

# Spastic quadriparesis due to pathological fracture of odontoid secondary to carcinoma prostate: A rare presentation

### ABSTRACT

Prostate carcinoma presenting as symptomatic metastases to atlantoaxial spine is extremely rare. Spastic quadriparesis due to pathological fracture of odontoid as the only initial manifestation without symptoms of primary malignancy is rarer still. We report a 64-year-old male who presented with progressive spastic quadriparesis along with urinary retention of 3 weeks duration. Computed tomography and magnetic resonance imaging cervical spine and craniocervical junction showed type III pathological fracture of odontoid with anterior translation of C1 with spinal cord compression. Biopsy from an enlarged prostate showed adenocarcinoma of prostate. The patient was managed conservatively from neurological aspect as he refused for any surgical intervention.

**Keywords:** Atlantoaxial metastasis, carcinoma prostate, pathological fracture odontoid, quadriparesis

### INTRODUCTION

The most common cause of neck pain in the elderly is degenerative disc disease.<sup>[1]</sup> Metastatic atlantoaxial malignancy is rather uncommon in patients presenting with cervical pain.<sup>[2]</sup> Metastatic cancers commonly associated with spinal metastasis include breast, lung, and prostate but they are usually to the dorsal spine.<sup>[3]</sup> More than 80% of bony metastases from all tumors are located in the vertebrae, hips, and ribs due to high blood flow. Spinal metastasis is generally to the dorsolumbar spine. Metastasis to the atlantoaxial spine are rare and from cancer prostate rarer still.<sup>[2,4,5]</sup> Sporadic case reports of metastases to cervical spine from thyroid carcinoma, nasopharyngeal rhabdomyosarcoma, and Von Recklinghausen's neurofibromatosis have also been reported in the literature but not to the atlantoaxial spine. Even if there is metastasis to the atlantoaxial spine, these patients present with bony pains or pathological fractures.<sup>[6]</sup> Presentation with cervical compressive myelopathy due to a metastatic atlantoaxial spine tumor is not very common. We report a case of prostate malignancy presenting as spastic quadriparesis as the first clinical symptom. An extensive literature search

reveals that this is a very atypical presentation of carcinoma prostate. To the best of our knowledge, this is the first case of an undetected prostatic cancer (with no symptoms pertaining to prostate) presenting as a pathological fracture of the odontoid causing myelopathy.

### CASE REPORT

A 64-year-old male presented with pain in the back of neck with restricted movements of 3 weeks duration. There was a history of the tightness of all four limbs of similar duration. The patient also complained of weakness of all four limbs of 2 weeks duration with urinary retention of 2 days duration. There was no history of lower urinary tract symptoms,

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hematuria, trauma to the neck, fever, or paraesthesia. General examination was unremarkable. Neurological examination showed increased tone of all four limbs with power of 4/5 (MRC grade) in all muscle groups. Bilateral hand grip was approximately 80%. Bilateral planters were extensor. There was no sensory deficit. Locally neck movements were restricted in all directions. X-ray craniocervical junction (CVJ) showed type III odontoid fracture [Figure 1]. Computed tomography (CT) CVJ and cervical spine showed type III odontoid fracture with anteroinferior displacement of dens with fracture bilateral pars interarticularis of axis vertebra [Figure 2]. Magnetic resonance imaging cervical spine showed compression of adjacent cervical spinal cord with subtle cord edema [Figure 3]. In view of pathological fracture in an elderly male with no history of trauma, a metastatic workup was done. Contrast-enhanced CT chest and abdomen showed bulky prostate and multiple skeletal metastasis. Bone scan showed multiple skeletal hot spots in calvarium, sternum, scapulae, bilateral humerus and forearm bones, multiple vertebrae (C2, D3, D6, D7), multiple ribs, pelvic bones, bilateral femur and tibiae [Figure 4]. Serum prostate-specific antigen was 150 ng/ml and prostatic biopsy

showed adenocarcinoma (Gleason score 3 + 3 = 6). The patient was offered surgery for the pathological odontoid fracture in the form of decompression and spinal stabilization. However, he refused surgery and was managed conservatively with a cervical collar and symptomatic pain relief.

## DISCUSSION

The most common cause of cervical pain in adults is degenerative disc disease.<sup>[1]</sup> Spinal metastasis accounts for 5%–10% in cancer patients. The most symptomatic spinal metastases are found in the thoracic part of the spine (70%) followed by the lumbar (20%) and cervical region (10%).<sup>[7]</sup> However, quadriplegia due to a cervical/atlandoaxial spine metastasis is not very common, and the same as the initial symptom with no manifestation of primary disease is



Figure 1: X-ray cervical spine lateral view showing type III comminuted odontoid fracture

