fallen. In such patients, the admitting team may not be as important as the services available to the patient. It is well recognised that comprehensive geriatric assessment is crucial in the management of patients with hip fractures.[47] A higher number of orthogeriatrician contact hours per patient has been shown to reduce 30-day mortality from a fractured hip.[48] Irrespective of specific injury, there is a high prevalence of cognitive impairment and polypharmacy among older trauma patients, and complications such as delirium and acute kidney injury are common.[49] In older patients with recognised frailty, there is robust evidence that comprehensive geriatric assessment improves outcomes from inpatient hospital stays.[50] Indeed, the argument has been made for this assessment to begin as early as possible, potentially by urgent care staff such as the ED physician. Although there is no evidence to directly support this approach in patients with rib fractures, recent changes to the Major Trauma Best Practice Tariff in England have aimed to incentivise the integration of geriatricians into the care pathway for older trauma patients. Data evaluating the impact of this change are awaited, but it seems plausible that routine frailty screening and early initiation of a complex geriatric assessment may influence trauma outcomes.[51]

The patient discussed here is at risk of complications from his injury and of further falls affecting his long-term functional status and quality of life. He should be admitted either to a medical ward experienced in managing patients with significant analgesia requirements or to a surgical ward with significant input from a geriatrician and multidisciplinary team with experience in managing the frail patient.

CLINICAL SCENARIO

The presenting patient is referred to the acute medical take, from where he is rapidly moved to a care of the elderly ward. He is prescribed multimodal systemic analgesia, including an opioid. Our typical practice for patients with significant chest wall pain is to start with immediate-release oral morphine sulfate 2.5 to 5 mg four times a day, depending on body habitus. This is dose equivalent to oral codeine, but in our experience facilitates up-titration. In patients with impaired renal function, we typically use the equivalent dose of immediate-release oral oxycodone. Side effects such as constipation and nausea and vomiting should be prevented with the prophylactic use of stool softeners and antiemetics.

He receives comprehensive geriatric and multidisciplinary assessment early in his admission. On day 2, he becomes acutely unwell, requiring increasing oral analgesia to enable deep breathing and mobilisation; he is also febrile and more breathless. A CXR shows a pneumonia, for which he is treated with antibiotics, but no increase in the size of the pneumothorax. Regional anaesthesia is discussed with the anaesthetic team, but on review they find him delirious and his anticoagulation has not been stopped, so are unable to intervene. They suggest a lidocaine patch and rationalising his systemic analgesia, which helps. He recovers from his delirium and pneumonia over the next 5 days. Following a falls assessment, he is provided with a walking aid and arrangements are made for short-term community multidisciplinary input on discharge.

CONCLUSION

The clinical scenario presented here is commonly encountered in the ED. It may be more complex than it first appears and highlights a number of dilemmas that arise in the investigation and management of such patients. There is relatively little evidence directly focusing on thoracic trauma in the elderly to guide assessment and management. Consequently, practice varies across EDs and there is a lack of national consensus guidelines on how to manage this complex patient group. Thorough assessment in the ED, access to sensitive imaging such as CT and early recognition of frailty are important in identifying patients at risk of complications from their injuries. Further development and validation of tools such as the STUMBL score discussed here will significantly add to this assessment.

Achieving adequate analgesia is crucial to avoiding complications, and there may be a growing role for regional anaesthesia in the management of rib fractures. Comprehensive geriatric

assessment should form an important part of the ongoing management of such patients, the beginnings of which may be started in the ED. Structured national guidelines for the assessment and management of such patients that include appropriate rib fracture assessment tools may improve outcomes. In the absence of such at present, EDs and associated acute specialties should examine their local practice to ensure they are providing consistently high standards of care to older patients with blunt thoracic injuries.

Contributors EC planned the manuscript following invitation from the editorial board and guarantees the overall content. FB, HW, DS and EC contributed equally to the manuscript content and approved final submission.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

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