CASE REPORT

Complete C4 vertebral body destruction: a dramatic finding in a patient with a new diagnosis of myeloma

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SUMMARY

We report the case of a 60-year-old woman who presented to accident and emergency with left arm and neck pain. She had reported these symptoms to her general practitioner over the preceding weeks but no imaging was obtained. Radiographs revealed a pathological lesion in her left humerus. On review in the Orthopaedic Fracture Clinic radiographs of the cervical spine were obtained and showed complete destruction of the C4 vertebral body. She underwent corpectomy and stabilisation. Tissue diagnosis confirmed myeloma and she is now under the care of the haematologists receiving chemotherapy and radiotherapy. Myeloma is known to cause severe destructive lesions. Through the dramatic radiographic images this case serves as a reminder to clinicians to obtain imaging of patients with a new or existing diagnosis of malignancy, who show symptoms of skeletal pain, as lesions requiring emergency management may be present.

BACKGROUND

Multiple myeloma is the most frequent primary cancer affecting the skeleton.¹ In approximately 20% of patients a pathological fracture is the first presentation of the disease.² Lesions in the bone can be extensive and severe.³ We report the case of a patient who was diagnosed with a pathological fracture of her left humerus following presentation in accident and emergency (A&E) with worsening left arm pain. She had reported symptoms of pain in her left arm and neck to her general practitioner over the preceding weeks but no imaging was obtained. Imaging of her cervical spine was not obtained in A&E despite her symptoms of neck pain even in the context of the new diagnosis of a pathological lesion. On review in the Orthopaedic Fracture Clinic cervical spine radiographs were obtained. These revealed an unstable cervical spine with complete destruction of the C4 vertebral body. Through the dramatic radiographs, this case serves as an illustration of the importance of imaging the spine, in patients with a new or existing diagnosis of malignancy, if they display skeletal symptoms, as destruction can be severe and warrant urgent attention.

getting worse. She had presented to her general practitioner during the preceding weeks with pain but no imaging was obtained. There was no history of trauma. Following examination of her arm, radiographs of the humerus were obtained. These showed a lesion in the lower half of the humerus with abnormal appearance of the bone throughout its length (figure 1). Despite symptoms of neck pain in A&E no cervical imaging was obtained. A&E staff provided acute management of the humerus fracture with splinting of the fracture and analgesia and arranged for review in the Orthopaedic Fracture Clinic for further investigation and to plan definitive orthopaedic management.

On review in the fracture clinic it was clearly felt the lesion in the left humerus was pathological. A full system inquiry was therefore conducted and examination performed. In addition to the pain in her left humerus it was noted that she had neck pain. As a pathological process was suspected, radiographs were obtained to rule out further pathological lesions in the cervical spine. Review of the radiographs revealed a rather dramatic finding with complete absence of the C4 vertebral body (figure 2). Given the unstable nature of this lesion the patient was immediately immobilised in a hard cervical collar and admitted for further investigation and review by the spinal surgery team.

The patient underwent MRI of the whole spine and CT scan of the neck, chest, abdomen and pelvis. MRI of the cervical spine revealed an

Figure 1 Pathological lesion in left humerus with abnormal bone architecture proximally and distally.

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CASE PRESENTATION

A 60-year-old woman presented to our institution's A&E with severe pain in her left upper arm and pain in her neck. The pain in her arm had been present for a number of weeks and was progressively

Figure 2 Anteroposterior and lateral cervical spine radiographs reveal complete absence of C4 vertebral body.

abnormal soft tissue mass replacing the C4 vertebral body and left posterior elements with extension into the paraspinal soft tissues. The cord was contacted and displaced but not compressed (figure 3). A tumour was also identified in the T6 vertebral body but without compression of the cord. CT scan confirmed the lytic lesions of C4 (figure 4) and T6, which were highly suspicious of metastasis but did not isolate a solid organ primary in the neck, chest, abdomen or pelvis. A myeloma screen was ordered including a serum electrophoresis and urinary Bence-Jones protein analysis.

The patient continued to be in severe pain from the humerus but given the unstable nature of the cervical spine, stabilisation of this was prioritised. The patient underwent C4 corpectomy and stabilisation with a cage and plate from C3 to C5 (figure 5). Tissue samples were obtained intraoperatively for histology. Several days later, after recovery from the cervical stabilisation

Figure 3 Sagittal T2 MRI at a level of C4 vertebral body displaying bony destruction and surrounding soft tissue reaction.

Figure 4 Axial CT image at a level of C4 demonstrating bony destruction of vertebral body.

surgery, the patient underwent intramedullary fixation of the left humerus (figure 6).

Investigations confirmed a diagnosis of myeloma. Bence-Jones protein analysis revealed a monoclonal IgG κ band. Immunoglobulins and electrophoresis showed IgA and IgM levels of 0.54 and 0.36 respectively with a monoclonal band present in β . Tissue samples taken at the time of surgery revealed a B-cell, mature, plasma cell myeloma. The haematology team reviewed the patient and plans were made for her to start chemotherapy and radiotherapy once the surgical wounds had healed.

OUTCOME AND FOLLOW-UP

Following discharge from hospital the patient has started chemotherapy and radiotherapy.

From the spinal surgery perspective she has been reviewed at 8 weeks postoperatively and has made good progress. Her surgical wounds have healed. The corpectomy cage and plate remain in a satisfactory position. Her pain is controlled and there are no signs of cord compression on examination.

DISCUSSION

We report the case of a dramatic radiological finding of complete destruction of the C4 vertebral body in a patient presenting with a pathological lesion of her left humerus. We have been unable to identify similar images or case reports of such dramatic isolated radiographic appearances in the literature. Myeloma is however common and is known to produce

Figure 5 Postoperative anteroposterior and lateral radiographs show corpectomy cage and anterior cervical plate in situ.

Figure 6 Postoperative radiographs of left humerus fracture intramedullary stabilisation.

destructive lesions.³ Up to 20% of patients present with a pathological lesion and the majority of patients will have a pathological fracture throughout the course of their disease.² The spine is one of the most commonly affected sites.²

In the majority of cases, chemotherapy and/or radiotherapy is sufficient to control symptoms in the spine. In cases where there is instability of the spine, pain or neurological compromised surgical fixation may be required.⁴ Dürre *et al*⁵ reported a series of 27 patients who underwent surgical fixation of the spine for myeloma lesions concluding that surgical fixation is an effective method of treatment with regard to quality of life and neurological condition. More recently, minimally invasive/percutaneous methods of stabilising the spine have produced successful results.^{6–9} Given the extent of destruction and resulting instability an open stabilisation was required in the reported case.

In the case reported here, due to the destruction of the C4 vertebral body, the patient had an unstable cervical spine that could have precipitated catastrophic neurological impairment. Opportunities to identify this lesion earlier were missed. This case with the dramatic cervical spine radiograph images presented serves as a reminder to clinicians that we must be alert to the possibility of skeletal lesions in a patient with proven or

suspected malignancy when they present with pain. Furthermore when symptoms are related to the spine, investigations should be conducted thoroughly and expeditiously to rule out instability and prevent serious neurological compromise.

Learning points

- ▶ All patients presenting with skeletal pain and a confirmed or suspected diagnosis of malignancy should undergo imaging.
- ▶ Clinicians should equip themselves with the knowledge and skills to instigate the basic management of a potentially unstable cervical spine as this may unexpectedly present itself.
- ▶ The majority of patients with myeloma-associated lesions of the spine do not require surgical treatment but good results have been reported in those with instability, refractory pain or neurologically compromised.

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Competing interests None.

Patient consent Obtained.

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