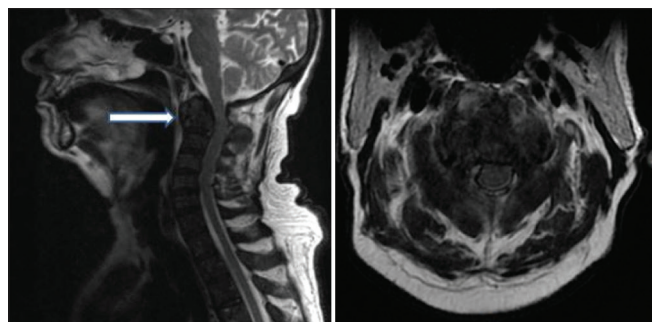


Figure 3: Magnetic resonance imaging cervical spine (sagittal and axial) showing abnormal T2 signal intensity involving C2 with cord compression and edema



Figure 2: Noncontrast computed tomography craniocervical junction (sagittal and axial) showing anteroinferior displacement of dens with fracture bilateral pars interarticularis of C2 vertebra

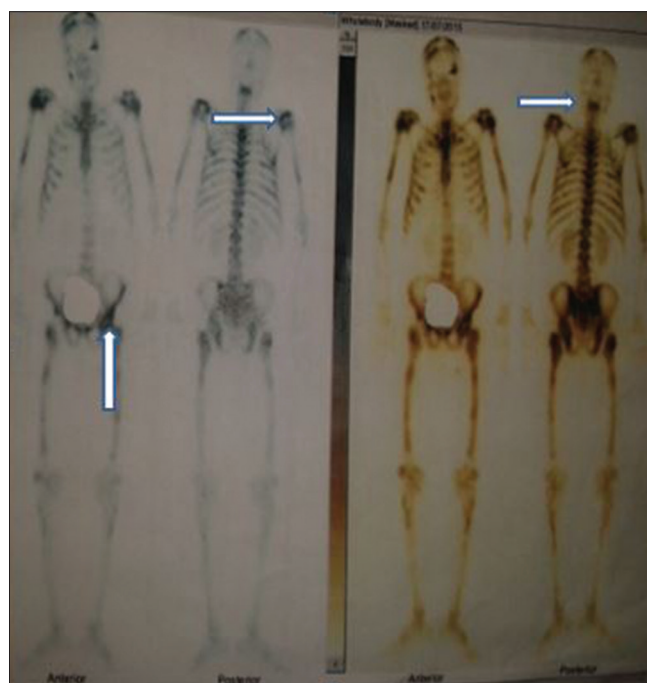


Figure 4: Bone scan showing multiple skeletal hotspots suggestive of bony metastasis

extremely rare. Lakemeier *et al.*<sup>[7]</sup> reported that in one of ten cases of all newly diagnosed spinal (including dorsolumbar spine) metastasis, cancer was not known before. It is known fact that in adults up to 60% of spinal metastasis are either caused by breast, lung, or prostate cancer with a preponderance among males.<sup>[7]</sup> However, these are metastasis to the dorsolumbar spine. Symptomatic metastasis to atlantoaxial spine is extremely rare.<sup>[4]</sup> Most metastases to the atlantoaxial spine present with neck pain. Myelopathy due to instability or an epidural mass is not very common in this region as per fairly large series from Memorial Sloan-Kettering Cancer Center and Prince of Wales Hospital Hong Kong.<sup>[2,8]</sup> Individual case reports of atlantoaxial metastasis also bear this out.<sup>[7,9,10]</sup> Rarely spastic quadriparesis due to metastasis to the atlantoaxial spine has been reported.<sup>[5]</sup> However, no case has been reported where this was the initial primary presentation from an undetected carcinoma prostate as in our case. Since most cases of atlantoaxial metastasis present with pain (and rarely with compressive myelopathy), a conservative approach is followed. In patients with normal alignment and minimal subluxation external beam radiotherapy is given. Surgery is reserved for selected patients with significant compression or subluxation/instability.<sup>[2]</sup> However, some authors advocate aggressive surgery even if pain is the only symptom.<sup>[8]</sup> In some patients, surgery might be warranted, but the general condition of the patient might preclude surgery.<sup>[7,10]</sup> Preoperative skull traction can be applied to maintain atlantoaxial alignment.<sup>[8]</sup> Surgical options are primarily posterolateral decompression and occipito-cervical fusion.<sup>[2,6,8]</sup> Transoral decompression and fixation remain an option, but the extreme bony erosion might make it technically non-feasible.<sup>[9]</sup>

## CONCLUSION

Metastases to the spinal column are generally located in the dorsal or lumbar spine. Metastasis to the cervical spine is not very common, and metastasis to the atlantoaxial spine is very rare. The metastases are generally from the breast, lung,

thyroid, etc. Prostate as primary is rare. Most of the atlantoaxial metastases present with pain and compressive myelopathy in these patients are unusual. Compressive myelopathy due to an atlantoaxial metastasis as an initial manifestation from a previously undetected cancer prostate is extremely rare. Treatment for atlantoaxial metastasis has to be tailored to the individual patient. Those with only pain maintained atlantoaxial alignment or poor general condition should be treated conservatively with external beam radiotherapy. For better performance grade patients, those with compressive lesions and when atlantoaxial instability is there, decompression with spinal fixation is the standard of care.

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## Conflicts of interest

There are no conflicts of interest.

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