

# A case of severe hypercalcemia in a young patient on the Neurorehabilitation Unit

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## Introduction

- Immobilization hypercalcemia (IH) typically develops 4-6 weeks post trauma. However it can present as early as two weeks and as late as six months.
- It is more common in children and adolescents due to an increased rate of bone turnover.
- We report a patient who developed hypercalcemia after sustaining multiple fractures and following prolonged immobilization.

## Case

- A 24 year old man was admitted for neurorehabilitation after a road traffic accident, sustaining a subarachnoid haemorrhage and multiple fractures.
- Four months after admission, he developed hypercalcemia (3.63 mmol/l) and PTH was suppressed at 0.9 pmol/l.
- He had mild renal impairment initially.
- Thyroid and adrenal function, serum ACE, Vitamin D level and PTHrp were normal. Myeloma was excluded. CT Thorax, abdomen & pelvis and bone scan were unremarkable except for extensive heterotopic ossification around both hips (Figure 1). Heterotopic ossification is frequently seen with musculoskeletal trauma<sup>1</sup> but it is not associated with pathophysiology of IH.
- Normocalcaemia was achieved following intravenous fluids and zoledronic acid (Figure 2).
- After extensive investigation a diagnosis of IH was made. Serum calcium was normal when last checked 9 weeks after intravenous bisphosphonate therapy.

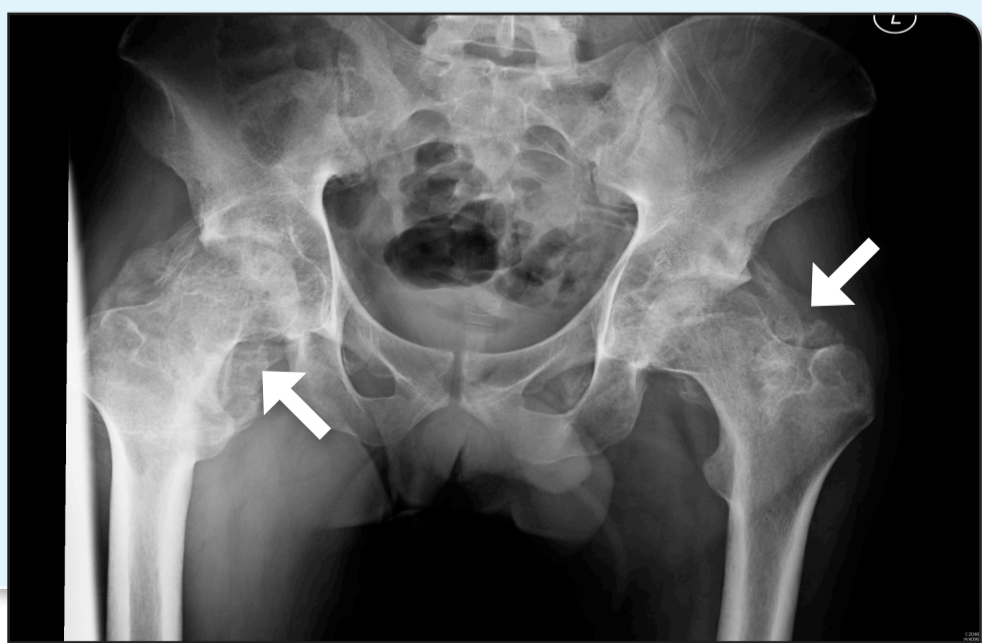


Figure 1 : Plain X-Ray Pelvis shows Heterotopic Ossification .

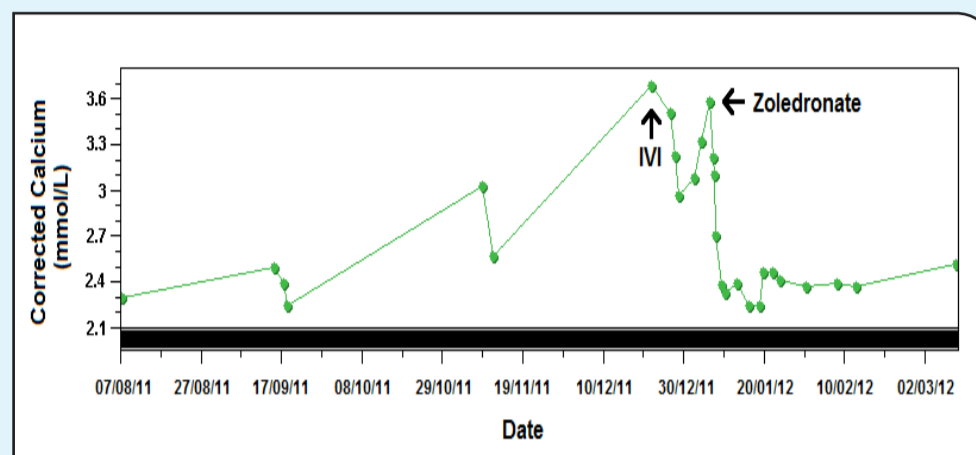


Figure 2: Serum calcium levels before and after intravenous bisphosphonate therapy.

## Discussion

- IH is an under-recognized cause of hypercalcaemia.
- In one study, it occurs in approximately 10-23% of patients with spinal cord injuries<sup>2</sup>.
- Immobilization is usually secondary to spinal cord injury, orthopaedic fracture, Guillain-Barre syndrome and cerebral vascular accident.
- The exact mechanism of IH is not clear. HM Frost<sup>3</sup> described the mechanostat theory and proposed that IH is related to loss of mechanical stress on the bone, leading to increased osteoclastic bone resorption and reduced osteoblastic bone formation.
- Risk factors for IH include more severe immobilisation, pre-existing renal disease, childhood/adolescence, and metabolic acidosis.
- Passive mobilisation or weight-bearing rehabilitation appears to be effective therapy and should be instituted early.
- The majority of patients respond to a single dose of bisphosphonate. Occasionally a second dose is required.<sup>4</sup>
- Although our patient presented later after his trauma than average, the diagnosis should be considered in the appropriate clinical setting after excluding other common causes of hypercalcaemia.
- Clinical suspicion of IH may reduce the need for unnecessary invasive procedures.

### References

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