



“Doc! My back hurts...”



Rose Mengual, MD, ACP

Martha's case

Martha, 76, arrives to the ED via ambulance after calling 911 for severe back pain and shortness of breath (SOB). She had been seen in the ED 2 weeks prior for SOB and back pain and was diagnosed with acute exacerbation of chronic obstructive pulmonary disease (AECOPD). On discharge she was placed on a 5 day course of doxycycline and prednisone. She reports intermittent SOB and back pain since this time which has not changed with completion of the prescribed medications. Today, while travelling as a passenger in her daughter's car, she developed sudden acute sharp back pain and SOB. It has improved significantly on her arrival. Martha denies SOB between episodes of back pain, cough, fever, chills, rigors, anorexia, chest pain, palpitations, orthopnea, or paroxysmal nocturnal dyspnea. She denies any traumatic injuries. She has been taking her medications as prescribed.

Medical history

- Osteoporosis
- COPD
- Ex-smoker
- Deep vein thrombosis (DVT)

Medications

- Warfarin
- Ipratropium bromide puffer
- Salbutamol puffer

For more on Martha, turn to page 2.

Questions & Answers

1. What is the differential diagnosis?

Given Martha's age and comorbidities, it is important to generate a broad differential diagnosis:

- Respiratory:
 - Pneumonia
 - Acute exacerbation of chronic obstructive pulmonary disease (AECOPD)
 - Pneumothorax
- Cardiac:
 - Acute coronary syndrome (ACS)
- Vascular:
 - Pulmonary embolism (PE)
 - Thoracic aorta dissection
- Musculoskeletal:
 - Rib fracture
 - Vertebral compression fracture (VCF)
 - Muscular strain

2. How should we approach Martha?

The absence of increased cough, quantity or purulence of sputum, combined with lack of infectious symptoms and absence of response to an appropriate course of antibiotics and prednisone makes pneumonia or AECOPD unlikely. A low pre-test probability of PE according to Well's PE Criteria (score = 1.5), combined with anticoagulation and an INR in therapeutic range and a negative D-dimer makes the possibility of PE negligible. Finally, a normal 12-lead ECG along with absence of elevation of cardiac markers makes ACS unlikely.

More on Martha

Examination

Martha's vital signs are as follows:

- Temperature: 36.7°C
- BP: 146/66 mmHg
- Heart rate: 78 bpm
- Respiratory rate: 20 breaths per minute
- Oxygen saturation: 97% on room air

On examination, Martha is alert and oriented to person, place and time. She is sitting upright and appears to have difficulty getting comfortable. She is shifting and moaning occasionally in bed. She has a normal first and second heart sound and there are no murmurs or extra heart sounds. The jugular venous pressure is 2 cm above the sternal angle. She is barrel-chested. There are no adventitious breath sounds. There is no spinal tenderness, but she is tender in the region of the lower thoracic costovertebral junction. Her neurological assessment is normal. There is no crepitus, deformity, rash, or allodynia in the affected area. Her legs are symmetrical and there is no edema, discolouration, or tenderness.

Laboratory evaluation

- White blood cells: 6.9
- Hemoglobin: 105 g/L
- Platelets: 253
- Creatinine: 79
- Urea: 8.5
- Creatine kinase: 84 U/L
- Troponin: < 0.01 ng/ml
- INR: 2.6
- D-dimer: < 200 µg/L

Investigations

12-lead ECG shows normal sinus rhythm, no ST segment or T wave abnormalities

For Martha's conclusion, turn to page 3.

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3. *What is the diagnosis?*

The chest x-ray (Figure 1 and 2) is essential in ascertaining the true diagnosis and lending further support to the absence of alternative diagnoses.

The lateral chest radiograph (Figure 2) demonstrates a vertebral compression fracture (VCF) of the mid thoracic vertebrae. When compared to her lateral x-ray from only two weeks earlier (Figure 3) we can see that even in this short period of time there has been additional collapse of the affected vertebrae.

4. *Why is Martha at risk for a VCF?*

Osteoporosis is the greatest risk factor for VCF. Martha's age, gender, post-menopausal state and periodic use of systemic corticosteroids places her at risk for osteoporosis. There are > 1.8 million Canadians living with osteoporosis. Amongst this group, one in four women and one in eight men > 50-years-of-age will suffer at least one VCF in their lifetime. This risk continues to increase with age in both genders.

5. *What is the expected clinical course of VCF?*

The pain that results from VCF is often severe and debilitating. With adequate analgesia, the majority of patients who suffer a VCF will have a benign clinical course with a gradual improvement in pain over six to eight weeks. Some patients will go on to develop chronic debilitating symptoms including pain, decreased mobility and functionality, or altered respiratory mechanics. Similar to the hip fracture population, those patients who suffer a VCF represent the medically frail subset of our population that is observed to have an increased mortality compared with age-matched controls.

Back to Martha

Martha's pain is controlled to an acceptable level with acetaminophen and small doses of hydromorphone. With supplemental home support, she is discharged with a prescription of calcitonin nasal spray 200 U q.d. and close follow-up with her FP.



Figure 1. Postero-anterior chest x-ray demonstrating left lower lobe atelectasis, which is a non-specific finding.

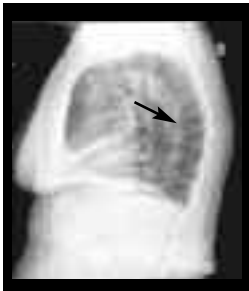


Figure 2. Lateral chest x-ray demonstrating atelectasis and vertebral compression fracture of the mid thoracic vertebrae.



Figure 3. Lateral chest x-ray from two weeks earlier demonstrating vertebral compression fracture of the mid thoracic vertebrae—degree of collapse less than that seen in Figure 2.

6. What can we do for Martha?

Management of VCF has traditionally consisted of multimodal pain management strategies including acetaminophen, NSAIDs and opioid analgesics. Acetaminophen alone is often inadequate to effect analgesia sufficient to permit execution of activities of daily living. Caution must be exercised when recommending NSAIDs and opioid analgesics in older patients given the potential for significant side-effects.


A recent systematic review demonstrated unequivocally that calcitonin is effective in reducing the debilitating pain of VCFs and promoting earlier mobilization in patients suffering a VCF. The safety profile and ease of administration make calcitonin an optimal choice for analgesia in the medically frail patient.

Despite aggressive analgesia, one in ten patients will require hospital admission for symptom management and rehabilitation.

7. How is calcitonin prescribed?

Calcitonin may be prescribed as 200 U intranasal q.d. to alternating nostrils, or 100 U intramuscular q.d. for the duration of pain. The most common side-effect with intranasal administration was headache.

8. What should we learn from Martha?

One in four women and one in eight men over the age of 50 will suffer a VCF, with a prevalence that continues to rise with age in both genders. As such, VCF should be considered in the differential diagnosis of all such patients presenting with severe back pain with or without respiratory compromise. Calcitonin is an extremely effective analgesic option for patients with acute VCF. 

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