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## A “cough induced” pelvic fracture as the first sign of a malignant neoplasm

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## ABSTRACT

**INTRODUCTION:** We report a case of a “cough induced” pelvic fracture. There has been no prior documentation of this.

**PRESENTATION OF CASE REPORT:** An eighty-year old patient presented to the emergency department after a severe coughing fit and subsequent inability to mobilize. A loud crunch was noted arising from the hip at the time of coughing. Radiographs demonstrated a left ilium fracture with metastatic deposits by computerized tomography. The patient had been investigated extensively six months before presentation for weight loss, but results were inconclusive. Investigations following admission (oesophagogastro-duodenoscopy, bronchoscopy, magnetic-resonance, computerized-tomography) confirmed a grade-4 non-small cell lung, and poorly differentiated gastric cancers with secondary metastases to bone and liver.

**DISCUSSION:** Despite this patient having been investigated extensively for a presumed neoplasm the results of which, at the time were inconclusive, she presented six-months later with lung cancer and gross metastasis to the stomach, liver and bone, not amenable for active treatment.

**CONCLUSION:** This case highlights the importance of considering sinister causes in patients presenting with non-traumatic pelvic fractures and the need for regular follow up for those patients investigated with unexplained weight-loss with inconclusive results, but with a high index of suspicion for malignancy.

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## 1. Introduction

Fracture is a rare complication of coughing, with the literature largely reporting those involving the ribs [1]. Fractures from chronic coughing tend to affect the lateral and middle aspects of the rib cage, with a marked female majority [2]. The muscular strain of repetitive coughing causes an internal force, as opposed to an external force from trauma. The subsequent chronic muscular strain from the internal force upon the rib can potentially cause a ‘stress fracture’ [3]. We report a case of an elderly woman who sustained an isolated, undisplaced pelvic fracture of the left ilium following a severe coughing fit. Investigations revealed this to be pathological in nature, secondary to metastatic deposits within bone. This was the first presentation of a neoplasm within this patient.

## 2. Case report

An eighty-year old woman presented to the emergency department with an inability to mobilize following an acute episode of coughing. She describes hearing a loud crunch originating from the left hip at the time of coughing. Subsequently she was unable to weight bear with significant left hip tenderness. There was no history of trauma and the patient had been previously mobilizing independently. Of note she was a heavy smoker, suffered from peripheral vascular and chronic obstructive pulmonary disease.

The patient had had significant weight loss of thirteen kilograms over a six-month period associated with epigastric pain. This had been extensively investigated prior to presentation, with oesophago-gastro duodenoscopy (OGD), chest radiographs and computerized tomography (CT) thorax and abdomen. A minor degree of pancreatic calcification and pulmonary nodules were identified. These were followed up by repeat CT and deemed to be benign. There was no other history of note.

On examination, there were no leg length discrepancy, swelling or skin changes. The left hip was tender on palpation. The patient could not straight leg raise, but there was good passive movement of her left leg. Clinical examination was otherwise unremarkable.

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Fig. 1. Plain radiograph of the pelvis with a left iliac wing fracture.

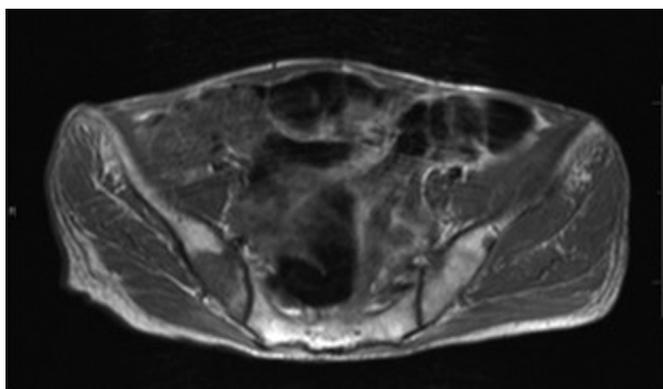


Fig. 2. Magnetic resonance imaging of the pelvis showing an undisplaced left iliac wing fracture due to metastases.

Plain radiographs demonstrated an undisplaced, fracture of the left ilial wing with suspicion of metastatic deposits around the fracture site (see Fig. 1). Further imaging, with magnetic resonance was obtained and revealed multiple focal abnormalities of the pelvis and femur with vertebral collapse at T7 and L1 (see Fig. 2). CT thorax identified a right hilar lung mass with multiple metastases to the ribs, T9, L1, pelvis and liver (see Fig. 3). This was thought to be a stage 4 metastatic lung cancers. The patient underwent a further OGD, on which an ulcer was identified. Histology revealed a poorly differentiated gastric adenocarcinoma. Serum electrophoresis and urinary Bence-Jones protein were both negative. The fracture was managed conservatively with analgesia, physiotherapy and mobilization.

The patient was discussed at both respiratory and upper GI multidisciplinary team meetings. It was unclear whether there were two synchronous primary malignancies of the stomach and lung, with secondary metastasis; or there was a single lung primary with metastases to liver, stomach and bone. The patient was not deemed appropriate for palliative chemotherapy but managed with palliative radiotherapy. She sadly passed away two months after current presentation.



Fig. 3. A computerized tomography of the thorax showing a right hilar mass with lymphadenopathy.

### 3. Discussion

Pathological fractures are known to occur more frequently in those with diseased bone. These can be of non-neoplastic origin, stress fractures occurring in osteoporotic bone [4], or neoplastic, as a result of primary or secondary deposits causing weakened areas in bone that are amenable to fracture with minimal trauma. These have been well documented, but the rarity of this case lies with the unusual mechanism of injury. Coughing can generate forces of up to 25 Joules of energy [5], however it is usually insufficient to result in pelvic fractures within normal bone [6].

Despite this patient having been investigated extensively for a presumed neoplasm the results of which, at the time were inconclusive, she presented six-months later with lung cancer and gross metastasis to the stomach, liver and bone, not amenable for active treatment.

### 4. Conclusion

This case highlights the importance of considering sinister causes in patients presenting with non-traumatic pelvic fractures and the need for regular follow up for those patients investigated with unexplained weight-loss with inconclusive results, but with a high index of suspicion for malignancy.

### Conflict of interest

Nothing to declare.

### Funding

Nothing to declare.

### Consent

Patient has sadly passed away. We are in process of obtaining consent from the NOK.

### Author contribution

Nikhil Sharma – Writing up the abstract, introduction, case report, discussion and conclusion.

Manpreet Sidhu – Writing up the abstract, introduction, case report, discussion and conclusion.

David Simpson – Reviewing and proof reading the article ready for submission.

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