

# Pelvic insufficiency fracture mimicking bone metastasis: A case report

Yusuf Ahmed, BMSc(C), Chris Dey, MBBS, Stephanie Chan, BSc(C), Bo Angela Wan MD(C), Arnab Agarwal, MD(C), Marko Popovic, MD(C), Leila Malek, BSc(Hons) Edward Chow, MBBS



Sunnybrook Odette Cancer Centre, University of Toronto, Toronto, ON, Canada

## Introduction

- Bone metastasis (BM) is a common, painful complication of cancer which weakens bone integrity and may cause pathological fractures.<sup>1</sup>
- Treatment for BM such as palliative radiotherapy and radioisotopes focus on improving patient quality of life and preventing further metastases.<sup>2</sup>
- Insufficiency fractures (IF) may develop naturally due to metabolic weakening of bones (ie. Osteoporosis)<sup>3</sup> or may be induced by radiotherapy.<sup>4</sup>
- Similarities between pathological fractures and IFs presents a diagnostic challenge in determining fracture etiology in cancer patients.

## Case report

- An 80 year old male with a history of bladder carcinoma and lung metastases was referred to radiotherapy clinic after recent bone scan and X-rays suggested a pathological fracture to left iliac wing (Figure 1).
- The patient incurred a fracture while lifting heavy box.
- Eight months prior to injury, patient received radical radiation treatment (~60Gy) to the left pelvis.
- The patient was referred to Rapid Response Radiotherapy Program (RREP) with suspicion of pathological fracture to the left iliac wing.
- The RREP team reviewed bone scan, X-ray, and computerized tomography (CT) scans of the pelvic area. Image results were inconsistent with presence of cancer.
- Physicians determined fracture was caused by radiation-induced bone insufficiency as opposed to BM.
- Radiotherapy treatment was forgone in favour of cementoplasty bone strengthening procedure.
- Post-cementoplasty imaging displayed callus formation and no evidence of BM (Figure 2).
- After cementoplasty procedure, pain symptoms resolved and ambulatory function was restored.

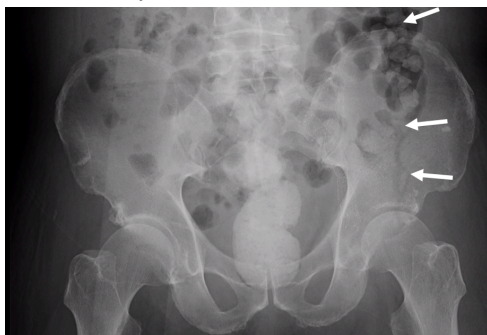


Figure 1. Plain pelvic radiograph showing fracture in the left iliac bone

## Case report (cont.)

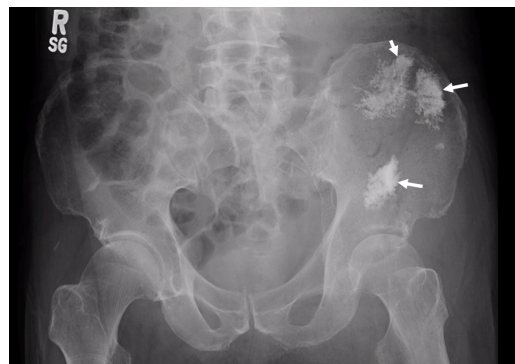


Figure 2. Plain radiograph of pelvis post-cementoplasty, with arrows indicating areas of cement injection showing dispersion into radiation weakened bone and fracture bridging

## Discussion

### Diagnosis Rationale

- Improved prognosis of cancer patients and greater overall survival have contributed to a greater frequency in observed IFs caused by naturally occurring bone deterioration (ie. Osteoporosis).<sup>3</sup> These injuries may be confused with induced pathological fractures.
- The patient's old age (80 years) was a risk factor for Osteoporosis. IFs, especially in the pelvic region, are common complications of Osteoporosis.
- The patient's recent history of high dose radiotherapy (~60Gy) was a risk factor for developing an IF. Radiotherapy destroys surrounding tissue and weakens bones in target area.<sup>4</sup>
- Sensitive imaging modalities such as CT, magnetic resonance imaging (MRI) and scintigraphy are useful in ruling out metastatic disease and confirming IF.<sup>5,6</sup>
- Early callus formation observed from case patient's post-operative radiographs supported the IF diagnosis. Pathological fractures caused by BM would have displayed delayed healing.<sup>1</sup>

### Treatment Rationale

- Patient was referred to the RREP for palliative radiotherapy. Radiotherapy is useful in treating metastatic disease, but in cases of unrelated IFs, radiation would unnecessarily harm the patient.
- Once the fracture was confirmed to be unrelated to the patient's cancer, a bone strengthening cementoplasty procedure was prescribed (radiotherapy was not needed).

## Conclusions

- Fractures in cancer patients are not equivocally of metastatic origin and physicians must explore the possibility of insufficiency fractures as a differential diagnosis.
- Thorough review of the patient's past medical history and appropriate imaging can confirm the cause of the fracture and guide management accordingly.

## References

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